

Age is Protective While Economical Punctuation and Body Image Are Risk Factors to Body Concern

A Idade é um Fator Protetor, Enquanto a Pontuação Econômica e a Imagem Corporal São Fatores de Risco para a Preocupação com o Corpo

La Edad es un Factor Protector, Mientras que la Puntuación Económica y la Imagen Corporal Son Factores de Riesgo para la Preocupación por el Cuerpo

RESUMO

Este estudo investiga o impacto de fatores socioeconômicos, acadêmicos, antropométricos, comportamentais e de imagem corporal nas preocupações com o corpo entre estudantes de nutrição do sexo feminino. Realizado na região Centro-Oeste do Brasil, envolveu 173 estudantes de nutrição. Dados sobre fatores sociodemográficos, acadêmicos, antropométricos, comportamentais e de imagem corporal (utilizando a Escala de Avaliação da Figura de Stunkard, o Questionário de Desejos Alimentares e o Questionário de Forma Corporal) foram coletados. Os resultados revelaram que 46,24% das estudantes apresentavam algum nível de preocupação com o corpo, com 10,98% apresentando preocupações graves. O status econômico ($p=0,02$) e as variáveis antropométricas ($p=0,01$) estiveram associadas aos níveis de preocupação com o corpo. A idade incremental foi associada a menores chances de preocupação (OR=0,84; IC95%: 0,72-0,98). A chance de preocupação com o corpo aumentou com a pontuação econômica (OR=1,07; IC95%: 1,03-1,12) e com a Escala de Avaliação da Figura de Stunkard (OR=2,10; IC95%: 1,34-3,28). O estudo destaca a importância de implementar intervenções que abordem as preocupações corporais entre estudantes de Nutrição.

PALAVRAS-CHAVE: Comportamento alimentar, imagem corporal, estudantes, aparência física, corpo.

ABSTRACT

This study investigates the impact of socioeconomic, academic, anthropometric, behavioral, and body image factors on body concerns among female undergraduate nutrition students. Conducted in the Midwest region of Brazil, it involved 173 nutrition students. Data on sociodemographic, academic, anthropometric, behavioral, and body image (using the Stunkard Figure Rating Scale, Food Desire Questionnaire, and Body Shape Questionnaire) were collected. Results revealed that 46.24% of students had some level of body concern, with 10.98% experiencing severe concerns. Economic status ($p=0.02$) and anthropometric variables ($p=0.01$) were associated to body concern levels. The incremental in the age in such way that one year older represents less chance of being concerned (OR=0.84; IC95%: 0.72-0.98). There is a higher chance of being concerned of their bodies with the incremental of economical punctuation represents higher chance (1.07; 1.03-1.12) and Stunkard Figure Rating Scale (2.10; 1.34-3.28). It emphasizes the importance of implementing interventions that address Nutrition students' body concerns.

KEYWORDS: Eating behavior, body image, students, physical appearance, body.

RESUMEN

Este estudio investiga el impacto de factores socioeconómicos, académicos, antropométricos, comportamentales y de imagen corporal en las preocupaciones sobre el cuerpo en estudiantes de nutrición mujeres. Realizado en la región Centro-Oeste de Brasil, involucró a 173 estudiantes de nutrición. Se recopilaron datos sobre factores sociodemográficos, académicos, antropométricos, comportamentales y de imagen corporal (utilizando la Escala de Evaluación de la Figura de Stunkard, el Cuestionario de Deseos Alimentarios y el Cuestionario de Forma Corporal). Los resultados revelaron que el 46,24% de las estudiantes presentaban algún nivel de preocupación por el cuerpo, con un 10,98% experimentando preocupaciones graves. El estatus económico ($p=0,02$) y las variables antropométricas ($p=0,01$) estuvieron asociadas con los niveles de preocupación por el cuerpo. A medida que aumenta la edad, las posibilidades de estar preocupado por el cuerpo disminuyen (OR=0,84; IC95%: 0,72-0,98). También hay una mayor probabilidad de preocupación corporal con el aumento de la puntuación económica (OR=1,07; IC95%: 1,03-1,12) y con la Escala de Evaluación de la Figura de Stunkard (OR=2,10; IC95%: 1,34-3,28). El estudio destaca la importancia de implementar intervenciones que aborden las preocupaciones corporales en las estudiantes de Nutrición.

PALABRAS CLAVE: Comportamiento alimentario, imagen corporal, estudiantes, apariencia física, cuerpo.

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INTRODUCTION

Many people only understand body image as what they see in the mirror. However, it is a complex construct related to anthropometric variables, body shapes, and contours⁽¹⁾. Body image is also a response to thoughts, feelings, evaluations, and behaviors toward one's own body, resulting, therefore, in the identity that each person creates of themselves⁽²⁻³⁾. An individual's perception of their body image is influenced not only by aspects of their subjectivity but also by cultural and social factors⁽¹⁾.

In addition, body image perception can reveal satisfaction with the body but also indicate conditions such as body dissatisfaction, body image distortion, and even body image disorder. In these three situations, body concern is a present factor⁽²⁾, and, in excess, it is related to the development of eating disorders⁽⁴⁾. Distortions in body image perception can cause eating disorders, promoting changes in eating behaviors⁽⁵⁻⁶⁾. These changes are referred to as disordered eating, which is a complex

eating attitude⁽⁷⁾.

Pursuing a slim body is closely linked to this type of behavior, particularly in women who feel a greater desire and pressure to attain such a body⁽⁸⁾. This idealized body type is associated with the belief that it can lead to greater happiness and social status. This process appears to be more intense among healthcare students. College students in the nutrition course have a higher prevalence of body dissatisfaction⁽⁹⁾. The explanation for the higher prevalence can be attributed to the increased vulnerability of this population to aesthetic standards in response to an idealized image of what a nutritionist should look like⁽¹⁰⁾, which is loaded with stereotypes related to the anthropometric parameters of this public and their level of knowledge and professional qualifications⁽¹¹⁻¹²⁾.

Studies have found that women, especially Nutrition students, are most concerned about their bodies^(7,13). However, there is still a lack of understanding regarding other factors that may determine or predict body image concerns in this group. Although some associat-

ed factors are commonly assumed, the magnitude of the problem is yet to be determined. Therefore, this study aims to estimate the impact of socioeconomic, academic, dietary, and nutritional aspects on body concerns in female nutrition students to improve our understanding of such aspects.

METHODS

Study design, population and sample

This is a cross-sectional study conducted in the Midwest region of Brazil with female undergraduate students aged 18 years or older who were studying nutrition at a public university. The sample was calculated using the Epiinfo software version 3.5.1. An expected frequency of 21.7% risk of developing eating disorders⁽¹⁴⁾, 5% error, and 95% confidence interval were considered, resulting in 148 individuals. An additional 17% was calculated for eventual losses and withdrawal, totaling 173 individuals. Students on sick leave or suspended enrolment and pregnant women were excluded from the study.

Socioeconomic, academic, and anthropometric assessment

During the academic year of 2019 (March to November), the following variables were collected in person: age (in years and categorized in <20, 20-24, >24); self-reported skin color or ethnicity (white; non-white – i.e. black, brown, yellow, indigenous); marital status (with or without a partner); economical punctuation (higher score represents richest household); completion rate of the course (%); global average score (rated on a 0-10 point scale); attending teaching; research; and extension projects and weekly hours spending in this activities; attending social university programs; weight (in kilograms); height (in centimeters); and waist circumference (in centimeters); anthropometric measurements were performed according to Gordon; Chumlea; and Roche⁽¹⁵⁾. Weight and height data were used to calculate body mass index (BMI).

Behavioral and body image assessment

The following self-administered instruments were used for the behavioral and body image assessment: Stunkard Figure Rating Scale, Food Desire Questionnaire and Body Shape Questionnaire (BSQ). The assessment of body image satisfaction was analyzed using the Stunkard Figure Rating Scale. The scale comprises nine silhouettes ranging from extremely thin to very obese⁽¹⁶⁾. The student indicated the image that currently represents her with the word "Me", and then the image she would like to be with the word "Ideal". Body dissatisfaction was assessed by the discrepancy between the number of the figure chosen as current and the number of the figure chosen as ideal (Me - Ideal). Results closer to zero indicate less dissatisfaction, while results farther from zero indicate greater dissatisfaction. Positive values indicate dissatisfaction with being overweight, and negative values indicate dissatisfaction with being underweight.

The Food Desire Questionnaire was used to evaluate cravings for particular foods⁽¹⁷⁾. This questionnaire was minimally adapted to local foods⁽¹⁸⁾, preserving the list of 38 foods and beverages, as in the original version. The food list contained milk chocolate, dark chocolate, white chocolate, sandwiches/burgers, French fries, pizza, sugars and sweets, candies and chewing gum, sweet cookies, stuffed cakes, ice cream, savory cookies, simple cakes, French bread, wholemeal bread, stuffed bread/pies and fried/baked snacks, açai, beans and other vegetables, fresh/dried fruits, nuts and oil seeds, natural juices, vegetables/salads, poultry/fish, beef, pork and sausages, rice, pasta, cassava and whole grains, milk and dairy products, and cheese/dairy products. Participants were asked to rate how much they would like to eat each item in the questionnaire on a 5-point scale, ranging from 0 (no desire) to 4 (very high desire), with a maximum score of 152 points. The participants were instructed to answer the questionnaire regardless of the time of their last meal.

The Body Shape Questionnaire⁽¹⁹⁾ was used to assess the individual's level of concern about their body and weight over the past four weeks. This questionnaire included six possible answers: 1) Never, 2) Rarely, 3) Sometimes, 4) Often, 5) Very Often, and 6) Always. The classification was obtained based on the total points scored. The sum < 80 points indicated a standard of normality; between 81 and 110 points, mild concern; from 111 to 140, moderate concern; and > 141 points, severe and excessive concern about body image⁽²⁰⁾.

Statistical analysis

The database was prepared in the Excel for Windows program (version 10) with double entries to ensure data consistency. Normality was assessed by the Shapiro-Wilk test ($p > 0.05$). Sample characterization was performed by absolute and relative frequency for categorical variables, mean and standard

deviation for parametric variables, and median and percentile 25 and 75 for non-parametric variables. Fisher's exact test assessed the association between independent variables and the outcome (Body Shape Questionnaire classification – individual's concern about their own body shape). The Analysis of Variance test or the non-parametric equivalent Kruskal-Wallis was applied to compare means or medians between the independent variables and the outcome, considering a significance level of 5%.

A multiple regression analysis was conducted with an estimate of the cross-product ratio (Odds ratio) and its 95% confidence interval. All variables were included in an automated stepwise model; only those with $p < 0.20$ remained. The significance level used for all tests was 5%. This analysis was performed using STATA® software version 14.0.

Ethical aspects

The study followed the ethical principles outlined in the Declaration of Helsinki and was approved by the Research Ethics Committee of the Federal University of Goiás under protocol No. 11162919.9.0000.5083. All participants were duly informed about the study protocol and signed the Informed Consent Form.

RESULTS

The study included 173 undergraduate Nutrition students from the 1st to the 10th semester of the course. The mean age of the participants was 22.65 (SD=4.02) years, but they mainly are 20-24 years. Most students declared themselves non-white ($n=91$; 52.60%), lived without a partner ($n=115$; 66.47%), and attending in teaching, research, and extension projects ($n=115$; 66.47%). Forty-seven (27.17%) students participated in participation in social university programs (Table 1).

Table 1. Socioeconomic and academic characterization of nutrition students. n=173

Variables	n (%) or median (p25-p75)
Socioeconomic	
Age	
< 20 years	22(12.72)
20 to 24 years	122(70.52)
>24 years	29(16.76)
Skin Color or ethnicity	
White	82(47.40)
Non-white	91(52.60)
Marital Status	
Without a partner	115(66.47)
With a partner	58(33.53)
Economical punctuation	7.92(8.41)
Academic	36(29-43)
Completion rate of the course (%)	45.46(26.40-67.83)
Global average score	7.68(7.03-8.20)
Attending teaching, research, and extension projects	
Yes	115(66.47)
No	58(33.53)
Weekly hours attending teaching, research, and extension projects	6(0-15)
Attending social university programs	
Yes	47(27.17)
No	126(72.83)
Anthropometric	
Weight (kg)	55.90(51.80-64.40)
Body Mass Index (kg/m ²)	21.86(19.87-24.07)
Waist Circumference (cm)	70(66-75)
Behavioral and body image	
Stunkard Figure Rating Scale	1(0-1)
Food Desire Que	66(55-79)
Body Concern	76(55-102)

Original Article

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Age is Protective While Economical Punctuation and Body Image Are Risk Factors to Body Concern

Eighty students (46.24%) showed some degree of body concern, with 10.98% reporting severe concern. No significant differences were observed among body concern classifications and age, skin color or ethnicity, marital status, completion rate of the course, global average score, attending teaching; re-

search; and extension projects or social university programs, and food desire (Table 2). Students with mild or severe body concern were observed to have a higher economic status than those with no concern ($p=0.02$). In terms of the anthropometric variables, moderate and severe concerned students have higher

weight, body mass index and waist circumference than non-concerned students ($p=0.001$). The Stunkard Figure Rating Scale score was higher among participants with severe body concerns, while those with mild and moderate concerns did not present any differences (Table 2).

Table 2. Socioeconomic, academic, anthropometric, and psychological characteristics regarding nutrition students' concern about their bodies, median [interquartile range]. n=173

Variables	Individual's concern about their own body								p-value
	No concern n = 93 (53.76%)		Mild n = 42 (24.28%)		Moderate n = 19 (10.98%)		Severe n = 19 (10.98%)		
Socioeconomic									
Age, median, p25-75	22	[21-24]	22	[20-23]	21	[19-26]	22	[20-24]	0.278 ²
Skin color or ethnicity, n, %									0.441 ¹
White	46	49.46	22	52.38	6	31.58	8	42.11	
Non-white	47	50.54	20	47.62	13	68.62	11	57.89	
Marital Status, n, %									0.365 ¹
Without a partner	15	16.13	4	11.91	5	26.32	2	10.53	
With a partner	78	83.87	37	88.09	14	73.68	17	89.47	
Economical punctuation, mean, standard deviation	33.95 ^a	9.32	40.02 ^b	9.72	39.37 ^{ab}	10.82	40.21 ^b	11.35	0.002 ³
Academic									
Completion rate of the course (%), median, p25-75	47.30	[30.43-72.87]	43.28	[25.30-65.26]	36.30	[17.23-67.09]	42.90	[24.20-69.66]	0.732 ²
Global Average Score, median, p25-75	7.85	[7.37-8.25]	7.50	[6.83-7.97]	7.62	[7.18-8.29]	7.18	[6.88-8.11]	0.194 ²
Attending teaching; research; and extension projects, n, %									
Yes	62	66.67	30	71.43	11	57.89	12	63.16	0.738 ¹
No	31	33.33	12	28.57	8	42.11	7	36.84	
Weekly hours attending teaching, research, and extension projects, median, p25-75	7	0-15	9	0-12	2	0-4	8	0-20	0.188 ²
Attending social university programs, n, %									
Yes	27	29.03	8	19.05	5	26.32	7	36.84	0.478 ¹
No	66	70.97	34	80.95	14	73.68	12	63.16	



Anthropometric									
Weight (kg), median, p25-75	53.25a	[50.60-59.75]	56.20ab	[52.10-65.50]	68.35b	[60.10-74.40]	64.75b	[56.40-78.40]	0.001 ²
Body Mass Index (kg/m ²), median, p25-75	20.59a	[19.60-22.15]	22.33ab	[19.98-24.29]	25.84b	[23.01-27.30]	24.44b	[23.06-30.23]	0.001 ²
Waist Circumference (cm), median, p25-75	68.00a	[64.45-71.90]	70.00a	[65.80-75.10]	75.50ab	[70.00-81.80]	73.95b	[70.00-89.30]	0.001 ²
Behavioral and body image									
Stunkard Figure Rating Scale§, median, p25-75	0a	[-1-1]	1b	[1-1]	1b	[1-2]	2c	[2-3]	0.001 ²
Food Desire Questionnaire, median, p25-75	69	[55-83]	66.50	[56-77]	64	[52-84]	65	[55-83]	0.973 ²

p-value obtained by ¹Fisher's exact test;

²Kruskall-Wallis test; ³ANOVA one -way. Different letters in the same row differ from each other (p<0.05).

The odds of being concerned about their own bodies is lower with the incremental in the age in such way that one

year older represents a reduction of 16% of chance of being concerned (OR= 0.84, p=0.001). In such a way that, there are higher chance of being concerned of their own bodies with the incremental of economical punctuation represents

higher chance (7% for each point, p=0.023) and Stunkard Figure Rating Scale (110% for each point, p=0.001). No associations were observed among color, global mean course, body mass index, and body image concern (Table 3).

Table 3. Factors associated with the nutrition students' concern about their own body (no concern versus any degree of concern). n=173

Variables	Individual's concern about their own body		
	OR	95%CI	p-value [†]
Socioeconomic			
Skin Color or ethnicity(non-white vs white)	1.83	0.80;4.17	0.150
Age	0.84	0.72;0.98	0.023
Economical punctuation	1.07	1.03;1.12	0.001
Academic			
Global Average Score	0.65	0.40;1.05	0.081
Anthropometric			
Body Mass Index (kg/m ²)	1.17	0.99;1.38	0.057
Behavioral and body image			
Stunkard Figure Rating Scale (points)	2.10	1.34;3.28	0.001

OR= Odds ratio. CI= Confidence interval.

Multiple regression with odds ratio estimation (Odds ratio) and its 95% confidence interval (95%CI) in an automated stepwise model.

DISCUSSION

The findings of the present study

highlight the increase in body concern with advancing age among young female college students of Nutrition. Younger age was a protective factor, whereas the chance of showing some degree of body concern is higher in students of higher economic class and

with greater body dissatisfaction. In addition, the anthropometric variables evaluated differed significantly based on the level of body concern, as well as economic classification.

In our study, students with some degree of body concern achieved pos-

itive values on the body figure scale, indicating dissatisfaction with being overweight. Body dissatisfaction and the desire to achieve the ideal of thinness seem to be universal among college women. This ideal of thinness can result in a negative body perception, leading to frustration⁽⁷⁾. Another notable finding in our study is that students from higher economic classifications demonstrated a greater concern about their bodies. A study carried out with college students from various courses, and another conducted with students of both genders found results similar to those of the present study. They indicate that the higher an individual's economic class, the greater their dissatisfaction with their body image^(6, 21). Nevertheless, other studies reported that dissatisfaction and distortion of body image are more prevalent in populations with high social vulnerability^(6, 21-22), however, found that college women desire a thin body regardless of their economic class

Women from various age groups have distorted body image perceptions and attitudes and the factors related to this distortion are multiple⁽²³⁾. However, the accuracy in judging their current and ideal body shape is modulated by age and explained by the BMI and concern about the body parts⁽²⁴⁾. Body concern is associated with a higher BMI^(13, 25-26), and the severity of such concern can be influenced by the amount of excess weight⁽²⁷⁾. It is worth noting that individuals who are not overweight may also have body image concerns⁽²⁸⁻²⁹⁾. In our study, weight, BMI, and waist circumference differed in relation to the degree of body concern, even though only the group with moderate concern was overweight. Individuals exhibiting a normal concern pattern had lower median scores for these variables than those with a severe concern pattern. This means that students are concerned about their bodies regardless of whether they are at an appropriate weight or overweight. Al-

though there were differences in the medians of anthropometric variables among the levels of concern, no variable was associated with the outcome. BMI had marginal significance and influence on the statistical model but was not a factor associated with body concern. In groups of underweight, normal weight, and overweight (but not obese) individuals, as described here, the correlations between body image concern and body weight were inconsistent⁽²⁸⁻²⁹⁾.

Regardless of their nutritional status, college-aged women are, in particular, at higher risk of experiencing body dissatisfaction⁽³⁰⁻³¹⁾. In our results, we observed a clear association between body dissatisfaction and body concern; that is, students who were dissatisfied with their bodies were 2.10 times more likely to have body concerns. It is believed that this association is due to the idealization of thinness by this group, which predicts the concern about the body. Other studies conducted with a group of Nutrition students revealed that college students with normal weight were dissatisfied with their body image, wishing to change it to leaner bodies and adapt to social standards⁽³¹⁻³²⁾. Therefore, it can be inferred that social pressure on the aesthetics of Nutrition students is a factor influencing their self-perception of body image⁽³³⁾.

The current study holds significant implications as it questions the idealization of thinness among young Nutrition students. In addition to their self-perception of body image, concerns about their body image may affect their professional practice and influence the individuals under their nutritional care^(32, 34-35). Thus, developing interventions that address sociocultural pressures and unrealistic beauty ideals and integrate means of acceptance of one's body can be beneficial strategies⁽³⁶⁾. Interventions in the university environment have a

preventive effect on the development of eating disorders, reducing symptoms and risk⁽³⁷⁾. Understanding the factors that influence the self-perception of body image can play an essential role in weight control practices⁽²⁹⁾ and guide preventive actions.

CONCLUSION

In conclusion, the results of this study indicate that nearly half of the students reported some level of body concern, with one to ten experiencing severe concerns. Economic status and anthropometric factors were significantly associated with body concern levels. Specifically, older students were less likely to be concerned about their bodies. Conversely, higher economic status and higher scores on the Stunkard Figure Rating Scale were linked to an increased likelihood of body concerns. In this sense, the findings of the current study highlight the need to promote self-care actions among young college women, considering factors such as age, economic class, and body image as predictors of body dissatisfaction. This study has some limitations that include the cross-sectional design, which does not allow direct causal inferences between variables, the centrality of sample in a single region of the country.

DECLARATION OF COMPETING INTEREST

The authors report no conflicts of interest.

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