

Body image perception and satisfaction in university students

Percepção da imagem e satisfação corporal em estudantes universitários

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Abstract – Body image represents the mental perception of body shapes and is a multifactorial structure that includes psychological, physical and emotional elements. The discrepancy between the subjective perception of body image and the desire for the ideal body type can interfere with the feeling of satisfaction and trigger the desire for changes in appearance, directly interfering with mental health and general well-being. Men and women may differ in body image satisfaction due to the different social influences and beauty standards imposed. The aim of this study was to evaluate the subjective perception of body image and satisfaction with body shapes among men and women. The sample consisted of 100 college students of both genders. Subjective perception of body image and satisfaction were measured through self-assessment, through scale figure silhouettes. There was a significant difference in the subjective perception of body image in the comparison between genders, and women presented greater discrepancy between the real and the perceived image. In the analysis of satisfaction with body image there were no differences between genders and both presented high percentage of dissatisfaction. In addition, 46.2% of men would like to decrease their body shapes, 53.8% would increase them. As for women, 76.1% would like to decrease their body dimensions and 23.9% to increase them. The strong pressures imposed by society and the standards set by the prevailing media in determining body image dissatisfaction or self-assessment negatively, regardless of gender.

Key words: Body image; Personal Satisfaction; Self-Assessment

Resumo – A imagem corporal representa a percepção mental das formas do corpo e é uma estrutura multifatorial que inclui elementos psicológicos, físicos e emocionais. A discrepância entre a percepção subjetiva da imagem corporal e o desejo do tipo ideal de corpo pode interferir no sentimento de satisfação e desencadear o desejo por mudanças na aparência, interferindo diretamente na saúde psíquica e no bem-estar geral. Homens e mulheres podem apresentar diferenças na satisfação com a imagem corporal, em função das influências sociais distintas e dos padrões de beleza impostos. O objetivo deste estudo foi avaliar a percepção subjetiva da imagem corporal e a satisfação com as formas do corpo entre homens e mulheres. A amostra foi composta por 100 estudantes universitários, de ambos os sexos. A percepção subjetiva da imagem corporal e a satisfação foram medidas através de autoavaliação através da escala de figura de silhuetas. Houve diferença significativa na percepção subjetiva da imagem corporal na comparação entre sexos, sendo que as mulheres apresentaram maior discrepância entre a imagem real e a percebida. Na análise da satisfação com a imagem corporal não houve diferenças entre os sexos e ambos apresentaram alto percentual de insatisfação. Além disso, 46,2% dos homens gostariam de diminuir as formas corporais 53,8% de aumentá-las. Já as mulheres, 76,1% gostariam de diminuir suas dimensões corporais e 23,9% de aumentá-las. As fortes pressões impostas pela sociedade e os padrões definidos pela mídia prevaleçam na determinação da insatisfação com a imagem corporal ou na autoavaliação de forma negativa, independentemente do sexo.

Palavras-chave: Autoavaliação; Imagem corporal; Satisfação pessoal.

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INTRODUCTION

Body image (BI) represents the mental perception of body shapes, being a multifactorial structure that includes psychological, physical and emotional elements^{1,2}, as well as perceptive components (perception of the body as a whole); cognitive (assessment of the body and its parts); affective (feelings about the body) and behavioral (actions and behaviors that occur from perception)³.

The perception of body image is permanently in a state of change and may not correspond to the actual appearance, being influenced by subjective aspects such as attitudes, experiences and evaluations that the individual has of his own body⁴ and also for social aspects like the influence of media and the setting of beauty ideas standards⁵.

The discrepancy between subjective perception of body image and desire for the ideal body type can interfere with feelings of satisfaction and trigger emotional responses and yearning for changes in appearance, directly affecting psychic health and overall well-being^{4,6,7}. Thus, dissatisfaction with body image occurs when the perceived image and the desired image are not congruent, causing negative evaluation of the body itself⁸.

On the sociocultural construction of the body Goldenberg⁹ states that the valorization of certain attributes and behaviors over others, makes a body typical for each society. Because of this, individuals who do not fit beauty models may self-evaluate negatively or unrealistically and even engage in inappropriate behaviors to modify weight and body shape, such as excessive exercise, medication use, plastic surgery and eating disorders⁶.

Thus, culture determines the ideal standards of beauty and promotes increasing pressure that interferes with body image satisfaction³. Moreover, in Western countries thinness symbolizes competence, success, control and attractiveness, while being overweight represents laziness, personal indulgence, lack of self-control and poor willpower^{10,11}. In line with this beauty archetype, in the study of Freitas et al.¹² It was identified that men and women rated underweight people as more beautiful and desirable than obese people.

According to data released by the International Society of Plastic and Aesthetic Surgery¹³, Brazil was the second country in the world ranking of plastic surgery procedures. Approximately 1.44 million surgeries were performed in the country, representing 13.9% of the total number worldwide. The most popular plastic surgeries were liposuction and abdominoplasty, both directly related to the decrease in body size, reinforcing the premise of thinness as a beauty standard.

In addition to plastic surgery, body image dissatisfaction may also influence increased involvement with physical activity, as individuals dissatisfied with their bodies are more likely to engage in exercise programs¹⁴. Another important point refers to the inaccurate perception of body shapes that may also favor weight gain. Overweight and obese people who do not really self-evaluate are more likely to exhibit detrimental attitudes toward

maintaining proper weight, such as overeating, eating unhealthy foods, and low levels of physical activity¹⁵.

In relation to gender, the culture of corpulosity sets different standards of beauty for women and men. For women the model of thinness and fitness prevails. The female body should be well cared for, free from unwanted marks (wrinkles, stretch marks, blemishes and cellulite) and excess fat and sagging^{9,16,17}. For men, the pattern is based on low body fat and higher muscle mass¹⁸. These patterns were verified in the study of Kuan et al.¹⁹, in which women wanted a body figure below their real weight, while men chose overweight images.

In addition, women are more concerned and dissatisfied with their bodies, are more likely to follow strict weight loss diets and are at higher risk of developing eating disorders^{12,20}. Because of this, women are more likely to have distortions in the subjective perception of body image when compared to men, overestimating body size and indicating a desire to be thinner²¹.

Men, on the other hand, tend to accept their bodies better, since they are less predisposed to social influences and pressures and to stigmas related to body weight²². However, in the study of Radwan et al.²³ who assessed body image dissatisfaction in 308 college students and the association between real and perceived BMI, it was identified that 80.9% of participants were dissatisfied with body shape, with no differences between women and men. Similarly Coelho et al.²⁴ evaluated the body image satisfaction of 1591 adults, evidencing that 85.9% of the subjects indicated dissatisfaction with the body image.

Considering the problems involved with body image dissatisfaction and distortion, it is important to understand the influence of gender on the formation of body self-concept and central structures linked to the identity of individuals. Thus, this comparative study aimed to evaluate the subjective perception of body image and satisfaction with body shapes between men and women.

METHOD

Sample

The sample consisted of 100 university students of both sexes, with an average age of 26,26 ($\pm 6,01$). The subjects were divided into two groups, according to gender, for the comparative analysis of the proposed objective. The study was approved by the Local Ethic Committee at the author's University of Estado of Minas Gerais (UEMG) CAEE n° 97237218.4.0000.5525.

Instruments

Subjective perception of body image and body satisfaction were measured by self-assessment using the Silhouette Figure Scale (SFS) adapted and validated for the Brazilian population in the studies of Kakeshita²⁵ and Kakeshita et al.²⁶. The SFS is composed of 15 female body shape silhou-

ettes and 15 male silhouettes arranged in ascending order BMI, starting from the smallest value of BMI (12,5 kg/m²) for the greatest (47,5 kg/m²).

To determine the actual body image (BI) Body Mass Index (BMI) was calculated, which is a measure expressed by the relationship between body mass (Kg) divided by height in meters squared (BMI= kg/m²). From the BMI, the relationship between the subjective perception of body image (SPI) and the real body image (BI) was established. For this, table 1 was used as reference, which shows the correspondence between BMI values and the representation of the SFS.

Table 1. Relationship between BMI and Silhouette Figure Scale. Source: Kakeshita25.

Figure	BMI Average (kg/m ²)	BMI range		Corresponding average weight	
		Minimum	Maximum	Female	Male
1	12.5	11.25	13.74	34.03	36.98
2	15	13.75	16.24	40.84	44.38
3	17.5	16.25	18.74	47.64	51.77
4	20	18.75	21.24	54.45	59.17
5	22.5	21.25	23.74	61.26	66.56
6	25	23.75	26.24	68.06	73.96
7	27.5	26.25	28.74	74.87	81.36
8	30	28.75	31.24	81.67	88.75
9	32.5	31.25	33.74	88.48	96.15
10	35	33.75	36.24	95.29	103.54
11	37.5	36.25	38.74	102.09	110.94
12	40	38.75	41.24	108.90	118.34
13	42.5	41.25	43.74	115.71	125.73
14	45	43.75	46.24	122.51	133.13
15	47.5	46.25	48.75	129.32	140.52

Note. BMI: body mass index

Experimental Design

The study was approved by the Research Ethics Committee of the University of Estado de Minas Gerais (UEMG), CAEE n° 97237218.4.0000.5525. Upon approval, the university students of UEMG - Ibitaré Unit were invited to participate in the research. The interested subjects read and signed an Informed Consent Form (ICF). For the data collection session, each volunteer attended the indicated place, according to the pre-scheduled time. First, the volunteer's height and body mass were measured for later BMI calculation. Then, the SFS was presented and the subject chose a representative figure for two questions, as follows: (1) Which image represents your body? (2) What body image would you like to have?

In case of selection of the same figure, the subject was classified as "satisfied" with his body image. When the figure chosen as "desired" was larger than the SPI, the intention to increase body size was considered. On the other hand, when the chosen figure was smaller, the desire to reduce it was considered. In both cases the subject was classified as dissatisfied with his body image.

Treatment and Data analyses

The measurements verified in this study were: (1) Subjective Body Image Perception (SPI); (2) Real Body Image (BI); (3) Desired Body Image (ID); (4) the difference between BI and SPI (Distortion); and (5) the difference between BI and ID (range).

The SPI indicates in the SFS (between 1 to 15) represents the subject's body (reference). From this proposition, this study also adopted other measures associated with SPI. Using the same scale, when an individual indicates a figure representing a desired image (ID), this measurement can give direction to the goal each one may have. To make comparisons by the scale, the real body image (BI) was adopted, which deals with associating the figure of the scale that corresponds to the volunteer's BMI.

However, this study also proposed two new forms of measurement, distortion and range. Distortion is the distance the individual has between the SPI and the BI. And Reach deals with the distance between BI and ID.

Descriptive statistics were performed using median and interquartile range. Normality was verified by the test Komolgorov-Sminorv, none of the data presented normal distribution. The significance value was $\leq 0,05$. Data were divided into two groups: (M) male subjects and (F) female subjects.

For inferential analysis of the data it was used tests U Mann-Whitney for the comparison of the above measures between the sexes. In addition, to verify the association between satisfaction with body image and gender, the test was performed Independence Chi-Square.

RESULTS

The descriptive characteristics of the sample are presented in Table 2. Both groups presented BMI values corresponding to SFS figure 6, being classified as eutrophic in relation to the appropriate distribution of body mass and height.

Table 2. Sample descriptive characteristics

Variables	Female (n=50)				Male (n=50)			
	Median	SD	Minimum	Maximum	Median	SD	Minimum	Maximum
Age (years)	26.5	6.41	20	40	23.0	5.49	20	40
Height (cm)	162	6.68	149	182	176	7.18	150	195
Mass (Kg)	63.0	12.7	42.0	90.0	74.5	12.2	48.0	108.0
BMI (Kg/m ²)	23.67	3.88	17.84	32.90	23.98	3.65	18.99	37.13

Note. BMI (body mass index), SD (standard deviation)

In the analysis of Subjective Body Image Perception (SPI), the central tendency was the choice of figure 9 by women (interquartile range ± 4) and figure 6 by men (interquartile range ± 4). In the comparison of SPI between sexes, there was a significant difference in the results presented by women SPI ($U = 801.5$, $p \leq 0.05$) (Figure 1A).

Distortion analysis refers to the difference between BI and SPI. There was a significant difference for this measure in the comparison between men and women. ($U = 689, p \leq 0,05$) (Figure 1B). Women presented as central tendency the Distortion of 3.0 (standard deviation ± 1.73) and for men the Distortion was 1.0 (standard deviation ± 1.08).

Regarding Desired Image (ID), women presented as their central tendency the choice of figure 7 (interquartile range ± 2) and men opted for figure 6 (interquartile range ± 2). No significant differences were observed for this measure when comparing gender ID. ($U = 975,5, p \leq 0,05$) (Figure 1C).

The distance between the BI and the subject's ID was assessed by means of the variable called Range. For this analysis there was no significant difference between genders. ($U = 1128,5, p \leq 0,05$) (Figure 1D).

In the analysis of satisfaction an association was used through the Chi-square of independence, which indicated no significant difference between Satisfaction and Sex, even after the use of the correction of *Bonferroni* (

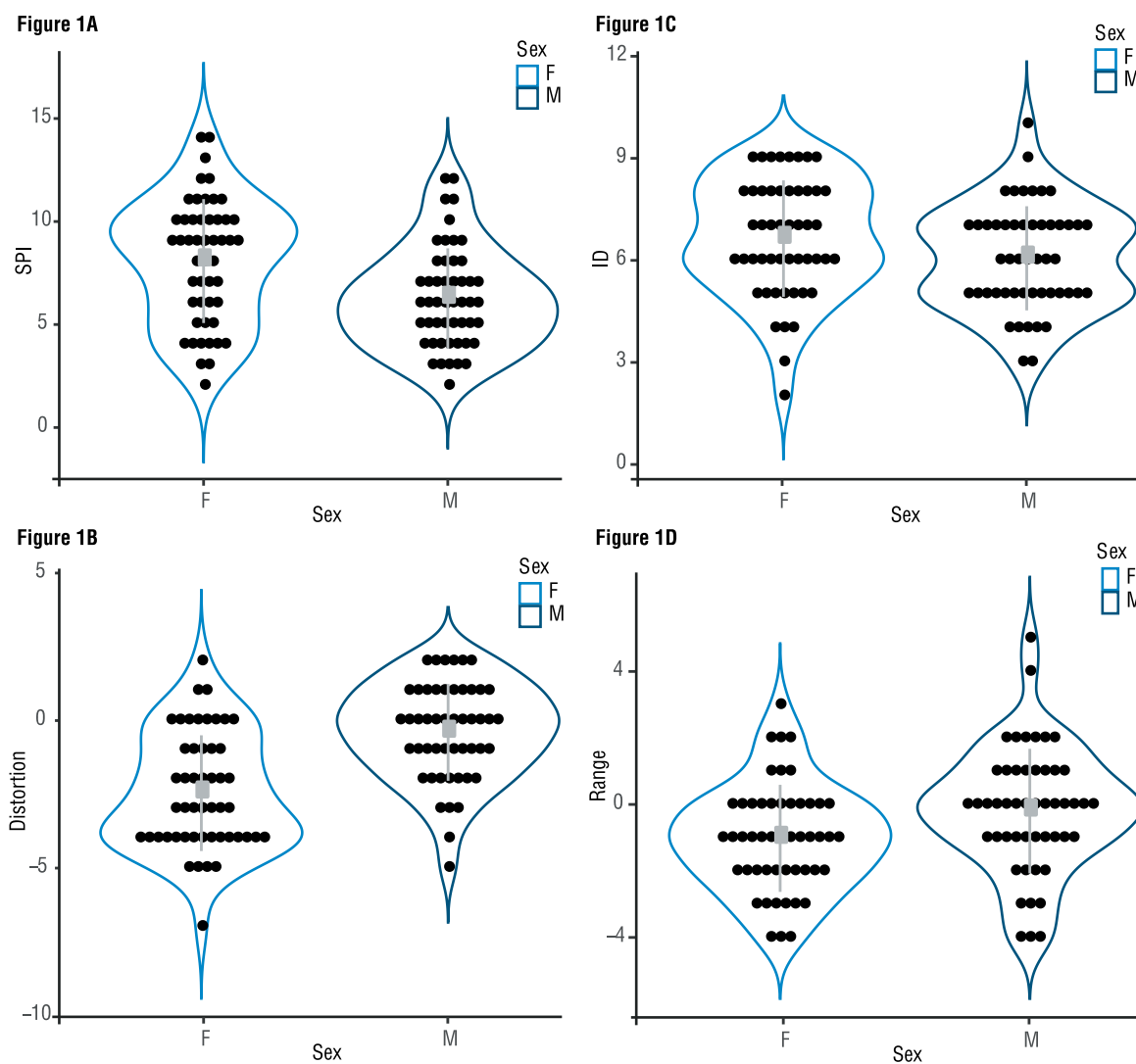


Figure 1. Comparison of Subjective Body Image Perception (SPI) (Figure 1A), distortion (Figure 1B), Desired Body Image (ID) (Figure 1C), and range of comparison (Figure 1D), between women and men.

$\chi^2_{Obs} = 5,26, p \leq 0,0025$). Frequency analysis of observed data also indicated that men and women are dissatisfied with body image (Table 3).

Table 3. Satisfaction with body image

	Satisfaction (n)	Percentage	Dissatisfaction (n)	Percentage
Females	4	8%	46	92%
Males	11	22%	39	78%

Of the 39 men dissatisfied with body image, 46.2% indicated the desire to decrease body dimensions ($n = 18$) and 53.8% indicated the desire to increase body dimensions ($n = 21$). Regarding dissatisfied women, 23.9% indicated the desire to increase their body dimensions ($n = 11$) and 76.1% indicated the desire to decrease their body dimensions ($n = 35$).

DISCUSSION

The present study evaluated the SPI and body satisfaction, as well as the actual (BI) and desired body images (ID). In addition, the responses between men and women were compared to identify the influence of gender on these variables. Finally, the study proposed two new variables, called Distortion (difference between actual image and subjective perception of image) and Range (difference between actual and desired image).

The results indicated that there was a significant difference in SPI between men and women, in which women overestimated their body shapes and chose larger figures than BI. There was also a significant difference in the Distortion analysis, as women presented greater discrepancy between BI and SPI. Alipour et al.²⁷ evaluated 184 college women and found that only 35.86% of them choose a correct body image. In another study it was observed that women tend to rate themselves as heavier compared to men, even when they have adequate BMI²⁸.

In the present study, women tended to choose representative images of bodies larger than their actual body shapes. Similarly, in studies Ansari et al.²⁰ and Kiviruusu et al.²¹ the women rated themselves as heavier and indicated a desire to be thinner. In this sense, it can be said that women are more influenced by the social impositions of the ideal model of body and beauty^{9,16,17} and are more likely to have SPI changes⁶.

In choosing the desired image (ID) there were no significant differences between women and men. However, the women self-rated as representative of figure 9 and chose as desired figure 7, indicating the desire to decrease body size. These results are in accordance with Kuan et al.¹⁹ and Jiménez et al.²⁹ that highlighted the women would like to lose weight by choosing leaner body images as desired. Similarly, Heiman and Olenik-Shemesh³⁰ identified that women are more concerned with body weight than men and are influenced by the media in determining their ideal appearance, projecting the desire for a tall, lean body.

For men, there was no discrepancy between SPI and ID. These results

differ from the study of Kuan et al.¹⁹ who found that men demonstrated a desire for an overweight body shape. However, some studies indicate that men have better acceptance of their bodies and are less prone to social influences on an ideal body pattern²².

In the satisfaction with body image variable, no differences were found between genders, and both men and women presented a high percentage of dissatisfaction. Still in this scope, it is noteworthy that 39 men (78%) were dissatisfied with body image, selecting a different ID from the PSI and 46 women (96%) also showed incongruence between the ID and the SPI. Similarly, in the study of Jiménez et al.²⁹ men and women presented 75% dissatisfaction with their body shape. Coelho et al.²⁴ also identified a dissatisfaction percentage of 85.9% in the participating subjects, without gender distinction. Conti et al.¹⁰ verified dissatisfaction for both sexes, especially regarding excess weight and abdominal fat. Already in the study Freitas et al.¹² it was observed that the percentage of dissatisfied women was double compared to men, reinforcing a more negative self-perception of women about body image.

Results indicated that women and men are dissatisfied with body image. In this regard, it is important to note that dissatisfaction with body shapes can trigger harmful health behaviors such as strict diets and the increased risk of developing eating disorders^{12,20}. Thus, it is essential to understand in a broader sense the possible influences of dissatisfaction with body image and the emergence of health risk behaviors, and it is necessary to deepen this issue.

Regarding the limitations of the study, it is noteworthy that the sample investigated showed similarity of demographic and sociocultural characteristics, such as age and educational level. These similarities may have influenced the perception of the ideal body type and satisfaction with body image, since the representation of body image suffers interference from the social context. Thus, it is suggested to investigate groups with greater distinctions in relation to socio-cultural aspects in the search for broader results.

CONCLUSION

Body image is an important construct of personal identity and is related to the subjective perception that the subject presents of his body dimensions. In addition, the subjective perception of body image and the level of satisfaction with the body can directly interfere with psychic health and general well-being, leading to the adoption of inappropriate behaviors and severe consequences for the subjects' health.

The results of this study indicate that both men and women had a high percentage of dissatisfaction with body image, with no differences between genders. In addition, women also had a subjective perception of body image that diverged from actual body image. Because of this, it can be said that the strong pressures imposed by society and the standards set by the media prevail in determining body image dissatisfaction or self-assessment negatively, regardless of gender.

Further studies are suggested to identify the attitudes assumed by the subjects regarding dissatisfaction with body image and its possible health risks.

COMPLIANCE WITH ETHICAL STANDARDS

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Ethical approval

Ethical approval was obtained from the local Human Research Ethics Committee – Ethical Committee of the Universidade do Estado de Minas Gerais CAEE n° 97237218.4.0000.5525 and the protocol was written in accordance with the standards set by the Declaration of Helsinki.

Conflict of interest statement

The authors have no conflict of interests to declare.

Author Contributions

Conceived and designed the experiments: I.L.B.L and A.S. Performed the experiments and analyzed the data: I.L.B.L, J.R.V.O and R.C.G. Contribute reagents/materials/analysis tools: M.T.M, J.R.V.O and M.P.C. Wrote the paper: I.L.B.L, A.S.

REFERENCES

1. Secchi K, Camargo BV, Bertoldo RB. Percepção da imagem corporal e representações sociais do corpo. *Psic Teor Pesq* 2009;25(2):229-236.
2. Malete L, Motlhoiwa K, Shaibu S, Wrotniak BH, Maruapula, SD, Jackson, et al. Body image dissatisfaction is increased in male and overweight/obese adolescents in Botswana. *J Obes* 2013;2013(2):763624.
3. Thompson JK, Heinberg LJ, Altabe M, Tantle-Dunn S. *Exacting Beauty: theory, assessment, and treatment of body image disturbance.* Amer Psych Assoc 2002.
4. Vaquero-Cristóbal R, Alacid F, Muyor JM, Lopez-Miñarr P A. Imagen corporal: revisión bibliográfica. *Nutr Hosp* 2013; 28(1):27-35.
5. Santos JF, Oliveira P, Campos AA, Pereira EO, Sousa EA. Relação entre insatisfação corporal e atividade física em adolescentes da zona urbana de irati-pr. *Rev Educ Fis/Uem* 2014; 25(2):193-201.
6. Sato PM, Timerman F, Fabbri AD, Scagliusi FB, Kotait MS. A imagem corporal nos transtornos alimentares: como o terapeuta nutricional pode contribuir para o tratamento. In: Alvarenga M, Scagliusi FB, Philippi ST. Organizadoras. *Nutrição e transtornos alimentares: avaliação e tratamento.* Barueri: Manole, 2011.
7. Lee M, Damhorst ML. Women's body image throughout the adult life span: a latent growth modeling approach. *The Int J of Aging and Hum Dev* 2019;1-23.
8. Harper L, Seaborn C, Peterson K, Klem, J. The impact of macronutrient intake and exercise on body image among female college undergraduate students. *J Amer Diet* 2010;110:54.
9. Goldenberg M, Gênero. “O corpo” e “imitação prestigiosa” na cultura brasileira. *Saúde Soc* 2011;20(3):543-553.

10. Conti M, Petroli M, Gambardella A. Excesso de peso e insatisfação corporal em adolescentes. *Rev Nutr* 2005;18(4):491-497.
11. Crossley KL, Cornelissen PL, Tovée MJ. What is an attractive body? Using an interactive 3d program to create the ideal body for you and your partner. *Plos One* 2012;7(11).
12. Freitas CMSM, Lima RBT, Costa AS, Lucena Filho A. O padrão de beleza corporal sobre o corpo feminino mediante o imc. *Rev Bras Educ Fís Esp* 2010;24(3):389-404.
13. International society of aesthetic plastic surgery. The international study on aesthetic/cosmetic procedures performed In 2016; Disponível Em: [<https://www.isaps.org/Wp-Content/Uploads/2017/10/Globalstatistics2016-1.Pdf>].
14. Zaccagni L, Masotti S, Donati R, Mazzoni G, Gualdi-Russo E. Body image and weight perceptions in relation to actual measurements by means of a new index and level of physical activity in italian university students. *J Transl Med* 2014;12:42.
15. Duncan DT, Wolin KY, Scharoun-Lee M, Ding EL, Warner ET, Bennett GG. Does perception equal reality? Weight misperception in relation to weight-related attitudes and behaviors among overweight and obese us adults. *Int J Behav Nutr Phys Act* 2011;8:20.
16. Egli T, Bland HW, Melton BF, Czech DR. Influence of age, sex, and race on college students' exercise motivation of physical activity. *J Amer Coll Health* 2011;59:399-406.
17. Heinzelman FL, Von Muhlen BK, Schleiniger CS, Leite MDP, Strey MN. Corpos em revista: a construção de padrões de beleza na vogue brasil. *Psicol Rev* 2012;(3):470-488.
18. Alwan H, Viswanathan B, Paccaud F, Bovet P. Is accurate perception of body image associated with appropriate weight-control behavior among adolescents of the seychelles. *J Obes* 2011.
19. Kuan PX, Ho HL, Shuhaili MS, Siti AA, Gudum HR. Gender differences in body mass index, body weight perception and weight loss strategies among undergraduates in universiti Malaysia Sarawak. *Malays. J Nutr* 2011;17:67-75.
20. Ansari EI, Dibba W, Labeeb E, Stock C. Body image concern and its correlates among male and female undergraduate students at assuit university in egypt. *Glob J. Health Sci* 2014;69:105-117.
21. Kiviruusu O, Konttinen HT, Aro H, Marttunen M, Haukkala A. Self-esteem and body mass index from adolescence to mid-adulthood. A 26-Year Follow-Up. *Int J Behav Med* 2016;23:355-363.
22. Barreto PS, Ferrandez AM, Guihard-Costa AM. Predictors of body satisfaction: differences between older men and women's perceptions of their body functioning and appearance. *J Aging Health* 2011;23:505-528.
23. Radwan H, Hasan HA, Ismat H, Hakim H, Khalid H, Al-Fityani L, Mohammed R, Ayman A. Body mass index perception, body image dissatisfaction and their relations with weight-related behaviors among university students. *Int J Environ Res Public Health* 2019;16:1-11.
24. Coelho CG, Giatti L, Molina MDCB, Nunes MAA, Barreto SM. Body image and nutritional status are associated with physical activity in men and women: the elsa-brasil study. *Int J Environ Res. Public Health* 2015;12:6176-6196.
25. Kakeshita IS. Adaptação e validação de escalas de silhuetas para crianças e adultos brasileiros. [Tese de Doutorado – Programa de Pós-graduação em Psicobiologia]. Ribeirão Preto: Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto: Universidade de São Paulo; 2008.
26. Kakeshita IS, Silva AIP, Zanatta DP, Almeida SS. Construção e fidedignidade teste-reteste de escalas de silhuetas brasileiras para adultos e crianças. *Psic Teor e Pesq* 2009;25:263-270.

27. Alipour IB, Farhangi MA, Dehghan P, Alipour M. Body image perception and its association with body mass index and nutrient intakes among female college students aged 18–35 years from tabriz. *Eat Weight Disord* 2015;20(4):465-471.
28. Lemon SC, Rosal MC, Zapka J, Borg A, Andersen V. Contributions of weight perceptions to weight loss attempts: differences by body mass index and gender. *Body Image* 2009;6:90-96.
29. Jiménez AR, Torres RPH, Medrano AW, Romero RU, Barahona IMRV. Body shape as body image determinant in university students. *Nutr Hosp* 2017;34(5):1112-1118.
30. Heiman T, Olenik-Shemesh D. Communication perceived body appearance and eating habits: the voice of young and adult students attending higher education. *Int J Environ Res Public Health* 2019;16:1-12.

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