


# Level of Physical Activity on the Body Image of Young Women

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## Abstract

Physical exercise has the ability to alter the measurements of the body related to esthetic. The objective of the present study was to compare the body image and body esthetic between two groups of women with different levels of physical activity. We evaluated 79 women who were divided into 2 groups: 39 women with low or moderate levels of physical activity, and 40 women with high levels of physical activity according to the International Physical Activity Questionnaire (IPAQ). Anthropometric and body composition measurements were taken using the InBody S10 multifrequency device (InBody Co., Eonju-ro, Gangnam-gu, Seoul, South Korea). The scale of silhouettes, which is composed of 9 engravings of body images, was used to verify the body image, as well as the Portuguese version of the Body Shape Questionnaire (BSQ) validated for university students. The group of evaluators was composed of twenty physical education professionals of both sexes, ten male and ten female. The group with low/moderate levels of physical activity, as expected, showed a lower amount (minutes per week) of physical activity of mild, moderate and vigorous intensity when compared with the group with high levels of physical activity ( $p < 0.05$ ), and they also had a higher ratio of fat mass (FM) per height squared ( $p = 0.047$ ). The BSQ questionnaire scores, the current and ideal silhouettes, as well as body image dissatisfaction, were not different between the groups ( $p > 0.05$ ). The overall body esthetic score, attributed only by the male and only by the female evaluators, did not differ significantly ( $p > 0.05$ ). We concluded that the level of physical activity did not influence the body image and body esthetic of the women.

## Keywords

- ▶ body composition
- ▶ body esthetic
- ▶ esthetic score

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## Introduction

Body image is defined as a person's perceptions, thoughts and feelings about his or her body.<sup>1</sup> The dissatisfaction with body image represents the difference between the actual mass and body shape compared to an idealized body.<sup>2</sup> Studies have shown that dissatisfaction with body image is related to health damage, including psychological stress,<sup>3</sup> eating disorders,<sup>4</sup> symptoms of depression,<sup>5</sup> impaired sexual function, and risky sexual behavior.<sup>6</sup> In women, dissatisfaction with body image is related to the woman's perception of how other people judge her attractiveness.<sup>7</sup> The judgment of attractiveness, in turn, has been shown to be dependent on body morphology and hormonal concentration.<sup>8</sup>

The practice of physical activity can be an alternative to enhance body image and body esthetic. Physical exercise has the capacity to alter the measurements of the body related to esthetic,<sup>9</sup> as well as to reduce women's dissatisfaction with their own body image, with an attenuation of depressive symptoms.<sup>1</sup> In addition, the practice of physical activity can improve the quality of life of university students mainly through increased physical self-esteem.<sup>10</sup>

However, when physical exercise is performed in a compulsive manner, it can cause psychological and physical damages to health.<sup>11</sup> Positive feelings arising from the practice of physical activity, such as elevated mood, depend on the purpose of such exercises.<sup>12</sup> Women who seek physical activity for health or pleasure are more likely to get the positive sensations that normally accompany physical exercises compared with those who practice physical exercises for esthetic purposes.<sup>12</sup> Furthermore, body image disorders, when associated with excessive exercise, may become a predictor for the development of eating disorders.<sup>12</sup>

Therefore, the practice of physical exercises is not always able to promote an improvement in body image; moreover, the potential effect of the practice of physical activity on the corporal esthetic of women has not yet been evaluated in the scientific literature. Therefore, the objective of the present study was to compare the body image and body esthetic between two groups of women with different levels of physical activity.

## Materials and Methods

The present is a cross-sectional and observational study using a non-probabilistic sample. All evaluations were performed by a single researcher, thus maintaining greater reliability in the data. All volunteers in the present study signed the informed consent form, which ensured the preservation of the integrity and the confidentiality of all the information pertaining to the participants. The project was approved by the Ethics in Research Committee of Universidade Federal do Mato Grosso (981.418/CEP/HUJM) under CAAE number 65133517.5.0000.5541.

A total of 79 healthy young women between the ages of 18 and 35 years, who at the time of the evaluations could not be in the menstrual period or pregnant, were evaluated. For the evaluations, a protocol was adopted: to abstain from physical

exercise on the day of the evaluation and to be fasting for at least 4 hours.

After this step, the women were divided into 2 groups: 39 women with low/moderate levels of physical activity, and 40 women with high levels of physical activity according to the International Physical Activity Questionnaire (IPAQ) – short version –, a self-completion instrument, to control the levels of physical activity in adults aged 15 to 69 years.

The pectoral, abdominal, hip and calf circumferences<sup>13</sup> were measured using an anthropometric chart (CESCORF, Porto Alegre, RS, Brazil), and the abdominal and hip circumference measurements were used to obtain the waist-to-hip ratio.<sup>14</sup> According to the techniques described by Lohman et al,<sup>15</sup> the level of ectomorphy and mesomorphy of the volunteers was calculated. The body composition was analyzed using an InBody S10 multifrequency device (InBody Co., Eonju-ro, Gangnam-gu, Seoul, South Korea), which calculates the percentage of fat mass (FM), the total FM in kilos, the skeletal muscle mass (MM) in kilos, the Body Mass Index (BMI, kg/m<sup>2</sup>), and the visceral fat area (VFA) in cm<sup>2</sup>. The anthropometric and body composition variables were selected because they had predictive power over the body esthetic of the study participants.

For the verification of the body image we used the scale of silhouettes,<sup>16</sup> which is composed of 9 pictures of body images. The set of silhouettes was presented to the individuals, who were asked the following questions: What is the silhouette that best represents your current physical appearance?; What is the silhouette you would like to have? The dissatisfaction with body image was determined by the difference between the self-perception regarding the current silhouette (CS) and the ideal silhouette (IS).

A Portuguese version of the Body Shape Questionnaire (BSQ), which was validated for Brazilian university students, was used to evaluate the degree of satisfaction or concern with body shape and to determine the body image disorder. This tool consists of 34 questions that are scored according to a Likert scale ranging from never to ever (scores from 1 to 6), and classifies the subject into 4 groups: no body dissatisfaction (below 80 points); mild dissatisfaction (between 80 and 110 points); moderate dissatisfaction (between 110 and 140 points); and severe dissatisfaction (above 140 points).<sup>17,18</sup>

The esthetic judgment proceeded with the image of the volunteers treated with a blur on the face, preserving their identities. They were requested to fill out the questionnaire made available through an Office document, which contained questions, with scores from 01 to 10, regarding esthetic. The images were displayed in a slide format in a 16-inch screen notebook. These evaluations took place in the presence of the 20 physical education professionals who were members of the research, 10 men and 10 women, who were active in the fitness, body esthetic and health market, and who were directly linked to some paid activity for at least 12 consecutive months.<sup>17,18</sup>

## Data Analysis

The normal distribution of the data was verified by the Shapiro-Wilk test. The homogeneity of the variance was

**Table 1** Profile and body composition of young women in the study sample

Variables	Low/Moderate (n = 39)	High (n = 40)	p-value
Age (years)	23 (18–35)	22 (19–35)	0.120 #
Height (m)	1.61 ± 0.06	1.65 ± 0.06	<b>0.004</b>
Body mass (kg)	61.7 (46.2–88.8)	63.1 (46.1–116.7)	0.709 #
Body mass index (kg/m <sup>2</sup> )	23.8 (18.3–30.9)	22.6 (18.0–37.2)	0.312 #
Fat mass/height <sup>2</sup> (kg/m <sup>2</sup> )	7.6 (2.8–15)	6.0 (2.7–15.8)	<b>0.047 #</b>
Visceral fat area (cm <sup>2</sup> )	83.0 (19.1–213)	68.3 (17.7–223)	0.161 #
Pectoral circumference	90.8 (81.3–106.5)	88.6 (75.0–115.0)	0.377 #
Abdominal circumference	82.7 (69.1–108)	81.1 (69.0–115.5)	0.283 #
Calf circumference	36.6 (30.5–45.4)	36.1 (31.8–47.7)	0.829 #
Waist-to-hip ratio	0.82 ± 0.04	0.82 ± 0.04	0.744
Abdominal adipometry	37.4 ± 8.7	34.2 ± 10.2	0.137
Calf adipometry	26.8 ± 8.7	24.9 ± 8.2	0.295
Mesomorphy	4.7 (2.2–7.8)	3.8 (1.3–8.6)	0.092 #
Ectomorphy	1.1 (0.1–3.9)	2.1 (0.1–4.7)	0.136 #
Physical activity (minutes/week)			
Light	90 (0–900)	140 (0–840)	0.062 #
Moderate	80 (0–540)	205 (0–1050)	<b>0.002 #</b>
Vigorous	0 (0–135)	300 (70–840)	< <b>0.001 #</b>

Note: # Mann-Whitney test with significance at  $p < 0.05$  and 95% confidence interval.

verified by the Levene test. For the comparison between the two groups of participants, the independent *t*-test and the Mann-Whitney test were used for parametric and non-parametric data respectively. The level of significance was set at 5% ( $p < 0.05$ ). The data are shown in figures (box diagrams) and descriptively in tables and texts as mean and standard deviation (mean ± standard deviation) for parametric data and median, minimum and maximum (median [minimum-maximum]) for non-parametric data.

## Results

A total of 79 women were evaluated, 39 of which had low/moderate levels of physical activity, and 40 of which had high levels of physical activity according to the IPAQ. The group with low/moderate levels, as expected, showed a lower weekly (minutes per week) level of physical activity of mild, moderate and vigorous intensity when compared with the group with high levels ( $p < 0.05$ ). There was no significant difference between the groups regarding age ( $p = 0.12$ ; low/moderate: 23 [18–35] years old versus high: 22 [19–35] years old), but there was a significant difference regarding height ( $p = 0.004$ ; low/moderate: 1.61 ± 0.06 m versus high: 1.65 ± 0.06 m) (► **Table 1**).

Regarding the anthropometric and body composition parameters, there was no significant difference between the two groups, except for the FM/height<sup>2</sup>, which was higher ( $p = 0.047$ ) in the low/moderate group (► **Table 1**).

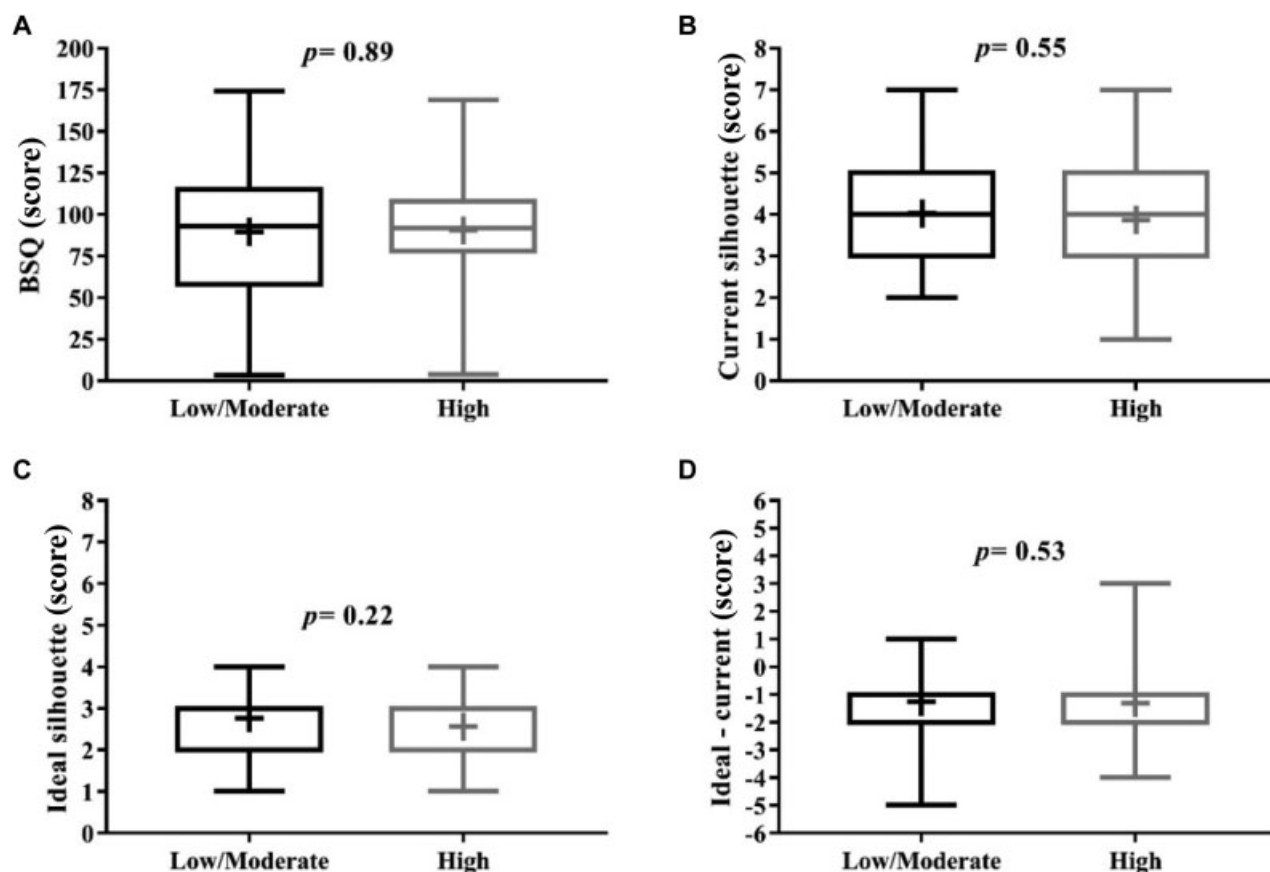
The score in the BSQ questionnaire (low/moderate: 95.9 ± 35.6 versus high: 96.9 ± 30.4), the current silhou-

ettes (low/moderate: 4 [2–7] versus high: 4 [1–7]) and ideal silhouettes (low/moderate: 3 [1–4] versus high: 2 [1–4]), as well as body image dissatisfaction (low/moderate: -1 [-5–1] versus high: 1 [-4–3]), were not different ( $p > 0.05$ ) between the groups (► **Fig. 1**).

The evaluation committee consisted of 20 individuals, 10 men and 10 women, with mean ages of 29.90 ± 3.84 and 35.20 ± 8.72 years respectively, without significant difference between the sexes ( $p = 0.096$ ). The overall body esthetic score (low/moderate: 3.9 ± 1.0 versus high: 4.3 ± 1.4), attributed only by men (low/moderate: 3.0 [1.7–5.4] versus high: 3.3 [1.5–6.2]), and only by women (low/moderate: 4.3 [2.3–7.0] versus high: 4.9 [2.1–7.9]) did not differ significantly ( $p > 0.05$ ) between the sample groups (► **Fig. 2**).

## Discussion

The present study aimed to compare the body self-image, the desired body image, as well as the body esthetic of women with different levels of physical activity. The main findings were that the practice of physical activity at different levels does not influence the corporal satisfaction and the body esthetic of young women. The groups studied did not present any differences regarding BSQ, which corroborates the results found by Costa et al.<sup>19</sup> who stated that they did not obtain a correlation between physical exercise and BSQ scores. Rech et al.<sup>20</sup> found a high level of body dissatisfaction among practitioners with moderate to high levels of physical activity, contrary to the findings of the present study.



**Fig. 1** Comparison between the groups classified according to the International Physical Activity Questionnaire (IPAQ) as low/moderate and high, Body Shape Questionnaire (BSQ), and silhouette scale of young women. Graph A - BSQ; Graph B- current silhouette; Graph C- ideal silhouette; Graph D- ideal silhouette minus the current silhouette. The line inside the box represents the median of the data, the plus sign represents the average of the data, the lower and upper rows of the boxes contain the data between the 25th and 75th percentiles, and the lower and upper bars represent the minimum and maximum values respectively. A: independent t-test. B, C, D: Mann-Whitney test.

Our findings indicate that in both groups the women presented mild dissatisfaction with body image according to the BSQ scores (low/moderate:  $95.9 \pm 35.6$  versus high:  $96.9 \pm 30.4$ ), with no statistical difference between the groups. Women with moderate to strenuous levels of physical exercise, when compared with sedentary women, tend to have better levels of body appreciation, internal body orientation, and functional satisfaction with the body, contributing to a positive body image.<sup>12</sup>

Zarshenas et al.<sup>1</sup> demonstrated that only four weeks of aerobic exercise is already capable of improving the self-assessment of the appearance of young women. According to Kruger et al.,<sup>21</sup> the participants who were somewhat or not satisfied with their body size had a 13% and 44% lower chance respectively of being regularly active than those satisfied with their body size. When investigating the relationship between physical activity and body image, one should be consider that physical activity may be a precedent or a consequence of body image.<sup>21</sup>

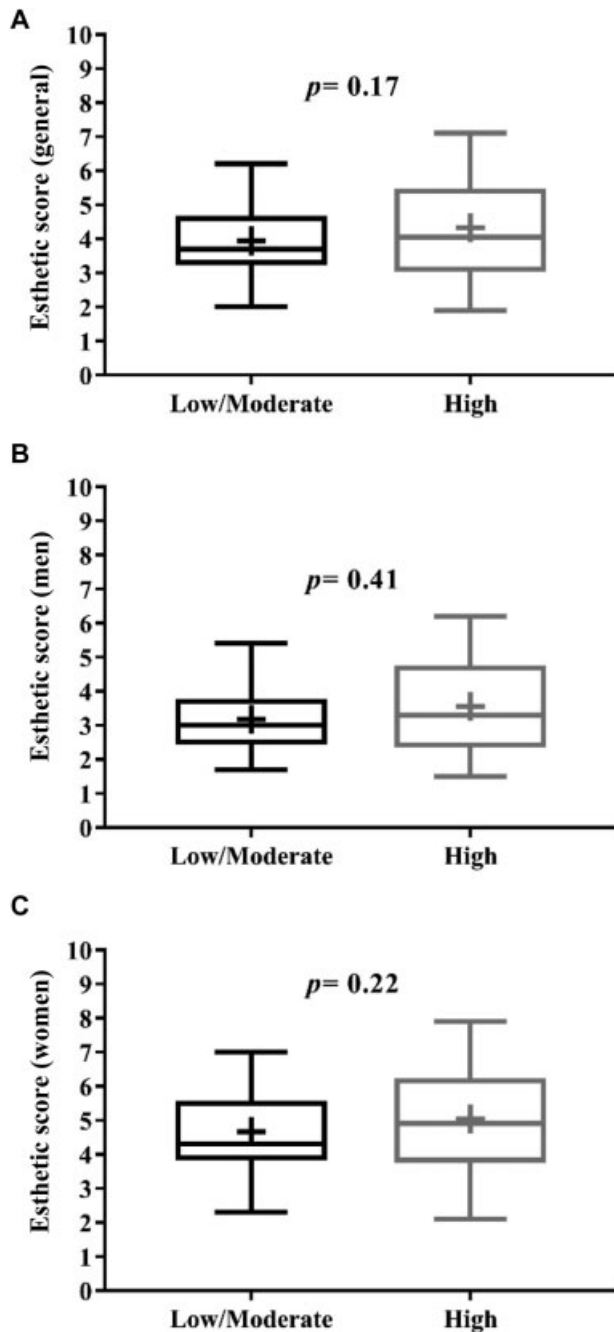
It should be emphasized that the positive body image is related not only to low dissatisfaction or lack of dissatisfaction, but to psychological well-being in the control of body image.<sup>22</sup> In both groups, the women want to reduce their silhouettes by at least one position on the scale thus corroborating the apparent consensus among other studies that

women wish to have smaller silhouettes than the ones they currently have.<sup>23</sup>

Uhlmann et al.<sup>24</sup> emphasize that, in recent years, there has been an increase in the popularity of the “fit” beauty standard. In short, the ideal biotypes are defined as bodies that are lean and have a little muscle tone, being compared with the classic fine ideal that has importance in the body satisfaction of women.<sup>25</sup>

The level of physical activity did not significantly influence the body esthetic of the women. Apparently, this is due to the similarity between the groups regarding almost all anthropometric and body composition measurements related to body esthetic, except for FM/height<sup>2</sup>. Contrary to our study, Zacagni et al.<sup>26</sup> demonstrated that the weekly amount of physical activity positively influences the BMI of female university students.

Studies that evaluated the physical attractiveness of women found that most observers favor leaner women as attractive, thus obtaining a strong negative relation between the percentage of fat and the body esthetic.<sup>9</sup> It is believed that the BMI is a morphological predictors of women's body attractiveness.<sup>8</sup> In the same vein, Stephen and Perera<sup>27,28</sup> verified that men and women differentiate between BMI values that are adequate for health and attractiveness, with the latter being estimated at lower values. Meta-analysis



**Fig. 2** Comparison between groups regarding esthetic scores A: general; B: attributed by men; and C: attributed by women. The line inside the box represents the median of the data, the plus sign represents the average of the data, the lower and upper rows of the boxes contain the data between the 25th and 75th percentiles, and the lower and upper bars represent the minimum and maximum values respectively. A: independent *t*-test. B, C: Mann-Whitney test.

studies demonstrate that physical exercise results only in a small loss of body fat and weight,<sup>28</sup> which also suggests that the potential of physical activity in enhancing female body esthetic is also small.

Due to the fact that the IPAQ questionnaire is a self-reported method, it makes the subjective filling. However, it is considered a coherent means of measuring the levels of physical activity among adults aged 18 to 65 years.<sup>29</sup>

## Conclusion

The level of physical activity was not shown to be able to influence the body image and body esthetic of women. In both groups, the women wanted to have smaller physiques; therefore, regardless of the level of physical activity, they are always striving for a different body shape.

### Conflict of Interests

The authors have none to disclose.

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