ORIGINAL ARTICLE

Mediating role of self-esteem on university students' physical activity attitude and frequency

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Abstract

Background and Study Aim: The benefits of physical activity for health are well known, but sometimes we fail to put that knowledge into action. There is an ongoing decline in total physical activity (PA), especially among adolescents and young women. This decline points to the need to find more effective solutions. This study aimed to determine the relationship between physical activity and attitudes toward physical activity, and also between self-esteem, body image (as subjective variables) and body mass index (as an objective variable).

Material and Methods: This cross-sectional study measured and investigated 152 female students from various faculties in their first and second years of study at the Bucharest University of Economic Studies. The research utilized direct anthropometrical measurements and several self-reported instruments. These included questionnaires on self-esteem, body image, physical activity attitude, and a report on the frequency of physical activity. Self-esteem was assessed using the Rosenberg Self-Esteem Scale. Body dissatisfaction was evaluated using the Contour Drawing Rating Scale.

Results: The mean Body Mass Index (BMI) value of 20.89 kg/m^2 indicates a healthy, normal BMI. The mean self-esteem score (31.48) falls within the normal range, but 60% of respondents could not match their actual body shape with their ideal or desired body image. 54% of respondents reported engaging in 30 minutes of physical activity, three times a week, outside the university program. As a result, the mean value of the attitude towards physical activity is slightly positive. 33% of young women's self-esteem is related to physical factors such as body image, frequency of physical activity, and attitude towards physical activity.

Conclusions: Self-esteem mediates the correlation between body image and physical activity frequency, and even more with students' attitudes towards physical activity. The study indicates that targeted physical education programs and consistent, independent physical activity can mitigate the challenges associated with the investigated variables.

Keywords: body image, physical education, health, attitude

Introduction

The decline in physical activity levels among adolescent and young adult females has become a significant public health concern. Despite widespread awareness of the benefits of physical activity, many young women fail to meet the recommended guidelines. This decline is associated with a range of negative outcomes, including poor physical health, decreased mental well-being, and issues related to body image and self-esteem. Addressing these challenges requires a deeper understanding of the factors contributing to reduced physical activity and the development of targeted interventions to promote healthier lifestyles among this demographic.

In this context, a concerning trend of diminishing overall physical activity (PA) levels has been observed with increasing age among adolescent and young adult females. The World Health Organization (WHO) [1] recommends a regular PA of 60 minutes daily for adolescents. However, it has been found that 81% of adolescent girls are less active than boys, with 85% failing to meet the recommended level of PA [1]. This significant shortfall highlights the urgent need for targeted interventions to encourage more active lifestyles among young women.

Body image is a complex and constantly evolving concept influenced by internal and external factors, including biology, psychology, culture, and society [2, 3]. During adolescence, girls are more likely than boys to have specific concerns about weight, body shape, and self-image. Research shows that women and girls tend to have more negative experiences with body image compared to men and boys [4]. Many are discontent with their body size and weight because a slim figure is often considered the ideal standard of beauty, especially for young women. Furthermore, in adulthood, there are more underweight women than men [5]. These findings underscore the pervasive impact of societal and cultural pressures on body image, particularly among young women. There is a clear need for interventions that address these concerns. Such efforts could help improve self-esteem and overall well-being.

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An important factor in adolescents' and emerging adults' negative self-evaluation is the intensive use of, or even addiction to, social media. Numerous researchers have reported a negative correlation between daily social media use and self-esteem levels [6, 7], alongside poor sleep quality, anxiety, and depression [8]. For overweight individuals, their perception of body size and volume can lead to social discomfort, shyness, low self-confidence, and an anxious posture and attitude [9]. Additionally, societal norms often associate being overweight with laziness, and overweight individuals are frequently perceived as less active. However, physical fitness is more closely linked to the frequency of physical activity rather than BMI [10]. These insights emphasize the complex interplay between social media use, body image, and physical activity.

Self-esteem is an individual's perception of self-worth, reflecting a positive or negative attitude toward oneself [11], and it is closely related to mental health [12]. An impressive amount of research has explored the positive effects of physical activity on physical and mental health, diet, and sleep [13], social integration [14], and overall well-being [15, 16]. Additionally, research has found that exercise in samples of overweight women increases self-confidence due to improvements in self-image [17]. These findings underscore the vital role of physical activity in enhancing both physical and mental health. They also highlight the importance of promoting exercise, particularly among those struggling with body image issues, to boost self-esteem and overall well-being.

Analysis of research shows that there is a concerning decline in physical activity among adolescent and young adult females, which negatively impacts both their physical and mental health. Despite the well-documented benefits of physical activity, many young women fail to meet recommended guidelines, resulting in issues related to body image and self-esteem. These problems are further compounded by societal pressures, particularly those perpetuated by social media, leading to negative self-perception and reduced physical activity levels. The complex interplay between body image, self-esteem, and physical fitness underscores the necessity for a more thorough understanding of these factors.

This study aimed to determine the relationship between physical activity and attitudes toward physical activity, and also between self-esteem body image (as subjective variables) and body mass index (as an objective variable).

Material and Methods

Participants

This cross-sectional study measured and investigated 152 female students at the Bucharest University of Economic Studies (Romania). The participants were enrolled in different faculties and followed a weekly program of physical education classes. The age range of the participants was between 18 and 21 years, with a sample average of 18.97 ± 0.57 years. The research was conducted within the context of physical education classes, with the inclusion criteria being active, weekly participation in these classes.

All participants provided informed consent prior to participation in the study. The research was conducted in accordance with the ethical standards outlined in the Declaration of Helsinki and was approved by the Ethics Committee of the Bucharest University of Economic Studies. Participants were assured of the confidentiality of their data, and all procedures were designed to minimize any potential risks or discomfort associated with participation in the study.

Research Design

Direct anthropometric measurements, including height and weight, were taken to calculate Body Mass Index (BMI) and estimate whether participants fell into the underweight, healthy weight, overweight, or obese range. Subjects completed an anonymous questionnaire to assess several variables: self-esteem, body image, physical activity attitude, and self-reported data regarding physical activity frequency. Self-esteem was measured using the Rosenberg Self-Esteem Scale [18], a 10-item scale with responses on a 4-point Likert scale ranging from strongly disagree (1) to strongly agree (4). Scores were compared with the reference range of 10 to 40, and the mean value was used for statistical analysis.

To evaluate body dissatisfaction, the Contour Drawing Rating Scale (CDRS) [19] was used. This scale comprises nine drawings of a female figure, ranging from very thin (1) to very obese (9). Participants were asked to rate their ideal figure (how they would ideally like to look) and their current size (perceived figure). The difference between the ideal and perceived current size scores (current – ideal ≠ 0) was used to indicate body size dissatisfaction.

The frequency of physical activity was assessed by asking university students whether they engaged in physical activity three times a week. The weekly physical activity amount was quantified by the response to one question: "Do you participate in at least 30 minutes of physical activity, three times a week, in addition to the university program?" Responses were coded as 1 for NO and 2 for YES.

Attitude towards physical activity was assessed using a subscale of The Physical Education Activity Attitude Scale [20]. The original questionnaire consisted of 20 statements divided into three parts (General Attitude, Physical Education, and Scientific

Basis), from which six statements referring to students' attitudes were selected. Respondents rated these statements on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

Statistical analysis

Descriptive statistics were used to analyze the raw demographic data and variables. For pairs of variables, the Pearson correlation coefficient (r) was calculated, and the coefficient of determination (r^2) was subsequently estimated to determine the proportion of variance explained by one of the variables. IBM SPSS Statistics 20 was used for the statistical analysis, while Microsoft Excel was utilized for creating tables and figures displaying the results.

Results

Table 1 displays the five variable values and the age of the research participants. The sample is homogeneous from the point of view of age, with teenage girls being the majority (18,92±0,57).

Data from Table 1 indicate a wide range in BMI, with most participants falling within the healthy weight range. Self-esteem levels are generally normal, though some variability is present. Body image results suggest varying levels of satisfaction, with some participants experiencing dissatisfaction. Most participants report regular physical activity, and overall attitudes towards physical activity are [generally] slightly positive.

In accordance with the data from Table 2, our results show that in the BMI distribution of the studied sample, approximately 33% of young women are situated in the underweight category, while more than 10% are classified as overweight or obese. The self-esteem mean score is 31.48, which falls within the normal range of 25 to 35 points. However, 13 participants, representing 8.5%, scored below 25, indicating low self-esteem. Regarding body image, 62 young women (40% of the sample) are content with their body image, while the remaining 60% could not identify their body shape with their ideal or desired body image. Most respondents aspire to a thinner silhouette, with only a few expressing a desire to gain weight. Additionally, 83 out of 152 young women (almost 54%) report engaging in 30 minutes of physical activity three times a week outside the university program. Consequently, the mean value of the attitude towards physical activity is 21.81, which is slightly positive, being just 1.81 points above the neutral limit.

Data from Table 3 indicate that body image is strongly correlated with BMI and moderately correlated with self-esteem. There is also a significant relationship between the amount of physical activity and the attitude towards physical activity. Additionally, both physical activity-related variables are statistically correlated with self-esteem.

Self-esteem occupies a central position between body-related variables (BMI and body image) and physical activity variables (PA attitude and PA frequency) (Fig. 1).

Discussion

This study aimed to determine the relationship between physical activity and attitudes toward physical activity, as well as the connection between self-esteem, body image (as subjective variables), and body mass index (BMI) (as an objective variable). The results revealed significant correlations between these variables, highlighting the central role of self-esteem in linking body-related factors,

Table 1. Demographic and variables descriptive statistic

Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Age	152	18	21	18.92	.57647
BMI	152	15.08	34.20	20.89	3.45654
Self Esteem	152	15.00	40.00	31.48	5.24622
Body Image	152	1.00	6.00	.9803	1.20962
Physical Activity	152	1.00	2.00	1.546	.49952
P.A. Attitude	152	10.00	30.00	21.81	3.72822

Table 2. BMI distribution

BMI	N (%)
BMI < 18.5	50 (32.9)
18.5 < BMI < 25	86 (56.5)
25 < BMI < 30	11 (7.2)
BMI > 30	5 (3.3)

Table 3. Correlation between variables

Variables		BMI	Self- esteem	Body Image	Physical activity	PA attitude
BMI	Pearson Correlation	1	-.155*	**.541****	.036	-.067
	Sig. (1-tailed)		.028	.000	.330	.207
Self Esteem	Pearson Correlation	-.155*	1	**-.339****	**.283****	**.364****
	Sig. (1-tailed)	.028		.000	.000	.000
Body Image	Pearson Correlation	**.541****	**-.339****	1	.051	-.035
	Sig. (1-tailed)	.000	.000		.267	.336
P.A	Pearson Correlation	.036	**.283****	.051	1	**.414****
	Sig. (1-tailed)	.330	.000	.267		.000
P.A Attitude	Pearson Correlation	-.067	**.364****	-.035	**.414****	1
	Sig. (1-tailed)	.207	.000	.336	.000	
	N	152	152	152	152	152

* Correlation is significant at the 0.05 level (1-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

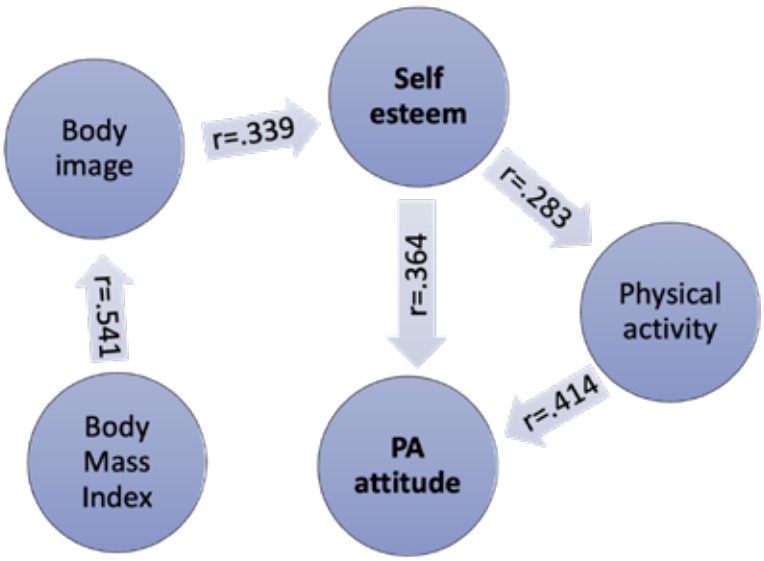

Figure 1. The model of variable interaction

such as BMI and body image, with physical activity behaviors and attitudes. Notably, self-esteem was found to be closely associated with both physical activity frequency and attitudes toward physical activity, underscoring its importance in promoting healthier lifestyles among young women.

A comprehensive literature review has established that engaging in physical activities and sports is directly linked to a more positive body image and reduced body dissatisfaction [2, 9, 16, 19, 21]. Conversely, lower levels of physical activity and sports participation are associated with a negative body image. In our study, 40% of the respondents reported a positive body image, which was linked to both physical and psychosocial well-being, including increased self-esteem, life satisfaction [22], and healthy behaviors. However, 60% of the young women in our sample reported a negative body image, which showed a strong correlation with BMI, particularly concerning weight.

The literature also highlights that women's frequent concerns about body image often revolve around aesthetics and physical functioning [4, 5, 22, 23]. In our sample of young women, the primary source of body dissatisfaction appears to be related to the aesthetic aspect of the body rather than its functionality. This finding aligns with other research indicating that young women are more likely to focus on the appearance of their bodies, which can significantly impact their self-esteem and overall body image.

The Sport and Physical Activity Eurobarometer survey concluded that 42% of European women between 15 and 24 never or seldom exercise or play a sport. In Romania, the percentage of sedentary young women is even higher, at 51%, and increases with age [24]. The results obtained in this research are similar to the percentages reported at the national level, with the notable difference that the female students in our study participate in at least one physical education lesson per week, engaging in at least moderate physical effort.

The data presented above confirm the attitude towards physical activity measured in our sample. Fifty-four percent of 19-year-old women reported practicing physical exercises or activities involving physical effort at least three times a week. However, it is well-documented that many girls and women fail to meet the physical activity levels recommended for good health and well-being. Studies have shown that physical activity levels tend to decrease significantly during the transition from adolescence to adulthood [25]. Our results align with these findings, as a substantial portion of our sample reported regular physical activity, but this percentage still reflects a concerning number of young women who may not be meeting the recommended levels.

In a previous survey, it was found that female students tend to prefer solitary activities for personal benefit, with limited physical contact and cooperation with teammates [26]. Despite these preferences, engaging in team sports could provide an opportunity to improve teamwork, take on responsibilities, and share experiences, knowledge, and emotions. This aligns with the current study's findings, where despite regular physical activity, students' attitudes towards physical activity and its frequency did not show a statistically significant association with physical features like BMI or body image.

After calculating the coefficient of determination (r^2), it was found that body image is most strongly correlated with BMI, with a coefficient of determination of nearly 30% (r^2=0.293). However, as expected, physical activity attitude and physical activity frequency were not statistically significantly associated with students' physical features such as BMI or body image. This suggests that while body image is closely linked to BMI, other factors may influence attitudes towards physical activity and the frequency of participation, indicating the complexity of these relationships. These findings are consistent with other studies on body image and BMI, as well as the role of physical activity in physical fitness regardless of BMI [9, 10].

This study is limited by its relatively small sample size and the potential biases associated with self-reported data, such as the overestimation of behaviors. Additionally, the cross-sectional nature of the study does not allow for conclusions about causality. Future research could benefit from larger, more diverse samples and longitudinal designs that track changes in physical activity, self-esteem, and body image over time. It would also be valuable to explore the role of additional factors, such as social media influence and peer relationships, in shaping these variables. Expanding the scope of research in these areas could lead to more targeted and effective interventions to promote healthy behaviors and positive self-image among young women.

Conclusions

This study highlights the intricate connections between physical activity, self-esteem, body image, and body mass index in young women. The critical role of self-esteem in mediating these relationships suggests that interventions aimed at improving both mental and physical health should be prioritized. These findings can be particularly valuable for educators and health professionals who are working to develop programs that support the physical and psychological well-being of young women. By fostering a positive self-image and encouraging consistent physical activity, it is possible to enhance the overall well-being of young women during a pivotal stage of their development. The results also reinforce the importance of considering psychological factors when addressing physical health, advocating for a holistic approach to health promotion.

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