

Characterization of self-esteem in adolescents according to age, sex, school grade, and body mass index

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†In memoriam

Abstract

Introduction: Self-esteem is one of the main indicators of psychological well-being. High self-esteem can be considered a protective factor for mental health and diseases of another nature, such as those that affect nutritional status. The study of self-esteem in vulnerable groups, such as adolescents, is important to design strategies that help maintain their overall health.

Objectives: The objective of the study was to know the degree of self-esteem in adolescents and its association with age, sex, school grade, and body mass index (BMI). **Material and methods:** A cross-sectional design was used in a sample of adolescents from a secondary school located east of Mexico City. Self-esteem was assessed using the Rosenberg instrument; they were weighed and measured to calculate BMI. **Results:** Four hundred and sixty adolescents with an average age of 12.6 years were studied, 54.0% were women, and the rest men. The overall frequency of low self-esteem was 18.3% (84), being more frequent in women aged 15 years and with a BMI corresponding to obesity. The frequency of high self-esteem was 81.7% (376), being more frequent in men aged 12 years and with a BMI classified as normal. **Conclusion:** It is necessary to plan strategies aimed at reinforcing and increasing self-esteem during adolescence, particularly through physical activity.

Keywords: Self-esteem. Adolescents. Body mass index. Schoolchildren. Obesity.

Introduction

Self-esteem is the extent to which people value themselves according to the perceived success or failure in achieving their goals. It is also an important factor in the development of personality, social, and emotional adaptation. Although self-esteem is formed throughout the life cycle, it is known that childhood and adolescence are the most relevant stages for its formation due to the risk of suffering worse physical and mental health¹.

During adolescence, which runs from 10 to 19 years of age, in addition to the physiological changes of development, other changes occur that is psychosocial, as well as the development of social and

cultural expectations, associated with the transition from childhood to adulthood. The adolescent seeks to express his feelings and behavior with an attitude of approval or rejection, this feeling expresses the degree to which he values and trusts himself in decision-making, aspirations, and achievements². Given the great influence that self-esteem can have on people's lives, different instruments have been developed in order to evaluate and classify it mainly as low or high self-esteem³. The World Health Organization reports that one in four individuals between 7 and 17 years of age has low self-esteem⁴.

When there is high self-esteem, the adolescent seeks personal growth by exercising his abilities to the limit,

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while recognizing his mistakes. Unlike adolescents with low self-esteem who are prone to feel awkward, shy, and unable to express themselves confidently, since they are worried about making a mistake or exposing themselves to ridicule. High self-esteem is related to more active personalities, with feelings of control over circumstances, less anxious, and with better capacities to tolerate internal or external stress, less sensitive to criticism, enjoy their interpersonal relationships, and value their independence; on the other hand, low self-esteem is associated with feelings of apathy, isolation, shyness, and anxiety⁵. Among the health consequences of having low self-esteem is the association with diseases such as eating disorders (anorexia nervosa, bulimia nervosa, among others), depression, or addiction to addictive substances⁶.

The main determinants of self-esteem are the family and society. With regard to the family, when violence occurs in the home environment, in particular sexual violence and harassment, or severe parenting by parents, and serious socioeconomic or other problems, there are risks that damage self-esteem. Likewise, today's society has established the slim body as an ideal of beauty and health, leaving people with excess weight (overweight and obesity) vulnerable to social rejection that affects their self-esteem. In vulnerable populations such as adolescents, who are looking for an identity and have the need to feel accepted and integrated into society, fear could lead them to unhealthy eating and exercise practices in their attempt to achieve a healthy and beautiful body⁷. Overweight and obesity are considered risk factors for especially chronic diseases; but also because they have a negative impact on the mental health of the adolescent population, since they feel guilty about their appearance, leading them to avoid situations where they may feel criticized, such as speaking in public, eating in front of other people, wearing clothes that hide their body, adopt a passive, sedentary lifestyle and social isolation, which leads them to have mainly low self-esteem^{8,9}. The objective of this study was to determine self-esteem in a sample of adolescents and its association by age, sex, school grade, and body mass index (BMI).

Material and methods

A cross-sectional observational epidemiological study was carried out. The population consisted of high school students from a public school located in the east of Mexico City. The sample was non-probabilistic. All students were invited to participate in the study

according to the request of the school authorities; however, only those who so wished and had the informed consent letter signed by their parent or guardian were included in the study.

Each group of the three school grades was visited to request verbal consent to participate in the study, and was given a letter of informed consent for signature by the parents or guardians. If they had this, they were asked to answer the instruments in the computer room electronically. At the end, they were weighed using a previously calibrated Tanita scale, and their height was measured using a wall stadiometer. The BMI was calculated for the corresponding age and sex reported by his parent or guardian. According to the classification World Health Organization: low weight (≤ -2.00), normal weight (-1.99 to 0.99), overweight (1.00 to 1.99) and obesity (≥ 2.00). It is important to clarify that there are other instruments to measure overweight and obesity, such as waist circumference and skinfold thickness¹⁰.

To assess self-esteem, the Rosenberg self-esteem scale (1965) was used¹¹, which has been adapted to Spanish and validated for Mexican adolescents and young people¹². The instrument was validated, the results were α 0.77, an intraclass correlation coefficient of 0.77, KMO test 0.68, and Bartlett test 97.49, both significant, and an explained variance of 73.98, so the instrument was valid and reliable for the group studied.

The questionnaire consists of ten scoring questions that allude to global feelings of self-worth, five are written in a positive sense and five in a negative sense. The answer options are on a Likert-type scale with four categories (from strongly disagree with a point value of one to strongly agree with a point value of four). The cutoff point for women was: low self-esteem from 0 to 28 and high self-esteem from 29 to 40; for men, it was: low self-esteem from 0 to 29 and high self-esteem from 30 to 40^{11,12}.

The statistical program the Statistical Package for the Social Sciences version 20.0 was used for data analysis. The qualitative variables are presented as a percentage and the quantitative variables (age and BMI) are presented with the mean and standard deviation; however, the distribution was not similar to the normal curve according to the Kolmogorov–Smirnov test, so to evaluate the differences between self-esteem and the rest of the variables, the χ^2 test (χ^2) was used, as well as the Mann-Whitney U, considering a level of statistical significance of 0.05¹³.

Results

A total of 460 adolescents aged 11-15 years were studied, of which 56.9% (248) were females and the rest were males. The overall mean age was 12.65 years with a standard deviation of 0.96 years. The median was 12 years for males and 13 years for females. No statistically significant differences were found according to sex and age. 50.6% (233) were in the 1st year, 28.5% (131) in the 2nd year, and 20.9% (96) in the 3rd grade. No statistically significant differences were observed in the distribution by sex, according to school grade.

According to the BMI classification, 3.0% (13) of the adolescents were underweight, 55.0% (253) normal weight, 17.0% (78) overweight, and 25.0% (116) obese. No statistical differences were found according to sex or age. The overall frequency of low self-esteem was 18.3% (84). Of these, 58.3% (49) were women and 41.7% (35) men. The difference, however, was not statistically significant. A statistically significant difference was found in the frequency of low self-esteem according to age. A statistically significant difference was found in the frequency of low self-esteem according to school grade. Correspondingly, the highest frequency of low self-esteem was observed in first-grade students with 42.9% (36), being statistically significant ($\chi^2 = 6.4$, $p < 0.05$) (Table 1).

It was observed that most students with high self-esteem had a normal BMI (52.5% males and 58.3% females). On the other hand, among men with low self-esteem, 48.6% (17) were overweight or obese, while in women this percentage was 44.9% (22). No statistically significant differences were observed between self-esteem and BMI (Table 2).

It was also observed that more than 90.0% of the women had responses in which they indicated that they disagreed or strongly disagreed with respect to considering themselves worthy of appreciation, having qualities, or feeling that they did things well (Table 3). In the case of men, more than 90.0% of the responses added to disagree with having a positive attitude and feeling satisfied with themselves (Table 4). Both men and women indicated that 90.0% did not consider themselves failures.

Discussion

In adolescence, the individual faces a physical and emotional development in which he will define and affirm his identity, this can imply the modification of various habits and behaviors, but it can also generate states of emotional instability that prevent him from

Table 1. Frequency of self-esteem according to school grade of the adolescent population studied

School grade	Low		High	
	No.	%	No.	%
First	36	42.9	197	52.4
Second	22	26.2	109	29.8
Third	26	31	70	18.6
Total	84	100	376	100

$\chi^2 = 6.4$, $p < 0.05$.

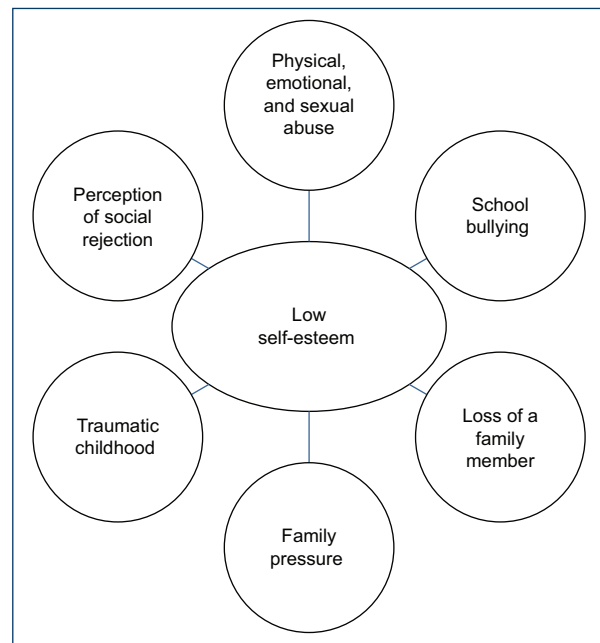


Figure 1. Other factors that influence the occurrence of low self-esteem.

facing difficulties and effectively facing the changes that the social environment assigns him¹⁴. The results of this study allow us to measure the frequency and risk groups that have low self-esteem, since it was found in 16.5% of men and 20.0% of women, particularly in younger adolescents, which simultaneously correspond to who were in the first grade of school. It should be considered that this group corresponded to half of the population studied. Sánchez-Rojas et al.¹⁵ reported a prevalence of low self-esteem of 23.3% and 21.3% in 295 children aged 8-13 years (116 overweight or obese and 179 with normal weight, respectively), without statistically significant differences.

Table 2. Self-esteem according to body mass index and sex of the adolescent population studied

Body mass index	Sex							
	Men				Women			
	Self-esteem							
	Low		High		Low		High	
	No.	%	No.	%	No.	%	No.	%
Low	0	0.0	6	3.4	1	2.0	6	3.0
Normal	18	51.4	93	52.5	26	53.1	116	58.3
Overweight and obesity	17	48.6	78	44.0	22	44.9	77	38.7
Total	35	100	177	100	49	100	199	100

χ^2 = no statistical significance.

Table 3. Frequency of responses according to the Rosenberg instrument to assess self-esteem in adolescent women

Questions	Answers No. (%)			
	Strongly agree	I agree	Disagree	Strongly disagree
I feel that I am a person worthy of appreciation at least in the same way as the people around me	1 (0.4)	17 (6.9)	112 (45.2)	118 (47.6)
I think I have a good number of qualities	3 (1.2)	22 (8.9)	133 (53.6)	90 (36.3)
I'm able to do things right like most people	3 (1.2)	11 (4.4)	106 (42.7)	128 (51.6)
I have a positive attitude toward myself	7 (2.8)	27 (10.9)	87 (35.1)	127 (51.2)
Overall, I am satisfied with myself	2 (0.8)	29 (11.7)	103 (41.5)	114 (46)
En general me inclino a pensar que soy una fracasada	4 (1.6)	19 (7.7)	95 (38.3)	130 (52.4)
I feel like I don't have much reason to be proud of myself	30 (12.1)	57 (23.0)	65 (26.2)	96 (38.7)
I wish I valued myself more	90 (36.3)	111 (44.8)	27 (10.9)	20 (8.1)
Sometimes I feel really useless	16 (6.5)	41 (16.5)	74 (29.8)	117 (47.2)
Sometimes I think I'm good for nothing	10 (4.0)	33 (13.3)	74 (29.8)	131 (52.8)

The fact that low self-esteem is found in approximately one in five students affects the personal, school, family, and social spheres (Fig. 1). In the first case, the self-perception of body image, and the state of health, in general, can violate self-esteem. In the present study, overweight or obesity was found in 44.8% of men and 39.9% of women, which constitutes, in itself, a reason for health care. According to the results of the National Health and Nutrition Survey 2020-2022, 23.9% of people between 12 and 19 years of age are overweight and 17.2% obese¹⁶.

On the other hand, secondary education has demands that primary education does not have, in terms of

workload, as well as the component that can be added by the participation of several teachers, as opposed to what was the case with basic education, with only one. In the family field, the structure, stability, dynamics, and material resources available are determinants present in the daily life of the adolescent¹⁷. In the social sphere, for example, although in the present study no statistically significant differences were found in the behavior of self-esteem between men and women, it has been described that these exist, and that they are associated with problems related to gender violence, based on the fact that self-esteem is higher in men. Moreover, it is linked to myths related to romanticism between couples¹⁸.

Table 4. Frequency of responses according to the Rosenberg instrument to assess self-esteem in adolescent men

Questions	Answers No. (%)			
	Strongly agree	I agree	Disagree	Strongly disagree
I feel that I am a person worthy of appreciation at least in the same way as the people around me	4 (1.9)	8 (3.8)	103 (48.6)	97 (45.8)
I think I have a good number of qualities	0 (0.0)	10 (4.7)	89 (42.0)	113 (53.3)
I am able to do things right like most people	1 (0.5)	8 (3.8)	69 (32.5)	134 (63.2)
I have a positive attitude toward myself	5 (2.4)	10 (4.7)	69 (32.5)	128 (60.4)
Overall, I'm satisfied with myself	1 (0.5)	12 (5.7)	76 (35.8)	123 (58.0)
In general, I am inclined to think that I am a failure	8 (3.8)	15 (7.1)	64 (30.2)	125 (59.0)
I feel like I don't have much reason to be proud of myself	33 (15.6)	36 (17.0)	46 (21.7)	97 (45.8)
I wish I valued myself more	1 (0.5)	12 (5.7)	76 (35.8)	123 (58.0)
Sometimes I feel really useless	13 (6.1)	28 (13.2)	65 (30.7)	106 (50.0)
Sometimes I think I'm good for nothing	12 (5.7)	20 (9.4)	56 (26.4)	124 (58.5)

Conclusion

Since adolescents are a vulnerable group, we consider it important to implement a health promotion program, which involves adolescents, parents, and teachers in the biological and psychological areas. The school is considered a key environment where actions are carried out to improve or protect self-esteem, such as workshops on social and emotional skills, increased physical activity, music and arts programs; all of the above would contribute, in addition to increasing self-esteem, to reduce bullying, eating disorders, suicides, or alcohol and tobacco consumption^{19,20}.

Promoting self-esteem can prevent the development of psychopathological problems mainly associated with depression, so actions such as physical activity have scientifically shown benefits on self-esteem, overweight, and obesity²¹. The treatment of obesity in children and adolescents must have a comprehensive approach: biological, psychological, and social. Rather than seeking the ideal weight or socially accepted weight as a goal²², it is necessary to seek to achieve healthy lifestyle habits and directly involve the family in treatment; it would be desirable that both friends and peers with whom they live are active members in the process.

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Conflicts of interest

The authors declare no conflicts of interest.

Ethical considerations

Protection of human subjects and animals. The authors declare that no experiments on humans or animals were performed for this research.

Confidentiality, informed consent, and ethical approval. The study does not involve patient personal data, medical records, or biological samples, and does not require ethical approval. SAGER guidelines do not apply.

Declaration on the use of artificial intelligence. The authors declare that no generative artificial intelligence was used in the writing or creation of the content of this manuscript.

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