



Review article

Effect of physical activity on adolescent self-esteem

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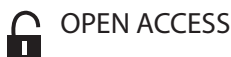
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Efecto de la actividad física en la autoestima de los adolescentes

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Abstract

Overweight and obesity in adolescents have increased globally, affecting not only their physical health but also their psychological well-being. Low self-esteem and negative body perception are common problems among adolescents with low physical activity, which may lead to an increase in the prevalence of depressive symptoms. This article aims to determine the effect of physical activity on adolescent self-esteem, exploring mediating factors such as self-perception and socialization, the relationship between frequency and intensity of physical activity and self-esteem levels, as well as the difference between participation in team sports versus individual activities. A review article was conducted of original articles in English and Spanish, published between 1995 and 2024, with a greater concentration of studies between 2019 and 2024, databases such as PubMed and Scopus were consulted. The results suggest that encouraging moderate or high physical activity and team sports could be an effective intervention to promote better mental health in adolescents, offering benefits both in their self-perception and social competence.

Keywords

Self Esteem, Psychological Well-Being, Exercise, Adolescent.

Resumen

El sobrepeso y la obesidad en adolescentes han incrementado a nivel global, estos afectan no solo su salud física, sino también su bienestar psicológico. La baja autoestima y una percepción corporal negativa son problemas comunes entre los adolescentes con poca actividad física, lo que puede llevar a un aumento en la prevalencia de síntomas depresivos. Este artículo tiene como objetivo determinar el efecto de la actividad física en la autoestima de los adolescentes, explorando factores mediadores como la autopercepción y la socialización, la relación entre la frecuencia e intensidad de la actividad física y los niveles de autoestima, así como la diferencia entre la participación en deportes de equipo, frente a actividades individuales. Se realizó una revisión narrativa de artículos originales en inglés y español, publicados entre 1995 y 2024, con una mayor concentración de estudios entre 2019 y 2024, se consultaron bases de datos como PubMed y Scopus. Los resultados sugieren que fomentar la actividad física moderada o alta y el deporte en equipo podría ser una intervención eficaz para promover una mejor salud mental en los adolescentes, ofreciendo beneficios tanto en su autopercepción como en su competencia social.

Palabras clave

Autoestima, Bienestar Psicológico, Ejercicio Físico, Adolescente.

Introduction

Adolescence is a crucial stage marked by physical, sexual, and cognitive changes, where self-esteem and self-perception are fundamental for healthy development. Chronic diseases such as overweight and obesity, which affect both physical health and adolescents' self-esteem, especially those with low levels of physical activity, are

often neglected.ⁱ According to the World Health Organization (WHO), in 2022 more than 390 million children and adolescents aged five to 19 were overweight. The prevalence of overweight has increased significantly in children aged five to 19, rising from 8 % in 1990 to 20 % in 2022. This affected boys and girls in a similar way: in 2022, 19 % of girls and 21 % of boys worldwide were overweight, according to WHO.ⁱⁱ

In Spain, the PASOS-22 study identified among the youth population (ages eight to 16) a prevalence of 33.4 % for overweight and 11.8 % for obesity.ⁱⁱⁱ According to Baldursdottir *et al.*, adolescents with low physical activity are more likely to develop depressive symptoms, as well as being more prone to psychological stress and low self-esteem compared to adolescents who engage in higher levels of physical activity.^{iv} Galán-Arroyo *et al.*, reported a difference between males and females, with females being less involved in physical activity, which compromises their self-perception.^v

In addition, the WHO reported in 2021 that globally, one in seven (14 %) adolescents aged ten to 19 experienced mental health problems, most of which were neither recognized nor treated. One of the key factors in caring for mental health is engaging in regular exercise, as it contributes to psychological well-being and reduces the risk of developing disorders such as depression and anxiety.^{vi} During adolescence, concepts such as self-esteem and self-perception gain greater importance due to the changes involved in this stage. Self-esteem is defined as the perspective an individual has about their own abilities and talents, how effective they are at performing them, and the self-worth they assign to themselves. Self-perception is the appreciation a person has of themselves, what others think of them, and how they intend to be with others.^{vii}

Treatments that include physical activity have gained attention due to their accessibility and benefits, such as the reduction of depressive symptoms. Exercise has shown a moderate effect in decreasing depression at all ages, and it is a cost-effective intervention without negative side effects, making it ideal for early treatment strategies.^{viii} For the purposes of this study, physical activity (PA) and its categories are understood according to the PAQ-A (Physical Activity Questionnaire for Adolescents). The questionnaire consists of eight questions that explore different aspects of adolescent physical activity. The level of PA is determined using a five-point Likert scale (1-2 low level, three moderate level, 4-5 high level), where point one indicates that the adolescent is inactive and engages in very little or no physical activity during the week, while point five implies that the adolescent is very active and participates in vigorous physical activities with high intensity and frequency on most days of the week.^{ix} Qin *et al.*, validated the Chinese version of the PAQ-A and demonstrated validity and reliability for assessing physical activity in adolescents aged 12-19 in China.^x Studies have evaluated the impact of

moderate or high physical activity (MHPA) on the neurobiology, psychology, and behavior of young people, concluding that participation in sports is associated with an increase in self-esteem; however, no evidence was found linking it to other neurobiological, psychosocial, or behavioral variables.^{xi} Positive results have also been found in the academic area of young people, although these are very few. Singh *et al.*, demonstrated a strong relationship between practicing any type of physical activity and academic performance; however, the only subject that showed improvement was mathematics, indicating that better tools are still needed to obtain higher-quality evidence.^{xii}

In the long term, adequate self-esteem in young people has been a protective factor against the appearance of depressive symptoms. It has also been shown that good self-esteem helps in the way a person copes with their problems. This evidence shows that individuals with high self-esteem are more likely to seek help and social support, producing less stress and being more autonomous in their actions, which leads to better mental health.^{xiii} Physical satisfaction—defined as a person's appreciation of their physical appearance, based on their own thoughts and feelings toward their body—has gained great importance in adolescence, and negative thinking can harm mental health.^{xiv}

Self-concept refers to the perception a person has of themselves, that is, how they value and think about themselves. It has a significant impact on mental health and behavior, and a positive self-concept is key to educational and psychological achievements. In addition, physical self-concept acts as a mediator in the relationship between physical activity and self-esteem, with an inverse relationship found with the onset of depressive symptoms.^{xv}

In a meta-analysis of 49 prospective studies, individuals with high levels of physical activity showed a significantly lower risk of developing depression (OR = 0.83; 95 % CI, 0.79-0.88), which reinforces the importance of promoting active lifestyles to improve emotional well-being and reduce the risk of mental disorders.^{xvi} A narrative review was conducted using databases such as PubMed and Scopus, including original articles in English and Spanish, published between 1995 and 2024, with a higher concentration of studies from 2019 to 2024, aiming to determine the effect of physical activity on adolescents' self-esteem. To this end, mediating factors such as body perception and socialization that may influence this relationship are identified; the connection between the frequency and intensity of physical activity

and levels of self-esteem is analyzed; and the effect of participation in team sports versus individual physical activities on adolescents' self-esteem is compared.

Discussion

Mediating factors in adolescent self-esteem

Body dissatisfaction (BD) refers to the negative thoughts a person has about their own body, critically evaluating its shape and size. It usually involves an unfavorable comparison between the real body and the ideal body the person wishes to have.^{xvii} Factors such as BD cannot be ignored, as evidence has shown that body dissatisfaction can have negative effects on physical aspects, but especially on psychological aspects, affecting self-esteem, self-concept, and increasing the prevalence of depressive and eating disorders.^{xviii} A recent analysis shows that MHPA not only improves self-esteem in adolescents but also acts as a key factor in reducing BD. Likewise, self-evaluation and self-confidence have been identified as mediating factors that positively influence psychological well-being. Results suggest that physical activity can be an effective intervention to reduce BD and strengthen physical self-concept.^{xix}

Some authors argue that MHPA could improve self-concept, which in turn would enhance adolescent motivation in all areas, including academic achievement.^{xx} AM is defined as: "a theoretical model that seeks to explain the reason for achieving success and the reason for avoiding failure, and how this influences behavior in a situation where performance is evaluated against a standard of excellence."^{xxi} Ishihara *et al.*, mention that adolescent motivation could be a determining factor in daily behaviors that influence physical capacity and the maintenance of a healthy weight, which contributes to better academic performance.^{xxii} It has also been postulated that another underlying factor in the relationship between PA and adolescent motivation is the increase in cardiorespiratory capacity. Numerous neurobiological mechanisms have been proposed to explain this relationship. For example, an increase in cardiorespiratory capacity leads to an increase in cerebral blood flow, which in turn promotes angiogenesis and neurogenesis in the brain, as well as improving oxygen saturation. Furthermore, it increases the level of neurotransmitters and causes changes in the regulation of neurotrophins, especially in areas linked to executive functions.^{xxiii}

The salutogenic model, defined by Aaron Antonovsky, postulates that the sense of coherence is a global orientation where life is understood as more or less comprehensible, meaningful, and manageable. A strong sense of coherence helps individuals mobilize resources to successfully cope with stressors and manage tension through the identification and use of generalized and specific resistance resources.^{xxiv} Reinodt *et al.*, applied MHPA to evaluate whether sense of coherence influences adolescents' ability to understand, find meaning, and manage their lives. Results showed that participation in MHPA was significantly associated with a healthier lifestyle, improved mental well-being, the promotion of more beneficial daily routines, and greater self-esteem. This study highlights the crucial role of physical activity not only in physical health but also in the psychological and emotional development of adolescents.^{xxv}

Frequency and intensity of physical activity and self-esteem in adolescents

Despite the evident benefits, many adolescents do not meet the recommended average of 60 minutes of MHPA per week, which includes activities such as brisk walking, running, cycling, swimming, and practicing sports like soccer, basketball, volleyball, and tennis. Disproportionately lower rates are observed among females compared to males. This disparity may be attributed to factors such as differences in access to physical activity opportunities, cultural norms, and gender expectations that limit adolescent girls' participation in physical activities and the development of fundamental motor skills.^{xxvi} According to Andermto *et al.*, the implementation of MHPA in a school context was related to reduced anxiety and increased self-esteem in adolescents. Considering the benefits for adolescent mental health, these results could encourage schools to implement MHPA in their activities. However, previous studies have shown that very vigorous and high-intensity MHPA has had a negative effect on adolescents, concluding that future research must focus on the mechanisms of action and the process of implementing MHPA in schools.^{xxvii}

It has been observed that during adolescence, the habit of PA is adopted more effectively, which makes it fundamental in the prevention of chronic diseases, in addition to its benefits for self-perception.^{xxviii} In a study conducted among Ethiopian adolescents, researchers Zeleke *et al.*, identified that self-perception of leading a healthy

lifestyle and practicing MHPA, along with having a family that promotes PA, were factors positively associated among the adolescents studied. The study suggests that a positive self-perception of PA—both personally and within the family—could be motivating factors for MHPA among adolescents. Despite these positive aspects, one factor that stands out is self-perception as being overweight, which was found to be a demotivating factor.^{xxxix}

Among the most important psychological factors in the relationship between mental health and physical activity is self-esteem. During adolescence, self-esteem is often low, which can influence young people's participation in physical activities. In this period, low self-esteem may be associated with unhealthy behaviors, creating dysfunctional dynamics that affect both physical and mental well-being.^{xxx} Pazzaglia *et al.*, examined adolescent self-esteem as a multidimensional construct, obtaining an overall measure of self-esteem by evaluating it across social, competence, affective, academic, family, and physical domains. The main findings of the research confirmed a relationship between PA and self-esteem. Notably, among the domains evaluated, MHPA showed a Cohen's effect size of up to 0.50, reaching 0.58, which indicates a considerable impact of PA on self-esteem. Additionally, gender differences in self-esteem were investigated as a secondary objective. The results indicated that females reported lower self-esteem than males in domains related to physical activity and affective well-being, with explained variances of 0.09 and 0.05, respectively.^{xxxi}

Adolescents suffering from common mental disorders (e.g., anxiety disorders, panic disorder, obsessive-compulsive disorder, phobias, depression, bipolar disorder, mood disorders, and eating disorders) face difficulties in successfully transitioning into adulthood and experience more challenges in health, education, and economic situations. They are more likely to disengage from education and employment as young adults, a status known as NEET (Not in Education, Employment, or Training).^{xxxii} According to Ringbom *et al.*, adolescents diagnosed with psychiatric disorders such as psychosis or autism spectrum disorder are at greater risk of remaining in the NEET condition long term, highlighting the importance of early interventions and continuous support for this group. It is necessary to identify the risk factors that lead adolescents to disengage from education and employment in order to promote specific preventive strategies for

those suffering from common mental disorders during their school years.^{xxxiii}

Studies have mostly focused on background characteristics as risk factors for becoming NEET. Economic situation, living in a single-parent household, being a young caregiver or adolescent relative, and educational performance are some of the key risk factors. In addition, psychosocial factors are also at play.^{xxxiv} In their study, Tayfur *et al.*, investigated longitudinal associations between psychosocial factors and subsequent NEET status in adolescents. The study focused particularly on self-esteem and PA. The main findings showed that adolescents suffering from common mental disorders who had low self-esteem, no career aspirations, and low or no PA had a significantly higher probability of becoming NEET between the ages of 25 and 26. However, it is important to emphasize that MHPA had the greatest magnitude of association in preventing NEET status, above other background characteristics. Overall, the study results indicate that psychosocial factors, including PA, play an important role in disengagement from education and employment after school for adolescents. Physical exercise, by improving mental health and fostering self-esteem, acts as a key component within these factors, helping young people remain engaged in their educational and professional development.^{xxxv}

Impact on self-esteem: team sports versus individual activities

It is important to focus on sports participation due to the benefits of PA for young people's mental health and social competence, which can also enhance self-esteem.^{xxxvi} A recent study found that high sports participation at age 15 was positively related to adolescents' mental well-being, suggesting that investing in sports could improve mental health outcomes.^{xxxvii} Therefore, sports can be a valuable additional component of mental health interventions in schools. For example, a recent innovation called Gamechanger, developed in Scotland, improved physical and mental health outcomes and social inclusion for vulnerable people through sports, showing the potential of similar intervention strategies.^{xxxviii}

Team sports such as soccer and basketball foster self-esteem through social interaction and support from peers and coaches, creating a sense of belonging and collaboration. In contrast, individual sports such as tennis and swimming develop self-esteem based on self-sufficiency and self-discipline, which strengthens self-confidence but can also generate greater personal pressure and

affect emotional well-being due to the lack of team support.^{xxix} Guddal *et al.*, described PA levels and the frequency of sports participation in a population-based sample of adolescent students. In addition, they investigated associations between PA level, type of sports participation, and mental health, including self-esteem. They concluded that participation in team sports, compared to no participation at all, was more strongly related to beneficial mental health outcomes than individual sports, especially for female adolescents. Overall, adolescents with high PA and participation in team sports were less likely to have low self-esteem.^{xi}

Since increasing PA alone does not guarantee better mental health, contextual factors are crucial. Understanding the specific factors that influence the relationship between PA and mental health, especially in leisure time, is essential.^{xii} Current evidence indicates that both physiological and psychological factors impact mental health through PA. One hypothesis suggests that psychosocial mechanisms such as self-esteem, self-perception, social connection, mood, and emotions play an important role.^{xiii} In addition, many theoretical frameworks propose that well-being is achieved by meeting basic psychological needs such as social connection, autonomy, self-concept, environmental mastery, and purpose in life. PA facilitates social interaction, physical mastery, improved body image, and independence.^{xiv} In their qualitative study conducted in Ireland, Murphy *et al.*, examined how PA, whether team or individual, may offer a protective effect against mental health problems and whether experiences differed between adolescents of both genders. Females identified PA, whether individual or team-based, as an opportunity to de-stress and return with a fresh perspective to daily life. In contrast, males used it primarily to avoid or distract themselves from daily demands. Women valued the sense of belonging and the relationships developed in team PA, while men mentioned “not being alone” as their main motivation, regardless of the type of PA.^{xv}

An umbrella review on PA and mental well-being in adolescents reported that those who practice AFMA are less likely to experience mental health problems and may have better cognitive performance.^{xvi} A study conducted in Europe examined the connections between PA, anxiety, depression, and mental well-being in adolescents. The findings indicated that a higher frequency of PA was associated with lower levels of depression and anxiety, as

well as greater overall well-being. In addition, participating in sports was found to offer additional mental health benefits, regardless of PA frequency. Specifically, women who participated in team sports (basketball, soccer, baseball) showed significantly lower levels of depression and anxiety.^{xi}

In a cross-sectional study in Ireland, the associations between PA and mental health in adolescents were explored. It was found that those who played team sports had higher levels of well-being and lower levels of depression and anxiety, compared to those who played individual sports or no sports. In addition, playing three or more sports was associated with higher well-being and lower depression and anxiety. These findings suggest that team sports offer significant mental health benefits for both sexes, regardless of the frequency of activity.^{xvii} Vella, *et al.*, have proposed that young athletes with high levels of self-esteem and increased social identification may experience additional mental health benefits.^{xviii}

Conclusion

Physical activity in adolescence is key to improving self-esteem and mental health, especially in contexts of overweight and sedentary lifestyles. Participation in team sports provides benefits such as social cohesion and a sense of belonging, important factors for healthy self-esteem. It has been shown that body perception, socialization, and academic motivation are mediating factors that influence the relationship between physical activity and self-esteem in adolescents. The frequency and intensity of physical activity directly impact self-esteem. These are moderate activities such as running, cycling, swimming and team sports such as soccer, basketball, volleyball and tennis. Team sports tend to generate better self-esteem outcomes than individual activities, especially in female adolescents. Therefore, interventions should be inclusive and tailored to individual needs to promote healthy lifestyles and prevent long-term mental health problems.

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