

Gender and Sport Type in Afterschool Activities: Exploring Their Relationship with Depression in High School Students

Euhyun (Brooke) Jahng

Received November 26, 2024

Accepted April 02, 2025

Electronic access April 30, 2025

This study examined the relationship between afterschool sports participation and depression levels in high school students, focusing on differences by gender and sport type (team vs. individual). A survey of 39 students was conducted using the Mental Health America (MHA) Depression Test. The findings showed that female students reported higher depression levels than male students, regardless of the type of sport. Male students who participated in team sports had the lowest depression levels, while those in individual sports experienced higher symptoms. For female students, the type of sport had little impact on their depression levels. These results highlighted the positive mental health effect of team sports for boys and the need for more effective strategies to support girls' mental health in sports settings. To maximize the mental health benefits of sports, schools should consider expanding non-competitive recreational team sports and offering flexible participation options that reduce stress while maintaining the psychological benefits of physical activity. Creating inclusive, socially engaging sports environments emphasizing peer support and emotional well-being could ensure that all students, regardless of gender or sport type, experience the full benefits of sports participation.

Keywords: afterschool sports, Mental health, Depression, Gender difference, Type of sport

Introduction

Adolescence is a period in which a young age develops into adulthood and goes through physical and mental growth. During adolescence, young people are highly vulnerable to mental disorders, which are highly correlated to their living environment. Depression, anxiety, low self-esteem, and self-confidence are some mental illnesses that a significant number of adolescents suffer. An estimated 2.8% of adolescents aged 15-19 are shown to have depression, and 4.6% have anxiety¹.

As adolescents spend most of their time in school, their habits, choices, and behaviors form at school. Schools can play a crucial role in providing afternoon activities, mainly by providing diverse options for sports. This effort is highly appreciated as it gives adolescents a broader perspective on their interests, chances to relieve stress, and opportunities to be involved in the community². Moreover, sports participation demonstrates short-term benefits as recreational and competitive sports prevent mental disturbances and increase teamwork³. Furthermore, the Journal of Adolescent Health found that students who played sports through high school had lower depression symptoms, stress, and overall better mental health than those who did not participate⁴.

The diverse afterschool activities, especially sports, they provide can be divided into two major groups: team sports and individual sports. Individual sports help cultivate critical psy-

chological aspects. Athletes can improve their skills, set their own goals, and have the ability to concentrate. Individual athletes may participate in a "higher level of preparation" since their success lies solely in their talents and training⁵. However, individual sports players may develop a more negative relationship with losing, as they lack teammates to share the emotional burden or provide support. This can contribute to feelings of loneliness and social isolation⁶.

In contrast, there was research that displayed a longitudinal relationship between the setting of physical activity and mental health in early adulthood⁷. The targeted audience, who were mainly college students, found that group participation and team sports are associated with increased mental health; they showed a reduction of depressive symptoms through the transition to young adulthood. Furthermore, it was shown that the most significant benefit of team sports is learning to collaborate building teamwork with others to achieve a common objective. As each player learns their job and the ability of others around them, they lose concentration on themselves and become more focused on what the team can accomplish. They celebrate victories together and bear the pain of defeat. Thus, it primarily helps mental health⁶.

Alongside the analysis of mental health, depending on the type of sports, gender plays a major role as well. Depending on gender, sports might affect them differently. Among the impacts of sports, females are more likely to experience health and safety

concerns, such as depression and anxiety. Some underlying factors are high injury risks and low energy availability⁸. Therefore, examining the psychological impacts of various sports requires an understanding of these gender disparities. While there are many advantages to playing team or individual sports, there are also unique difficulties that might affect an athlete's mental health.

Thus, this study aimed to analyze the relationship between sports participation, gender, and depression levels among high school students. Specifically, it examined whether participation in team or individual sports is associated with different mental health outcomes and how these patterns vary by gender. Rather than identifying the best sport for mental well-being, this study sought to provide insights into how different types of sports participation relate to adolescent mental health, contributing to a better understanding of the role of school-based physical activities in supporting student well-being.

Background Information

Teenage Depression

Teenage depression has become a severe mental illness problem that detrimentally affects adolescents. Teenage depression has the potential to affect adolescents' lives in terms of mood, problems in school or home, and their attitude. Depression symptoms can vary, but there are two significant aspects: emotional changes and behavioral changes. Although there is a high chance that feelings will be amplified during adolescence, it is critical to discover modifiable variables and preventative measures that may be implemented throughout adolescence to protect those symptoms from lasting to adulthood⁹. Recent data from the 2017 National Surveys on Drug Use and Health show that 13.3% of adolescents aged 12 to 17 (3.2 million adolescents) underwent major depressive symptoms in the past year, and 9.4% of adolescents (2.3 million adolescents) had major depressive symptoms with severe debilitation as well¹⁰. Furthermore, there is a tendency for depression symptoms to increase over the years. Ever having been diagnosed with either anxiety or depression among children aged 6-17 years increased from 5.4% in 2003 to 8% in 2007 and to 8.4% in 2011-2012.¹¹

Depression is caused by a combination of factors, consisting of educational achievement, income, employment, pregnancy, relationship status, social support, genetics, and loneliness^{12,13}. In other words, the environment is the most essential factor that leads to the building of mental illness.

Depression in Genders

From a mental health perspective, women are more vulnerable to depression and anxiety. In the United States, the prevalence of depression in adults was higher in women (8.7%) than men

(5.3%), and the highest rate was shown in people 18-25 years old (13.1%)¹⁴. Women are nearly twice as likely as males to be diagnosed with depression, which is impacted by hormonal fluctuations throughout life¹⁵. Puberty-related hormonal changes, premenstrual dysphoric disorder (PMDD), pregnancy, postpartum depression, and menopause are all significant contributors to mood disruption caused by hormonal variations and other stresses. Furthermore, biological factors, genetics, and personal situations contribute to women's risk of depression¹⁵.

These statistics are shown to female athletes as well. In research that included 465 athletes who participated in teams sponsored by the NCAA⁸, over one-third of the female participants showed symptoms of sadness, compared to 18% of the male participants. Data from NCAA surveys conducted in 2008 and 2012 revealed that 48 percent of female collegiate athletes said they had symptoms of anxiety or despair. The origin of the roots of depressive symptoms come from many different reasonings: abuse from the coaches, athletes lacking guidance, and complicated relationships with food⁵. Although women tend to be more vulnerable to mental illness and various statistics are shown to specific athletic fields, sports support with beneficial factors as well.

Influence of Sports

Schools offer many opportunities for students to participate in diverse sports and offer advantageous benefits: physical, social, and academic. Physical activities help people be physically fit and healthy, yet they are often suggested to improve mental health and well-being. Adolescents who participate in athletics tend to have higher self-esteem, confidence, and overall well-being as they develop emotional awareness. Playing team sports also improves cooperation and social skills. From a neuroscientific perspective, engaging in physical activity causes the brain to release dopamine, commonly referred to as happy chemicals. Numerous studies indicate that youth engage in physical activities mutually decrease depression and anxiety since 30-40% of them will have moderate to severe depression symptoms between the ages of 12 and 19¹⁶. Moreover, kids who participated in sports in middle and high school had a more upbeat outlook on life than kids who did not play sports, which suggests that kids who played sports had fewer suicidal thoughts¹⁷.

Although physical activities improve well-being, not all sports have the same impact. Once quoted, (there are) significant differences between [team sports and individual sports] in terms of psychological skills and motivation of athletic success⁵. Sports participation is interlinked with depression symptoms in early adulthood as well. Team sports contain factors that can lead to stress; for example, coordinating opinions and befriending a teammate can be challenging. However, playing a team sport provides an opportunity to learn how to work well with others and allows interacting with others to impart as a group. Ac-

According to research by Boone and Leadbeater (2006), teenagers who have good experiences on teams with coaching, skill development, and peer support are more likely to feel accepted by others, have lower levels of body dissatisfaction, and exhibit fewer depressive symptoms overall¹⁸.

On the other hand, individual sports influence mental well-being in complex ways. Individual sports, much like overall sports participation, can have positive effects on mental health by fostering self-discipline and contributing to personal mastery^{6,16}. However, these sports can also trigger anxiety as there is immense pressure for perfection, and it is difficult for them to handle it without team support¹⁶. One longitudinal study found that adolescents who participated in team sports showed a decrease in severity or number of signs of depression. Compared to peers who participated in both team and individual sports, players in team sports reported the lowest depression level¹⁹.

Therefore, the following research questions were set to explore the relationships between gender, type of sports participation, and depression in adolescents:

1. How do depression levels differ between adolescent boys and girls?
2. What is the relationship between participation in individual vs. team sports and depression among adolescents?
3. How does the combination of gender and type of sport (individual vs. team) influence depression levels in adolescents?

While schools provide an important environment for adolescent development, mental health outcomes are influenced by a variety of other factors, such as family dynamics, social media exposure, and personal interests. Although this study focuses on the relationship between sports participation and depression, it is essential to recognize that sports are just one of many influences on adolescent mental health.

Method

Study Design

This study employed a cross-sectional design to explore the relationship between gender, type of sport participation (individual vs. team), and depression levels among high school students. The study aimed to assess whether there were significant differences in depression scores based on gender and participation type.

This study focused on the relationship between afterschool sports participation, gender, and depression in high school students. And did not control certain confounding variables, such as socioeconomic status, academic performances, or prior history of depression, which may influence depression levels in adolescents. While these factors are important, collecting such

sensitive information can be challenging, as adolescents may be reluctant to disclose personal details related to their family background or mental health history. To encourage honest participation and maintain ethical standards, this study focused on sports participation and self-reported depression levels without including potentially intrusive questions. Future research could explore methods for collecting such data in a way that ensures participant comfort and confidentiality.

Participants

The data collection took place from a high school located in the eastern part of the United States between May 14 and 16, 2024. The school offers a wide range of afterschool activities, including diverse sports program. Participants were recruited through an online survey distributed via the schools emailing system. The survey was anonymous to protect the privacy of the students and encourage honest responses. A total of 42 students participated in the survey; however, 3 respondents were excluded as they did not participate in afterschool sports activities, resulting in a final sample of 39 participants.

Survey Instrument

The survey questionnaire consisted of three sections: 1) Demographic information, 2) afterschool activity participation, and 3) Depression assessment. The demographic information section collected data on participants ages, genders, cultural backgrounds, and school grades. The afterschool activity participation section inquired about the type of afterschool activities the participants were involved in and how often they engaged in sports activities per week.

The final section measured the participants depression levels using four items sourced from the Mental Health America (MHA) Depression Test²⁰. To make the test quick, simple, and available to students, the four items were taken by reducing repetitious or similar questions. More students could complete the assessment without getting bored by making it more concise. Simplifying the questionnaire was intended to boost response and participation rates. The user-friendly questions without sacrificing the essential components required to detect possible indicators of depression, even if this condensed version lacks comprehensive validation data. Each item on the questionnaire was rated on a 4-point Likert scale (1= Disagree to 4 = Agree). The questionnaire assessed key depressive symptoms through the following items: 1) I have little interest or pleasure in doing things. 2) I feel tired and have little energy. 3) I have a poor appetite or overeat. 4) I generally feel down and unhappy. The reliability of the scale was assessed to ensure the accuracy of the measurement. Cronbachs alpha (= .760) indicated acceptable internal consistency, exceeding the recommended threshold of .70. The result confirms that the scale is a statistically reliable tool

for assessing depressive symptoms among high school students participating in afterschool sports.

Data Analysis

Descriptive analysis was computed to summarize the depression scores for each subgroup. Independent t-tests were used to compare depression scores between gender (male vs. female) and between participation type (individual vs. team). Cohen's d was calculated to assess the effect size of these differences, providing additional context to statistical significance. To examine specific group differences, Fishers Least Significant Difference (LSD) test was applied for post hoc comparisons. The significance level was set at $p < .05$ for all statistical tests. All analyses were performed using Jamovi.

Result

Participant Demographics

The study included 39 high school students, consisting of 22 females (56.4%) and 17 males (43.6%). The mean age of the participants was 16.2 years. The distribution of students by grade level was as follows: 14 freshmen (35.9%), 11 sophomores (28.2%), 7 juniors (17.9%), and 7 seniors (17.9%). The afterschool sports activities in which the respondents participated included Crew (n=10), Lacrosse (n=8), Track and Field (n=8), Ultimate (n=5), Baseball (n=4), Tennis (n=2), and Yoga (n=2). These activities were further categorized into individual sports (n=12) and team sports (n=27).

Table 1 Demographic information of participants

Variables		n (%)	
Gender	Female	22(56.4)	
	Male	17(43.6)	
Age	Mean	16.2	
Grade	Freshman	14(35.9)	
	Junior	7(17.9)	
	Senior	7(17.9)	
	Sophomore	11(28.2)	
Afterschool sports	Team	Crew	10(25.6)
		Lacrosse	8(20.5)
		Ultimate	5(12.8)
		Baseball	4(10.3)
	Individual	Track and Field	8(20.5)
		Tennis	2(5.1)
		Yoga	2(5.1)
Total		39(100)	

Depression Scores by Gender

Descriptive statistics revealed that female students reported higher depression scores (Mean = 2.52, SD = 0.60) compared to

male students (Mean = 1.9, SD = 0.78). An independent t-test confirmed that this difference was statistically significant ($t(37) = 2.85, p < .01, d = -0.920$). This indicates that, on average, female students experienced higher levels of depression than their male counterparts, with a large effect size ($d = -0.920$) suggesting a meaningful difference between the groups.

Depression Scores by Participation Type

When comparing depression scores based on participation type, students who participated in team sports reported slightly lower depression scores (Mean = 2.15, SD = 0.76) compared to those who participated in individual sports (Mean = 2.48, SD = 0.68). However, this difference was not statistically significant ($t(37) = 1.3, p = .202, d = 0.451$), suggesting that the type of participation (individual vs. team) did not have a significant impact on overall depression levels.

Table 2 Comparison of Depression Levels by Gender and Participation Type

Variable	n	Mean	SD	t	df	p	Cohen's d
Female	22	2.52	0.78	-2.85	37	0.007	-0.92
Male	17	1.9	0.6				
Individual	12	2.48	0.68	1.3	37	0.202	0.451
Team	27	2.15	0.76				

Interaction Between Gender and Participation Type

Further analysis showed interaction between gender and participation type. For male students, even though there was no significant difference in depression scores based on the type of sports ($t(35) = 1.85, p = .072, d = 1.059$), those who participated in team sports had lower depression scores (Mean = 1.73) compared to those who participated individually (Mean = 2.44), suggesting a large effect size.

In contrast, female students had relatively similar depression scores regardless of sport type, with those in individual sports (Mean = 2.5) reporting nearly identical scores to those in team sports (Mean = 2.54), indicating no meaningful difference ($t(35) = -0.12, p = .905, d = -0.054$).

Post hoc analysis revealed significant differences between specific groups. Male students in team sports had significantly lower depression scores compared to female students in individual sports (Mean Difference = $-0.77, t(35) = -2.57, p < .05, d = 1.153$). Additionally, male students in team sports also reported significantly lower depression scores than female students in team sports (Mean Difference = $-0.80, t(35) = -3.13, p < .01, d = -1.206$). It supports the trend that team sports may have stronger associations with lower depression symptoms among male students.

Table 3 Depression Levels by Combination of Gender and Type of Sports

Gender	Type	n (%)	Mean Depression
Male	Individual	4 (10.3)	2.44
	Team	13 (33.3)	1.73
Female	Individual	8 (20.5)	2.5
	Team	14 (35.9)	2.54

Table 4 Interaction between Gender and Type of Sports on Depression Levels

Gender	Variable		Mean Difference	t	df	p
	Type	Gender				
Male	Individual	Male	0.71	1.86	35	0.072
		Female	-0.06	-0.15	35	0.879
		Female	-0.1	-0.26	35	0.797
	Team	Female	-0.77	-2.57	35	0.015
		Female	-0.8	-3.13	35	0.004
		Female	-0.04	-0.12	35	0.905

Discussion

An estimated 2.8% of adolescents experience depression, and 4.6% suffer from anxiety¹. Given the known mental health challenges among adolescents, understanding the role of afterschool sports in relation to depression is crucial. These findings suggest that students depression levels did not significantly differ based on whether they participated in individual or team sports. However, the results revealed that boys involved in the team sports exhibited the lowest depression levels, while girls participating in team sports had the highest depression levels. Consistent with national data showing that females report higher rates of depression than males¹⁵, the findings of the study indicate that female students had higher depression scores regardless of sport type.

Playing team sports, particularly for boys, significantly reduces depression and fosters a stronger sense of school connection. Previous studies indicate that boys who participate in team sports during adolescence are less likely than girls to experience depression²¹. This raises the question of why boys tend to suffer less from depression than girls in the context of team sports. Research comparing depression rates between the genders based on team and individual sports found that team sports are linked to better psychosocial health, particularly for males²². Boys tend to report a stronger sense of belonging at school than girls²², and one key reason is that participating in team sports offers opportunities for peer bonding and shared goals^{4,18}, all of which contribute to fewer depressive symptoms. Additionally, the social dynamics of boys team sports tend to foster a sense of brotherhood and collective identity^{16,17,23}, which helps buffer against loneliness and enhances coping mechanisms.

While team sports generally provide strong social support and a sense of belonging, this study found that female students

did not experience the same mental health benefits as male students. One possible explanation is that the restrictive nature of school environment and societal expectations surrounding gender norms, which can limit opportunities for self-expression and diminish the potential psychological benefits of sports⁸. Societal gender norms shape expectations around athleticism, body image, and competitiveness. Girls tend to report feeling less competent in sports and are more likely to experience teasing from both same- and opposite-gender peers while participating in physical activities²⁴, ultimately reducing the mental health benefits of participation.

Additionally, as team sports contribute positively to boys mental well-being, boys may be more motivated to participate in sports than girls. Adolescent girls often prioritize social bonding through activities such as social outings and digital communication, including social media, over physical activities like sports^{25,26}. They are more likely than boys to receive social support through social media, and girls who use social media are more likely to say that these platforms help them feel better connected to their friends lives and emotions²⁷. This suggests that social connection for adolescent girls is more often facilitated through digital communication rather than through in-person, structured activities such as team sports. This difference in socialization pattern may help explain why team sports did not significantly reduce depression levels for female students in this study.

However, individual sports, which are often linked to positive self-confidence and personal mastery^{5,16} but can also have a negative impact on mental health, did not significantly reduce or increase depression levels in female participants. This may be influenced by the type of individual sports included in the study. The majority of female participants in individual sports were involved in track and field, which primarily requires self-competition and personal performance metrics (e.g., race time, distance, or height achieved), rather than direct competition against an opponent. These sport-specific characteristics may have buffered participants from some of the performance anxiety or social comparison effects seen in other individual sports. Furthermore, because track and field training can involve both solitary practice and team-based relay events, this may have led to a limited impact, either positive or negative, on mental health.

Although not statistically significant, boys who participated in individual sports showed higher levels of depressive symptoms than those who engaged in team sports. Boys in individual sports may face heightened pressure to succeed, leading to feelings of shame or guilt after failure, which increases the risk of depression²⁸. Boys who participate in individual sports frequently experience social pressure to be strong and competitive, associating achievement with self-worth. Anxiety and sadness may result from this strain, particularly if failure is perceived as a weakness. Boys who have few opportunities to show vulnerability may find it challenging to live up to high standards, which

might have an adverse effect on their mental health. While individual sports may still offer mental health benefits for girls, boys may experience greater risks if not adequately supported.

Limitations

One limitation of this study is the relatively small sample size, which may affect the generalizability of the findings. However, despite the limited number of participants, the statistical analyses revealed large effect sizes, indicating strong practical significance in the relationship between gender, sport type, and depression levels. While the findings provide valuable insights, future research should aim to replicate the study with a more extensive and more diverse sample to confirm these trends across different populations.

This study did not compare depression levels between students who participate in sports and those who do not. Including such a comparison would make the findings more persuasive, as it would provide a more comprehensive understanding of how sports participation influences overall mental well-being. If sports participants have lower depression levels than non-participants, it would reinforce the argument that sports, in general, are linked to better mental health. And students who choose to participate in afterschool sports may already have specific characteristics such as higher social engagement or resilience that contribute to better mental health. Therefore, including non-participants could have provided a clearer understanding of whether sports participation itself is associated with better mental health or if other underlying factors contribute to the observed differences.

Also, further research would benefit from directly asking students how they perceive sports activities in relation to their depressive symptoms. It could incorporate qualitative methods, interviews, or focus groups, to explore how students view their participation in sports. These perceptions could include whether students use sports to relieve stress, build social connections, or cope with pressure. Understanding students' personal experiences and feelings toward sports could provide deeper insights into the connection between sports participation and mental health. This approach could help clarify the impact of sports on depression and reveal additional factors that might influence its effectiveness in reducing depressive symptoms among high schoolers.

Conclusion

The findings highlight several key aspects: (a) the benefits of team sports, (b) the varying effects of sports on different genders, (c) the specific challenges individual sports pose for boys. It is essential to address depression among students and explore strategies for prevention. As discussed, the current school sport

environment is insufficient in reducing depressive symptoms for female students, indicating a need for more effective methods to lower their overall depression levels. For boys, encouraging participation in team sports could help foster social support and lower depression. In contrast, those involved in individual sports may require additional care and guidance to manage stress better and reduce their vulnerability to depressive symptoms. Due to the absence of the social support network that team sports offer, boys participating in solitary sports may be more susceptible to loneliness. Furthermore, they are under constant pressure to perform well, which can raise stress, anxiety, and the danger of burnout.

To translate these insights into practical applications, schools and policymakers should consider tailored interventions that ensure afterschool sports programs are structured to maximize their mental health benefits. One approach could be introducing mental health-informed coaching strategies in school, training coaches to recognize signs of depression and foster an environment that prioritizes emotional well-being alongside athletic performance. Schools also should consider expanding their sports programs to include non-competitive, recreational team sports that focus on social bonding rather than performance, especially for students who may feel pressured by highly competitive environments. For female students, who exhibited consistently higher depression levels regardless of sport type, school programs could implement flexible participation options that reduce stress while maintaining the psychological benefits of physical activities. Additionally, creating more inclusive, socially engaging sports environments that emphasize peer support and mental well-being could help ensure that all students regardless of gender or sport type experience the full psychological benefits of sports participation.

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