



Research Article

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The Association of Team Sports with Psychological Distress and Suicidal Ideation Among High School Students



Becca Grizzard^{1*}, Natasha T Brison² and Tamika D Gilreath³

¹Department of Kinesiology and Sport Management, USA

²Department of Kinesiology and Sport Management, USA

³Department of Health Behavior, School of Public Health, USA

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***Corresponding author:** Becca Grizzard, Department of Kinesiology and Sport Management, USA

Abstract

The purpose of this study was to examine the relationship between feeling sad or hopeless and suicidal ideation among high school youth participating in team sports. The 2019 YBRSS data from the CDC (N=13,677) for grades 9-12 were analyzed through a series of logistic regression models. Results indicate playing any number of team sports provides protection against feeling sad or hopeless. Meanwhile, playing two or more sports provided protections against suicidal ideation. Therefore, parents should encourage their children to participate in at least one team sport, with more protection being provided with multiple team sport participation. In addition, the results support the idea that additional funding should be allocated for team sports in schools.

Keywords: Adolescents; Physical Activity; Team Sports; Participation; Suicidal Ideation; Psychological Distress

Introduction

Depression and suicide among adolescents are a significant public health concern. In 2016, suicide became the second leading cause of death in people aged 10-34 [1]. Physical Activity (PA) is widely accepted to boost mental and physical health [2,3]. Because of these and other benefits, recommended PA guidelines have been developed for children starting as young as three years old. The most recent recommendations of the US Department of Health and Human Services (USDHHS) released in 2018 recommend a minimum of 60 minutes of moderate-to-vigorous physical activities each day for children aged 6-17 years. The USDHHS defines PA as aerobic and strength training activities [4]. Although the USDHHS has encouraged PA for children and adolescents, inactivity among adolescents is at an all-time high [5].

Approximately 50% of people who suffer from depression and anxiety develop these symptoms in their mid-teens, increasing to 75% by their mid-20s [6]. Worldwide, depression is a leading cause of disability and has become a significant cost to society, and can lead to suicide [7,8]. Depression is linked to many physical health issues, such as increases in cardiovascular disease,

morbidity, suicide, and other brain functions [9,10]. Treatments for depression often are therapy and prescription medications to help people combat their depressive state [11]. However, not everyone presents depression the same, and not everyone responds to these treatments [12,13]. Through a meta-analysis conducted by people with high levels of PA have lower odds of depressive symptoms than those with low levels of PA.

Meta-analysis showed low PA, identified through low cardiorespiratory fitness increases the risk of depression. Still, a comparative analysis by You et al. [14] ranging from 2000-2020 found that exercise alone was not the most effective course of action for teenagers to prevent depression. Studies have shown team sport participation, which involves PA, is a better protective measure to combat depression and suicidal ideation [15]. However, just as there has been a decline in physical activity, there has also been a decline in team sport participation. A systematic review of an international sample, including the years 1950-2020, showed that team sports helped lower additional risk behaviors such as smoking, alcohol, and drug use compared to people who exercise outside of a team environment.

Team sports have also been associated with lower odds of self-reporting of depression and anxiety in middle and high school athletes [16,17]. Harrison et al. [18] found that team sport participation in high school lowered the odds of emotional distress compared to students who participated in non-sport extracurricular activities such as band. Also, they found that team sports participation reduced the rate of suicidal ideation and suicide attempts. Club sport activities in five-, seven-, and eleven-year-olds improved peer relationships and decreased emotional issues as they progressed through school [19] Sabiston et al. [20,21] found that as the number of years of team sport participation increases, early adulthood depression decreases. Yet, the same relationship was not found in students participating in individual sports.

Depression is the primary factor leading to suicide. Despite significant research on depression and physical activity, there are few studies on the impact team sports have on suicidal ideation among adolescents. Meanwhile, suicidal thoughts in adolescents lead to attempts in about 60% of the students [22]. A longitudinal study found that middle and high school students involved in team sports have greater protections against suicidal ideation in high school than non-athletes [23]. However, the study also found that students who did not participate in team sports after middle school reported higher suicide attempts than those who did not participate in any sports Sabo et al. [24] determined that females and males who played sports had lower odds of considering or attempting suicide. A study conducted in 2017 found that team sports demonstrated lower odds of suicidal thoughts. Still, there is conflicting evidence of team sports lowering the odds of depression and suicidal ideation.

In some studies, team sports have had negative impacts on depression in highly involved athletes participating at high levels of competition [25] discovered that highly involved athletes had

the lowest odds of considering suicide, but only female athletes had lower odds of planning for a suicide attempt. Lester [26] consolidated all Youth Risk Behavior Surveillance System (YBRSS) studies from 1991-2011, comparing non-sport students to students who played sports by combining one team, two teams, and three or more teams into one group. He found that those who played sports reported less suicidal ideation than those who did not play on a sports team. While the study focuses on adolescents who play team sports versus those who do not, this study aims to examine how the number of team sports an adolescent participates in is associated with psychological distress and suicidal ideation. More than one team sport is anticipated to be associated with decreased odds of psychological distress and suicidal ideation. These results will inform US policymakers about the immediate need to fund team sports for adolescent youth.

Methods

This study used data from the 2019 YBRSS collected by the Centers for Disease Control and Prevention (CDC). YBRSS data is a national representation of high school youth that measures a wide range of health-related behaviors. However, this survey does not account for high school-aged youth not enrolled in school, homeschooled, or living in a US territory. YBRSS data is collected every two years to identify trends of various types of risky behaviors across the US over time. National and state researchers use this secondary data to inform research on interventions and treatments, hoping to lower these risk factors and improve the mental and physical health of 9th – 12th grade students. Demographics included sex, race/ethnicity, and grade. The total number of participants was 13,677, with sex evenly distributed (males=50.6% and females=49.4%). (Table 1) shows that White students represented 51.2% of students, while multi-race Latinx students represented the second largest group at 16.9%.

Table 1: Demographic Characteristics Among Youth (N=13,677).

	n	weighted %
Race/Ethnicity		
American Indian or Alaska Native	214	0.98
Asian	618	5.1
Black	2040	12.2
White	6668	51.2
Latino	1009	9.2
Latino (multi-race)	2029	16.9
Other/Mixed	661	4.4
Grade		
Nine	3637	26.6
Ten	3717	25.5
Eleven	3322	24.3
Twelve	2850	23.6
Sex		

Male	6641	50.6
Female	6885	49.4
Academics		
Mostly A's and B's	609	4.8
Mostly C's	2068	16.7
Mostly D's and F's	9785	78.5
Cardio		
0 Days	2320	17
1-2 Days	2331	16.7
3-4 Days	2944	22.2
5-7 Days	5625	44.1
Weight Training		
0 days	2568	29.7
1-2 Days	1785	20.8
3-4 Days	1830	21.7
5-7 Days	2291	27.7
Number of Team Sports		
None	4242	42.6
One	2584	25.9
Two	1737	18.2
Three or More	1224	13.3

Note: The number of subjects varies because of missing data.

The next highest group are Black students (12.2%), with the remaining groups making up the remaining participants (American Indian or Native American=0.98%, Asian=5.1%, Latinx=9.2%, and other/mixed race 4.4%). The grades of the students were also evenly distributed (9th=26.6%, 10th=25.5%, 11th=24.3%, and 12th=23.6%). Although the student's self-reporting of feeling sad or hopeless is not a diagnosis of depression, according to the National Institutes of Health (NIH) these are signs and symptoms of depression (NIH, n.d.). Therefore, lowering the incidence of feeling sad and hopeless potentially reduces the risk of depression. For this reason, this study analyzes the likelihood of feeling sad or hopeless and suicidal ideation among students participating in team sports compared to students who do not participate. However, this study takes the analysis further by comparing the number of team sport participation to those without team sport activities.

Covariates

In addition to sex, grade, and race/ethnicity (American Indian/Native American/Pacific Islander/Native Hawaiian, Black, White, Latinx (single race), Latinx (multiple race), other/multiple race, Asian) from the YBRSS 2019 data, the student's self-reported academic grades over the past 12 months were included (mostly A's and B's=4.8%, mostly C's=16.7%, mostly D's and F's=78.5%). Two additional survey items addressing physical activity and

strength training were included. Both questions inquired about how many days in the previous seven days they participated in physical activity for at least 60 minutes and how many days they did strength training. For this study, the days were grouped into the following categories: 0 days, 1 – 2 days, 3 – 4 days, and 5 – 7 days. Lastly, the question "During the past 12 months, on how many sports teams did you play? (Count any teams run by your school or community groups.)" addresses team sport participation. The response options were 0, 1, 2, and 3 or more.

Dependent Variables

The two dependent variables this study focuses on were feeling sad or hopeless and suicidal ideation. Feeling sad or hopeless was measured by one item: "During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?" Suicidal ideation was similarly measured through one item: "During the past 12 months, did you ever seriously consider attempting suicide?" Both questions were answered as either yes or no.

Analysis

SAS 9.4 statistical program was used for all data analysis. Proc survey logistic was utilized to control the complex sample design of the YRBS. Two Logistic regression models were conducted to determine if the number of team sports is associated with feeling sad or hopeless and suicidal ideation.

Results

As seen in (Table 2), females demonstrated over two times the odds of experiencing sadness or hopelessness (OR=2.36, CI=2.08-2.68) and suicidal thoughts (OR=2.12, CI=1.81-2.48) compared to males. For race, only Black and multiple race Latinx students had significant differences compared to White participants. Black students have lower odds of experiencing sadness or hopelessness (OR=0.79, 95% CI=0.62-0.995), while multiple race Latinx students experience higher odds (OR=1.52, CI=1.21-1.90). When analyzing suicidal ideation, three races differ significantly from White students. American Indian/Native American/Pacific Islander/Native Hawaiian and Multiple Race Latinx high school

youth are 2.03 and 1.41 times higher to have suicidal thoughts than White participants, respectively (CI=1.06-3.92 and CI=1.10-1.81).

Furthermore, Latinx youth are less likely to experience suicidal ideation comparatively (OR=0.60, CI=0.47-0.75). As seen in (Table 2), any team sport participation was significantly associated with lower odds of feeling sad or hopeless compared to students who did not play any team sports (1 team OR=0.76, CI=0.63-0.91, 2 teams OR=0.66, CI=0.54-0.81, 3+ teams OR=0.69, CI=0.54-0.88). However, only participation in 2 or 3 or more teams lowers the odds of suicidal thoughts (OR=0.72, CI=0.56-0.92 and OR=0.56, CI=0.40-0.78).

Table 2: Logistic Regression of Sad or Hopeless and Suicidal Ideation.

	Sad/Hopeless vs. Not Sad/Hopeless		Thoughts of Suicide vs. No Thoughts of Suicide	
	OR	95% CI	OR	95% CI
Sex				
Female vs Male	2.36	[2.08-2.68] *	2.12	[1.81-2.48] *
Race/Ethnicity				
AINH vs White	1.61	[0.93-2.79]	2.03	[1.06-3.92] *
Asian vs. White	0.8	[0.62-1.04]	1.01	[0.69-1.46]
Black vs. White	0.79	[0.62-0.995] *	0.79	[0.62-1.00]
Latino vs. White	0.97	[0.76-1.23]	0.6	[0.47-0.75] *
Other Latino vs. White	1.14	[0.99-1.32]	0.77	[0.58-1.04]
Other race vs. White	1.52	[1.21-1.90] *	1.41	[1.10-1.81] *
Grade				
Nine vs Twelve	0.87	[0.70-1.07]	0.93	[0.74-1.16]
Tenth vs Twelve	1.01	[0.85-1.19]	0.98	[0.76-1.27]
Eleventh vs Twelve	1.02	[0.84-1.24]	1.03	[0.83-1.27]
Academics				
D's and F's vs A's and B's	2.37	[1.82-3.09] *	3.16	[2.36-4.22] *
C's vs A's and B's	1.74	[1.51-2.01] *	1.59	[1.37-1.84] *
Cardio				
1-2 Days vs 0 Days	1.06	[0.84-1.34]	0.87	[0.65-1.15]
3-4 Days vs 0 Days	1.02	[0.82-1.27]	1.02	[0.79-1.34]
5-7 Days vs 0 Days	0.83	[0.65-1.07]	0.72	[0.57-0.91] *
Weight Training				
1-2 Days vs 0 Days	1.08	[0.84-1.37]	1.1	[0.90-1.33]
3-4 Days vs 0 Days	1.04	[0.88-1.24]	0.85	[0.65-1.11]
5-7 Days vs 0 Days	1.04	[0.84-1.30]	1.09	[0.89-1.33]
Teams				
1 Team vs 0 Teams	0.76	[0.63-0.91] *	0.82	[0.64-1.04]
2 Teams vs 0 Teams	0.66	[0.54-0.81] *	0.72	[0.56-0.92] *
3+ Teams vs 0 Teams	0.69	[0.54-0.88] *	0.56	[0.40-0.78] *

* p < .05.

Discussion

As suggested, this study shows combining PA with team sports involvement reduces the risk of feeling sad or hopeless and suicidal ideation. Further, two or more sports may be especially helpful in preventing suicidal ideation. Our study demonstrates highly involved athletes who participated in 3 or more sports still had protections against both depression and suicidal ideation. The mental health benefits associated with team sports are likely due to the social aspect of a team that provides camaraderie, connectedness, positive attachment, and structure discuss that some potential indirect effects could increase self-esteem, a sense of belonging, development of work ethic, and resiliency to adversity. Additionally, the more team sports a student participates in, the amount of PA also increases.

For example, among those on three or more sport teams, 47% report 7 days of 60 minutes of PA compared to only 10% of those on no teams. The difference in PA is a large disparity that cannot be ignored. Therefore, team sports can be used to meet the USDHHS daily recommendations for PA that provide physical health benefits. It has been estimated that global costs of lost output from mental health problems may reach 8.5 trillion. Multiple studies have shown that individuals who suffer from depression and suicidal thoughts in adolescence have an increased risk of experiencing these feelings as an adult [27]. And for those who unfortunately do commit suicide, the majority were diagnosed with at least one major mental diagnosis beforehand, predominantly depression [28,29]. It is no secret that middle and high schools nationwide are cutting funding for extracurricular activities such as sports, band, chorus, and drama [30].

The answer for many of the schools has been a “pay-to-play” (P2P) structure where the students and their families are picking up the costs to run these programs. In 588 Michigan school districts, there were 10% fewer participants with P2P costs of only \$100 [31]. Preventing depression-related symptoms at an earlier age potentially prevents depression and suicide later in life. Since depression is linked to other risk factors, such as cardiovascular disease and obesity, preventing depression will likely lower these risks. As seen, not only do team sports provide protections against feeling sad or hopeless and suicidal ideation, but there could also be implications of lower suicide rates in high school and adulthood. Therefore, funding high school sports is a low-cost treatment and a much-needed option.

Implications for Health Behavior Research

This study urges policymakers to provide team sport participation funding for all high school students. Lower-income areas are at greater risk of experiencing the mental and health issues previously discussed in high school or later in life. As demonstrated by these areas are hit particularly hard by the P2P structure. This type of data shows the importance of keeping

sports within the budget in high schools in the US. Both state and national policies should be revisited to provide adequate funding for these programs. Further, parents and guardians should encourage high school youth to participate in Team Sports for both physical and mental health benefits.

Students should also be encouraged to participate in multiple sports to provide greater protection against feeling sad or hopeless and suicidal ideation. If preventing sadness or hopelessness or suicidal ideation in high school youth can lower the risk of similar symptoms later in life, then team sport participation at an earlier age likely provides greater protections. Therefore, this study needs to expand to younger adolescent populations. Also, this dataset is the last collection before the COVID-19 pandemic, making this a timely and vital dataset. The results of the data are expected to be significantly impacted, and the rates of sad or hopeless and suicidal ideation will increase as team sport participation decreased due to the pandemic. Future research should re-examine adolescent mental health using post-Covid data.

Limitations

The dataset does not specify what sports the athletes played or at what level they participated, such as community, school, or higher. Therefore, understanding the competitive demands of the teams they participated in is important for future studies. Also, the definition of team sports may vary depending on the person. For example, some might view track and field as an individual sport or a team sport by others. Thus, identifying what sports the students participated in and how they define them is important in understanding the impact different sports have on the students.

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