

Participation in Sports, Level of Self-esteem, and Major Depression in Adolescents

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Abstract

The primary objectives of this study were to examine the associations between sports participation, self-esteem, and major depression in adolescents. Specifically, the study examined (a) the bivariate associations between sports participation and depression; (b) whether gender moderated the association between sports participation and depression; and (c) whether self-esteem accounted for the association between sports participation and depression. Concerning potential bivariate associations, it was hypothesized that number of years of participation in sports other than gym in school would be negatively associated with prevalence of major depression. Finally, it was hypothesized that self-esteem would account for the association between sports participation and major depression. The aims and hypotheses were evaluated in a United States probability sample of 6,445 adolescents between the ages of 13 and 18. Consistent with study hypotheses, results suggested that the number of years of sports participation was significantly and negatively associated with 12-month prevalence of major depression and that self-esteem partly accounted for this association. However, there was no evidence that gender moderated the association between sports participation and major depression.

Mental health problems are among the most common problematic issues occurring in society and they affect a large percentage of the general population (American Psychological Association, 2018). Adolescents are a unique age group that experience an assortment of stressors and challenges growing up and navigating through life. The lifetime prevalence of major depressive disorder (MDD) or dysthymia in adolescents is approximately 12%, with 9% of adolescents having MDD or dysthymia with severe impairment (Merikangas et al., 2010). The rise in MDD has been driven by multiple factors. Adolescents may use outside factors to cope with their problems, including participation in sports. The present study was conducted to examine the association between sports participation, self-esteem, and MDD in a large probability sample of adolescents.

Adolescent Mental Health

The prevalence of mental health problems in the adolescent community suggest that they affect a large number of youths. The American Psychiatric Association (2018) describes mental illness as “any changes in action, thoughts, or emotions, which may lead to relationship, social, or employment issue” (Ryan, Gayles & Bell, 2018). The growing body of research and awareness encircling mental health in adolescence has encouraged researchers and clinicians to take action in addressing these mental health concerns. For example, a book written by Ogden, Hagen and Amlund (2018) provides a better understanding of evidence-based treatments and prevention programs created to build on prior knowledge regarding behavioral and emotional problems in adolescence and how they are sustained. The ever-changing issue of mental illness is growing steadily and affecting both the adult population and adolescence as well.

According to The World Health Organization, mental health is defined as a “state of well-being whereby individuals recognize their abilities, are able to cope with the normal stresses

of life, work productively and fruitfully, and make a contribution to their communities”

(Michaud et al., 2015, p. 835). This definition, based as a description for all age groups, can be far more difficult to identify in young people, especially given the substantial changes that arise during the teenage years. Behavior, intellect, and identity seem to change frequently during this time.

The rise in difficulties regarding detection of mental health concerns in adolescents has been attributed to a lack of research. Although a lack of research remains in the detection of mental health concerns in adolescents, information surrounding factors contributing to preventing mental illness in adolescents is vastly studied. In regard to prevention, participation in sports may reduce risk for depression in adolescents. Adolescents experience sports in a way other age groups do not, as it is typically a fun and engaging environment. In a study done on adolescent girls, the authors tested whether physical self-concept and self-esteem would mediate the cross-sectional relations of physical activity and sport participation with depression (Dishman, Hales, Ward, Pfeiffer, Felton, Saunders, Dowda, & Pate, 2005). The correlational findings from the study suggest physical activity and sport participation may reduce the risk for depression among adolescent females (Dishman et al., 2006).

Depression

Depression in adolescents has been widely studied and is one of the highest priorities in adolescent mental health (Michaud & Fombonne, 2005). According to the American Psychological Association (2018), depression occurs when there is a persistent feeling of guilt or worthlessness, decreased interest in daily activities, lack of energy, weight loss or gain, change in sleep, change in psychomotor activity, diminished concentration, irritability and suicidality. From a psychological perspective, adolescents may be prone to experience depression when they

face a decline in self-esteem. Conceptually, the act of changes and behaviors occurring in adolescents may result in behavioral deactivation, negative self-perceptions, and feeling of helplessness or hopelessness, which are consistent with depression symptoms (Wolanin, Gross & Hong, 2015). Although many areas of research around depression and mental health are understudied, data collected suggest that adolescents worldwide are easily more susceptible to depression than the general population, but it often goes unrecognized (Thapar, Collishaw, Pine & Thapar, 2012). Although a lack of consistency remains, mental health disorders in adolescence have been on a steady increase in the past 20-30 years (Michaud & Fombonne, 2005). With respect to prevalence, as many as 9-13.3% of the U.S. adolescent population has suffered from some form of depressive state (National Institute of Mental Health, n.d.). In relation to adulthood, prevalence of depression increases from around 2% in early adolescence to nearly 18% in young adulthood (Hankin et al, 1998; Oldehinkel & Ormel, 2015 as cited by Masselink, Roekel & Oldehinkel, 2017).

Self-Esteem

Self-esteem in the general population is a common indication of confidence in one's worth and has been studied to assess multiple lingering factors that may contribute to high and low levels. Particularly, self-esteem in adolescence has a strong effect on overall mental well-being, along with self-esteem potentially being a strong protective factor for depression. Research on adolescent self-esteem has focused on the important changes experienced during adolescent years (Kort & Butler, 2011). In one study, Kort et al. (2011) used a growth-curve analysis to examine self-esteem trajectories in individuals ages 14 to 26 years old. The results of the study showed that age had a linear relationship with self-esteem over the course of time (Kort et al., 2011). Many studies show positive associations in relation to a higher level of self-esteem

accounting for a decrease in the risk for mental disorders. A meta-analysis of the longitudinal association between self-esteem and depression found that low self-esteem and depression were significantly associated, with a mean cross-lagged effect of self-esteem on depression of .16 (Sowislo & Orth, 2012). Similarly, other researchers have concluded that “ample research has shown that low self-esteem increases the risk to develop depressive symptoms during adolescence...(but that) the mechanism underlying this association remains largely unknown, as well as how long adolescents with low self-esteem remain vulnerable to developing depression” (Masselink, Roekel & Oldehinkel, 2017, p. 932).

Although the mechanism underlying the association between self-esteem and depression is not yet well understood, knowing that these constructs are associated may have important implications for prevention and intervention (Masselink et al., 2017). Intervention and prevention are essential for mental health disorders across the nation, given that quality of life is heavily rooted in mental health and overall well-being. Increasing self-esteem may be expected to reduce the risk for depression and potentially reduce symptoms in depressed individuals.

In the same way that the general population is exposed to high pressures and internalized self-worth, adolescents display an association between self-esteem and depression. In prior research, studies have examined mental health concerns in adolescence and found numerous associations between sports participation, self-esteem, and physical self-concepts leading to a reduction of serious mental health effects (Liu, Wu & Ming, 2015). High self-esteem is also correlated with active engagement in daily activities, a more optimistic attitude, and better psychological health (Bowker, 2006).

Sports Participation in Adolescence

Sports participation is commonly known as a healthy activity outlet for adolescents in terms of their physical well-being but can also be beneficial for their self-esteem and psychosocial adaptation (Sygusch, 2002 as cited by Noack, Kauper, Benbow & Eckstein, 2013). Sports participation among adolescence is strongly advised, using its benefits to decrease mental disorders, such as depression. Sports participation has been among the highest factors reducing the risk of depression, suicide ideation, and so forth (Taliaferro, Rienzo, Miller, Pigg & Dodd, 2010). According to a study done that examined multiple pathways between sports participation and suicide ideation, researchers found that self-esteem and depression both mediated the relationship between physical activity and suicidal ideation (Taliaferro et al., 2010). Other prior studies also show more general results expressing a positive association between sports participation and adolescent developmental outcomes (Super, Hermens, Verkooijen, & Koelen, 2018).

Gender

Adolescence is a period of transformation, and gender may play an important role in regards to depression, self-esteem and sports participation. Prior studies examining for one or more variable associations between depression, self-esteem and sports participation have yet to find significant results. In a study done by Bowker, Gadbois and Cornock (2003), the researchers examined the role of gender, sports participation, and gender orientation in predicting individual's self-esteem. The results of the study showed that although gender differed for level of satisfaction with weight and appearance, there were no significant differences in overall general self-worth (Bowker et al., 2003). Gender differences in sport and physical exercise have heightened the attention towards the existence of gendered aspects of leisure involvement that

restrain girls' participation (Wiley, Shaw, & Havitz, 2000 as cited by Gomez-Baya, Mendoza, Gaspar de Matos, & Tomico, 2016).

Although no significant gender differences in sport participation and self-esteem and depression have been found, prior studies have found significant gender differences in prevalence of depressive symptoms among college athletes, in which females exhibited almost 2 times the risk of males for endorsing clinically relevant symptoms (Wolanin, A., Gross, M., Hong, E., Marks, D., & Panchoo, K., 2016). In addition to females elevated risk for depression, females typically experience a multitude of factors influencing their participation in sports that generally differ from males (Women's Sports Foundation, 2016).

The results from prior studies have focused on mean differences between adolescent boys and girls in their level of depression, self-esteem, or participation in sports. However, researchers have typically not examined gender as a potential moderator of the associations between these variables. That is, is the strength of the association between sports participation and depression greater for boys than for girls? Examining gender differences in the strength of the association between sports participation and depression was one aim of the current study.

Current Study

This study was conducted to examine associations between sports participation, self-esteem, and major depressive disorder (MDD) in a large probability sample of adolescents recruited from across the nation. The study was designed to address some of the limitations of prior research through the use of models examining bivariate associations, moderation, and a result that would be consistent with mediation. Regarding potential bivariate associations, it was hypothesized that participation in sports would be negatively associated with MDD. Regarding moderation, it was hypothesized that gender would moderate the association between sports

participation and MDD. Regarding potential mediation, we examined whether self-esteem accounted for the association between sports participation and depression, which would be consistent with a mediation model in which participating in sports leads to better self-esteem, which in turn leads to reduced likelihood of depression.

Method

Participants

Participants were drawn from the National Comorbidity Survey Replication Adolescent Supplement (NCS-A: Merikangas et al., 2010). The NCS-A is a large probability sample of 13-18-year-old adolescents who completed an interview to examine the prevalence and correlates of psychopathology. The current study included 6,445 participants (3,135 males, 3,310 females). The average age was 15.08 years ($SD = 1.46$). The participants race and ethnicity were categorized as White (65.8%), Black (16.9%), Hispanic (11.6%), and other (5.7%).

Measures

Major Depressive Disorder. Major Depressive Disorder was measured by way of diagnostic assessment using the Composite International Diagnostic Interview Version 3.0 (CIDI). The CIDI is a structured interview for assessing psychiatric disorders. The current study focused on 12-month prevalence of MDD.

Self-esteem. Self-esteem was measured with an abbreviated, 5-item version of the widely used Rosenberg (1965) Self-esteem Scale. A sample item was *Overall, I am satisfied with myself*. Respondents rated how true each statement was for them on a 4-point rating scale, with response options of *very*, *some*, *a little*, and *not at all*. Responses were reverse-scored as necessary and summed, with higher scores indicating higher levels of self-esteem. Cronbach's alpha for the measure in this sample was .75 indicating good internal consistency of the measure.

Sport Participation. To measure participation in sports, respondents were asked: *How many years were you involved in sports teams other than in gym at school?* The independent variable was the number of years of sports participation, with a potential range of 0-12.

Results

Descriptive information on the prevalence of MDD and level of self-esteem and sports participation are presented in Table 1.

To evaluate the association between MDD and both sports participation and self-esteem, logistic regression analyses were conducted. In these analyses, 12-month prevalence of MDD (coded 0 for *no* and 1 for *yes*) was regressed on years of sports participation and/or self-esteem, adjusting for age, gender (0, *male*; 1 *female*), and race/ethnicity (dummy coded for black, Hispanic, other, with white as the reference category). Because evidence of moderation qualifies the interpretation of associations between variables, we first examined whether gender moderated the association between sports participation and MDD (Hypothesis 2). To test for gender moderation, a Gender \times Sports Participation interaction term was created; years of sports participation was mean deviated (i.e., centered) prior to creating the interaction term. Prevalence of MDD was regressed on the Gender \times Sport Participation interaction term, adjusting for the component terms, as well as age and race/ethnicity. After adjusting for the component terms (and age and race/ethnicity), the Gender \times Sports Participation interaction term was not significantly associated with MDD, Odds Ratio (OR) = 0.98, 95% Confidence Interval (95% CI) = 0.92, 1.05, $p = .51$. Therefore, data were collapsed across gender for the remainder of the analyses.

Results from the logistic regression analyses predicting MDD from sports participation are presented in Table 2 (Model 1). As can be seen in this table, after adjusting for demographic covariates, number of years of sports participation was significantly and negatively associated

with 12-month diagnosis of MDD: as number of years of sports participation increased, the prevalence of MDD decreased. Results from the logistic regression analyses predicting MDD from self-esteem are also presented in Table 2 (Model 2). As can be seen in this table, after adjusting for demographic covariates, self-esteem was significantly and negatively associated with 12-month diagnosis of MDD: as self-esteem increased, the prevalence of MDD decreased.

Sports participation was also significantly and positively associated with self-esteem, $r = .10, p < .001$; this association remained significant in a multiple regression analyses adjusting for demographic characteristics, $b = .02, SE = .01, \beta = .08, p < .001$. Because sports participation was significantly associated with self-esteem and MDD, and because self-esteem was significantly associated with MDD, we were interested in evaluating whether SE accounted for the association between sports participation and MDD. To test this model, MDD was regressed on both sports participation and self-esteem, as well as demographic characteristics; results from this logistic regression analysis are presented in Table 2 (Model 3). As can be seen in this table, after adjusting for demographic covariates and years of sports participation, the association between self-esteem and MDD remains significant. Although the association between sports participation and MDD also remained significant in this model, the strength of the association was somewhat smaller than Model 1, which did not include self-esteem. Taken together, the pattern of results suggest that self-esteem partially accounted for the association between sports participation and MDD.

Discussion

The current study was conducted to examine the associations between sports participation, self-esteem, and MDD in a large, probability sample of adolescents. We found that more participation in sports during adolescence was associated with lower prevalence of MDD,

that self-esteem was associated with lower prevalence of MDD, and that self-esteem partially accounted for the association between sports participation and MDD. In addition, we found that the association between sport participation and depression did not significantly differ by gender.

The results for sports participation and MDD are consistent with previous studies that have found an association between sports participation and depression. A prior study by Taliaferro et al. (2010) reported that sports participation has been an important factor in reducing risk of depression and other mental illnesses in adolescence, similar to the results of the current study that show number of years of sports participation to be significantly and negatively associated with 12-month diagnosis of MDD. As summarized by Jewett, Sabiston, Brunet, O'Loughlin, Scarapicchia, and O'Loughlin (2014),

Numerous researchers report an association between physical activity and mental health. Several mechanisms may underpin this link including neurobiological influences (i.e., monoamine availability, regulation of the hypothalamic pituitary-adrenal axis, increased neurotrophic factors, changes in brain circuitry), psychological characteristics (i.e., enhanced self-efficacy and mastery, self-concept), and social factors (i.e., social interaction, belonging, connectedness). For example, physical activity offers an opportunity to enhance self-concept, and increased perceptions of self-concept help reduce depressive symptoms. Similarly, physical activity in the context of sport participation provides opportunities for social interaction and connectedness that may foster positive mental health (pp. 640-641).

The current findings build on prior research in demonstrating that sports participation is associated not only with lower levels of depressive symptoms but also lower likelihood of meeting diagnostic criteria for MDD in the prior year. The current findings also build on prior

studies in demonstrating that sports participation is associated with MDD in a nationally-representative probability sample of adolescents. This is important because most prior studies have examined this association in samples of convenience.

Finally, the current findings build on prior studies in suggesting one pathway by which sports participation may influence risk for depression. Specifically, findings from the current study suggest that increased self-esteem may be a potential pathway by which participating in sports lowers risk for depression. This is important because studies on sports participation and depression have frequently acknowledged the need for research on potential pathways.

Results from the current study suggest that gender did not moderate the association between sports participation and depression, which suggests that the strength of this association is comparable for boy and girls. In the current study, after adjusting for age and race/ethnicity, the Gender \times Sports Participation interaction term was not significantly associated with MDD. To the extent that sports participation is associated with lower risk for depression, the results of the current study suggests it would be important to encourage both boys and girls to participate in sports.

Results from the current study may have implications for the prevention of depression in adolescents. Prior research suggests that encouraging participation in sports may be helpful for reducing the risk for depression. By encouraging participation in sports, adolescents may be involved in an environment that heightens their self-esteem, body image, and active social engagement, leading to a reduced risk for developing depression or depressive symptoms. Results from prior studies suggest that engagement in sports during adolescence shows a statistically significant association with lowered mental health problems. For example, one study found that participation in school sports during adolescence was associated with lower

depressive symptoms, lower perceived stress, and higher self-rated mental health (Jewett et al., 2014). These results may also suggest further potential positive outcome for sports participation affecting more mental health problems than just depression, encouraging further research on the associations between physical activity and reduced risk for mental health disorders in general.

Limitations and Future Directions

Despite the fact that several of the study hypotheses were supported, there were a few limitations in the study design that may influence the interpretation of the findings. The current study was not a longitudinal study; therefore, causation between sports participation, self-esteem, and depression cannot be inferred. This limits the overall contribution of the study. Although it is possible that participating in team sports reduces risk for depression in adolescents, it is also possible that depression reduces the likelihood of a person participating in sports. Finally, although the association between sports participation and MDD was observed adjusting for demographic variables, it is possible that some unmeasured third variable is contributing both to the likelihood of sports participation and MDD.

Other potential limitations may involve the lack of specificity used when interviewing or assessing general participation in sports in adolescents. A potential, more effective method for assessing sport participation may include specific information regarding the assessment of sport participation (individual versus team sports), relationships within the sport (teammates and coaches), and the differences and/or similarities between sport participation and physical activity. Evaluating the difference between individual and team sports may lead to a more descriptive understanding of the risk level of depression an individual may experience. Studies show that individual athletes have been found to be more prone to depression compared to those in team-oriented sports. For example, one study found higher levels of depressive symptoms in

athletes in individual sports relative to those in in team sports (Nixdorf, Frank, & Beckmann, 2016). Relationships within sports are another potential source of influence on the risk for depression in adolescents. In a study done by Hagiwara, Iwatsuki, Isogai, Van Raalte, and Brewer (2017), researchers found that relationships in intercollegiate athletes between teammate social support and mental health problems were a contributing factor to the reduced risk of depression regarding sports participation and was gender specific. This gender difference was only found to be statistically significant in females, but not for males (Hagiwara et al., 2017). This result illustrates the potential for examining the atmosphere individuals are a part of and how relationships may affect their risk for depression, including potential gender differences in this association. Finally, examining the differences and/or similarities between sport participation and physical activity and their associations with mental health could contribute to the understanding of whether participation in sports in particular is essential to the reduced risk for depression in adolescents or whether similar associations would be observed for physical activity in general.

Future improvements to the study may include a more detailed assessment to gather more specific information regarding aspects of sports participation. Creating a more in-depth analysis of sports participation in adolescents could contribute to a better understanding of the specific aspects of sports participation that are associated with better mental health. Along with addition to details regarding sports participation, future research would benefit from the use of a longitudinal study design to determine whether sports participation precedes and therefore is potentially causally associated with depression in adolescents. Although prior studies have used longitudinal study designs to examine these associations, there still is not a sufficient amount of information regarding how sports participation in adolescence impacts individuals as they

continue into young adulthood (Kort et al., 2011). In addition, a longitudinal design is necessary for testing mediation; in this case, whether self-esteem mediates the longitudinal association between sports participation and subsequent risk of depression. A longitudinal study would allow testing self-esteem as a potential mediator between sports participation and depression. In order to address the limitations of the current study, researchers would need to study the same participants across time and throughout adulthood.

The results from this study shed a positive light on the potential attributes that may prevent or decrease the risk of depression in adolescents. Furthermore, the results are consistent with a model in which physical activity and participation in sports may lead to improvements in self-esteem and self-concept and therefore decreasing depressive symptoms (Calfas & Taylor, 1994). The main finding of the study was the negative association between sports participation and MDD, along with the finding that self-esteem partly accounted for this association. These results support continued investigation into the associations between participation in sports and mental health outcomes in adolescents, including research on potential mechanisms of these associations.

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Table 1

Prevalence of Major Depressive Disorder and Level of Self-esteem and Sports Participation

| Measure | % | Mean | <i>SD</i> |
|---------------------------|------|------|-----------|
| Major Depressive Disorder | 12.9 | | |
| Self-Esteem | | 2.51 | 0.54 |
| Sports Participation | | 2.48 | 2.68 |

Note. *SD* = standard deviation

Table 2

Logistic Regression Analyses Predicting Major Depressive Disorder from Sports Participation, Self-Esteem, and Demographic Characteristics

| Variable | Model 1 | | Model 2 | | Model 3 | |
|----------------------|---------|------------|---------|------------|---------|------------|
| | OR | 95% CI | OR | 95% CI | OR | 95% CI |
| Age | 1.22*** | 1.15, 1.28 | 1.24*** | 1.17, 1.31 | 1.26*** | 1.19, 1.33 |
| Female | 2.10*** | 1.80, 2.44 | 1.68*** | 1.43, 1.97 | 1.65*** | 1.40, 1.94 |
| Black | 0.89 | 0.71, 1.13 | 1.07 | 0.84, 1.37 | 1.01 | 0.79, 1.29 |
| Hispanic | 1.17 | 0.91, 1.50 | 0.97 | 0.74, 1.27 | 0.91 | 0.69, 1.19 |
| Other | 1.10 | 0.77, 1.55 | 1.05 | 0.72, 1.52 | 0.96 | 0.66, 1.40 |
| Self-Esteem | ----- | ----- | 0.22*** | 0.19, 0.25 | 0.23*** | 0.20, 0.26 |
| Sports Participation | 0.88*** | 0.86, 0.91 | ----- | ----- | 0.91*** | 0.88, 0.94 |

* $p < .05$. ** $p < .01$. *** $p < .001$.