



The effect of physical activity on depression in adolescence and emerging adulthood: A growth-curve analysis[☆]



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ABSTRACT

This study examined the influence of physical activity on the trajectory of depression from adolescence through emerging adulthood (EA). Using data from the National Longitudinal Study of Adolescent Health (Waves I to IV), latent growth curve modeling was performed to assess how physical activity and gender influenced depression across adolescence and EA. Higher levels of physical activity in mid-adolescence were associated with lower levels of depression during mid-adolescence and slower inclines and declines in depression over time. Boys had lower levels of depression in mid-adolescence and slower inclines and declines in depression over time compared to girls. Findings provide evidence that current theories on understanding depression and mental health prevention programs may be enhanced by the inclusion of physical activity.

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Depression is a mental health issue facing individuals across the life span and is commonly associated with negative health, economic, and quality of life consequences. Depression typically emerges during adolescence (Kessler, Avenevoli, & Merikangas, 2001; Paus, Keshavan, & Giedd, 2008) and endures into adulthood (Rudolph, 2009). Noticeable gender differences exist with women and adolescent girls experiencing higher rates of depression than men and adolescent boys (Hyde, Mezulis, & Abramson, 2008), although these gender differences are not consistently found until mid-adolescence (Hankin et al., 1998; Nolen-Hoeksema & Girgus, 1994).

Traditionally, research has focused on established risk factors for depression, such as emotion dysregulation (Joormann & D'Avanzato, 2010; Yap et al., 2011), and poor social support (Needham, 2008; Vaughan, Foshee, & Ennett, 2010). More recently, the literature focuses on factors that lessen one's likelihood of experiencing low mood. Physical activity is a behavioral strategy that has been linked to improved mood (Birkeland, Torsheim, & Wold, 2009; Jerstad, Boutelle, Ness, & Stice, 2010; McPhie & Rawana, 2012; Motl, Birnbaum, Kubik, & Dishman, 2004). However, the long-term influence of engagement in physical activity on depressive symptoms beyond adolescence and into the next developmental stage of life, namely emerging adulthood (EA; 18–29 age range), is relatively unknown. Thus, the current study explored the influence of

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engagement in physical activity and the predictive effect of gender on the longitudinal trajectory of depressive symptoms from adolescence to EA using a national, longitudinal sample.

Trajectories of depression across development

The developmental psychopathology perspective suggests that depression is best conceptualized as a heterogeneous condition that occurs through a diversity of developmental pathways (Cicchetti & Toth, 1998). This perspective highlights the importance of examining developmental trajectories of psychopathology, such as depression, and using longitudinal research designs that allow one to examine the relationship between various risk and protective factors and long-term outcomes. As it currently stands, the literature on depression trajectories is limited in several respects. For one, relatively few studies have extended these findings further into EA, a period marked by significant changes and exploration, and important decisions regarding love and work (Arnett, 2000). Second, the literature has focused on the influence of risk and vulnerability factors. Third, few studies have examined gender differences in trajectories of depression that extend from adolescence through late EA, as the majority of research has tended to focus on either the adolescent or EA period independently, or a brief transitional period between these two stages of development. Thus, trajectory analyses represent a relatively new approach in which to examine depression pathways from adolescence to late EA.

Physical activity

The relationship between mental well-being and physical activity has attracted considerable attention in the literature. However, there are presently few studies on the interplay between physical activity and depressive symptoms among adolescents, as the majority of the research has focused on adult populations. Additionally, the paucity of studies using adolescent samples have generated mixed findings. Cross-sectional studies have consistently reported a negative relationship between physical activity and depressive symptoms; however, a temporal relationship cannot be assumed (Brand et al., 2010; Elliot, Kennedy, Morgan, Anderson, & Morris, 2012; Jerstad et al., 2010; McPhie & Rawana, 2012; Sigfusdottir, Asgeirsdottir, Sigurdsson, & Gudjonsson, 2011). Further, recent research has provided some encouraging support for physical activity as a beneficial intervention for mood in both clinical (Josefsson, Lindwall, & Archer, 2014; Mota-Pereira et al., 2011; Stanton, Happell, Hayman, & Reaburn, 2014) and non-clinical (Kalak et al., 2012) samples of adolescents and adults.

Research has demonstrated that physical activity and depressed mood tend to negatively covary across time in both adolescent (Birkeland et al., 2009) and adult populations (Lindwall, Gerber, Jonsdottir, Börjesson, & Ahlborg, 2014); however, few studies have examined the direction of the relationship between physical activity and depressive symptoms longitudinally during adolescence (Birkeland et al., 2009; Jerstad et al., 2010; Raudsepp & Neissaar, 2012). Birkeland et al. (2009) found no evidence for the influence of initial physical activity level on later changes in depressive symptoms among adolescents and early emerging adults. Moreover, Jerstad et al. (2010) found a bidirectional relation among physical activity and depression among adolescent girls, wherein physical activity was found to significantly reduce risk for future depressive symptoms and vice-versa. Raudsepp and Neissaar (2012) found that baseline level and changes in physical activity were negatively associated with baseline level and changes in depressed mood among adolescent girls. Thus, to date the literature has produced mixed findings, and the long-term effects of physical activity on depressive symptoms among male and female adolescents and emerging adults is unclear.

The few studies that have examined the prospective connection between physical activity and depressive symptoms are limited in several ways. Studies are generally restricted to the adolescent period, have short follow-up periods (e.g., less than 10 years), and include mainly adolescent girls (e.g., Jerstad et al., 2010; Raudsepp & Neissaar, 2012). As such, the current study aimed to build on the existing literature by examining the connection between physical activity and depressive symptoms over a span of 14 years from mid-adolescence into late EA using a large, longitudinal sample of adolescent boys and girls.

Current study

The overarching objective of this study was to examine the predictive effect of engagement in physical activity and gender on the longitudinal trajectory of depressive symptoms from adolescence into EA. Individuals were followed from mid-adolescence (i.e., age 15) to late EA (i.e., age 28) to encompass the time period in which gender differences in depression are consistently observed (Nolen-Hoeksema & Girgus, 1994). As far as the authors are aware, this is the first study to predict a depression trajectory across adolescence and into later EA.

The first study goal was to examine the prospective relationship between engagement in physical activity and depression. It was expected that engagement in physical activity would be associated with lower levels of depressive symptoms at baseline (age = 15 years) and that initial levels of engagement in physical activity would be related to more gradual declines and inclines in depressive symptoms over development.

The second objective was to examine gender differences regarding the trajectory of depression. It was expected that gender differences in depressive symptoms at baseline would exist, with adolescent girls having higher initial levels compared to adolescent boys. Moreover, it was expected that gender would significantly predict the rate of change in depressive symptoms across adolescence into EA in that boys would have steeper declines and more gradual inclines in depressive symptoms compared to girls.

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