

# **Understanding the Association Between Depression and Physical Activity in Adolescents and Emerging Adults from an Interdisciplinary Perspective**

## **Introduction**

Depression, including increased negative affect, a lack of energy, motivation or joy, affects around 300 million people worldwide and is one of the most common major psychiatric disorders according to the World Health Organization (2017). Depression often emerges during adolescence and continues into adulthood with symptoms being the highest during emerging adulthood (Kessler et al., 2001; Paus et al., 2008). Depression can be defined as a heterogeneous condition that occurs through the biological, psychological and social system pathways (McPhie, 2015a), and thus there are many possible points of intervention to lower the likelihood of experiencing depressive symptomatology. Recent evidence has shown that physical activity is associated with improved mood (Birkeland et al., 2009; Jerstad, et al., 2010; McPhie & Rawana, 2012; Motl, et al., 2004) and lowered depressive symptoms, thus highlighting a health behavior that can possibly improve psychological well-being. However, the direction of effects between depression and physical activity remain largely unknown, especially during adolescence and emerging adulthood, making it difficult to know where is best to focus intervention efforts. These challenges necessitate efforts to determine which course of action is best in reducing depression and increasing physical activity. Given the significance of changes in both depression and physical activity, adolescence and emerging adulthood have become an important time to examine the associations between mental and physical health, especially for female youth.

## **Background**

Adolescence, which describes the age range of 12 to 18, is a key developmental period with significant changes in biological, psychological, and social functioning that can have

lifelong effects (Steinburg 2007; 2008). Given the vast developmental changes that occur, as well as unprecedented social forces that affect health and well-being (Sawyer, 2022), research on adolescent mental and physical health has grown rapidly. Emerging adulthood (ages 18-29), the transitional period from a more structured lifestyle in late adolescence to the independence of young adulthood, has also become a developmental period of interest for researchers aiming to understand long-term physical and mental health. In the U.S., the events that traditionally marked the transition to adulthood, including finishing education, obtaining stable work, marriage, and parenthood, have been delayed for many (Arnett, 2010). Instead, identity exploration, instability, self-focus, and a sense of broad possibilities for the future (Arnett, 2010a) are now hallmark features of this time period. These challenges often result in high stress, which can negatively impact depressive symptomatology (Arnett, 2010b). Indeed, depressive symptoms are the highest during emerging adulthood causing depression rates during adolescence and emerging adulthood twice as prevalent in young women (14.1%) than young men (8.6%) (Khalil, 2010).

As depression rates increase during adolescence and emerging adulthood, physical activity significantly decreases. Physical activity consists of any bodily movement that is produced by skeletal muscles that result in an increased metabolic rate (Bouchard, 2012). Physical activity consists of both moderate and vigorous activities. However, recommendations are different at each level: moderate activity, including riding a bike or dancing, is recommended for at least 150 minutes a week while vigorous activity, including running or swimming laps, is recommended for at least two times a week (Pruthi, 2021). Physical activity is known to buffer many health challenges, such as lowering diabetes or cardiovascular risk. However, less than one of four males and less than one of five females participate and meet the required physical activity

criteria (Gradalsmoen, 2020). Specifically, less than 24% of adolescents engage in 60 minutes of physical activity everyday (Youth Guidelines).

Importantly, physical activity can also be defined as a behavioral strategy that can improve one's mood and is associated with lowered somatic and mental disorders (McPhie, 2015b & Gradalsmoen, 2020a). Indeed, a growing literature has shown that increased depressive symptomatology is associated with decreased physical activity. For example, Pascoe and colleagues (2020) found that emerging evidence indicates that physical activity is effective in the reduction of depressive symptoms in adolescence and emerging adults. Yet, there are few studies that examine physical activity as a mental health promotion strategy. While some research finds no association between physical activity and adolescence and emerging adulthood, the bulk of the current literature suggest that the relationship is bidirectional.

### **A Bidirectional Relationship**

Importantly, while there is a growing literature highlighting that depression and physical activity are associated with one another, very few longitudinal studies exist that address the direction of effects. Some studies suggest that physical activity lowers depressive symptoms. For example, in a study conducted by Jerstad and colleagues (2010), physical activity was associated with a reduction of future onset depression, as well as depression resulting in the reduction of physical activity. On the other hand, one study assessed moderate and intense physical exercise and found that there was no associated reduction in depressive symptoms in women (Pascoe, 2020). Jerstad and colleagues concluded that the decline in physical activity might contribute to the increased incidence of depression during adolescence and emerging adulthood. Taken together these studies suggest that a bidirectional relationship between depression and physical activity cannot be assumed based upon the limited studies. With the lack of literature

surrounding the topic of depression and physical activity in adolescence and emerging adults, it is suggested that more studies address the possible bidirectional relationship between the two.

### **Limitations of the Literature**

To date, most studies examining depression and physical activity are cross-sectional, which limits the ability to discern the direction of effects. Longitudinal research could better inform how depression and physical activity may be linked to one another over a period of time. Unfortunately, very few studies have longitudinally tested the relationship between physical activity and depressive symptoms (Jerstad, 2010). Another limitation of the literature is that studies usually focus on the adolescent population without looking at emerging adults, as well. We know that adolescence and emerging adult women suffer from depression at higher rates than adolescent and emerging adult men, however, the lack of studies examining gender differences in the associations between physical activity and depression limits our full understanding (McPhie & Rawana, 2015). Given the known changes in both depression and physical activity across these developmental periods, as well as the significant challenges that are present in emerging adulthood, it is important for additional work to conduct longitudinal studies across the transition from adolescence into emerging adulthood. In addition, studies are needed to investigate the factors that mediate the relationship between physical activity and depression (Jerstad, 2010a). These limitations make it difficult to understand the depression-physical activity direction of effects. However, ample evidence suggests that these are interrelated and prevalent issues for adolescents and emerging adult females.

### **Resources**

As stated above, to date, we cannot conclude that increased physical activity among adolescents and emerging adults leads to decreased depressive symptomatology. Yet as Jerstad

and colleagues (2010b) note, interventions that increase physical activity may reduce the risk for depression among this high-risk population. One example of a resource to lower depression is an educational program about mental and physical health that educates adolescents and emerging adults about recognizing the signs of depression. A resource for physical activity could be a social support group that meets weekly to walk together as a way to increase physical activity. Access to resources that promote mental health in emerging adults has the potential to lower the prevalence of depressive symptoms and physical activity making these resources valuable and necessary.

### **The Counseling Center and HealthyUNCG as a Resource**

Although there are still unknowns about how and for whom physical activity may lower depressive symptoms and vice versa in adolescents and emerging adults, access to interventions and resources should not be disregarded to allow for community health assessments to be conducted. A community health assessment allows for a public health specialist to identify community health needs and priorities. One of the most common community health assessments is a questionnaire or survey. These sources provide specific information from and about a targeted population because the data comes directly from the community. For example, to better understand the needs of the UNCG students, during the Fall semester of 2018, UNCG students completed a National College Health Assessment to indicate their interest in receiving information about mental and physical health and if these resources were being utilized by the students. Results indicated that 56% of men were interested in receiving information about depression and physical activity while 73% of women were interested in receiving this information. Taking this a step further, 27% of men and 28% of women reported that in the past seven days, they did not engage in moderate physical activity for at least one day. The data set

also concluded that in the past seven days, 38% of males and 57% of females reported that they did not engage in vigorous activity for at least one day. It was also reported that 53% of men and 68% of women did not engage in strength training exercises for at least one day. Based upon the data set, most emerging adults at UNCG do not engage in physical activity at least once a day, which may also impact the percent of college students suffering from depressive symptoms. This data also showed that a little less than half of UNCG students reported some form of depressive symptomatology. Given this significant number and the current state of the literature about emerging adults, I interviewed two stakeholders on UNCG's campus: one from the Counseling Center; Jennifer Whitney, and one from HealthyUNCG; Stefanie Milroy, to explore resources and interventions related to physical activity and depressive symptoms. I was especially interested in programming that connected these two issues.

In the interviews, I asked questions about use of resources promotion, evaluation of resources and/or use of services, and what prevents students from accessing/utilizing resources. As a means of collecting data, the Counseling Center uses electronic annual reports to determine what specific resources have been utilized from the center.

Based upon the data that was received from the electronic reports, it was concluded that the counseling center is the primary mental health center for enrolled students and is promoted through Spartan Connect, Division of Student Affairs, Spartan Weekly emails, and lastly, Toilet Talk, a communication tool through the use of posters in most bathroom on campus that address upcoming events about mental health. Each of these promotional tools are utilized to encourage students to use the Counseling Center whenever they experience mental and physical health challenges. Existing data show that students who attend the Counseling Center are from various races, however Latinx students do not utilize this resource at the same rate as other races.

According to Dr. Whitney, access to the Counseling Center is negatively affected by stigma and the lack of knowledge regarding mental health. It was also concluded that social determinants, such as the environment in which students are in, race, ethnicity and culture, play a role in if students utilize the counseling center.

Another on-campus resource that recognizes the importance of depression is HealthyUNCG. Mrs. Milroy stated that HealthyUNCG is a safe space for enrolled students who suffer from depression. While HealthyUNCG is focused on employee wellness, HealthyUNCG also recognizes the possible bidirectional relationship between depression and physical activity in students. To promote HealthyUNCG, different school (HHS) and departments (Nutrition, Kinesiology, Business and Communication Studies) invite Mrs. Milroy to attend classes and present information about mental health and wellness. Newsletters, emails and social media are other ways that HealthyUNCG promotes its activities on campus. HealthyUNCG collects data through surveys, participant data of who swipes in and out of the Kaplan Center, focus groups, and meeting with human resources on campus to retrieve data about race, gender and ethnicity amongst on-campus students. Based upon the data that was collected, time and support for on-campus students limits the utilization of HealthyUNCG offerings. According to Mrs. Milroy, time has an influence on the utilization of HealthyUNCG in a way that emerging adults and staff feel that they are not allowed enough time to participate in various activities hosted by HealthyUNCG. The data that was analyzed also concluded that the lack of support (e.g; “are these programs and activities for me?”) was also another health disparity in utilizing this resource. HealthyUNCG overall was designed for faculty and staff, but Mrs. Milroy realized that students, specifically, emerging adults, also need resources and support to offset depression and a lack of physical activity in their lives, as well. Based upon this conclusion, I would encourage

the expansion of HealthyUNCG so that on-campus students would be able to feel included and that this resource was available to them.

The Counseling Center and HealthyUNCG are just two of the many resource available to students who suffer from depressive symptoms and lack of motivation for physical activity. As stated above, the vast changes and challenges that occur across adolescence and emerging adulthood can negatively impact mental and physical health. To help assist students with their mental and physical health, some further recommendations can include creating focus groups once a month that address mental and physical health. A second recommendation is to receive feedback from students once a month regarding their mental and physical health using of a survey. Lastly, it is recommended that creating a safe and stigma-free environment for all students to openly discuss their mental and physical health. There are many recommendations that can help address mental and physical health, however, it is imperative that resources are available to adolescents and emerging adults to help improve their overall health.



## References

- Albert, P. R. (2015). Why is depression more prevalent in women? *Journal of Psychiatry and Neuroscience*, 40(4), 219–221. <https://doi.org/10.1503/jpn.150205>
- Arnett, J. J. (2000). A theory of development from the late teens through the twenties. *The American Psychologist*, 55(5), 469–480.
- Bélair, M. A., Kohen, D. E., Kingsbury, M., & Colman, I. (2018). Relationship between leisure time physical activity, sedentary behaviour and symptoms of depression and anxiety: evidence from a population-based sample of Canadian adolescents. *BMJ Open*, 8(10), 42–49. <https://doi.org/10.1136/bmjopen-2017-021119>
- Birkeland, M. S., Torsheim, T., & Wold, B. (2009). A longitudinal study of the relationship between leisure-time physical activity and depressed mood among adolescents. *Psychology of Sport and Exercise*, 10(1), 25–34. <https://doi.org/10.1016/j.psychsport.2008.01.005>
- Depression and Other Common Mental Disorders: Global Health Estimates*. (2017). World Health Organization. Retrieved April 19, 2022, from <https://apps.who.int/iris/bitstream/handle/10665/254610/WHOMSD-MER-2017%B72-eng.pdf?sequence=1>
- Grasdalsmoen, M., Eriksen, H. R., Lønning, K. J., & Sivertsen, B. (2020). Physical exercise, mental health problems, and suicide attempts in university students. *BMC Psychiatry*, 20(1), 1–11. <https://doi.org/10.1186/s12888-020-02583-3>
- How much physical activity do children need? | Physical Activity | CDC*. (2021, August 21). Centers For Disease Control and Prevention. Retrieved March 2, 2022, from [https://www.cdc.gov/physicalactivity/basics/children/index.htm#:~:text=Children%20and%20adolescents%20ages%206,doing%20push%20Dups\)%20%E2%80%93%203](https://www.cdc.gov/physicalactivity/basics/children/index.htm#:~:text=Children%20and%20adolescents%20ages%206,doing%20push%20Dups)%20%E2%80%93%203)

- Jerstad, S. J., Boutelle, K. N., Ness, K. K., & Stice, E. (2010). Prospective reciprocal relations between physical activity and depression in female adolescents. *Journal of Consulting and Clinical Psychology, 78*(2), 268–272. <https://doi.org/10.1037/a0018793>
- Kessler, R. C., Avenevoli, S., & Ries Merikangas, K. (2001). Mood disorders in children and adolescents: an epidemiologic perspective. *Biological Psychiatry, 49*(12), 1002–1014. [https://doi.org/10.1016/s0006-3223\(01\)01129-5](https://doi.org/10.1016/s0006-3223(01)01129-5)
- Khalil, A. H., Rabie, M. A., & Abd-El-Aziz, M. F. (2010). Clinical characteristics of depression among adolescent females: a cross-sectional study. *Child and Adolescent Psychiatry and Mental Health, 4*(1), 1–7. <https://doi.org/10.1186/1753-2000-4-26>
- McPhie, M. L., & Rawana, J. S. (2015). The effect of physical activity on depression in adolescence and emerging adulthood: A growth-curve analysis. *Journal of Adolescence, 40*, 83–92. <https://doi.org/10.1016/j.adolescence.2015.01.008>
- Pascoe, M., Bailey, A. P., & Craike, M. (2020). Physical activity and exercise in youth mental health promotion: a scoping review. *BMJ Open Sport & Exercise Medicine, 6*(1), 1–11. <https://doi.org/10.1136/bmjsem-2019-000677>
- Paus, T., Keshavan, M., & Giedd, J. N. (2008). Why do many psychiatric disorders emerge during adolescence? *Nature Reviews Neuroscience, 9*(12), 947–957. <https://doi.org/10.1038/nrn2513>
- Sampasa-Kanyinga, H., Colman, I., & Goldfield, G. S. (2020). Combinations of physical activity, sedentary time, and sleep duration and their associations with depressive symptoms and other mental health problems in children and adolescents: a systematic review. *International Journal of Behavioral Nutrition and Physical Activity, 17*(1), 1–17. <https://doi.org/10.1186/s12966-020-00976-x>

Sawyer, S., & Azzopardi, P. (2018, March 1). *The age of adolescence*. ScienceDirect. Retrieved March 24, 2022, from

<https://www.sciencedirect.com/science/article/abs/pii/S2352464218300221?via%3Dihub>

Steinberg L. Risk taking in adolescence: New perspectives from brain and behavioral science.

*Curr Dir Psychol Sci.* 2007 Apr;16(2):55-9.

Steinberg L. A Social Neuroscience Perspective on Adolescent Risk-Taking. *Dev Rev.*

2008;28(1):78-106. doi:10.1016/j.dr.2007.08.0

Young, D. R., Cohen, D., & Koebnick, C. (2018). Longitudinal Associations of Physical Activity

Among Females from Adolescence to Young Adulthood. *Journal of Adolescent Health,*

63(4), 466–473. <https://doi.org/10.1016/j.jadohealth.2018.05.023>

*Youth Physical Activity Guidelines | Physical Activity | Healthy Schools | CDC.* (2019, May 29).

Centers for Disease Control and Prevention. Retrieved March 2, 2022, from

<https://www.cdc.gov/healthyschools/physicalactivity/guidelines.htm>