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Impact of COVID-19 Pandemic on Children's Physical Activity and Well Being

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Abstract

The COVID-19 pandemic started with a total shutdown of in-person public schools and the end of team sports for middle school students. Preliminary research surrounding the change in physical activity during the pandemic has shown a large decrease in rates of adequate exercise recommended by the World Health Organization (Ammar et al., 2020). The present study investigated the impacts of the COVID-19 pandemic on middle schoolers' physical activity and mental well-being. The researchers hypothesized that COVID-19 has caused a decrease in the levels of physical activity in early adolescents. Those with higher levels of physical activity were predicted to have higher scores on mental well-being measurements. The final hypothesis was that access to social opportunities like participating in sports teams and being with friends would be associated with higher mental well-being scores, as opposed to those with less social interaction. To analyze emotional well-being, researchers used the Short Warwick-Edinburgh Mental Well-being Scale to compare students' social behaviors. The sample included 18 participants between the ages of 12-14. The present research showed no significant change in physical activity levels. Students were more likely to be motivated for exercise if they reported feeling happy. Socialization with friends increased mental well-being scores and feelings of happiness. These findings add to the developing literature surrounding the effects of COVID-19 lockdowns on adolescents' physical activity by showing that happiness increases physical activity motivation, and socialization increases happiness.

1. Introduction

The COVID-19 safety protocols implemented in March 2020 resulted in an immediate end to in-person schooling and the spring sports season for many students. Playgrounds, organized sports fields, gyms, and any indoor gathering places for exercise were closed. While some schools have gone back to in-person classes with new social distancing and other measures, most options for children's sports teams and other physical activity opportunities are still halted. Organizations that would otherwise provide after school care that incorporate physical activity, like the YMCA and Boys and Girls Club of America, were closed. Summer camps that children look forward to all year were cancelled, leaving many young students confined at home. The lock-down precautions can take a toll on low-income urban areas that do not have access to private outdoor yards. A study found that younger children without independence from their families were playing outside in their home yard for 70% of the time (Veitch, 2006). The effects of having a yard have not been researched in relation to physical activity in the COVID-19 pandemic.

People are assumed to be spending more time looking at screens whether it be adults working from home or children doing online courses. Since the normal opportunities for social events and other activities have been limited, it is likely people are using screens more often for leisure. Screen time in adolescents is associated with a decrease in physical activity and an increase in depressive symptoms (Cao, 2011).

The COVID-19 pandemic has had some of the most devastating impacts on social interactions. Evolving research in the past year has pointed to almost 90% of people not gathering in person with their friends (Fancourt, 2020). These results are positive in showing that individuals are following health officials' recommended protocols, but concerning due to the detrimental effects of lack of socialization. People who spend more time with friends and speaking to companions tend to have higher moods than those with lower rates of socialization (Brannan, 2012). The long-term effects of this dip in social interactions have yet to be discovered. For young children who are in their prime who are learning from interactions with different people, this lack of social resources could be devastating to current mental well-being and beyond.

Sedentary behavior is described as any form of sitting, laying, or other lack of active body motion. Research by exercise and sport scientists has shown that those with increased sedentary behavior are at increased risk for negative health effects and lower physical activity motivation (Margaritis, 2020). Once people started working or learning from home on their computers, there were not as many explicit opportunities to move throughout the day. Typically, children will walk the hallways between classes or do an activity that requires moving to different tables through the classroom. Preliminary findings show the COVID-19 pandemic has increased sedentary behavior (Bates, 2020). Rising rates of sedentary behavior point to negative consequences for already unstable mental well-being during the pandemic.

Physical activity is closely tied to physical and emotional health. It has been shown that daily physical activity in adolescents is crucial to ward off later negative health outcomes of cardiac disease, obesity, and chronic diseases (Janssen & LeBlanc, 2010). Children who get the recommended amount of daily exercise are more likely to have better outcomes in school and improved mental and emotional health (Biddle, 2011).

The lack of access to facilities for organized exercise have been studied in low-income areas. Most studies have shown that access to resources of organized sports and exercise increase overall rates of moderate and intensive physical activity (Andersen, 2018; Rosewater, 2009). At the beginning of the COVID-19 pandemic in the U.S., lack of access to resources was widespread. Those who previously depended on social exercise that followed CDC guidelines were put in a position to independently take on a physical activity routine. A combination of factors influenced rates of physical activity after March 2020, inaccessibility of facilities is likely closely tied to the average decrease in exercise.

Recent research has discovered that levels of physical activity in adults since the beginning of lockdown procedures have dropped to almost half of pre-COVID performance (Ammar et al, 2020). Since lack of physical activity is likely to decrease mental and emotional well-being, this drop is deeply concerning. Research is not extensively available about the long-term impacts of a lack of exercise during the pandemic. Contributing factors including screen time, social interactions, physical activity, and sedentary behavior confound the general decrease in well-being. However, the available research has shown that such a large decrease in physical activity is strongly and negatively impacting well-being in adults (Bates, 2020). Similar results have only been seen in a handful of child studies due to the limited time COVID-19 has been a large issue.

The current study aims to see how closures and limited access to facilities is affecting early adolescents' emotional well-being and levels of physical activity. This age group was selected because physical activity levels throughout the life course are heavily dependent on habits formed in early adolescence (Raudsepp, 2008). The purpose of this research is to learn more about the impact of the COVID-19 pandemic on children's physical activity and emotional well-being. The effects of physical activity on emotional well-being are confounded by the new stressors COVID-19 has introduced, but the researchers hope to find valuable information about children's changes in movement. This study also examines how pre-COVID sports team participation will determine current levels of activity. This study is necessary to look at the impact COVID-19 has on participants' well-being and to learn more about options to help those most at risk for sedentary behavior. There are three hypotheses that COVID-19 has caused a decrease in the levels of physical activity in early adolescents, that hose with higher levels of physical activity will have higher scores on mental well-being measurements, and that access to social opportunities, like participating with sports teams and being with friends, will indicate higher mental well-being scores, as opposed to those with less social interaction.

2. Method

2.1 Participants

Participants included 18 middle-schoolers between 12-14 years old. There were 9 females, 8 males, and 1 unidentified. Two students were in 7th grade while the remaining participants were 8th graders. The majority (64.7%) of participants was white, 17.64% were mixed race, and 5.88% identified as Latino. The qualifications to be included in the study were that participants were in grades 6 through 8 and resided in the United States. A link to the survey was sent out to 47 middle schools in North Carolina. The survey was posted on social media to distribute through snowball sampling. There was no monetary or other incentive to participate.

2.2 Testing Materials

The survey was made and distributed through Qualtrics. Informed consent documents were separately stored from survey responses to ensure participant confidentiality. Students were given access to the survey through a computer or cell phone. They were asked to answer a series of 55 questions. These included recalling their physical activity (PA) levels before the pandemic and at the time of the survey. To measure mental well-being, the researchers used the Short Warwick-Edinburgh Mental Well-Being Scale (SWEMWBS). Questions were also asked about their current technology use, social life, academic experiences, sedentary behavior, and other emotions.

2.3 Procedure

Students completed an online informed consent document before moving on to the survey. Participants could skip any question or stop the survey at any time. They were provided with a debriefing form with access to the CDC's COVID-19 information website, with links for further information about physical activity opportunities in the pandemic and mental health resources. Students were given unlimited time to complete the survey, and the average completion time was 15 minutes and 30 seconds.

3. Results

Two thirds of the sample reported that they personally knew someone diagnosed with COVID-19. The participant group all had access to a private outdoor yard, 83.3% had a park within a 15-minute walk from their home, and 66.7% had areas for organized sports within a 15-minute walk from their home. Regarding sports participation, there was a 22% decrease in the number of students who currently play on a school sports team compared to numbers of participants before March of 2020.

Rates of physical activity (PA) were measured by hours spent exercising per week. Participants reported an average of 3.97 hours of PA per week (SD = 2.67) before the pandemic and M=3.29 (SD = 2.85) at the time of the study. This difference was not significant (t =1.85, p<.08). Trends in the data indicate a possibility of significant difference with a larger sample.

This study used the Short Warwick-Edinburgh Mental Well-Being Scale (SWEMWBS) to assess students' emotional well-being; scores were then analyzed in conjunction with students' social behaviors and self-reported levels of PA. The average SWEMWBS score was 20.71 (SD = 3.7) and 21 is the lowest score in the range of average mental well-being. Mental well-being among students was negatively correlated with feeling tired (r =-.62, p<.05). This suggests that students who reported feeling tired more often experienced decreased mental well-being.

The findings showed that feeling tired was negatively correlated with taking daily hourly walks (r=-.64, p<.001). Feeling tired was also negatively correlated with mental well-being scores (r=-.62, p<.05) and feeling connected to peers (r=-.6, p<.05). Motivation to complete schoolwork was negatively correlated with feeling tired (r=-.68, p<.01). Feelings of happiness were positively correlated with feeling connected to peers (r=.65, p<.01) and negatively correlated with feeling tired (r=-.621, p<.01). There was a correlation between time spent with friends and positive mental well-being scores. These results indicate that connection to friends and energy levels are the most impactful to adolescents' mental well-being during the pandemic. Average hours spent socializing with friends was positively correlated with the number of hours students used social media (r=.521, p<.05).

4. Discussion

This study aimed to discover the presence or absence of change in rates of PA in middle-school-aged adolescents and the state of their mental and emotional well-being during pandemic protocols. Researchers hypothesized that levels of physical activity have decreased since the implementation of lockdown procedures. The results indicated that there was no difference in PA levels. It was also anticipated that lower levels of PA were linked to lower scores of mental well-being. The current study did not find a significant correlation between SWEMWBS scores and hours of PA. The hypothesis that COVID-19 caused a decrease in the levels of physical activity in early adolescents was not supported by the results. The researchers hypothesized that those with higher levels of physical activity will have higher scores on mental well-being measurements. Findings pointed to correlations between feeling happy and being motivated for physical activity. However, the SWEMWBS scores did not have a significant relationship to the number of hours spent doing physical activity. Finally, the present study hypothesized that access to social opportunities, like participating with sports teams and being with friends, will indicate higher mental well-being scores, as opposed to those with less social interaction. This hypothesis is supported by the results of the study with significant positive correlations between feeling happy and higher well-being scores after spending time with friends.

Previous research showed that physical activity is linked to positive mental well-being scores and life satisfaction. In the past year, several studies about levels of PA during the COVID-19 pandemic have shown a decline in low-energy and high-energy movement (Bates, 2020). These prior studies have mostly explored the experiences of young adults or general adult populations. Our findings could not confirm these results, which may be due to a small sample size. Other studies have also found an increase in sedentary behavior and technology use (Andersen, 2018; Rosewater, 2009). An interesting finding from the research was a positive correlation between hours spent on social media and hours spent socializing with friends. This may mean students are using social media as a form of socializing with friends. Another possibility is the students who have cell phones may spend time on social media and have easy access to chat with their friends, while those without a cell phone may not have the same social experience. Whereas past researchers have found a connection between increased hours of sleep and higher mental well-being scores (Hamilton, 2014), these results showed no significant relationship between the two. Utilization of different quantitative measures may cause this discrepancy. This may also be due to a small, non-representative sample and differences between reported hours of sleep and actual hours. If this study's sample was representative, results would challenge findings of prior research that have indicated a causal relationship between increased hours of sleep and mental well-being.

This study showed that the most impactful factors on mental well-being for adolescents were social interactions and reported energy levels. Those students who reported feeling tired were less likely to be motivated to engage in physical activity. They were also more likely to have lower mental well-being scores. The researchers' findings on feeling tired, compared to PA and mental well-being scores, supported existing conclusions in the field. Due to the adjustments made in light of the COVID-19 pandemic and similar experiences across the world, it is imperative that children's sleep is a top priority. It is recommended that parents encourage healthy sleep habits. Physical activity improves sleep, so it is possible to get better sleep that creates the energy to engage in PA again (Hamilton, 2014).

One limitation of this study was the sample. The number of participants who completed the full survey was too small to find significant results in some categories, although the data trended toward previous studies' findings. The small sample prevents this study from generalization to a wider middle-school student population. The sample was limited because it was composed of mostly non-Hispanic, white students. Additionally, the finding that the whole sample had access to a private yard is not representative of the larger U.S. population. There were participants who lived in different states; however, 70.58% of them lived within the same zip code. This clumping of participants creates difficulty in generalizing results to the U.S. population because the stated zip code encompasses only rural and suburban areas. Engaging in physical activity is mostly accepted to be a positive trait, and reports of PA may be impacted by social desirability bias. Due to the promise of confidentiality, it is still possible that the report's rates of PA were largely accurate. Last, the study has potential validity limitations due to the possible inaccuracies of self-report scales of PA from over a year ago. For younger populations, previous behavior may be skewed in their memory.

In terms of future research, it is important to expand the current findings to larger adolescent populations. If possible, a weekly tracking diary of physical activity would have a better chance of accurately displaying the current number of hours of physical activity. This method could relieve issues of memory recall and social desirability, as the participants would have less room for those factors to interfere with their final answers. This study relied on self-report scales of physical activity levels from one year ago and at the time participants took the survey. It would be helpful to use the same measurement forms as prior studies before COVID-19 to accurately see what differences exist. It will be important to involve a diverse group of adolescents in future studies to examine possible barriers to physical

activity based on individual differences. This study lacked diverse representation that negatively influences the ability to generalize the results to larger populations.

The study has increased knowledge of adolescents' experiences during the COVID-19 pandemic. This study adds to the body of research focused on fostering social interactions and physical activity for the improvement of middle-schoolers' mental well-being.

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