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Research Article

Impact of Social Media Use on Mental Health and Anxiety Among Minority Students

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Abstract

Social media is one of the most popular online platforms among minority students. Facebook, YouTube, Instagram, and Twitter have emerged as a common medium for sharing information, connecting with peers. The research entails the effect of social media use on anxiety levels within minority students, particularly by examining the changes in heart rate of students before and after using social media. Within modern times, electronic and internet access have exponentially increased in accessibility to the general population, but also specifically to students and young children. The research project aims to analyze the effect of social media use on the average heart rate of students before and after use, to determine if social media may commonly increase anxiety levels of students and younger children alike.

Keywords: social media; mental health; anxiety; minority; adolescents

Introduction

Increasing mental distress and treatment for mental health conditions among youth has paralleled a steep rise in the use of smartphones and social media by children and adolescents. High proportions of youth engage in heavy smartphone use and media multitasking, with resultant chronic sleep deprivation, and negative effects on cognitive control, academic performance, and socioemotional functioning. The growth and popularity of social media applications to the youth have contributed to the potentiality of emotional dependency and addictive patterns towards such applications, especially for younger generations who often grew up with such applications and internet-access (Beaubrun *et al*., 2018; Abi-Jaoude *et al*., 2020; Mougharbel *et al*., 2023; Anto *et al*., 2023; Onyeaka *et al*., 2023). Such risks for social media addiction may contribute to heightened senses of anxiety levels within students and could further contribute to the possibility of the development of mental health issues (Nguyen *et al*., 1970; Tao and Fisher, 2022; Bozzola *et al*., 2022; Chochol *et al*., 2023; Nazari *et al*., 2023). Relative to White Americans, Black Americans report greater use of social media platforms, such as Facebook (74% vs 67%) and Instagram (49% vs 35%; PRC, 2021, Matsuzaka *et al*., 2023). On May 23, 2023 U.S. Surgeon General issued an advisory urging action to protect children online (https://www.hhs.gov/sites/default/files/sg-youth-mental-health-social-media-advisory.pdf).

Methods

The study consisted of a sample of 30 students ranging from middle school to college level. Each age group of middle school, high school, and college contained a sample of 5 students, with an even number between male and female students (15 males and 15 females). The sample for the study consisted of students of a minority background, throughout different areas of Florida. The data was collected over an inquiry process of contacting minority students who are residents of Florida to fill a self-reported blood pressure measurement form, asking participants to record their heart rate twice in the morning, and twice in the night-time. In the morning, participants were asked to record their heart rates once before using any social media, and once more after using social media for at least 20 minutes. In the night-time, participants were asked to complete the same process before going to sleep. Additionally, participants were asked to note which specific social media applications they used during this time. Participants self-recorded their heart rates in this way over a course of two days in total to amass the data. An average of the increase in beats per minute (BPM) for the heart rate was then taken for each participant, noting the distinctions between variables such as morning and night, males and females, and the three different age groups of middle school, high school, and college. A statistical analysis using a t-test method analysis determined the general trends and any existing commonalities or influences between the different variables, when looking at the average BPM increase between groups. Distinctions between variables affecting the increase in BPM among the sample selection contributed to the objectives and findings of the research project.

Results and Data Analysis

Within the dimensions of this study, factors such as time of day, gender, and age in school were taken into consideration when examining the data analytics of the collected data points from participants. The averages of the increase in heart rate post-social media use were taken per participant, for both mornings and night-times, and for each day of measurement for each participant. Additionally, a t-test analysis was performed on the comparison

of the groups analyzing male versus female and morning versus nighttime social media use to determine if any significance existed between the use of social media and increase in average heart rate, not due to randomized chance. Results of the data analytics indicated a p-value of less than 0.05 (P=1.48E-7) for analyzing differences in males and females with average heart rate increase post-social media use, indicating that there is in fact a significant correlation between social media use and the difference in average heart rate increases between males and females within the sample study. According to trends in the data, it was seen that females on average result in a larger increase in BPM when compared to males (difference of about 11.05 BPM increase for females versus about 5.87 BPM increase for males), not considering age differences and other external variables. Other external influential factors may be considered as well for possibly influencing the results, such as hormonal biology of women, time of day of social media use, length of time of use, application specificity, etc. The obtained p-value when comparing morning versus night-time average BPM increases, in all genders and grades, resulted in a value below 0.05 (0.006), also indicating statistical significance in the difference between social media use's effect of increased BPM between the mornings and the night-time. On average, it was seen that the mornings produced a larger increase in BPM post-social media use (9.93 BPM) than in the nighttime (6.98 BPM), although this difference is not as large as between males and females. It may be considered that external factors such as adrenaline spikes after waking, possible caffeine intakes by participants, and other variables that were not controlled within this study had an influence on the data. It should also be noted that a general trend in the data existed that average BPM increase post-social media use was highest amongst younger ages in middle school and was lowest amongst college-aged students. The statistical significance of the two data sets of gender and time of day of social media use indicates that these factors do indeed influence and affect increases in BPM post-social media use, potentially contributing to heightened anxiety with using social media.

MALES VS FEMALES		
t-Test: Paired Two Sample for Means		
	MALES	*FEMALES*
Mean	5.86666667	11.05
Variance	12.8781609	41.5577586
Observations	30	30
Pearson Correlation	0.80818081	
Hypothesized Mean Difference	0	
df	29	
t Stat	-6.877001	
P(T<=t) one-tail	7.4185E-08	
t Critical one-tail	1.69912703	
P(T<=t) two-tail	1.48E-07	
t Critical two-tail	2.04522964	

Table 1: t-test analysis of social media use between male and female

MORNING VS NIGHT		
t-Test: Paired Two Sample for Means		
	MORNING	*NIGHTTIME*
Mean	9.93333333	6.98333333
Variance	48.9609195	14.8704023
Observations	30	30
Pearson Correlation	0.62998965	
Hypothesized Mean Difference	0	
df	29	
t Stat	2.9582145	
P(T<=t) one-tail	0.00305091	
t Critical one-tail	1.69912703	
P(T<=t) two-tail	0.00610182	
t Critical two-tail	2.04522964	

Table 2: t-test analysis of social media use between morning and nighttime

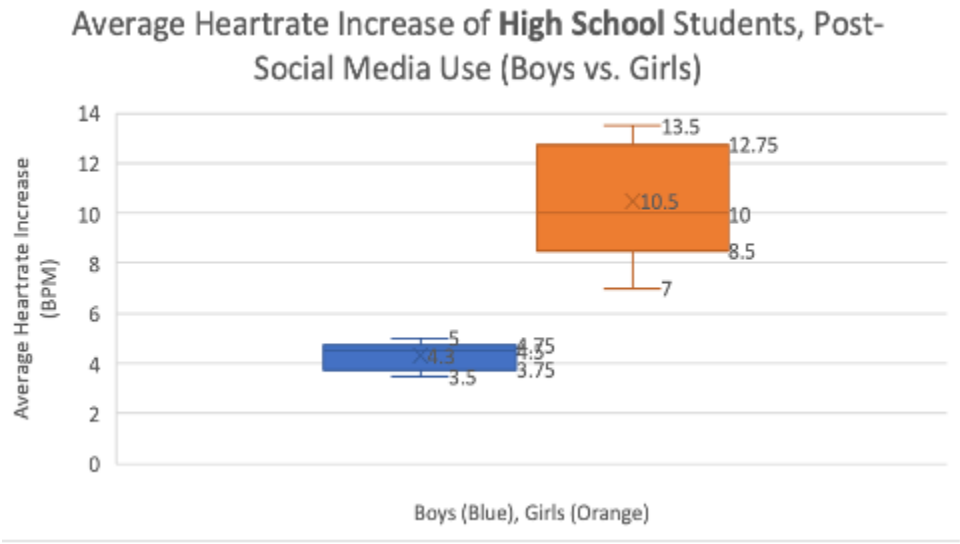

Table 3: Heartrate of High School male and female students

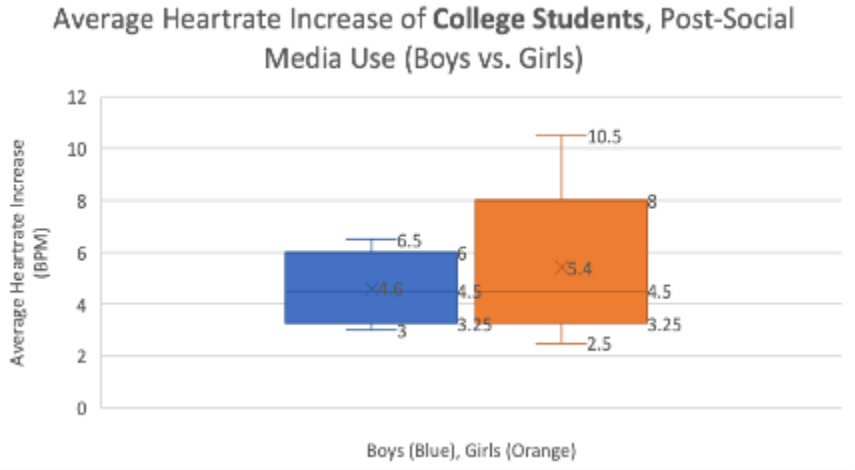

Table 4: Heartrate of College male and female students

Discussion

Social media is part of everyday life for most minority students. This study contributes to which social media engagement has exposed minority students and how such exposure may impact mental health. Limitations of the project included multiple factors within the dimensions of the project. For example, the sample selected for the dimensions of the project was small, and examined over the past few weeks and is not part of a longitudinal study. Additionally, external factors regarding the participants must be considered, such as variables that were not controlled within the experiment. Variables not controlled for include biological influences of genders, not controlling actions done or environment during social media use and noting how often participants usually use social media for. Additionally, a three-way ANOVA analysis was to be performed to examine differences between the three age groups, but technical limitations hindered this. In the future, such considerations would be noted to pursue an even more accurate study on this topic.

The impact of social media and relationship with anxiety has been understudied. Results obtained during the COVID-19 pandemic may not be generalizable to future time frame. Further research focused on social media and anxiety is needed on the potential for positive impacts.

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