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**Physical Activity and Mental Well-Being Among UC Undergraduate Students:
An Analysis Using UCUES Data**

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Physical Activity and Mental Well-Being Among UC Undergraduate Students: An Analysis Using UCUES Data

College campuses are facing a major issue: how can we help students increase their mental well-being? Even before the pandemic, college students were facing rising levels of stress, anxiety, and depression; however, after the pandemic, levels have been rising to alarming numbers (Abrams, 2022; Li et al., 2025). Researchers estimate that “12–50% of students encounter at least one mental health issue during their time in college” (Li et al., 2025). One major impact of negative mental health is on students' academic performance because mental health challenges can undermine motivation, learning ability, and self-efficacy (Chu et al., 2023). Mental health professionals and researchers are calling for college and university campuses to not only increase funding for mental health initiatives, but also find creative and innovative approaches to addressing triggers and symptoms (Abrams, 2022; Li et al., 2025).

One promising possibility could lie in the research on the relationship between physical activity and mental health. This relationship has been long documented and researched, as seen in Paluska and Schwenk's (2000) and White et al. 's (2024) analysis of previous academic articles on the topic. Research shows that physical activity, no matter what kind, can and does reduce symptoms of depression, anxiety, and feelings of upsetness (Chu et al., 2023; Weather et al., 2023; Pauluska and Schwenk, 2000; Tamminen et al., 2020; White et al., 2024).

But what does this mean for college and university students? Perhaps this is a solution that campus administrators, mental health professionals, and researchers have been looking for.

To explore this possibility, I researched: What does the relationship between physical activity and mental well-being among undergraduate students look like at the University of California system? To be more specific, I answered the following question: How does the

reported hours undergraduate students participate in physical exercise, recreational sports, or physically active hobbies relate to how often they report feeling depressed, stressed, or upset as an obstacle to schoolwork or academic success, across UC campuses in 2024?

To answer this question, I used the University of California Undergraduate Experience Survey to examine undergraduate students at each UC campus for the year 2024. With that data, I ran a Pearson's R correlation for every combination of responses between reported hours participating in physical exercise, recreational sports, or physically active hobbies to reported instances when feeling depressed, stressed, or upset was an obstacle to school work or academic success.

I found that the correlations between category combinations across UC campuses is overall strong — with a majority above 0.70 —, but because of the presence of a few moderate correlations, there is some variability in how physical activity relates to mental health acting as an obstacle to school work. I also found that the strongest and most consistent correlation at all nine UC campuses was between 1-15 hours and Rarely/Occasionally at 0.99, with the only notable discrepancy being at UC Berkeley and UC Los Angeles which had an additional strong correlation between 0 hours and Frequently/All the time at 0.99. With these findings, further research needed to better understand the relationship between physical activity and mental well-being. Additionally, these findings show that should the University of California implement policies on this topic, they should do so system wide, and not campus by campus.

Context and Significance:

College students' mental wellbeing has been decreasing over the last decade. The National Education Association reported that more than 60 percent of college students “meet the criteria for at least one mental health problem”, like depression, anxiety, and considering suicide

(Flannery, 2023). Zara Abrams (2022) at the American Psychological Association reported that “even before the pandemic, schools were facing a surge in demand for care that far outpaced capacity”. While this increase in demand for care does come from a destigmatization of mental health within younger generations, increases in “economic strain, social injustice, mass violence, and various forms of loss related to COVID-19” on top of the already stressful environment of college life are shown to be contributing to increased demand for care (Abrams, 2022).

According to Chu et al. (2023), students who begin college with poorer mental health face a higher risk of long-term academic struggles, a pattern researchers attribute to the ways mental health problems can lessen motivation, learning capacity, and self-efficacy. As funding hasn’t increased, college campuses have had to get creative to make sure every student is getting the care that they need and deserve (Abrams, 2022).

It has been long established that exercise and physical activity eases symptoms of depression and anxiety. Paluska and Schwenk (2000) established that regular physical activity is associated with reduced symptoms of anxiety and depression, improved mood, and overall enhanced psychological functioning. Their work is widely cited, and later research continues to show the relationship between physical activity and mental well-being. The Mayo Clinic (2023) describes that regular exercise decreases depression and anxiety by releasing feel-good endorphins and taking the mind off worries, while also improving general mental wellbeing and mood by improving confidence and increasing social interactions. This proven connection could be a creative solution to helping students’ mental well-being, without overwhelming campus resources.

In California, the University of California (UC) system is a major research university system in the United States, enrolling a total of 236,070 undergraduate students across all nine

campuses in Fall 2024 (University of California, 2025). Every two years, the UC Office of the President conducts the UC Undergraduate Experience Survey (UCUES) where students are asked to share their opinions and experiences at the UC campus. The UCUES data is used by administrators to better improve and implement policies across and at specific campuses. Because the UCUES asks about physical activity, stress, and depression, it provides a rare opportunity to be able to study how student behavior interacts with mental wellbeing and academic success across a statewide system. By better understanding how the relationship between physical activity and mental well-being looks like within UC undergraduate students, campus administrators can better allocate resources and implement policy that encourages physical activity. Because the UC system is a leading college system in California, success at the UCs could lead to implementation across the state.

Literature Review:

Studies show that college students are facing unprecedented levels of mental health challenges, like anxiety, depression, and stress. Some researchers estimate that “as many as 12-50% [of] students will experience at least one mental health issue during their time at university” (Li et al., 2025). Li et al. (2025) find that risk factors include, but are not limited to, stressors associated with transitioning to university, financial difficulties, or pre-existing conditions. They also find that students face many barriers in getting support, such as stigma, limited resources, and a lack of awareness (Li et al., 2025). Chu et al. (2023) highlights an important relationship to consider – how mental well-being affects academic performance. After following 1,823 Japanese undergraduate students for four years, tracking their mental health status, academic performance, and lifestyle choices, Chu et al. (2023) found that students who had worse mental health in their first semester were at higher risk of poor academic performance

over the four year period. They believe this is because worse mental health impairs motivation, learning ability, and self-efficacy, which are tied to academic performance and outcomes (Chu et al., 2023).

While many colleges and universities have been implementing common strategies to address this pressing issue, like increasing mental-health education across campuses and increasing funding for resources, Li et al. (2025) call for innovative and creative approaches. Chu et al. (2023) provides a possible solution to this issue, one that would fit Li et al. 's (2025) call for innovation and creativity. Chu et al. (2023) found that the association between poor mental health and poor academic outcomes disappeared for students who had healthy lifestyle behaviors, like regular breakfast, earlier wake-up times, and participating in physical activity.

The relationship between physical activity and mental well-being has long been established. As previously stated, Paluska and Schwenk (2000) found that exercise reduces symptoms of depression and anxiety and improves mood through physiological and psychological mechanisms. Recent literature continues to establish and defend the relationship between physical activity and mental well-being. For example, through their cross-sectional study examining the relationship between physical activity and positive mental health in the FinHealth 2017 survey, Tamminen et al. (2020) found that people who spent less time participating in physical activity, had a higher likelihood of having low positive mental health. These findings show a strong correlation between physical activity and mental well-being.

White et al. (2024) expands on this relationship by analyzing 247 academic articles and finding that there is strong evidence for twelve factors influencing why and how physical activity affects mental well-being – also known as mediators. These factors are “affect, mental health and well-being, self-esteem, self-efficacy, physical self-worth, body image satisfaction, resilience,

social support, social connection, physical health, pain, and fatigue” (White et al., 2024). They also found moderate evidence for factors that influence when, whom, and what conditions affect the relationship between physical activity and mental well-being (White et al., 2024). These factors include “depressive symptoms, bipolar disorder, neuroticism, social support, sleep, race, age, and occupation” (White et al., 2024).

Other scholars examine specific types of physical activity, and how those influence mental well-being. Tamminen et al. (2025) additionally found that those who spent more time participating in physical activity due to their commute to work or school, had higher levels of positive mental health. On the other hand, Eather et al. (2023) examine how participation in sports affects mental well-being. Through their analysis of 29 academic articles, they found an association between sports participation and mental well-being, as it reduced depressive symptoms, lowered anxiety, and increased life satisfaction in adults (Eather et al., 2023). It was also found that this association was greater for those participating in team sports versus individual sports (Eather et al., 2023). The authors explain that this relationship is due to what they call the mental health through sport model, where there are three pathways in which sports improves mental health: physical health, psychological, and social pathways (Eather et al., 2023).

As research shows, perhaps one of the solutions to addressing poor mental health in college students is through physical activity. To help colleges and universities better figure out how to structure and implement policies that encourage and promote physical activity, future research needs to understand what the relationship between physical activity and mental well-being looks like on the local individual level. Taking inspiration from the above-mentioned academic articles, my research project will contribute to existing literature by studying a new

geography, undergraduate students at the University of California campuses. This research will help UC administrators determine how and what policies can be implemented at their respective campuses.

Theory and Hypotheses:

Drawing from White et al.'s (2024) and Eather et al.'s (2023) theories of how physical activity and sports affects mental health, my conceptual hypothesis is that there will be strong correlations between reported weekly hours of physical activity and reported mental health obstacles. My operational hypothesis is that, all the correlations between the categories of hours students report spending participating in physical exercise, recreational sports, or physically active hobbies and the categories of the frequency in which students report feeling depressed, stressed, or upset as an obstacle to students' ability to complete their school work or accomplish academic success will be equal to or greater than 0.70.

This is because physical activity improves mental health through physical, psychological, emotional, and social mediators and pathways (Eather et al., 2023; White et al., 2024). Because of these pathways, physical activity increases a person's ability to cope with stressors, increase positive emotions, and gain access to social support (White et al., 2024). Additionally, sports participation enhances and reinforces the physical, psychological, and social pathways (Eather et al., 2023).

My second conceptual hypothesis is that, because UC campuses operate under one university system, the relationship between physical activity and mental health obstacles will be the same across campuses. My second operational hypothesis is that, all nine UC campuses will have the same strongest correlation between the categories of hours students report spending their time doing physical exercise, recreational sports, or physically active hobbies and the

categories of the frequency in which students report feeling depressed, stressed, or upset as an obstacle to students' ability to complete their school work or accomplish academic success.

Research Design and Methods:

To answer my research question, I will be using 2024 data from the UC Undergraduate Experience Survey (UCUES). My independent variable is physical activity. I will be measuring this variable by using the UCUES question "During this academic year, how many hours do you spend in a typical week (7 days) on participating in physical exercise, recreational sports, or physically active hobbies?". Respondents responded by categorizing themselves into one of eight categories: 0; 1-5; 6-10; 11-15; 16-20; 21-25; 26-30; more than 30. For the purposes of this research project, I combined these categories into four: 0 hours; 1-15 hours; 16-30 hours; more than 30 hours. As previously stated, regular physical activity improves people's mental well-being and measuring the amount of hours a person spends a week participating in physical activity indicates how regular their physical activity is.

My dependent variable is the frequency in which a student's mental health has acted as an obstacle to their school work. I will be measuring this variable by using the UCUES question "In this academic year, how often has feeling depressed, stressed, or upset been an obstacle to your school work or academic success?". Respondents responded by categorizing themselves into one of five categories: Not at all; Rarely; Occasionally; Frequently; All the time. For the purpose of this research project, I combined these categories into three: Not at all; Rarely/Occasionally; Frequently/All the time. I chose this specific question as my dependent variable because there wasn't another question in the UCUES dashboards with publicly available data that got at undergraduate students' mental well-being. Even though it is the only question on the UCUES dashboard with publicly available data, as Chu et al. (2023) has shown, there is a direct

connection between mental well-being and academic outcomes, which this question encapsulates perfectly.

My control variables are gender, and class level. I choose these two variables because the UCUES dashboards can filter data through a series of identifying information such as gender and class level. I will measure gender as either male or female. I choose to only focus on female or male because there wasn't enough reported data for non-binary and unknown genders to conduct any statistically significant tests. I will measure class level as either freshman, sophomore, junior, or senior. It's important to note that all of these variables are self-reported by the respondents.

Gender is a confounding variable that needs to be controlled for because men and women tend to “experience different kinds of mental health” as women experience internalizing disorders like depression and anxiety and men experience externalizing disorders like substance abuse and antisocial behavior (Rosenfield and Mouzon, 2012). Because of this, treatments and symptomatic relief could look different for men and women and so participating in physical activity may be more helpful for one and not the other. Class level is a confounding variable that needs to be controlled for because as Barbayannis et al. (2022) found, second year students reported higher levels of academic stress and worse mental well-being. With these varying levels of stress and mental well-being, students who participate in physical activity for the same amount of hours may not experience the same change in their mental well-being because they are starting out at different levels.

UCUES collects data on undergraduate students across all the UC campuses: Berkeley, Davis, Irvine, LA, Merced, Riverside, San Diego, Santa Barbara, and Santa Cruz. I will be examining data on undergraduate students from each of the nine campuses for the year 2024, which results in 144 observations.

To answer my research question and test my hypothesis, I ran Pearson's R correlations on each category combination. For example, 0 hours and not at all, etc. I ran these correlation tests for total undergraduate students, and for each UC Campus (Berkeley, Davis, Irvine, LA, Merced, Riverside, San Diego, Santa Barbara, and Santa Cruz). This will determine if there is a relationship between hours exercising and mental health acting as an obstacle and what it looks like across the UC campuses.

Results:

The 2024 UCUES had a total of 57,512 undergraduate students who responded to the survey and a total of 46,687 undergraduate students who completed the survey. This resulted in a response rate of 26% and a completion rate of 81%. Figure 1 shows the survey population, respondents, completers, response rate, and completion rate for each UC campus.

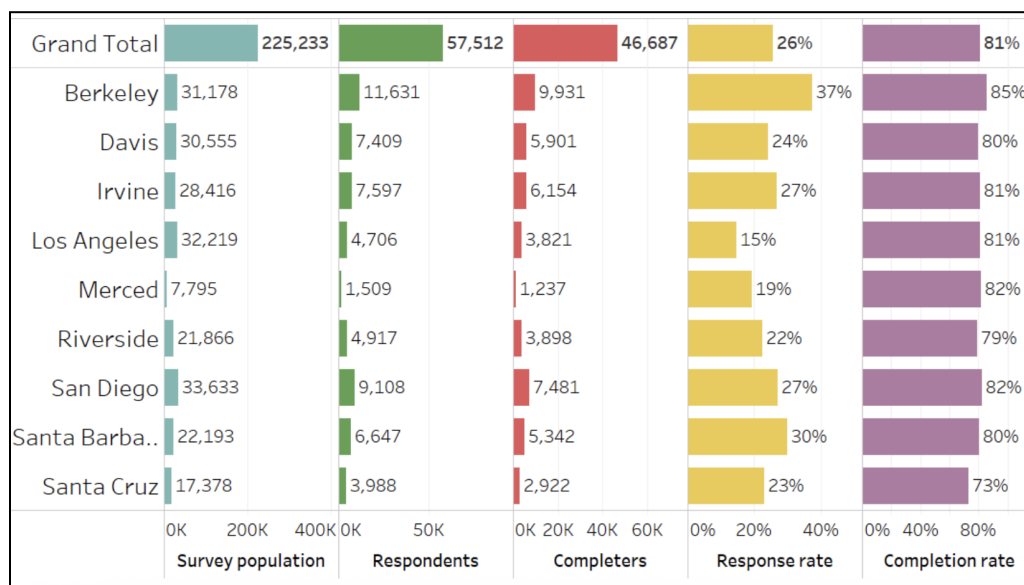


Figure 1: UCUES Survey Population, Respondents, Completers, Response Rate, and Completion Rate for Each UC Campus (Source: 2024 UCUES Survey Administration Summary)

From those who responded to the survey a total of 45,901 undergraduate students responded to the question “During this academic year, how many hours do you spend in a typical

week (7 days) on participating in physical exercise, recreational sports, or physically active hobbies?” and 44,704 undergraduate students responded to the question “In this academic year, how often has feeling depressed, stressed, or upset been an obstacle to your school work or academic success?”. Figure 2 shows the distribution of how students categorized themselves in response to how many hours a week they spend participating in physical activity. Figure 3 shows the distribution of how students categorized themselves in response to how often their mental health has been an obstacle to their school work.

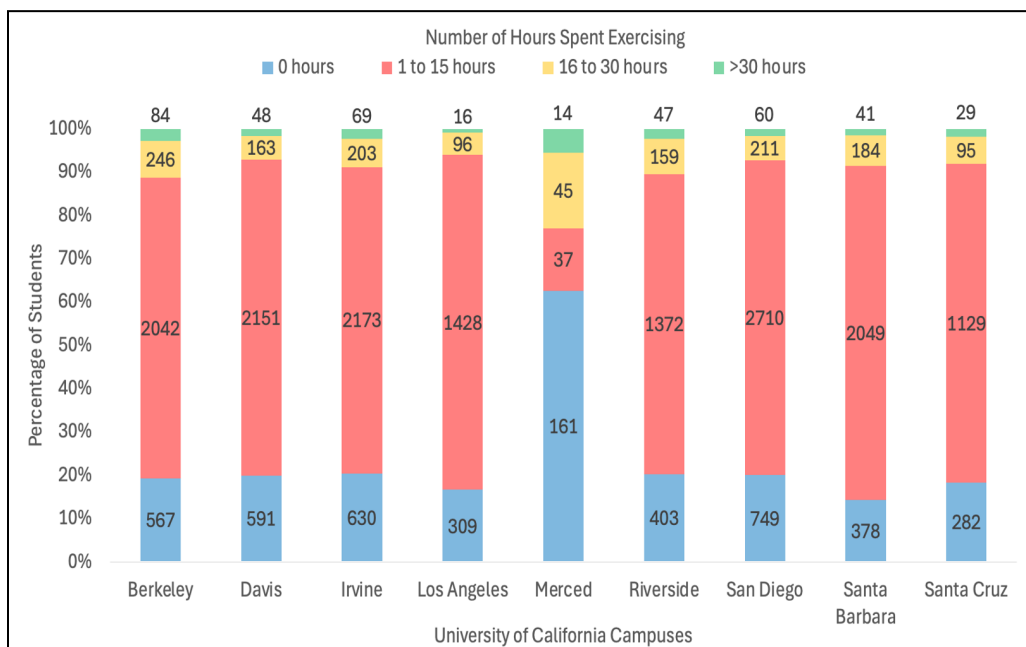


Figure 2: Hours Undergraduate Students Participated in Physical Activity in 2024 across UC Campuses (Data Source: 2024 UCUES)

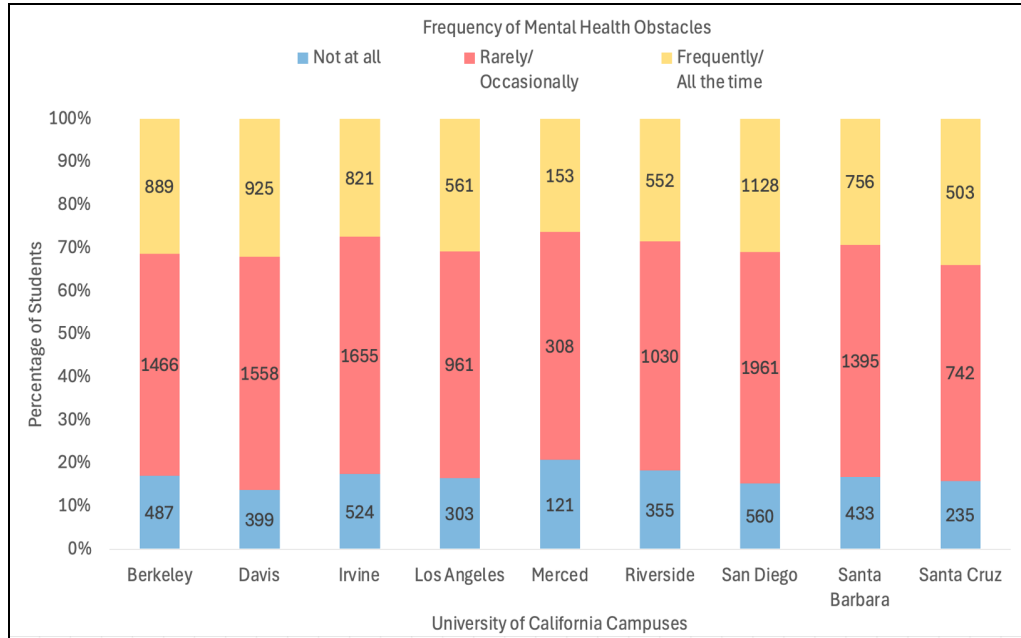


Figure 3: Times Feeling Depressed, Stressed, or Upset Was an Obstacle to Undergraduate Students' School Work or Academic Success in 2024 (Data Source: 2024 UCUES)

After running Pearson's R correlation tests for each response category combination, five out of the twelve category combination correlations are greater than 0.90, five out of the twelve category combination correlations are between 0.70 to 0.90, and two out of twelve category combinations are less than 0.70. These results show that there is some variability in the relationship between reported hours participating in physical activity and reported times mental health acted as an obstacle to academic performance for undergraduate students at the University of California. Table 1 shows the results of each Pearsons' R Correlation for each response category combination from all University of California Campuses.

All Campuses				
Hours Exercises Category	Reported Mental Health Category	Correlation Rounded	Meaning	
			positive or negative	strong or weak
0 hours	Not at all	0.67	Positive	moderate
0 hours	Rarely/Occasionally	0.94	Positive	very high
0 hours	Frequently/All the time	0.96	Positive	very high
1 to 15 hours	Not at all	0.85	Positive	high
1 to 15 hours	Rarely/Occasionally	0.99	Positive	very high
1 to 15 hours	Frequently/All the time	0.96	Positive	very high
16 to 30 hours	Not at all	0.91	Positive	very high
16 to 30 hours	Rarely/Occasionally	0.82	Positive	high
16 to 30 hours	Frequently/All the time	0.71	Positive	high
>30 hours	Not at all	0.78	Positive	high
>30 hours	Rarely/Occasionally	0.78	Positive	high
>30 hours	Frequently/All the time	0.56	Positive	moderate

Table 1: Results of Pearson's R Correlation for Each Response Category Combination from All

University of California Campuses (Data Source: 2024 UCUES)

After running Pearson's R correlation tests for each response category combination at each UC campus, the strongest category combination across all nine campuses is between 1-15 hours and Rarely/Occasionally at 0.99 Pearson's R coefficient. One notable discrepancy was at UC Berkeley and UC Los Angeles which had an additional strong category combination correlation between 0 hours and Frequently/All the Time at 0.99 Pearson's R coefficient. This means that across the UC campuses, the relationship between physical activity and mental health obstacles is very similar (if not the same). Figure 4 shows which category combination had the strongest correlation across the UC campuses.

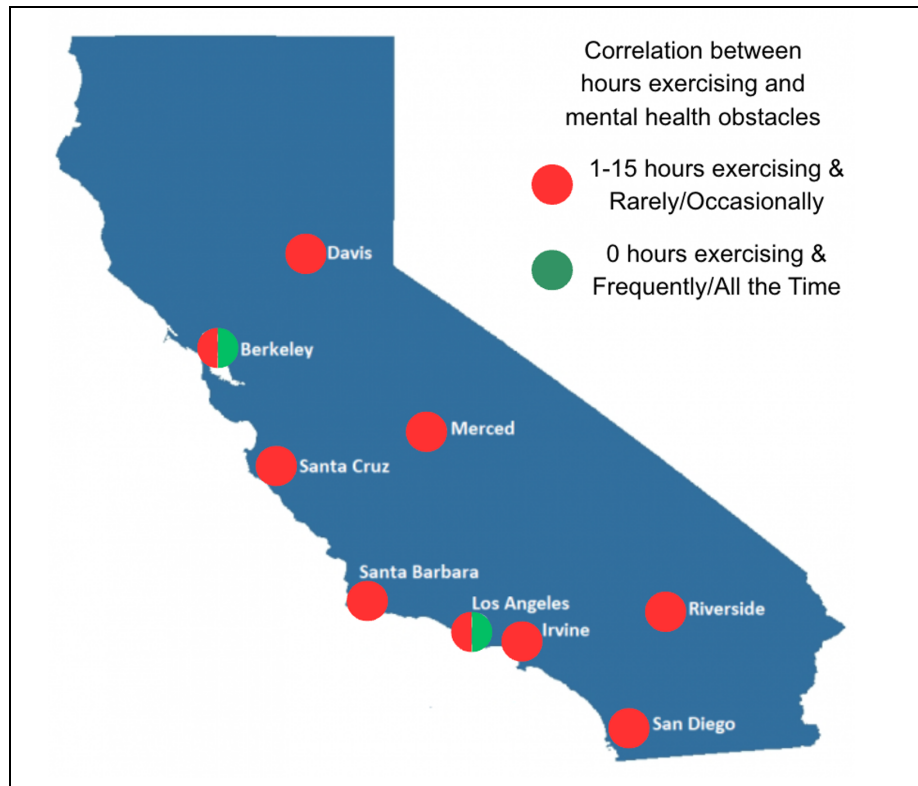


Figure 4: Strongest Correlation between Hours Exercising and Mental Health Obstacles at each UC Campus (Data Source: 2024 UCUES)

Discussion and Research Implications:

The purpose of this study is to examine the relationship between physical activity and mental well-being among undergraduate students in the University of California system, specifically how does the reported number of hours undergraduate students participate in physical exercise, recreational sports, or physically active hobbies relates to how often they report feeling depressed, stressed, or upset as an obstacle to schoolwork or academic success, across UC campuses in 2024. The results from the Pearson's R correlation tests support my hypothesis that all nine UC campuses will have the same strongest correlation between the categories of physical activity and categories of mental health obstacles, but does not support my

hypothesis that all the correlations between the categories of physical activity and categories of mental health obstacles will be equal to or greater than 0.70.

As seen in Table 1, a majority of the category combinations had a correlation equal to or greater than 0.70, however there were two category combinations that were less than 0.70. The category combination 0 hours and Not at all had a Pearson's R correlation coefficient of 0.67. This moderate correlation is possible because, as previous literature has shown, lesser to no physical activity is strongly related to poorer mental health. We can see this reigning true for undergraduate students at the University of California campuses both in the moderate relationship between 0 hours and Not at all and the strong correlation between 0 hours and Frequently/All the time (which had a Pearson's R correlation coefficient of 0.96). The second category combination that contradicted my hypothesis was more than 30 hours and Frequently/All the time with a Pearson's R correlation coefficient of 0.56. This moderate relationship is probably happening because it is reflecting student athletes who face additional demands for excellence – both in their sport and their academics. Because of the structure of the UCUES data, these student athletes are grouped into a general population of undergraduate students and thus are affecting the correlation results.

As seen in Figure 4, my hypothesis that all nine UC campuses will have the same strongest correlation is mostly supported. The category combination that had the strongest correlation coefficient at each UC campus was between 1-15 hours and Rarely/Occasionally at a 0.99 Pearson's R coefficient. The only two campuses that had a slight discrepancy was at UC Berkeley and UC Los Angeles who had two category combinations tie for strongest correlation. At UC Berkeley and UC Los Angeles, the category combination of 0 hours and Frequently/All the Time also had a correlation of 0.99 Pearson's R coefficient. This could be because UC

Berkeley and UC Los Angeles are ranked “top two public universities in the country” and so it is possible that their demand for academic excellence is higher compared to the other seven UC campuses (University of California, September 2025). This demand could be influencing some student’s time management resulting in them not being able to allocate time to physical activity and such influencing their mental well-being.

What these results establish is that there is a relationship present between physical activity and mental well-being within undergraduate students at the University of California system and that the relationship is similar across all UC campuses. With that, the University of California should continue further research on this topic as it is prevalent within this population. Additionally, should the University of California implement policies on this topic, they should do so system wide and not campus by campus. Policies could look like the creation of low-cost programs to educate and promote exercise as a part of student wellness. The reason why educational programs are important is because all nine UC campuses have free resources for physical activity that students can access, but it is possible that students are not aware of said resources or just how impactful physical activity is to mental well-being.

Limitations and Research Extensions:

One major limitation I faced was in the data collection process and how that influenced the type of research questions and hypotheses I could make. The UCUES publicly publishes the summary results of student responses on dashboards that can filter for campus, student level (class level), applicant level, residency, discipline, campus major name, classification of instructional programs (CIP) name, gender, race/ethnicity, pell grant, first language, and/or first generation. Because of the dashboard’s structure and what was publicly available, I only had data on the number of students who responded to each category of both my questions - “During this

academic year, how many hours do you spend in a typical week (7 days) on participating in physical exercise, recreational sports, or physically active hobbies?” and “In this academic year, how often has feeling depressed, stressed, or upset been an obstacle to your school work or academic success?”. I couldn’t see how an individual responded to the physical activity question and how that same individual responded to the mental health obstacles question.

This made it difficult to just simply run a correlation test and see if physical activity is in fact influencing or affecting mental health obstacles. Instead, I had to run a correlation test for each possible category combination to be able to determine if there is a relationship between these two questions at all. This then influenced my research question and my hypotheses, hence why I hypothesized that there would be strong correlations between the category combinations and that the strongest correlation would be the same across all nine UC campuses. If I had more time — or if future researchers study this topic within this population — I would have requested the raw data from the 2024 UCUES to be able collect individual responses to both questions and then run a Cramer’s V correlation test.

An improvement I could have done, was also controlling for disciplines (ie Arts, Humanities, Social Sciences/Psychology, Engineering/Computer Sciences, Health Professional and Clinical Sciences, Life Sciences, Physical Sciences/Math, Professional Fields, Undeclared/All others/Unknown). Discipline could be a controlling variable because differing disciplines have differing demands for academic excellence. While all demand academic excellence, they do so in different ways. Humanities and social science majors tend to have more essays and writing based examinations versus stem majors who have more timed exams based examinations. This could vary the levels of stress and mental well-being for students of differing disciplines and as such would need varying levels of physical activity to see the same benefits.

Future research could look at raw data from the 2024 UCUES, and/or include disciplines as a control variable. Future research could also look at resource availability at each UC campus to examine if the establishment of more or less resources available impacts the relationship between physical activity and mental health obstacles. Future research could also look at a longer time period instead of just one year. No matter what type of research is conducted, it is important to continue research on the topic of physical activity and mental well-being for college students, in order to best create and implement policies.

Conclusion:

College students are reporting the highest levels of stress and depression ever recorded, and college campuses cannot keep up with the demand for mental health support. This increased demand calls for innovative and creative solutions, like physical activity. The goal of this research project was to examine the relationship between physical activity and mental well-being among undergraduate students at the University of California. By looking at how the reported number of hours undergraduate students participate in physical exercise, recreational sports, or physically active hobbies relates to how often they report feeling depressed, stressed, or upset as an obstacle to schoolwork or academic success, across UC campuses in 2024, this research paper adds to previous literature on the topic and provides an important element to consider when implementing new policies.

The results show that there is a real and fairly consistent relationship between physical activity and mental well-being at the University of California campuses. The majority of the category combinations had a strong correlation coefficient, with only two being moderate. These findings show that there is a presence of a strong relationship between these two variables for undergraduate students at the University of California in 2024. Additionally, all nine UC

campuses had the same strongest category combination correlation, with only UC Berkeley and UC Los Angeles having two category combinations tying for strongest correlation. This shows that the relationship between physical activity and mental health obstacles is consistent across UC campuses.

Because of these findings, further research is needed and policies need to be implemented system wide, not campus by campus. Further research could look at the raw data from UCUES, expand time frames, or look at other confounding variables. In terms of policies, the University of California can implement low-cost programs to educate and promote exercise as a part of student wellness as it is possible that students simply do not understand how beneficial physical activity is or that free resources on campus exist. This and future research could reduce negative mental health on UC campuses through physical activity, making the University of California answer the call for innovation and pave the way for other colleges and universities.

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