Determining if Academic Burden is Associated with Time Spent Exercising Among University of Washington Seattle Full-Time Undergraduate Students

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INTRODUCTION

College students across the United States often feel pressured to maintain packed schedules and take on heavy course loads. However, high academic demands can directly correlate with poor physical and mental health. A 2017 study found that Pennsylvania college students with heavier academic workloads engaged in less vigorous physical activity and experienced weight gain, with 24% of students failing to meet the Health and Human Services physical activity requirements (Calestine et al., 2017). Exercise is a crucial aspect of a healthy lifestyle, as it allows for efficient blood flow, improved heart health, and the release of endorphins (Nystoriak & Bhatnagar, 2018). Students who engage in higher levels of physical activity experience improved feelings of happiness and life satisfaction. A 2022 study of 826 college students from two universities in southwest China further demonstrated that physical exercise is positively associated with self-efficacy, emotional intelligence, and subjective well-being. They found that exercise contributes to 50% of an individual's subjective well-being through a direct pathway, proving the direct impact exercise has on students mental health (Wang et al., 2022). This is particularly important for college students, as they navigate academic and social stressors while adjusting to independent living. Although prior research has identified links between academic pressure, reduced physical activity, and poorer health outcomes, few studies have specifically examined this relationship among diverse student populations at large, urban universities in the United States. This study aims to address these gaps by investigating the following: Is academic burden associated with time spent exercising among full-time undergraduate students at the University of Washington Seattle Campus?

Specific Aims

Descriptive aim: To determine the mean hours UW Seattle full-time undergraduate students spend exercising per week during Spring 2025. Hypothesis: UW Seattle full-time undergraduate students will spend on average 5 hours exercising weekly during the Spring 2025 quarter.

Analytic aim: To assess the association between high academic burden (at least 2 out of 4 burden criteria) and the time spent exercising among UW Seattle full-time undergraduate students during the Spring 2025 quarter. Hypothesis: UW Seattle full-time undergraduate students that meet 2 out of the 4 burden criteria are 50% less likely to spend at least 7 hours per week doing strength training (for the first 24 participants) and 4 hours per week doing strength training (for the remaining 65 participants) compared to UW Seattle full-time undergraduate students who are taking 15 credits or less per quarter.

METHODS

Study Design

We performed a cross-sectional study design on University of Washington, Seattle, full-time undergraduate students.

Study Population

Our target population was college students in the United States, and our source population was University of Washington Seattle full-time undergraduate students. We focused on full-time students on the Seattle campus to reduce the risk of confounding by the number of credit hours. Since part-time students have significantly less coursework compared to full-time students, we excluded them from our study. Students enrolled at universities may have varied academic structures and access to facilities, which affects academic burden. We excluded students with physical disabilities that prevented them from exercising. These criteria ensured that our data accurately reflected the association between academic burden and time spent exercising. We used non-probability, convenience sampling due to its less complex nature, low cost, and low resources, making it more feasible to collect a large number of responses. Our target sample size was 300 respondents, so we would have a large enough sample for generalizability.

Data Collection Procedures

Our study was self-administered through an online survey. We opened this survey from May 9 to May 19. We conducted passive recruitment by posting on our social media pages, texting our peers, and sending our survey to clubs and programs with which we are affiliated. Participants completed a set of nineteen

questions electronically at home, which took approximately 5-10 minutes to complete. Our survey was divided into several parts, including questions about population characteristics, academics, and physical activity levels. The first five questions were the population characteristic questions, while the rest focused on our study. Our questionnaires consisted of binary choice responses, either yes/no, or hour input, as well as continuous responses. All the numerical inputs were rounded to the nearest whole hour or number. There were four exposure questions, two outcome questions, and one open-ended question. The open ended question allowed us to better understand how students prioritize their time, keeping academic burden in mind.

Key Variables

We conceptualized academic burden as a combination of course load and time-use data. Participants indicated the number of credits they were enrolled in, specifying the number of upper-level courses (300/400-level), and the hours they spend each week on academic activities, such as attending classes and studying. This provided a fuller picture of academic demands beyond course enrollment. After gathering data, we adjusted our cutoffs: 1) 15 credits or above is “high” academic burden and less than 15 is “low” (*UW Undergraduate Advising: General Education*, n.d.), 2) 9 hours or less spent doing work in the classroom is “low” and more than 9 is “high”, 3) 17 hours or less outside the classroom is “low” and more than 17 is “high” (Riddle, 2018), 4) taking 3 or more 300+ level classes is “high” and less than 3 is “low”. Exercise was measured by self-reported weekly hours spent on strength training and cardio activities such as weightlifting, body weightlifting, running, or walking on campus (excluding team activities). Separating these categories allowed for a detailed understanding of a student's exercise activity. We also adjusted our cutoffs for exercise: 14 hours or less of cardio per week is “low,” while more than 14 is “high”. We decided this based on the average college student taking around 12,000 steps a day, which takes around 2 hours, thus, 2 hours per day for a week would be 14 hours per week (Behrens & Dinger, 2005). Due to an issue in the format of our survey, the first 24 responses did not have an option to put 0 hours for either exercise questions. To ensure we respected all the participants, we made 2 cutoffs for strength training: 7 hours or less is “low” while more than 7 is “high” for the first 24 participants. 4 hours or less is “low” while more than 4 is “high” for the remaining 65 participants. The confounding variable that we decided to choose was being a pre-major versus in a major. Being in a major or completing prerequisites can increase academic burden and can be associated with reduced time for exercise. Students in their major often prioritize academics and studying over exercising because they are taking harder classes that have high numbers of assignments and projects to complete. Additionally, academic burden does not cause someone to declare a major; therefore, it is not part of the causal pathway.

Data Analysis

For data cleaning, we began by removing ineligible participants (n = 8) from the dataset. With our eligible sample (n = 89), we first categorized the two confounding variables. The question about sports participation was already binary (yes/no), but the question regarding major status required recoding. We grouped “taking prerequisite courses” and “applying/waiting on decisions” under “pre-major,” and grouped “in a major” and “in more than one major” under “major.” Next, we recoded all exposure and outcome variables as binary. Participants were assigned a “1” if they were above the cut-off, and a “0” if they were below. There were four exposure questions total; participants with more than two “1” responses were classified as having a “high burden,” and all others as “low burden.” For the outcome, participants who answered “1” to both outcome questions were categorized as having “high weekly exercise”; all others were classified as not. We also calculated total hours of weekly exercise to determine the mean for our first aim. To address our second aim, we used the counts of “low burden” and “high burden” for the exposure, and “high weekly exercise” and “low weekly exercise” for the outcome to calculate a prevalence ratio. To assess whether major status was a confounder, we stratified the data by “major” status and calculated a Mantel-Haenszel prevalence ratio. For our open-ended question, we used thematic analysis to identify common themes among eligible participants.

RESULTS

Population Characteristics

Out of the 98 responses, 2 of them were not eligible to be included as they were not full-time students, and one was not physically able to exercise. One of our respondents answered that they were not sure if they were an uninjured member and four respondents had missing and unfeasible information. After making revisions based on missing data and impossible values, we had a total of 89 respondents to draw results from

for our study. Our results showed that 69.8% of participants were women and 28.1% were men. There was an underrepresentation of non-binary and gender fluid individuals (Figure 1).

Aim 1 Findings

For our descriptive aim, we hypothesized that UW Seattle full-time undergraduate students would spend an average of 5 hours exercising per week during Spring 2025. However, our results showed that students exercised an average of 15.7 hours per week (SD = 8.4). This is more than three times our hypothesized value (Table 1).

Aim 2 Findings

Our analytic aim analysis showed that students with high academic burden were 13% less likely to engage in high levels of exercise compared to those with low academic burden (crude PR = 0.87, 95% CI: [0.2,3.9]). After adjusting for major status using the Mantel-Haenszel method, the prevalence ratio was 3.32. Since the adjusted PR differed from the crude PR by more than 10%, we concluded that major status did confound the relationship between academic burden and exercise activity.

Qualitative Analysis Findings

Reviewing the open-ended text data, we found a recurring theme of prioritizing academics over exercising, especially when students are taking higher numbers of credits or have high amounts of work outside of class to do. We asked participants, “How does your academic burden (rigor, time spent on academics overall, and number of credits) for Spring 2025 impact the way you balance academic responsibilities with personal health/fitness?” One participant stated, “I feel that I often prioritize my studies over exercise, and my academic burden limits how long and often I exercise.” (Man, 2nd year). This was a common theme among most respondents, when choosing between getting their homework done or going to the gym, most chose the former. Setting aside time for exercising doesn’t only mean time spent in the gym, but also travel time and showering, which can easily add up to take over an hour, and most students noted that they simply don’t have enough time in the day. Another participant stated that while they love physical fitness, if they don’t prioritize it, it often gets left behind, and “not being able to exercise throughout the week had extreme negative impacts on (her) mental and physical health” (Woman, 3rd year). While students may not be able to prioritize exercising, being able to do so is something that can help with their mental health and stress. Many students noted that not being able to prioritize fitness is a source of stress in itself, on top of the existing academic burden. Students have differing amounts of time to exercise each quarter and even week, which affects their routine and time schedule for attending the gym. From these quotes, we collected initial codes such as poor mental health, lack of time for personal health and fitness, and school as a number one priority. These translate to emergent codes of prioritized studies, personal health, and time spent studying, resulting in themes of balance, priorities, and time. Balance referred to the ongoing struggle to navigate competing demands; “priorities” captured how students consistently place schoolwork at the top; and “time” emerged both as a limited resource and as a stress factor itself. Together, these themes highlighted a deeper tension between student well-being and academic expectations. Rather than viewing time management as an individual issue, these findings suggest structural pressures within academic life that may limit students' capacity to maintain their health.

DISCUSSION

Summary

Several themes, such as stress and lack of time, helped explain the link between academic burden and exercise. Many students reported prioritizing school work over physical activity, often choosing to cope with stress by focusing on academics, leaving them little time for exercise. Our results showed that full-time undergraduate students at UW Seattle with high academic burden were 87% as likely to participate in high exercise compared to students with low academic burden. Our analytical hypothesis stated that UW Seattle full-time undergraduate students taking more than three classes per quarter would be 50% less likely to exercise at least three hours per week compared to those taking three or fewer classes. Our findings did partially support this, as students with high academic burden were 13% less likely to engage in high levels of exercise compared to students with low academic burden. Students with high academic burden were less likely to engage in high levels of exercise, but was less than the 50% we hypothesized.This may be because students view exercise as an activity that requires additional effort and planning. Those with a larger academic burden may spend more time in campus libraries or academic buildings, making access to gyms less convenient. Previous research has shown that students weigh factors such as accessibility and time

constraints when deciding to exercise (Brown et al., 2024). If they lack time or easy access to a fitness facility, they may be discouraged from being physically active (Ferreira Silva et al., 2022). Our thematic analysis also built upon the studies with high prevalence of themes, like priorities and time, in many responses. Respondents mentioned that they prioritized studying over exercising, especially if exercising meant they would have less time to study.

During the Spring 2025 quarter, the average weekly exercise time among UW Seattle full-time undergraduate students was 15.7 hours. We estimated that UW Seattle full time undergraduate students would average 5 hours of weekly exercise as stated in our descriptive hypothesis. Therefore, we did not confirm our hypothesis as the results showed more than triple our expectation. This discrepancy suggests that students are far more engaged in physical activity than anticipated. A possible reason could be that students use physical activity to reduce academic stress. For instance, a study found that leisure-time physical activity positively affects stress load, recovery experience, and perceived academic performance among university students (Teuber et al., 2024). Another reason could be explained by the layout of the university itself. Since UW Seattle is a large and spread-out campus, students likely accumulate more physical activity through walking and commuting between classes compared to students at smaller universities.

Strengths and Limitations

One strength of our study was our cross-sectional survey design and passive recruitment strategy, which made data collection quick, accessible, and affordable. This study design allowed us to have adequate time to analyze and complete our study within the time constraints of our class project. Our results were very generalizable and replicable due to the study design, topic, and number of respondents. Within our survey it was important that we informed participants about survey details and got consent to use their results, along with keeping information confidential. Additionally, clearly defining our exposure and outcome variables enhanced the internal validity of our study while also reducing the risk of misclassification bias.

Some of the limitations of our study included confounding factors, both ones we measured, major status, and unmeasurable ones, such as a student's mental health or work schedules. These might affect both academic burden and exercise. Information bias, specifically recall bias, may be present as students might not accurately remember or report the amount of time they spend exercising or on schoolwork. Because all variables were measured at the same time, we cannot determine whether being busy leads to less exercise, if exercising less contributes to feeling busier, or if another factor is influencing both. Our study's external validity may be limited because UW Seattle full-time undergraduate students during Spring quarter might experience different academic demands and have greater access to gym equipment and facilities. Some students reported finding it harder to stay physically active during the Winter quarter compared to Spring. This may be due to Seattle's seasonal weather conditions, such as rain and cold in the winter, which can make it more difficult to access the gym, unlike at some other schools. Additionally, with only one gym located on the UW Seattle campus, it can be less accessible for students who live off campus or those who commute.

It's important to mention that the exercise questions within our survey capped responses at a maximum of 5 hours per week, which may not accurately reflect the habits of students who exercise more than that. Additionally, selection bias may have influenced our sample. Among the 89 respondents, 69.7% identified as women, which differs from the University's actual demographics, where women comprise 57% of the student population (*Here's What Student Life Is Like At University of Washington*, n.d.). As a result, our findings may not be representative to the overall student body, particularly those underrepresented in our sample.

Conclusion and Implications

Our study's findings imply that academic burden may be a barrier to physical activity among full-time UW Seattle undergraduate students. UW should encourage departments to reduce excessive workloads and better coordinate high-stress periods across courses to support student balance and promote physical activity. UW Seattle can partner with King County Public Health to create free, quick, online, at-home exercise programs for college students with busy schedules. Additionally, further research should be done on measuring other causal factors such as mental health status, part-time work, and involvement in extracurricular activities. They should also consider examining potential differences between male and female participants, given that the majority of our survey respondents self-identified as female.

APPENDIX

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Tables

Table 1: Distribution of demographics, academic burden, and exercise hours among University of Washington Seattle full time undergraduate students during Spring Quarter 2025 who participated in the academic burden and exercise study.

Characteristic	Statistic
Age	20.2 (1.2)
Gender*	
Woman	69.7% (62/89)
Man	28.1% (25/89)
Non-binary	0.01% (1/89)
Gender fluid	0.02% (2/89)
Sports team participation	
Yes	19.1% (17/89)
No	80.9% (72/89)
Don't know	0% (0/89)
Major Status	
Pre-major	15.7% (14/89)
Major	84.3% (75/89)
Number of total hours weekly spent doing academic work in class	12.8 (5.6)
High > 10 hours	10.1% (9/89)
Low </= 9 hours	89.9% (80/89)
Number of total hours weekly spent doing academic work outside of class	13.9 (8.9)
High > 18 hours	24.7% (22/89)
Low </= 17 hours	75.3% (67/89)
Number of total credits taken during spring 2025	15.4 (2)
High > 15 credits	41.6% (37/89)

Low </= 15 credits	58.4% (52/89)
Number of 300+ level classes taken during spring 2025	2.2 (1.4)
High >/= 2 hours	42.7% (38/89)
Low < 2 hours	57.3% (51/89)
Hours spent doing cardio	10.9 (5.9)
High > 15 hours	19.1% (17/89)
Low </= 15 hours	80.9% (72/89)
Hours spent strength training*	4.8 (4.1)
High >7 or 4 hours	25.8% (23/89)
Low </= 7 or 4 hours	74.2% (66/89)
Average Weekly Hours Spent Exercising	15.7 (8.4)
High Exercise – by activity > 14 hours of cardio & 7 hours of strength training*	10.1% (9/89)
Low Exercise – by activity </= 14 hours cardio & 7 hours of strength training*	89.9% (80/89)

*Participants were allowed to select more than one gender

*Due to survey issues, there are two cutoffs for strength training. 7 hours for the participants before the change (n = 24) and 4 hours for the participants after the change (n=65).

Figures

Figure 1. Gender Distribution of UW undergraduate students participating in the academic burden and exercise study during Spring quarter, 2025.

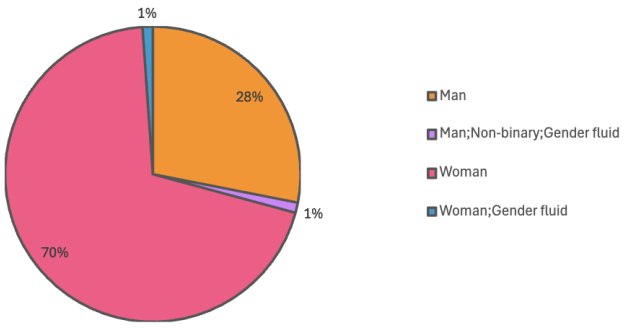

Figure 1. Gender distribution of UW undergraduate students participating in the academic burden and exercise study during Spring 2025. The pie chart shows that the largest portion of participants identified as women (shown in pink). Followed by men (orange), who represent a smaller portion. Smaller slices are made up by Woman;Gender fluid (light blue), and Man;non-binary;gender fluid (light purple). This pie chart shows a skewed distribution of gender among the respondents.

Synthesis

Our findings supported our hypotheses. However, while we expected that students with higher academic burden would be 50% less likely to engage in at least three hours of exercise per week, our results showed a smaller association (adjusted PR = 0.87, 13% less likely), suggesting that academic burden may play a role, but not as strongly as predicted. This aligns with existing literature demonstrating that increased academic stress correlates with decreased physical activity and greater mental health strain (Calestine et al., 2017). However, our results diverge from these studies since a small group of students maintained high levels of exercise despite a high academic burden, potentially using exercise as a coping mechanism. The high average of 15.7 exercise hours per week was notably above our expected mean of 5 hours, suggesting that students may integrate physical activity into daily routines, such as walking to class, or use it for stress relief, which contradicts our assumptions that academics fully displace exercise time. Qualitative themes of balance, priorities, and time revealed how students consciously prioritize academics over personal health, yet also experience distress when unable to meet their fitness goals. One unexpected finding was that time itself was described as both a barrier and a stressor; students did not just lack time, but also felt stressed by the lack of it. While major status was tested and not found to be a confounder, other potential influences like mental health conditions, part-time employment, and access to exercise resources were not measured and may warrant further investigation. Future research should also explore seasonal and gender-based differences in exercise patterns, as well as institutional policies that can aid in relieving academic burden and supporting student wellness.