Honors Theses   University Honors Program

4-2018

How Academic and Extracurricular Workload and Stress Impacts the Mental and Physical Health of College Students

Aidan Koch

How Academic and Extracurricular Workload and Stress Impacts the Mental and Physical Health of College Students

Honors Thesis

Aidan Koch

Department: Psychology

Advisor: Erin O'Mara, Ph.D.

April 2018

How Academic and Extracurricular Workload and Stress Impacts the Mental and Physical Health of College Students

Honors Thesis

Aidan Koch

Department: Psychology

Advisor: Erin O'Mara, Ph.D.

April 2018

Abstract

Academic workload and extracurricular involvement can be sources of stress for college students. Academic workload is characterized as the student's major, course work and future graduate school and/or career path plans. Extracurricular involvement can pertain from anything to intramural sports to being the President of a student organization. The current research sought to investigate changes in mental and physical health over a semester by examining physiological and perceived stress levels in college students, in conjunction with academic workload and extracurricular involvement. Previous research found an association between stress and physical health (Peer, Hillman, Van Hoet 2015). Studies have shown sympathetic nervous system activation due to stressors in people's lives (Conley & Lehman, 2012). Mental Health has also been shown to decrease when stress is overwhelming in the lives of college students (Murff, 2005). The goal of the present work was to examine academic workload, extracurricular involvement, physiological stress, perceived stress, and mental and physical health over the course of the semester to better understand how they are associated. Using a longitudinal design, participants completed measures of mental and physical health, perceived stress, as well as academic workload and extracurricular involvement at the beginning and end of the fall semester. Physiological stress was assessed at each time point by collecting a saliva sample from participants in order to measure the hormone cortisol.

Acknowledgements

UNIVERSITY *of*

DAYTON

Table of Contents

Introduction

Various aspects of life can affect a college students stress levels, anything from sleeping habits to heavier work-load (Murff, 2005). The present study aimed to examine the effects of academic and extracurricular workload, and student stress levels on physical and mental health. Academic workload is considered one of the main stressors for college students, as it has been shown to account for increased stress levels in college students (Murff, 2005). Additionally, extracurricular workload may also be a cause of stress in college students. Although previous research has found no association between extracurricular activities and college student stress, extracurricular activities were narrowly defined and did not include employment (Civitci, 2015). The proposed study attempted to discern which, if any, of these extracurricular activities are correlated with college student stress. The goal of the present study was to examine what aspect of academic workload and extracurricular workload is associated with stress, and how workload and stress influences mental and physical health.

Previous research has found an association between various aspects of stress, academic workload, and physical health. Stress in college students is a large factor that depicts student success, as it has been shown in previous research (Peer, Hillman, Van Hoet, 2015). Due to the fact that student success is so dependent on both mental and physical health, the connection between stress and these aspects of health is key when looking at academic and extracurricular workload. Research has found various aspects of physical health being affected by actual stress or perceived stress (Largo-Wight, Peterson, & Chen, 2005). Connections between stress and decreased immune system function have been shown in previous research (Largo-Wight, Peterson, Chen, 2005). This is an obvious impairment to college students as both physical and mental performance decrease as immune system function is impaired (Largo-Wight, Peterson, & Chen 2005). Additional physical impairments due to stress, according to past research, include high blood pressure and even stroke (Largo-Wight, Peterson, Chen 2005). More specific to cardiovascular aspects of physical health, connections between acute academic stressors and elevated systolic blood pressure have been noted in previous research. Systolic blood pressure being the pressure against the arterial walls when the

heart is contracting (Conley & Lehman, 2012). These systolic blood pressure elevations could possibly be causative of health issues later in life (Conley & Lehman, 2012). Allostatic load, or the physiological cost of repeated stress exposure, has been linked with increased risk for cardiovascular disease and hypertension (Conley & Lehman, 2012). The proposed research aimed to investigate how exactly physical health is affected by stress created from academic and extracurricular work-loads.

Mental health is also affected heavily by stress, and stress has shown the ability to prevent students from being successful in their respective educational goals (Murff, 2005). For example, poor mental health is associated with poor academic performance (Murff, 2005) Research has also found that students cope with depressed mood, hopelessness, and concentration difficulties, all due to stress (Peer, Hillman, & Van Hoet, 2015). Previous studies have also reported depressive symptoms being linked to systemic external stressors, such as requirements of schoolwork and participation in extracurricular activities (Goldring, 2012). These stressors are more so linked to depressive symptoms when the importance of said stressor is high (Goldring, 2012). This stress, when transformed into mental health disparities can have drastic effects on a student's college career as well as their future.

The presented research will thoroughly examine the academic and extracurricular workloads of college students, as well as their stress levels and mental and physical health, through a two-part study.

Method

Participants: Seventy-six University of Dayton undergraduates were recruited to participate from introductory psychology and received course credit in exchange for participation.

Procedure. The present study was a longitudinal study that consisted of two parts. Time 1 took place during the first several weeks of the semester, and Time 2 took place during the last few weeks of the semester. The Time 1 and Time 2 procedures were similar but not identical, due to a task implemented during Time 1. The data collected for this study was part of a larger ongoing study examining health and stress.

Participants were brought to the lab at Time 1 and after providing consent to participate completed measures on the computer. After given time to acclimate to the lab, participants had their blood-pressure and heart rate measured using a standard blood-pressure wrist cuff (Omiron). Next, participants provided their first saliva sample into a cryovial saliva collection tubes in order to examine each participant's baseline cortisol level. Participants then completed the Trier Social Stress Test (TSST; REFERENCE), an acute laboratory stressor used to assess physiological reactivity to stress. The second saliva sample was taken approximately 20 minutes after the start of the TSST. Saliva tubes were temporarily stored in a freezer before being analyzed by examining the amount of cortisol in each sample.

Participants then completed a series of questionnaires before being debriefed regarding the purpose of the TSST and were scheduled for Time 2. At Time 2 participants completed the same measures from Time 1 but did not do the TSST.

Measures. Participants completed measures of academic and extracurricular workload, perceived stress, mental health, and physical health.

Workload. Academic workload was examined by asking the participants how difficult they perceived their major to be (the scale for this measure was 1-6, with 6 being the most difficult), as well as how many hours a week they spent studying and working on schoolwork. Extracurricular workload was examined by asking the participants about hours spent engaged in any and all involvement they take part in outside of their classroom and academic requirements. These involvements could have included volunteer work, club, athletic, or organizational involvement, and on or off campus employment. Specific questions regarding the student's level of involvement in these extracurricular activities were included such as the time commitment per week and the importance of their position in this specific activity.

Stress. Stress levels were examined through the use of cortisol testing via saliva samples. The saliva test illustrated the cortisol levels of the college students, which are directly related to stress levels. Cortisol is a steroid hormone secreted by the adrenal glands. The hypothalamic pituitary adrenocortical (HPA) axis regulates the release of cortisol. Activation of the HPA axis is initiated by the hypothalamic release of corticotrophin releasing hormone (CRH). CRH in turn triggers the adrenal cortex to

release cortisol into the blood stream (Sapolsky, Romero, & Munck, 2000), and can be measured in saliva. Measures of perceived stress were also used in order to understand how stressed students perceived themselves to be. The perceived stress scale (Cohen, Kamarck, & Mermelstein, 1983), was used to measure the perceived stress.

Health. Measures were also used to investigate physical and mental health. The measures for physical health included several items from the MOS 36-Item Short-Form Health Survey assessing perceptions of health (SF36; Ware & Sherbourne, 1992). Mental health was assessed using the Center for Epidemiological Studies Depression Scale (Radloff, 1977). This measure used a 1-4 scale to indicate how many days in the past week participants had certain feelings of depression, with 4 being the most often (about 5-7 days).

Results

Time 1 Results.

To understand whether physical health and mental health are associated with stress, and whether this association is moderated by workload and perceived major difficulty, several analyses were conducted. First, Time 1 physical health was examined by testing whether it varied by workload, perceived major difficulty and perceived stress. Time 1 physical health was found to be negatively associated with Time 1 perceived stress, $b = -0.70$, $SE = 0.27$, $t(df) = -2.46$, $p = 0.02$. That is, the more stressed a student perceived themselves to be, the poorer their perceived physical health was. Workload was not associated with physical health, $b = 0.01$, $SE = 0.01$, $t(df) = 0.72$, $p = 0.47$, and neither was perceived major difficulty, $b = 0.12$, $SE = 0.08$, $t(df) = 1.45$, $p = 0.15$. Second, Time 1 physical health was examined by testing whether it varied by baseline physiological stress, perceived major difficulty, and workload. No association was found between perceived physical health and baseline physiological stress, $b = -0.36$, $SE = 0.38$, $t(df) = -0.94$, $p = 0.35$, workload, $b = 0.00$, $SE = 0.02$, $t(df) = 0.28$, $p = 0.78$, or perceived major difficulty, $b = 0.03$, $SE = 0.09$, $t(df) = 0.37$, $p = 0.71$. Lastly, Time 1 physical health was examined by testing whether it varied by stress reactivity, perceived major difficulty, and workload. No association was found between perceived physical health and stress reactivity, $b = -0.36$, $SE = 0.40$, $t(df) = -0.89$, $p = 0.38$, workload, $b = 0.00$, $SE = 0.02$,

t(df) = 0.18, *p* = 0.86, or perceived major difficulty, *b* = 0.04, *SE* = 0.09, *t(df)* = 0.49, *p* = 0.62.

Time 1 depression was examined by testing whether it varied by workload, perceived major difficulty and perceived stress. Depression was positively associated with perceived stress, *b* = 0.89, *SE* = 0.20, *t(df)* = 4.47, *p* = <.0001. That is, that one with higher perceived stress at Time 1, also had higher depression at Time 1. There was no association between depression and workload, *b* = 0.01, *SE* = 0.01, *t(df)* = 0.91, *p* = 0.37, or perceived major difficulty, *b* = -0.11, *SE* = 0.063, *t(df)* = -1.83, *p* = 0.074. Time 1 depression was examined by testing whether it varied by baseline physiological stress, perceived major difficulty, and workload. There was no significant association found between Time 1 depression and baseline physiological stress, *b* = 0.36, *SE* = 0.31, *t(df)* = 1.16, *p* = 0.25, workload, *b* = 0.012, *SE* = 0.0077, *t(df)* = 1.50, *p* = 0.14, or perceived major difficulty, *b* = 0.01, *SE* = 0.07, *t(df)* = 0.10, *p* = 0.92. Lastly for Time 1 data, Time 1 depression was examined by testing whether it varied by stress reactivity, perceived major difficulty, and workload. There was no association was found between depression and stress reactivity, *b* = 0.22, *SE* = 0.33, *t(df)* = 0.65, *p* = 0.52, workload, *b* = 0.01, *SE* = 0.01, *t(df)* = 1.55, *p* = 0.13, or perceived major difficulty, *b* = -0.00, *SE* = 0.07, *t(df)* = -0.06, *p* = 0.95.

Time 2 Results.

To understand whether physical health and depression at Time 2 are associated with perceived major difficulty, workload, and stress at Time 1, several analyses were conducted. For all analyses examining Time 2 outcomes, the Time 1 outcome was controlled for in that analysis. First, Time 1 physical health was examined by testing whether it varied by workload, perceived major difficulty and perceived stress. No association was found between Time 2 physical health and Time 1 perceived stress, *b* = -0.16, *SE* = 0.17, *t(df)* = -0.96, *p* = 0.35, workload, *b* = -0.00, *SE* = 0.01, *t(df)* = -0.66, *p* = 0.51, or perceived major difficulty, b = 0.07, SE = 0.05, t = 1.32, p = 0.20. Secondly, Time 2 physical health was examined by testing whether it varied by workload, perceived major difficulty, and Time 1 baseline physiological stress. No association was found between Time 2 physical health and Time 1 baseline physiological stress, *b* = -.012, *SE* = 0.21, *t(df)* = -0.58, *p* = 0.57, workload, *b* = -0.01, *SE* = 0.01, *t(df)* = -0.89, *p* = 0.38, or

perceived major difficulty, $b = 0.04$, $SE = 0.05$, $t(df) = 0.83$, $p = 0.42$. Time 2 physical health was lastly examined by testing whether it varied by workload, perceived major difficulty, and Time 1 stress reactivity. No association was found between Time 2 physical health and Time 1 stress reactivity, $b = 0.23$, $SE = 0.27$, $t(df) = 0.83$, $p = 0.41$, workload, $b = -0.01$, $SE = 0.01$, $t(df) = -1.06$, $p = 0.30$, or perceived major difficulty, $b = 0.05$, $SE = 0.05$, $t(df) = 1.10$, $p = 0.28$.

Time 2 Depression was next examined by testing whether it varied by Time 1 perceived stress, baseline physiological stress, stress reactivity, workload and perceived major difficulty. There was no association between depression and Time 1 perceived stress, $b = 0.04$, $SE = 0.30$, $t(df) = 0.12$, $p = 0.91$, workload, $b = 0.01$, $SE = 0.01$, $t = 0.77$, $p = 0.45$, or perceived major difficulty, $b = 0.10$, $SE = 0.08$, $t(df) = 1.24$, $p = 0.23$. Next, Time 2 depression was examined by testing whether it varied by Time 1 baseline physiological stress. It was found that there was an association between Time 2 depression and Time 1 baseline physiological stress, $b = 0.56$, $SE = 0.24$, $t(df) = 2.36$, $p = 0.03^*$. That is, students with higher Time 1 baseline physiological stress, were more depressed at Time 2. Depression was not associated with workload, $b = 0.01$, $SE = 0.01$, $t(df) = 0.77$, $p = 0.45$, but was associated with perceived major difficulty, $b = .13$, $SE = 0.06$, $t(df) = 2.11$, $p = 0.05^*$. That is, more difficult majors were associated with more depression. Time 2 depression was lastly ran against Time 1 stress reactivity. No association was found between depression and stress reactivity, $b = -0.21$, $SE = 0.38$, $t(df) = -0.57$, $p = 0.57$, workload, $b = 0.01$, $SE = 0.01$, $t(df) = 0.86$, $p = 0.40$, or perceived major difficulty, $b = 0.10$, $SE = 0.07$, $t(df) = 1.49$, $p = 0.12$.

Discussion

From the results of this study, one can examine how health, stress and workload are associated, and make inferences on what that means for college students. As stated in the results section, it was found that at Time 1, the higher perceived stress a student had, the worse their physical health seemed to be. This association was not found between Time 1 physical health and Time 1 baseline physiological stress or Time 1 stress reactivity. This indicates that the type of stress that seems to be having a significant

impact on health is not in fact how physiologically stressed a student is, but how stressed a student thinks they are. The same was found with regards to depression at Time 1. There was a strong positive association between Time 1 perceived stress and Time 1 depression, indicating that students with higher perceived stress experienced higher levels of depression. This was once again no association found between Time 1 baseline physiological stress or Time 1 stress reactivity, and Time 1 depression. These results indicate once again that the physiological stress, or the actual stress that your body is experiencing, does not seem to be connected to physical or mental health. It is the stress that students are perceiving themselves to have that is more likely responsible for decreases in their health and increases in their depressive states.

From the Time 2 data, one can see what may be predictors of physical and mental health, as well as what seem to have no effect on future health outcomes. The results showed that instead of Time 1 perceived stress being associated with Time 2 depression, just as Time 1 perceived stress was associated with Time 1 depression, it was actually Time 1 baseline physiological stress that was associated Time 2 depression. This is showing that if a student reports high baseline physiological stress at Time 1, then their depression level at Time 2 was higher. From this data one can deduct that physiological stress, although not impactful at the immediate time of reported high depression, may have a long term effect on mental health. It was also found that higher reported academic difficulty at Time 1 was a moderating factor between Time 2 depression and Time 1 baseline physiological stress. From this one might suggest that with already high levels of baseline physiological stress at Time 1, if a student also perceives their Time 1 difficulty of major to be high, then that will only increase their level of depression more. What we are seeing is that physiological stress, as well as perceived academic difficulty have a long term association with mental health (depression).

Although these findings were significant, it should be noted that the sample size of this study was relatively small, and the participant pool consisted predominantly of first year college students. Other variables could very well be associated with physical and mental health, both concurrently and over time. It should also be noted that certain associations were found to be close to significant (having a p-value near .05), but due to the studies low sample size were not found to be significant. It was presumed that with a

larger sample size, these associations might reach significance but that cannot be said for sure.

   Future research recommendations for a recreation of this study might include increasing the sample size, as well as increasing the diversity of the sample size. This would entail including college students of all grade levels, from first year student to fourth year students, and quite possibly fifth year students as well as graduate students. This would allow one to thoroughly analyze which year may provoke the most amount of stress, and consequently the lowest levels of mental and physical health. This would also help researchers gain an idea of what individual factors are associated with stress academically speaking, instead of just the perceived difficulty of major. These factors might include individual courses, CAP courses versus major specific courses, and possibly factors more related to upperclassmen, such as research and thesis projects.

References

Murff, S. (2005). The impact of stress on academic success in college students. *ABNF Journal*, *16*(5), 102-104.

Civitci, A. (2015). Perceived Stress and Life Satisfaction in College Students: Belonging and Extracurricular Participation as Moderators. Procedia - Social and Behavioral Sciences, 205, 271-281.

Conley, K. M., & Lehman, B. J. (2012). Test Anxiety and Cardiovascular Responses to Daily Academic Stressors. *Stress & Health: Journal Of The International Society For The Investigation Of Stress*, *28*(1), 41-50.

Goldring, M. A. (2012). Cycling through the blues: The impact of systemic external stressors on student mental states and symptoms of depression. *College Student Journal*, *46*(3), 680-696.

VanKim, N. A., & Nelson, T. F. (2013). Vigorous Physical Activity, Mental Health, Perceived Stress, and Socializing Among College Students. *American Journal Of Health Promotion*, *28*(1), 7-15.

Peer, J. W., Hillman, S. B., & Van Hoet, E. (2015). The Effects of Stress on the Lives of Emerging Adult College Students: An Exploratory Analysis. *Adultspan Journal*, *14*(2), 90-99.

Largo-Wight, E., Peterson, M., & Chen, W. W. (2005). Perceived Problem Solving, Stress, and Health Among College Students. *American Journal Of Health Behavior*, *29*(4), 360-370.