2-2022

Health Risk-Related Outcomes Associated with Academic Burnout and Engagement

Madeline Blair Trahan

Health Risk-Related Outcomes Associated with Academic Burnout and Engagement

by

Madeline Blair Trahan, M.S.

Bachelor of Science (Honors)
Psychology
Loyola University New Orleans
2018

Master of Science
Clinical Psychology
Florida Institute of Technology
2020

A Doctoral Research Project Submitted to the School of Psychology at the Florida Institute of Technology

In partial fulfillment of the requirements for the degree of Doctor of Psychology in Clinical Psychology

Melbourne, Florida

February 2022

We the undersigned committee
hereby approve the attached doctoral research project

Health Risk-Related Outcomes Associated with Academic Burnout and Engagement

by

Madeline Blair Trahan, M.S.

_____	_____
Vida L. Tyc, Ph.D. Professor School of Psychology Major Advisor	Anthony LoGalbo, Ph.D. Associate Professor School of Psychology
_____	_____
Theodore G. Petersen, Ph.D. Associate Professor School of Arts and Communication	Robert A. Taylor**,** Ph.D. Professor and Interim Dean College of Psychology and Liberal Arts

Abstract

TITLE: Health Risk-Related Outcomes Associated with Academic Burnout and Engagement

AUTHOR: Madeline Blair Trahan, M.S.

MAJOR ADVISOR: Vida L. Tyc, Ph.D.

Research has demonstrated a connection between burnout and self-rated health and health risk behaviors, specifically substance use, mental health problems, low physical activity, and sleep difficulties. However, studies have focused primarily on job-related burnout, rather than academic burnout. Additionally, engagement (the conceptual opposite of burnout) has not been well examined in relation to behavioral health outcomes. The goal of this study was to examine the association between both academic burnout and engagement concurrently to health-risk behaviors, perceived health status, and perceived academic stress among college students. Participants were recruited through requests to professors and/or social media. Students were asked to complete an online survey containing the Maslach Burnout Inventory – Student Survey (MBI-SS), the Utrecht Work Engagement Scale for Students (UWES-S), selected and adapted items from the Youth Risk Behavior Surveillance System (YRBSS) – Standard High School Version (2021), self-rated health items, and the Perception of Academic Stress Scale (PAS). Results indicated a significant association between academic engagement and burnout as students with high levels of burnout were significantly more likely to report low levels of engagement. No significant relationships existed between burnout or engagement and overall health risk behaviors. However, significant relationships were found for burnout and perceived health status and mental health, meaning students who

reported high levels of burnout were more likely to rate their general physical health as poor and have more negative perceptions of their mental health. Furthermore, burnout and engagement were also significantly related to perceived academic stress, suggesting that those with high burnout and low engagement were more likely to experience stress from academics. Reducing academic stress may be an effective method for treating burnout and its associated negative health outcomes; however, more research is necessary to better understand this relationship.

TABLE OF CONTENTS

List of Tables

Chapter 1

Review of the Literature

Burnout

The term ‘burnout’ has been used often since the 1970s (Maslach, Schaufeli, & Leiter, 2001). The phenomenon was identified by practitioners and social commentators long before research began to take note. As research began to focus on burnout, the conceptualization of a psychological syndrome created as a response to occupational stressors emerged. Burnout is composed of three core dimensions, which consist of emotional exhaustion, feelings of detachment or cynicism, and perceptions of oneself as professionally inefficient or inadequate (Maslach, Schaufeli, & Leiter, 2001).

Burnout research began with a focus on service occupations, which inherently included emotional and interpersonal stressors (Maslach, Schaufeli, & Leiter, 2001). Specifically, studies concentrated on occupations which served someone in need, e.g., human services and/or healthcare professionals. As the provider and client relationship is at the core of service-oriented careers, burnout was originally reviewed from the interpersonal context of the job. Relational transactions, individuals’ emotions, and the values that guided one’s work were areas of interest. Therefore, from a social perspective, burnout focused on the relationship between provider and client. However, clinically, the interest was on the provider’s symptoms of burnout and the mental health issues related to it.

Research demonstrated that job overload and the emotional strain of service-based careers laid the landscape for burnout symptoms like emotional exhaustion and detachment (Maslach, Schaufeli, & Leiter, 2001). Emotional exhaustion is a common

phenomenon in response to overwhelming work. Detachment has been viewed by some as a healthy way to moderate one's emotional attachment to the client and, thereby, reduce intense emotionality that may affect one's ability to perform a job. However, excessive detachment has led to providers who are unemotional, callous, and uncaring with their clients.

Service-based occupations demonstrated an urgent need for research focusing on the causes and correlates of burnout (Maslach, Schaufeli, & Leiter, 2001). In response, empirical research on the topic of burnout began in the 1980s. The most widely used scale for the measurement of burnout has been the Maslach Burnout Inventory (MBI), developed by Maslach and Jackson (1981). This instrument was originally developed for use with human service occupations. However, as research began to demonstrate the occurrence of burnout in the educational area, a new version of the MBI was created for use with teachers (Maslach, Schaufeli, & Leiter, 2001). During this time, burnout came to be viewed as a response to job stress and focused heavily on job satisfaction, organizational commitment, and turnover.

The 1990s saw a change in burnout research as the syndrome of burnout was evidenced to present in various occupations beyond human services and education (Maslach, Schaufeli, & Leiter, 2001). A third version of the MBI was created for use with occupations outside of this original limited scope. The Maslach Burnout Inventory – General Survey (MBI-General Survey or MBI-GS) formulated the three core components of burnout in slightly broader constructs that focused on the individual response to the job rather than the relational aspect of the occupation. Burnout was conceptually modified to consist of exhaustion, cynicism about one's job, and reduced professional efficacy. Leiter

and Schaufeli (1996) validated the use of the MBI-GS with various occupations including managers, nurses, maintenance workers, and technical personnel. The results demonstrated the presence of the same 3-factor structure throughout several occupational fields, implying that occupational burnout manifests similarly across careers.

Exhaustion is the central aspect of burnout and is most often the feeling to which people are referring when they described themselves as 'burned out', making it the most obvious indicator of burnout (Maslach, Schaufeli, & Leiter, 2001). It denotes the individual stress response of burnout, conceptualized as the subjective depletion of one's physical and psychological resources. Exhaustion refers to the feeling of being overworked, overwhelmed, fatigued, and drained with one's job. The experience of exhaustion prompts one to cope emotionally and cognitively with one's job by distancing from it.

In reference to human services, this emotional distancing is conceptualized through depersonalization, the adoption of an attitude that increases the emotional space between providers and recipients and, thereby, reduces engagement with others (Maslach, Schaufeli, & Leiter, 2001). For other occupations, cognitive distancing is more common and is manifested through the adoption of a cynical or indifferent attitude towards one's career. The immediacy of this reaction to exhaustion is evidenced by the consistent relationships found between exhaustion and cynicism, hereafter inclusive of depersonalization, throughout burnout research. In contrast to exhaustion, cynicism encompasses the interpersonal aspect of burnout and refers to the negative, unfeeling, and detached manner with which one approaches aspects of the job.

The final factor of burnout is lack of professional efficacy, which is described as self-perceived ineffectiveness in the job (Maslach, Schaufeli, & Leiter, 2001). Some research shows that lack of professional efficacy is, to some degree, a response to exhaustion, cynicism, or both (Bryne, 1994; Lee & Ashford, 1996). However, other studies (Leiter, 1993) demonstrate that ineffectiveness develops alongside exhaustion and cynicism. Lack of professional efficacy is further debated, and some researchers, such as Maroco and Campos (2012), contend that certain types of occupational burnout are best described without the influence of perceived ineffectiveness. Efficacy issues also differ from other aspects of burnout in that these seem to result from lack of resources, while exhaustion and cynicism result from overload and interpersonal conflict (Maslach, Schaufeli, & Leiter, 2001).

Burnout is sometimes confused with another mental health issue often encountered by clinicians: depression (Maslach, Schaufeli, & Leiter, 2001). As depression may involve emotional exhaustion, cynicism, and a lack of feeling of personal accomplishment, it presents similarly to burnout. However, the difference between burnout and depression has been established empirically (Bakker et al., 2000; Glass & McKnight, 1996; Leiter & Durup, 1994). In a study conducted by Leiter and Durup (1994), three self-report measures, the MBI, Beck Depression Inventory (BDI), and Profile of Mood States (POMS) depression scale were administered to 307 hospital workers at a Canadian teaching hospital. Factor analysis fit best when depression and burnout were considered as separate factors, supporting the notion that burnout and depression were distinct concepts and that valuable insight would be lost through combining the two. Furthermore, Bakker et al. (2000) used confirmatory factor analysis

in a study of 156 Dutch teachers to determine that the inherent structure of the MBI was statistically discriminant from the Center for Epidemiologic Studies Depression Scale (CES-D), a self-report measure that screens for depressive symptomology in the general population. Lack of reciprocity in relationships with students was predictive of burnout amongst teachers, whereas lack of reciprocity in the relationship with one's partner predicted depression, demonstrating that burnout was specifically related to the work environment. These collective findings indicate that burnout, unlike depression, is context-specific, e.g., related to work and/or academic environments. Depression is much more generalized, affecting all aspects of one's life, not specifically those related to the work/academic environment. Despite evidence of the distinction between depression and burnout, these concepts are related. Leiter and Durup (1994) noted a high correlation between the two and an even stronger correlation between depression and emotional exhaustion. Depression-prone individuals were more likely to experience burnout, although each can occur exclusively (Maslach, Schaufeli, & Leiter, 2001).

Given the wide reach of burnout and its similarity to mental health disorders such as depression, a discussion of how to treat it is warranted. Treatments for burnout have been studied with mixed efficacy. Nurses who utilized positive psychology through recording three good things that happened every week over six months reported a decrease in emotional exhaustion (Luo et al., 2019). This decrease was most significant when nurses recorded, on average, twice a week. This intervention, however, did not influence the two other dimensions of burnout. Cynicism and lack of personal efficacy increased in both the treatment and control conditions. Not all individuals in need of treatment seek help; as stigma and negative personal experiences increase, help-seeking

behaviors for burnout are reduced (Dyrbye et al., 2015). Many medical students, for example, endorsed perceived stigmas about seeking treatment for burnout and had witnessed supervisors negatively judge students for seeking treatment. In fact, it has been reported that only one-third of medical students with burnout seek treatment (Drybye et al., 2015). Although burnout appears to be a syndrome which perpetuates itself and should, therefore, be treated, spontaneous recovery from burnout is possible. In a study by Drybye et al. (2008), 27% of medical students who met burnout criteria had recovered in one year without intervention. Despite possible spontaneous recovery, the majority of cases do not remit on their own and therefore necessitate treatment.

Academic Burnout

Although burnout research began with a focus on occupational work, later research has demonstrated that burnout can occur in any work-related context, including academics. Academic burnout (also referred to as student burnout) is burnout experienced in response to academic pursuits. Academic burnout is defined similarly to job burnout and consists of exhaustion, cynicism, and lack of personal accomplishment (termed professional efficacy in work-related burnout), the context of which is specific to the school environment (Salmela-Aro et al., 2009a).

Although academic burnout is primary described using the aforementioned 3-factor structure, it has been also studied using a 2-factor structure and a 4-factor structure. The 2-factor structure defines academic burnout as primarily physical and psychological exhaustion and secondarily as detachment and cynicism towards coursework. Maroco and Campos's (2012) research suggested that lack of accomplishment was not an inherent aspect of academic burnout. Reis, Xanthopoulou, and Tsaousis (2015) demonstrated that

the two-factor structure (exhaustion and cynicism) of academic burnout was equivalent across populations, using samples of Greek and German university students. This structure was also equivalent to a 2 factor-structure of work-related burnout, as shown in a sample of German nurses, supporting the possible accuracy of this 2-factor definition. The expanded definition of academic burnout includes emotional exhaustion, cynicism, and lack of personal accomplishment as well as a fourth new factor, negative learning emotion, as identified by Huang and Lin (2010). This dimension is related to emotional exhaustion in that it captures the development of negative emotions. However, Huang and Lin (2010) posit that emotional exhaustion is a broader psychological phenomenon, whereas negative learning emotion specifically relates to energy depletion and apathy in the context of school. As there is insufficient empirical evidence to assert that either Maroco and Campos' (2012) 2-factor or Huang and Lin's (2010) 4-factor definition of academic burnout is more accurate than the 3-factor structure posited by Maslach and Jackson (1981), academic burnout throughout this paper will be described using the original three dimensions, unless otherwise stated.

Longitudinal studies have been utilized to determine the trajectory of academic burnout among student populations. Academic burnout has been shown to first emerge as cynicism and emotional exhaustion, with lack of personal accomplishment appearing later. In a longitudinal study of 852 Finnish students, the MBI was administered on four separate occasions: the beginning of high school, just prior to the transition to university, and in the first and second years of university attendance (Parker, P. D., & Salmela-Aro, 2011). The results from this study found that the cynicism and emotional exhaustion dimensions of academic burnout predicted later feelings of inadequacy in relation to

academic pursuits. Additionally, results indicated that level of academic burnout was strongly to moderately consistent throughout school. Researchers have further investigated the longitudinal relationship between academic burnout and future job-related burnout. Robins, Roberts, and Sarris (2018) hypothesized that burnout would be higher on the job if the participant had experienced burnout in college. The MBI-Student Survey (MBI-SS), a measure of academic burnout that retains the same dimensions of the MBI-GS, was administered to 260 Australian health students studying nursing, psychology, occupational therapy, and social work in their final year of university. Participants included undergraduates, masters-level, and doctoral-level students. Over the next two years, the participants completed the MBI-GS twice, once each year. Results showed that although burnout levels were found to decrease quickly after graduation from college, exhaustion and cynicism measured in the final year of college predicted variance in those dimensions of burnout during the first two years of employment. When controlling for mental health and neuroticism ratings, academic exhaustion predicted 6% of variance in work exhaustion, and academic cynicism predicted 8% of variance in job-related cynicism. These studies illustrate the chronic nature of burnout and the importance of identifying and addressing academic burnout in an effort to prevent future job-related burnout.

Prevalence of academic burnout. Although burnout during the academic years may be a precursor to work-related burnout, the prevalence of academic burnout has not been clearly documented, particularly for younger students. Studies have instead focused on rates of job-related burnout among workers and graduate level students, including medical student who are employed as part of their career training. On average, about 50%

of medical students in the United States experience burnout (Dyrbye et al., 2006a; Drybye et al., 2008). In another sample of medical students, Santen et al. (2010) found that approximately one-third experienced burnout. Of 517 medical students in Brazil, 14.9 % experienced burnout and 57.7 % were at risk of experiencing burnout (Almeida et al, 2016). Gómez-Urquiza et al. (2017) examined the prevalence of each factor of burnout in a sample of emergency room nurses. Results indicated that 31% experienced emotional exhaustion, 36% faced cynicism/depersonalization, and 29% felt low professional efficacy. Approximately 30% of all nurse participants experienced high levels of at least one dimension of burnout. Although the participants of many of these studies were students, the measures used to assess prevalence of burnout focused on work rather than academics. Therefore, the true academic burnout rates among these students, separate from job-related stress, were not clearly established.

Prevalence studies have also focused on burnout frequency according to year of academic study. Dyrbye et al. (2006a) found that more senior level medical students were more likely to experience burnout; however, Santen et al. (2010) found burnout rates to be the highest amongst second- and third-year medical students, those closer to the middle of their programs. On the factor-level, Dahlin et al. (2007) found that sixth year medical students were more cynical and disengaged than first- and third-year students. The mixed results across studies and emphasis on job-burnout rather than academic burnout make it difficult to determine when students are at greatest risk for burnout. More research is necessary to determine if year of study, and by extension the duration and/or chronicity of exposure to academic and job-related stressors, influences burnout.

Correlates and Outcomes of Burnout

In the context of academic burnout, the methodology across studies varies most in the definitions of academic burnout employed and the specific measures used to assess it. Most studies have used one of three self-report measures to determine academic burnout. The most common of these is the MBI – Student Survey (MBI-SS; Schaufeli et al., 1996), adapted from the MBI for use in students. Other studies have used the School Burnout Inventory (Salmela-Aro et al., 2009a) or the Olgenburg Burnout Inventory – Student Survey (OBI-SS) (Demerouti et al., 2003). Although the School Burnout Inventory retains the same 3-factor structure as the MBI, the OBI is based on the 2-factor structure of exhaustion and cynicism. Despite the popularity of these three primary measures, other self-report measures that have been used less frequently include the Secondary School Burnout Scale (Apay & Eryilmaz, 2011) and the Learning Burnout Scale (Huang and Lin, 2010). For studies involving graduate level students, (e.g., dental, medical, or nursing students), the MBI-Human Services Survey is often utilized instead of the student survey due to the clinical work requirements related to graduate education. Most studies of academic burnout have focused on samples of high school, college, or graduate-level students. Examination of correlates of burnout has been primarily focused on factors of burnout in the context of employment, with less attention to specific correlates of burnout within academics. As academic and job burnout appear to have the same factor structure, it seems likely that correlates for both types of burnout would be similar. Therefore, the following sections review the correlates for burnout in both academic and work settings.

Demographic Correlates. Gender has been shown to be related to job burnout across various countries and cultures, including the US (Purvanova & Muros, 2010), Finland (Salmela-Aro et al., 2009a; Salmela-Aro et al., 2008a), France (Walburg et al., 2014), Sweden (Dahlin et al., 2007), and Taiwan (Yang, 2004). Examination of trends across studies suggests that females, overall, appeared to report higher rates of job burnout than males across most professions. However, a meta-analysis of job-related burnout in adults showed that females were also more likely to be emotionally exhausted, whereas males were more likely to experience cynicism and depersonalization (Purvanova & Muros, 2010). Therefore, the most impactful factors of burnout may also vary by gender. Additionally, it was found that these gender differences were greater in the United States compared to the European Union. Although the cynicism dimension of job-related burnout in adults was consistently higher in males, the difference between genders was notably small but statistically significant (Maslach, Schaufeli, & Leiter, 2001).

Similar to adults, adolescent girls have been reported to experience academic burnout more often than their male counterparts (Salmela-Aro et al., 2008a; Salmela-Aro et al., 2009a). Additionally, Walburg et al. (2014) demonstrated that high school aged girls exhibited higher scores on the exhaustion dimension of academic burnout compared to male students. This tendency for females to report more exhaustion was also found when examining job-related burnout among female medical students in the US (Dahlin et al., 2007). Of note is that Walburg et al. (2014) and Dahlin et al. (2007) utilized versions of the Oldenburg Burnout Inventory (OBI), which measures burnout without including the lack of professional efficacy component. These results, therefore, may not be

consistent with studies that used a burnout measure that includes all three dimensions. In contrast to the findings by Salmela-Aro et al. (2008a; 2009a) and Walburg et al (2014), Yang (2004) found that male college students demonstrated more academic burnout on the MBI-GS than their female peers. The contradictory findings across studies may be due to different outcome measures used to assess burnout. Vizoso et al. (2019) calls for further research to examine gender differences in academic burnout and its dimensions by utilizing standard or rigorous measures of burnout across studies.

In addition to gender, socioeconomic status has also been linked to academic burnout (Luo et al., 2016), whereby students of lower socioeconomic status are more likely to experience burnout. These results may be explained by the increased access of families of high socioeconomic status to resources to meet academic demands, (e.g., tutors, technology, textbooks, etc.), thereby decreasing the likelihood of academic burnout. This relationship appears to be mediated by various familial environmental factors, including the emphasis placed by the family on achievement, the family's participation and interests in politics or religion, and the family's involvement in social and recreational activities. Luo et al. (2016) contends that students from families of low socioeconomic status who also emphasize high academic achievement would be more likely to experience burnout. For students who are of lower socioeconomic status, a strong emphasis on academics coupled with a lack of adequate resources could potentially exacerbate burnout risk as achievement may seem less possible. Although there is likely a link between burnout, socioeconomic status, and family environment (Luo et al., 2016), the exact underlying mechanisms of interaction among these variables remain largely unknown.

Organizational/School-Related Correlates. Along with demographic factors, positive perceptions of school-related and organizational factors have also been reported to influence burnout. Students' negative perceptions of the academic environment have been positively linked to burnout, meaning that students who perceived school negatively were more likely to experience academic burnout. Conversely, a positive perception of the school environment, as demonstrated through students' high ratings of school support and positive motivation provided by teachers, was negatively related to academic burnout. Support has also been studied in reference to organizational support and job-related burnout (Lin, 2013). The relationship between the two is mediated by the presence of psychological capital, defined as positive psychological resources for individual growth. These findings suggest that increased support on a school and organizational level may be necessary to promote the acquisition of psychological capital and, therefore, prevent and/or reduce burnout.

Other academic factors that have been found to be related to burnout include perception of classroom assessment, defined as the way in which students are evaluated in school. Ilhan & Cetin (2014) compared performance-based assessments, which evaluated students based off a required level of mastery, such as achieving a certain percentage of correct answers on a test, and learning-based assessments, which evaluated students based on improvement. Results indicated that exhaustion and cynicism were significantly correlated with perception of classroom assessment. Higher levels of exhaustion and cynicism were related to higher levels of perceived performance-based classroom assessment, while higher levels of perceived learning-based classroom assessments were negatively correlated with exhaustion and cynicism. Additionally,

personal accomplishment improved with increases in perceived learning-based classroom assessment and declined with increases in perceived performance-based assessment. Classroom-assessment environment accounted for 17% of the variance in academic exhaustion, 24% of the variance in cynicism, and 9% of the variance in efficacy, suggesting that these outcomes were largely influenced by other factors.

Individual Factor Correlates. Other individual psychological factors have also been demonstrated to play a role in the development of burnout, specifically personality factors. Soliemanifar & Shaabani (2013) studied the Big Five personality traits in reference to academic burnout risk. In their study of 150 Iranian graduate students, openness to experience, conscientiousness, and extraversion were found to be negatively related to academic burnout, whereas neuroticism was positively correlated with academic burnout. These results suggest that traits of openness to experience, conscientiousness, and extraversion may function as a buffer to burnout while neuroticism increases an individual's susceptibility to burnout. Although Soliemanifar & Shaabani (2013) found little relationship between agreeableness and academic burnout, De la Fuente-Solana et al. (2017) noted a negative correlation between agreeableness and the burnout dimensions of exhaustion and cynicism, and a positive correlation between agreeableness and professional efficacy in a sample of oncology nurses. Increased agreeableness was correlated with decreased risk of experiencing all three factors of burnout. Additionally, Watson et al. (2008) and De la Fuente-Solana et al. (2017) found that neuroticism was positively correlated with the emotional exhaustion and cynicism dimensions of burnout and negatively correlated with professional efficacy in job-related burnout of nurses and nursing students. This was further illustrated in studies suggesting

students with low self-efficacy beliefs experienced high levels of academic burnout (Bilge et al., 2014; Salmela-Aro & Upadyaya, 2014). Conversely, optimism negatively predicted burnout in a sample of Spanish college students (Vizoso et al., 2019). Taken together, these study findings suggest that openness to experience, conscientiousness, agreeableness, and extraversion reduce the likelihood of burnout, whereas neuroticism and the personality characteristics associated with it increase one's risk of burnout.

Despite the possible buffering effect of conscientiousness, perfectionistic tendencies have been found to be related to increased burnout (Shih, 2012; Zhang, Gan, & Cham, 2007). In a sample of 456 Taiwanese students, perfectionism accounted for a 46% reduction in positive efficacy beliefs, thereby increasing overall burnout levels among sample participants. In fact, perfectionism was found to be more closely related to academic burnout than achievement goals. In a similar study of 482 Chinese undergraduates, those who were more preoccupied with evaluative concerns and fear of making mistakes, conceptualized as maladaptive perfectionism, had higher levels of burnout (Zhang, Gan, & Cham, 2007). The impact of maladaptive perfectionism on burnout appears to be mediated by the use of emotion-focused coping, defined as preoccupation with strong emotions that limits an individual's ability to deal directly with stress. That is, those who were maladaptively perfectionistic experienced more burnout only if they engaged in emotion-focused coping (Chang, 2012).

Types of coping styles used by individuals to deal with stress have also been reported to contribute to the presence and extent of burnout. Visozo et al. (2019) examined different coping styles employed by a sample of Spanish college students and corresponding burnout levels. In this study, maladaptive coping was defined as utilizing

problem avoidance, wishful thinking, self-criticism, and/or social withdrawal to cope with stress, as measured by the Coping Strategies Inventory (CSI). Adaptive coping styles included problem solving, cognitive restructuring, expression of emotions, and seeking of social support. On the basis of the CSI and MBI-SS, used to assess burnout, results showed that maladaptive coping styles used by students positively and directly predicted burnout. Adaptive coping, on the other hand, explained low levels of burnout. Using a longitudinal design, Watson et al. (2008) similarly examined coping styles among a sample of 147 nursing students who were asked to complete the Coping Inventory for Stressful Situations (CISS) at the beginning and end of their first year in the nursing program. The CISS measured emotion-oriented (becoming emotionally upset in the face of stress), task-oriented (addressing the causes of stress), and avoidance-oriented (doing something to avoid facing stress) coping methods. The MBI was also completed at the start and end of their first year. Of all coping styles, only the use of emotion-focused coping, a more maladaptive way to deal with stress, at the beginning of the year predicted burnout at the end of year. The finding that coping style preceded and affected later burnout in this study suggests that early identification of maladaptive coping styles and implementation of more effective coping strategies may help to reduce burnout among students.

Adaptive coping can also include the utilization of peer support. However, research has demonstrated that degree of burnout in adolescents is similar to that of those in their peer groups (Kiuru et al., 2008), thereby likely affecting their ability to adaptively cope with burnout. Kiuru et al. (2008) studied 517 Finnish ninth graders at the beginning and end of their final term in comprehensive school. Students were asked to complete the

School Burnout Scale (BBI-10). Peer groups were determined by having participants nominate the three students with whom they most liked to spend their time. Reciprocal (two participants nominated each other), unilateral (one participant nominated another), and indirect (e.g., common peer) links were utilized in the determination of peer groups. Group members were required to have 50% of their reciprocal and unilateral links within the group, and all group members were required to have one of the three types of links. Changes in peer groups from the beginning to end of the term were used to determine peer group influence. Results found that adolescents were somewhat similar to their peer groups in level of reported burnout. Kiuru et al. (2008) further demonstrated that similarity in burnout levels was more likely a result of the influence of the peer group rather than the individual's selection of a peer group similar to him/her. Peer group members became more similar in terms of academic burnout across time and also demonstrated similar changes in burnout over time. This was likely related to students' tendencies to confide in their peers about their stress and reinforce each other's burnout through reciprocal communication. Such findings suggest that peer group associations and related communications could be a potential area to target in the treatment and prevention of burnout.

Academic Outcomes. If untreated, burnout can have potential negative consequences for students in the school environment. Lower academic performance is common among students experiencing academic burnout (Haghighi & Gerber, 2019; Salmela-Aro et al., 2008a). Sense of efficacy, the third dimension of burnout, have been found to specifically predict academic performance, as students with higher reported efficacy perform better academically (Haghighi & Gerber, 2019). Students with lower

grade point averages (GPA) were also more likely to have higher levels of burnout compared to peers with higher GPAs (Salmela-Aro et al., 2008b). Likewise, low academic performance, as measured by failed examinations, has been identified as a risk factor for burnout (Almeida et al., 2016), whereas high academic achievement can serve as a buffer to burnout (Kiuru et al., 2008). Additionally, serious thoughts of dropping out of school are more likely to be entertained by those experiencing burnout (Almedia et al., 2016; Drybye et al., 2010). In one study of 858 medical students, a 7% increase in thoughts of dropping out was associated with each one-point increase in emotional exhaustion and cynicism and one point decrease in personal efficacy as assessed by the MBI (Drybye et al., 2010). Specifically, low personal efficacy was shown to be an independent predictor of serious thoughts of dropping out. In a study of Finnish teenagers, cynicism and lack of professional efficacy, as defined as low grade-point averages, were found to be significant predictors for school drop-out (Bask & Salmela-Aro, 2013). Consequently, understanding academic burnout is necessary to develop treatments that can increase school performance and decrease attrition.

Engagement

Engagement is defined as "positive, fulfilling, work-related state of mind" (Schaufeli et al., 2002b, p. 74) and is conceptualized as the absence of burnout (Maslach & Leiter, 1997 in Maslach, Schaufeli, & Leiter, 2001). Like burnout, engagement has a 3-factor structure: vigor, dedication, and absorption (Schaufeli et al., 2002b). Vigor and dedication are defined as the opposite of emotional exhaustion and cynicism, respectively. Vigor refers to willingness to continue to try in the face of difficulties, as well as high energy level and mental adaptability when working. Dedication is defined as

enthusiasm, vitality, pride, and a sense of importance in reference to one's work, primarily the cognitive and affective sense of involvement. However, absorption is not the direct opposite of reduced efficacy; they are conceptually distinct. Absorption is conceptualized as being fully present with one's work as demonstrated by complete concentration and complete immersion so that time passes quickly. Some researchers, such as Rostami et al. (2012), have conceptualized engagement as the opposite of burnout and measured it using low scores on the burnout scale. However, Schaufeli et al. (2002b), argued that one cannot simply measure engagement by low levels on a burnout scale. Rather, engagement must be operationalized separately as its structure differs from that of burnout. Schaufeli et al. (2002a) further proposed that future research should investigate whether the correlates of engagement and burnout are the same, but opposite in their directionality.

Correlates of Engagement

Engagement is a relatively new area of research with few published studies. Most research has focused on high school and college students from European or Asian countries with limited data regarding engagement among American college students. Engagement is measured in multiple ways across studies, thereby limiting the generalizability of study findings. Most studies (Bilge et al., 2014; Salmela-Aro & Upadyaya, 2014; Zhang, Gan, & Cham, 2007) have utilized the Utrecht Work Engagement Scale to measure this construct among students (Schaufeli et al., 2002a). Other studies have measured engagement through low scores on burnout measure (Rostami et al., 2012) or rating scales that identify the frequency of observed engagement

behaviors including “attention, effort, verbal participation, persistence, positive emotion, and voice” (Jang, Reeve, & Deci, 2010, p. 93).

Like burnout, engagement seems to be related to the quality of the school environment. Jang, Reeve, and Deci (2010) studied 1,584 students at 133 public high school classrooms across the Midwest. The teachers of these students were rated by trained professionals on the level of autonomy support and structure within their teaching styles. Students reported subjective engagement using a 4-item survey, developed specifically for the study that included items about paying attention, “trying hard,” “learning as much as possible,” and enjoying class. Additionally, their level of behavioral engagement was rated by trained observers using six broad areas: attention, effort, verbal participation, persistence, positive emotion, and voice. Results from this study found that students’ behavioral engagement, as measured by outside observers, could be predicted by the level of autonomy support provided by the teachers and the amount of structure in the classroom environment. Furthermore, student’s subjective engagement was correlated with the amount of autonomy support present in the classroom, suggesting that a sense of independent ability may be important for fostering personal feelings of engagement.

Academic Stress

It is well known that high levels of stress may result in negative psychological and physiological outcomes. Stress, in general, appears to be related to the experience of burnout (Santen et al., 2010). Job burnout is often viewed as a response to overload – too many demands which exhaust one’s resources (Maslach, Schaufeli, & Leiter, 2001). Often, lack of intrinsic rewards may play a role in the mismatch of workload and resources, leading to feelings of inadequacy among those employed. Many facets of an

occupation can create stress and induce burnout. Among them, role conflict, defined as conflicting information about one's role, and role ambiguity, described as inadequate information about one's role, have both been linked to burnout and its dimensions. Lack of feedback and lack of participation in work-related decision-making have also been shown to be associated with job burnout levels (Maslach, Schaufeli, & Leiter, 2001). People tend to feel more exhausted and cynical when there are unrealistic expectations in the job field (Maslach, Schaufeli, & Leiter, 2001). These findings suggest that when individuals work too hard and do not achieve the expected results, burnout may result (Maslach, Schaufeli, & Leiter, 2001).

Despite the theory that burnout is caused by work-related stress, job-related burnout has also been linked to negative personal life events (Drybye et al., 2006). In a study of 545 medical students, negative life events were found to be a better predictor of burnout than year of training. Negative life events included divorce, personal illness, illness in a close family member or significant other, or death of a close family member. Of these life events, personal illness was found to be significantly associated with burnout, whereas the other life events were not. The number of negative life events was also related to level of burnout, i.e., students that experienced more negative life events were more likely to report burnout. However, this study included only medical students and assessed job-related burnout rather than academic burnout, limiting generalizability of the study results to other students in training. Further, it should be noted that the negative life events reported in this study may not in themselves have directly caused stress but could have resulted in depressive symptomology which may overlap with burnout symptoms. The impact of these life events was also not evaluated in reference to

ongoing academic and/or occupation stressors, making it difficult to determine which are more closely related to burnout or whether burnout could best be predicted by an interaction of personal and occupational/academic stressors.

Academic stress, defined as stress that occurs within the academic arena (Bedewy & Gabriel, 2015), has been reported to be higher among female college students (Misra & McKean, 2000), despite often better academic performance among this group (Pomerantz et al., 2002). This may be due to females placing higher value on academic success (Berndt & Miller, 1990) and to higher anxiety and lower satisfaction with free time activities among females (Misra & McKean, 2000). Among college students, freshmen and sophomores were found to be more effected by the stress of academics, largely because first- and second-year college students had less effective time management skills, higher anxiety, and less engagement in leisure activities than juniors and seniors. Lower classmen may also lack the social support systems and coping mechanisms to manage stress associated with the recent transition to college while upper classmen have had more time to adapt to these changes.

While the literature has extensively focused on job stress and work-related burnout, research on the relationship between academic stress and academic burnout is limited. Instead, many studies have examined the association between general life stress and academic burnout (Haghighi & Gerber, 2019; Huang & Lin, 2010). For example, Haghighi & Gerber (2019) examined the relationship between perceived stress and burnout among Iranian medical students. In this study, over 200 medical students completed the MBI-Student Survey (MBI-SS), a measure of burnout, and the Perceived Stress Scale (PSS), a 10-item self-report measure of perceived stress. Results indicated

that those who reported higher levels of perceived stress also experienced more academic burnout. However, no measure specific to academic stress was included in this study. In a similar study, 3,812 Taiwanese college students were asked to complete the Learning Burnout Inventory, a measure of the 4-factor structure of burnout, and the Life Stress Scale, a 26-item measure created for this study (Huang & Lin, 2010). The Life Stress Scale required respondents to rate the personal impact of each stressful life event item. Items were broken into 6 categories: academic stress, interpersonal stress, family stress, emotional stress, future development stress, and self-identity stress. A canonical correlational analysis demonstrated that students with more stressful events reported higher levels of burnout and that students who reported high impact of events also reported more burnout. These findings suggest that both the number and impact of stressful life events influence academic burnout. Although this study included a few items that specifically measured academic stress, no significant correlation between academic stress and burnout was found. Future research should utilize more in-depth measures of academic stress to better determine its relation to academic burnout.

The negative outcomes often related to stress may be due to an interaction between stress and burnout. Over 130 graduate social work students were recruited to test Koeske and Koeske's (1991) hypothesis that burnout mediated the relationship between stress and negative outcomes, i.e., that without burnout, stress would likely not lead to negative consequences. Stress in this study was measured through academic stress, felt stress, and conflict stress. Academic stress was measured using 48 items related to negative school events. Participants rated these events as having occurred, occurred more than once, or not occurred. Felt stress was measured with one item, designed to assess

global appraisal of subjective stress, and conflict stress was measured using 10 items which evaluated conflict from simultaneously held roles. An adapted version of MBI that places burnout within the academic environment was used to measure academic burnout. Outcomes of stress and burnout were measured through psychological and physiological symptoms (25 items on extent to which these symptoms were bothersome or caused distress) and intention to quit school (1 item rated on a 7-point Likert scale).

While controlling for factors such as non-school related stress and social support, Koeske and Koeske (1991) found that three dimensions of school-related stress (event stress, conflict stress, and felt stress) led to the intention to quit school and other negative physical and psychological outcomes in a sample of 136 graduate-level social work students. This relationship, however, was mediated by emotional exhaustion. Only one of six direct relationships between stress and negative outcomes was significant, i.e., event stress and intention to quit school. This suggests that negative school events may lead to intention to quit, whether or not burnout is present. However, burnout, especially emotional exhaustion, may be necessary for negative stress outcomes to occur. Of note is that this study employed a sample of graduate students, who are likely to be under greater academic strain than college students due to the rigor of their studies. It also used only one item to evaluate felt stress, which did not sufficiently capture the concept of perceived stress. Despite these limitations, Koeske and Koeske (1991) found evidence of interactional effects of burnout and stress on psychological, physical, and school-related outcomes.

Although academic stress remains relatively understudied, research has investigated specific facets of academic study that may be related to stress. Higher study

demands have been found to be related to higher burnout scores assessed one year later among British adolescents, using the School Burnout Inventory, which contains the same burnout 3-factor structure as the MBI (Salmela-Aro & Upadyaya, 2014). Similarly, workload, an aspect of academic stress, has been found to predict concurrent burnout in 3rd year medical students, demonstrating that large workloads lead to more burnout (Dahlin & Runeson, 2007). In another study, the MBI and Psychosocial Stress Inventory (PSSI), a questionnaire used to assess sources of stress, were administered to 161 dental students. Results showed that the emotional exhaustion dimension of burnout was most influenced by academic conditions, specifically workload and examinations (Pohlmann et al., 2005). Future development stress, defined as stress caused by worry about one's future in their professional role, has also been reported to be related to the low personal efficacy dimension of academic burnout among Taiwanese college students (Huang & Lin, 2010). Academic burnout in this study, however, was measured using the Learning Burnout scale, which has a 4-factor structure. Huang & Lin (2010) determined that this fourth factor was necessary for the evaluation of academic burnout in Taiwanese college students, although no research has determined it integral to the evaluation of European or American students. To date, most of the research linking these facets of academic stress to the 3-factor structure of burnout has focused on samples of children (Salmela-Aro & Upadyaya, 2014) or graduate-level students (Haghighi & Gerber, 2019); limited studies have examined this relationship among college students.

It has been suggested that the relationship between burnout and stress may be moderated by mental toughness, a natural ability to cope effectively with stressors and demands (Haghighi & Gerber, 2019). Over 200 Iranian medical students were given the

Perceived Stress Scale (PSS), the Mental Toughness Questionnaire (MTQ48), and the MBI-SS to examine the association between perceived stress, mental toughness, and burnout, respectively. The MTQ48 measures mental toughness in 4 broad categories: challenge, commitment, control, and confidence. Results showed that irrespective of stress, participants with high mental toughness reported less symptoms of burnout. These findings suggest that interventions which focus on enhancing mental toughness may decrease the impact of stress and, thereby, reduce the level of academic burnout. However, this study focused only on medical students and general life stress. It is not clear if mental toughness similarly moderates the relationship between academic stress and academic burnout in younger populations or students in other areas of training.

Stress is often conceptualized as a result of inadequate resources in the face of overwhelming demands. In a study of 1st year college students, Alacron et al. (2011) attempted to validate the conservation of resources theory for academic burnout and engagement. According to this theory, perception of academic demands is thought to mediate the relationship between resources and coping while coping mediates the relationship between academic demands and academic burnout/engagement. In this study, perception of demands was assessed using the Inventory of College Students Recent Life Experiences (ICSRLE), with a specific focus on the subscales related to developmental challenges (e.g., "lower grades than you hoped for") and time pressures (e.g., a lot of responsibilities). Resources were measured through measurements of conscientiousness, via the Big Five Inventory, and social support was assessed with the Multidimensional Scale of Perceived Social Support. Finally, coping was evaluated using the Coping Orientation to Problems Experienced (COPE) instrument, which

measured problem- and emotion-focused coping. Results demonstrated that perception of demands of academic study at least partially mediated the relationship between resources and coping mechanisms, i.e., those with less resources and more demands were more likely to engage in emotion-focused coping rather than problem-focused coping. Additionally, personal characteristics, such as conscientiousness, had a direct effect on coping styles (Alarcon et al., 2011). Coping strategies, in turn, were used to moderate academic stress and, thereby, influenced the burnout and/or engagement experience (Alarcon et al., 2011). Findings from Alacron et al. (2011) partially supported the conservation of resources theory in relation to academic burnout/engagement. These findings suggest that prevention and treatment of academic burnout in college students may involve teaching effective coping strategies (i.e., more problem-focused coping) and decreasing reliance on maladaptive coping (Alarcon et al., 2011).

Building on the importance of coping in the context of burnout, Shih (2015) examined the influence of the school environment on coping with academic stressors. It was hypothesized that classroom structure and student social support would be positively associated with adaptive coping and negatively associated with burnout. To examine these relationships, a sample of 374 8th grade Taiwanese students completed 4 self-report measures: Coping Orientation to Problems Experienced (COPE), Measure of Teacher Provision of Structure, the Student Social Support Scale, and the MBI-SS. As hypothesized, students who perceived higher levels of classroom structure and peer support utilized more engaging (actively handling the problem) and social support-seeking coping strategies; the use of these coping strategies was associated with less academic burnout than the use of disengagement, or avoidance, to cope with academic

stressors. Interestingly, each aspect of the school environment was related to a different dimension of burnout. Students who perceived high peer support were less emotionally exhausted, and students who perceived high levels of classroom structure were less cynical. Therefore, efforts to prevent burnout in the classroom setting may require a focus on increasing classroom structure and fostering healthy peer relationships in order to increase the likelihood of effective coping.

Behavioral Health Outcomes Associated with Burnout/Engagement

Studies have consistently demonstrated a positive association between job-related burnout and behavioral health risk outcomes among adults (Ahola et al., 2012; Koeske & Koeske, 1991; Maslach, Schaufeli, & Leiter, 2001; Melamed, 2009) and medical students (Dahlin et al., 2007). However, research on health-related outcomes associated with academic burnout among younger populations is sparce. Studies have shown that a large percentage of college students engage in unhealthy lifestyles which can lead to chronic disease development (Faria et al., 2014). In order to mitigate these unhealthy lifestyles, it is important to understand the precursors and treat them accordingly. It has been hypothesized that the adoption of unhealthy lifestyles in college students is related to demands of their academic lifestyles (Faria et al., 2014). As burnout is the result of a mismatch between demands and resources, it is, therefore, likely that academic burnout may play a role in the development of adverse health risk behaviors among college students. Health risk behaviors such as low physical activity, insomnia, and limited practice of safety behaviors have been given little attention in the context of academic burnout. Additionally, engagement, especially academic engagement, has been

understudied, with few studies examining whether engagement could reduce adverse behavioral health outcomes.

Much of the research into adverse stress-related health outcomes has specifically examined the exhaustion component of job-related burnout (Ahola et al., 2012; Dahlin et al., 2007; Maslach, Schaufeli, & Leiter, 2001). These outcomes mirror the physiological outcomes of prolonged stress, thereby indicating that exhaustion is a stress response that can be both physiological and psychological (Maslach, Schaufeli, & Leiter, 2001). One longitudinal study found that burnout increases risk of the development of musculoskeletal pain 1.67-fold, even in apparently healthy individuals (Melamed, 2009). Academic stress, as mediated through burnout, has also been associated with various psychological and physical complaints, such as "being fearful," "headaches," "feeling that people are unfriendly or dislike you," and "pains in heart or chest," etc. (Koeske & Koeske, 1991). Likewise, negative health outcomes, including anxiety, insomnia, and depression have been reported to result from stress in adolescents (Haghighi & Gerber, 2019). In general, these studies tended to focus on more general health outcomes, rather than the behaviors that could increase these negative outcomes. Future research should look to answer the question of whether increased burnout leads to more behaviors that risk good health and if engagement leads to more behaviors that promote good health.

The negative health outcomes of burnout may have more far-reaching consequences in the workplace as reflected by increased absences from work. (Borritz et al., 2006; Parker, P.A., & Kulik, 1995; Schaufeli et al., 2009). In a study of human services workers, a one standard-deviation increase in work-related burnout predicted a 21% increase in sick days from work. Burnout-related sick days ranged between 5.4 and

13.6 (Borritz et al., 2006). Similarly, Schaufeli et al. (2009) found that work-related burnout was positively associated with illness duration whereas work engagement was negatively associated with illness frequency. These findings illustrated that burnout was related to absences with longer duration but not more frequent absences. On the other hand, engagement resulted in fewer absences due to illness.

Beyond health outcomes, perception of health status has also been studied in relation to burnout. Cheng et al. (2013) surveyed 35,000 Taiwanese employees using a single item to measure SRH scored on a 5-point Likert scale from 1 = "very good" to 5 = "very poor." Good SRH was defined as a score of 1 or 2, and poor SRH was defined as a score greater than 2. Participants also completed the Copenhagen Burnout Inventory (CBI), which measures burnout, using the dimensions of personal burnout, work-related burnout, and client burnout. Results revealed that those with poor SRH were more likely to report an experience of burnout. These results, though informative, lacked generalizability due to the instrument used in this study. The CBI utilizes a completely different structure from most other burnout inventories which focus on emotional exhaustion, cynicism/depersonalization, and/or lack of personal accomplishment in the workplace. Additionally, self-rated health, measured by one item which asked participants to rate their health on a 5-point Likert scale, has also been found to be negatively associated with burnout (Dahlin et al., 2007). In this study, medical students with poor self-rated health reported themselves to be more cynical and exhausted than their counterparts. However, this study utilized the Oldenburg Burnout Inventory (OGBI), which measures the 2-factor definition of burnout. Future research should

examine the association between SRH and burnout using more commonly accepted definitions of burnout.

Substance Use

Although the relationship is unclear, study findings have suggested that burnout is associated with substance use behaviors among all age groups, specifically tobacco, alcohol, and caffeine use. For example, McGeary and colleagues (2014) studied the relationship between burnout and the practice of health risk behaviors (i.e., smoking, alcohol use, and caffeine use) among Veteran's Health Administration providers (McGeary et al., 2014). The measures utilized in this study were the MBI-GS and three 5-point Likert Scale items related to the frequency of using smoking/tobacco products, alcohol, and caffeine as a means of coping with work-related stress. In contrast to the findings from previous research, alcohol and tobacco use were not found to be related to burnout, but burnout was a significant predictor of caffeine use. The use of caffeine was suggested to be a mechanism through which the study participants counterbalanced the exhaustion component of burnout. This study, however, failed to utilize standardized questions for the assessment of substance use. Furthermore, the items specifically asked about using substances to cope. Participants may not have had full awareness that their substance use was a coping mechanism for their work stress, thereby underestimating the relationship between burnout and substance use as a coping mechanism. Findings suggest that future research should utilize a "multi-item multidimensional questionnaire" that captures the frequency, amount, and duration of substance use to better study the relationship between burnout and substance use.

Studies have also demonstrated similar relationships between burnout and substance use among adolescents and elementary-aged school children. For example, Rathmann et al. (2016) studied smoking behaviors in youth using a single yes/no item which assessed whether the student had smoked at least one cigarette in the previous year. The measures utilized for burnout and engagement were shortened versions of the School Burnout Inventory and the School Engagement Inventory. Results indicated that both adolescents and elementary school students were more likely to smoke if they experienced high levels of academic burnout (Rathmann et al., 2016). Adolescents also demonstrated a higher incidence of smoking when they had low levels of school engagement. Although these results demonstrated a relationship between burnout, engagement, and smoking, they did not demonstrate a clear pattern of smoking related to burnout. Of note is that only one item that asked about smoking "at least once" was used to determine tobacco use in this study. Therefore, it could not be determined whether students who were highly "burned out" smoked more than students who were less "burned out." Future research should more closely examine the frequency of smoking, as well as the number of cigarettes smoked, to better discriminate heavy or regular smokers from social smokers who may occasionally experiment with cigarettes. As electronic vapor products have become increasingly popular among young people, investigating the use of other nicotine products besides cigarettes in relation to burnout is certainly warranted.

In a similar study, Walburg and colleagues (2015) attempted to study if burnout predicted cannabis use and dependency among 286 high-school aged adolescents and reported a bi-directional relationship between academic burnout and cannabis use. In this

study, The School Burnout Inventory was utilized to measure academic burnout, and cannabis use was assessed in terms of frequency, dependency, and abuse. Participants were categorized as consuming cannabis or not (use). Their frequency of use was determined using a 9-point Likert scale from 0 = no consumption to 8 = more than once per day. Abuse and dependency were assessed using the Mini International Neuropsychiatric Interview (MINI), which evaluated abuse and dependency based on to *Diagnostic and Statistical Manual of Mental Disorders – IV (DSM-IV)* criteria. Results indicated that cynicism specifically, and burnout more broadly, predicted the frequency of cannabis use and the likelihood of abuse. These variables, however, did not predict dependency. Additionally, cannabis users were more likely to have high burnout rates. Walburg et al. (2015) determined that adolescents experiencing burnout, especially those with little interest or feelings of purpose associated with their work, were more likely to engage in cannabis use than those who experienced meaningfulness and enthusiasm for their schoolwork. It was posited that cannabis use may be a form of self-medication to manage the school stress involved in burnout; it is also possible that cannabis use reduced school performance, leading to cynicism and burnout. Despite these important findings, this study was limited in that no information about academic engagement and/or other substance use, was obtained. Mediating and moderating variables related to burnout and substance use should also be considered in future studies.

Sleep

Insomnia is a common problem for college students as supported by the results from a recent metanalysis of seven studies that determined that approximately 18.5% of college students experience insomnia. This is notably higher than the 7.4% of the general

population who experience insomnia (Jiang et al., 2015). In one of the few studies that examined the association between burnout and sleep, burnout, specifically the dimensions of cynicism and exhaustion as measured by the MBI-SS, was found to be significantly associated with sleep complaints among 256 Iranian medical students (Haghighi & Gerber, 2019). It should be noted that insomnia was assessed in this study using the Insomnia Severity Index (ISI) which measures symptoms of insomnia as related to the *Diagnostic and Statistical Manual of Mental Disorders – IV (DSM-IV).* DSM-IV is an outdated diagnostic system which was replaced by *Diagnostic and Statistical Manual of Mental Disorders – 5th Edition (DSM-5)* in 2013. Therefore, Haghighi & Gerber's (2019) findings may not appropriately reflect the revised and current definition of insomnia. Additionally, the relationship between burnout and other sleep complaints, besides insomnia, was not studied. In addition to college students, heavy school workloads and extracurricular activities may also prevent young children from achieving adequate sleep (U Leong & Shing Wong, 2012). More research is necessary to determine if burnout can negatively affect sleep on a broader scale and if engagement results in better sleep habits among students across the age span.

Physical Activity

As burnout is a function of work-related stress, it is important to determine the relationship between burnout and physical activity. The state of burnout may further decrease one's physical activity than the reduction in activity due to stress alone. Ahola et al. (2012) studied over 5,000 Finnish adults between the ages of 30 and 65, utilizing the MBI-GS to measure burnout. Physical activity was assessed based on the amount of leisure time spent in physical activity. Of all participants, 26% reported low physical

activity, with less than 4 hours of leisure time a week spent in physical activity. Work-related burnout was demonstrated to be related to reduced physical activity. This study determined that a one Standard Deviation increase in burnout was associated with 1.12-fold increase in the likelihood of low activity. Of the three burnout factors, exhaustion was most related to low activity. As this study included adults 30 and older, the results may not generalize to younger adults who may have different lifestyles and activities. Additionally, this study measured physical activity during leisure time and, therefore, likely excluded job-related physical activity occurring outside of leisure time. A standardized measurement of physical activity would be necessary to more accurately assess the behavioral health risks associated with decreased physical activity.

More research has been conducted on stress, rather than burnout, in relation to physical activity. For example, Chacon-Cuberos et al. (2019) examined physical activity and academic stress in college students between the ages of 18 and 28. A self-report measure was utilized to assess physical activity over the last 7 days. Results indicated that students who experienced more academic stress reported less physical activity. However, this relatively short assessment period did not capture sufficient information to account for the chronic change in physical activity related to more long-term syndromes like burnout. Similarly, Fares et al. (2015) examined physical exercise, defined as working out or participating in sports, and its relationship to stress among a sample of preclinical doctoral students. Findings showed that students with high levels of engagement in physical activity reported low general stress levels (Fares et al., 2015). This study did not consider general activity level, as individuals may still be fairly active without expressly working out. Future research should utilize measures which are broader

in their definition of physical activity and that account for activity over a longer duration of time as they relate to both burnout and engagement.

The observed decrease in physical activity in relation to stress and burnout may be an immediate coping response to stress. Jones et al. (2017) studied real-time stress and its association with physical activity in 105 adults. Stress measurements were taken multiple times a day, using one item which asked the participant to rate level of stress at the present moment on a 5-point Likert scale. Participants used an accelerator to measure activity, with less than 100 counts per minute denoting sedentary behavior. Results showed that those who engaged in sedentary activity for the prior 15 minutes reported lower stress levels. The opposite relationship was also observed, i.e., participants reported reduced physical activity after experiencing stress. These findings suggest that sedentary behaviors may relieve moment-to-moment stress, despite causing more long-term stress. Therefore, it seems likely that in order to cope with academic stress and burnout, students may decrease physical activity.

Mental Health

Many believe that burnout is the cause of mental health problems, in that it negatively affects anxiety, self-esteem, depression, suicidal ideation, and other areas of mental health (Drybye et al., 2008; Maslach, Schaufeli, & Leiter, 2001; Salmela-Aro & Upadyaya, 2014). Burnout may also lead to missed work for mental health reasons (Parker, P. A., & Kulik, 1995). It has also been argued that those with greater coping resources are more adaptable to stress and, therefore, less likely to experience burnout. One study of adolescents identified burnout as a stronger predictor of subsequent depression (Salmela-Aro et al., 2009b). Engagement, on the other hand, has been

negatively associated with depression (Upadyaya & Salmela-Aro, 2013). This study suggested that the relationship between depression and lack of engagement was, in fact, reciprocal: low levels of engagement predicted depression, and depression predicted low engagement. As depression and burnout are quite similar and may be mistaken for each other, research should be expanded to include other mental health outcomes in relation to burnout and engagement.

Burnout has also been identified as an independent predictor of suicidal ideation. Drybye et al. (2008) surveyed over 2,000 medical students and assessed burnout and suicidal ideation twice in the span of a year. Students who demonstrated recovery from burnout after one year reported similar rates of suicidal ideation to students who had never experienced burnout and lower rates than students currently experiencing burnout. Although there is no definitive evidence that burnout leads to suicide, it has been noted that suicide rates are higher in populations who experience burnouts at high rates, e.g., physicians (Moukaddam et, al, 2020). The potential link between burnout and risk for suicide and the fact that suicide is currently the second leading cause of death in young adults highlights the need to address the prevention of burnout among college students.

The relationship between stress and mental health appears to be mediated by burnout and some of its factors. This has been demonstrated in both adolescent (Salmela-Aro & Upadyay, 2014) and adult populations (Chen et al., 2019). For instance, Salmela-Aro & Upadyaya (2014) surveyed 1,709 adolescents to determine if academic burnout mediated the relationship between depression and study demands and resources. Study demands were measured using two self-report items that assessed how challenging a personal study goal was for the adolescent. Depression was measured with the Finnish

Depression Scale (DEPS-10), and the School Burnout Inventory was used to assess burnout. Results indicated that burnout explained the relationship between academic demands and mental health problems, such as depression (Salmela-Aro & Upadyaya, 2014). Furthermore, emotional exhaustion and levels of social support were found to explain the relationship between job stress and depression and anxiety in a sample of over 1,000 full-time Chinese nurses at major hospitals (Chen et al., 2019). The interactions of emotional exhaustion and social support explained 72.0% of the variance in anxiety and 43.4% in depression. These findings have not been replicated in college student or US populations and raise the question as to whether burnout mediates the relationship between stress and other behavioral health risk factors.

Findings from several other studies have shown that burnout and engagement are associated with an individual's subjective well-being (Aypay & Eryilmaz, 2011; Upadyaya & Salmela-Aro, 2013). In a longitudinal study of 113 nursing students, emotional exhaustion was identified as the most relevant dimension of burnout for predicting psychological well-being (Rios-Risquez et al., 2018). Moreover, lower psychological well-being was associated with more emotional exhaustion and cynicism. The negative relationship between burnout and psychological well-being suggests the importance of preventing emotional exhaustion, in order to promote psychological well-being. Despite equal prevalence in burnout among minority and nonminority students, minority students with burnout have demonstrated lower psychological quality of life in many areas, suggesting that burnout may affect them more intensely (Dyrbye et al., 2006b). On the other end, engagement appears to be related to positive mental health outcomes, i.e., life satisfaction and positive emotionality (Salmela-Aro & Upadyaya,

2014; Upadyaya & Salmela-Aro, 2013), although this has not been examined extensively among minority students.

Motor Vehicle Safety Risk Behaviors

No research has been conducted on the relationship between burnout or engagement and safety risk behaviors. Despite this, motor-vehicle safety risk is a prevalent problem among college students (Blair et al., 2004). Approximately 44% of college students drive over the speed limit "most of the time" and 19% "always" drive over the speed limit. Female students are less inclined to engage in these risky behaviors than their male counterparts. This may be important in the context of burnout because high job stress has been shown to be a risk factor for motor vehicle accidents (Norris et al., 2000). As younger individuals are more prone to motor vehicle accidents, it is especially important to consider motor-vehicle safety in the context of academic burnout. In 2018, drivers between the ages of 16 and 24 had the highest rates of involvement in motor vehicle crashes, accounting for approximately 20% of motor vehicle accidents (National Highway Traffic Safety Administration, 2020). If safety behaviors are negatively affected by burnout, students experiencing burnout may be more likely to engage in reckless behavior, such as drinking and driving, texting and driving, or not wearing a seatbelt, which may put them at a higher likelihood of causing an accident or being seriously injured or killed in an accident.

Chapter 2

Study Rationale and Justification

Burnout is a highly prevalent social phenomenon affecting various occupations and career fields (Maslach, Schaufeli, & Leiter, 2001). Its three dimensions relate to emotional exhaustion, cynicism and detachment, and a perceived lack of productivity and ineffectiveness. Job-related burnout has been demonstrated to impact absenteeism, intention to quit, and turnover (Maslach, Schaufeli, & Leiter, 2001). Additionally, burnout has been linked to various risky health behaviors, including substance use (McGeary et al., 2014), sleep complaints (Haghighi & Gerber, 2019), low physical activity (Ahola et al., 2012), various mental health problems (Maslach, Schaufeli, & Leiter, 2001) and overall negative health outcomes (Dahlin et al., 2007) among working adults in various fields including ex-military (McGeary et al., 2014), medical personnel (Dahlin et al., 2007; Haghighi & Gerber, 2019), and other nonspecific samples (Ahola et al., 2012).

Academic burnout among adolescents and young adults is thought to be predictive of later job burnout (Robins, Roberts, & Sarris, 2018) which impacts one's ability to perform their job efficiently and effectively (Maslach, Schaufeli, & Leiter, 2001). Furthermore, burnout may negatively affect academic performance (Haghighi & Gerber, 2019; Salmela-Aro et al., 2008b) and is related to serious thoughts of dropping out of school (Bask & Salmela-Aro, 2013; Drybye et al., 2010). Despite the negative impact of burnout, little is known about its prevalence. It has been estimated that between 14 to 50% of students may experience burnout during their studies (Almeida et al, 2016; Drybye et al., 2008; Santen et al., 2010).

One way to potentially combat burnout is through the cultivation of engagement (Salmela-Aro et al., 2009a). Prevalence rates for engagement in college-aged and young adults have not been clearly documented. While the reciprocal relationship between burnout and engagement has been established and is generally accepted in the literature (Salmela-Aro & Upadyaya, 2014; Schaufeli et al., 2002a), these factors have not been examined together in the context of behavioral health outcomes. Although some research has determined the opposite directionality of impact of engagement on various correlates associated with burnout, future research should continue to focus on relating known correlates of burnout to engagement (Schaufeli et al., 2002a). For example, little is known about the relationship between engagement and health factors that have been found to be associated with burnout.

Negative health behavior outcomes have been observed in relation to burnout while there are many positive outcomes that go along with engagement. In regard to general health outcomes, self-rated health (SRH) has been found to be low in those with high job burnout (Cheng et al., 2018). Tobacco use has been reported to be more common among elementary and middle school students experiencing burnout and low levels of engagement (Rathmann et al., 2016). In high school students, cannabis use and abuse were more common in students experiencing academic burnout (Walburg et al., 2015); engagement has not been studied in relationship to cannabis use. Additionally, a positive relationship between depression and academic burnout and a negative association between depression and academic engagement have been demonstrated in adolescents (Salmela-Aro et al., 2009b; Salmela-Aro & Upadyaya, 2014). Other health behaviors, i.e., physical activity (Ahola et al., 2002) and sleep (Haghighi & Gerber, 2019) have been

studied very little in reference to burnout and engagement. However, many of these relationships have not been examined in the context of academics (Ahola et al., 2002; Cheng et al., 2018) and/or related to engagement (Ahola et al., 2002; Cheng et al., 2018; Haghighi & Gerber, 2019). A better understanding of academic burnout and engagement and their relationship to health behaviors could be provided by utilizing measures of both academic burnout and engagement in the same study along with a multi-dimensional health behavior questionnaire.

Academic burnout, specifically, has been related to high levels of perceived stress (Haghighi & Gerber, 2019; Huang & Lin, 2010). Stress appears to be a significant predictor for many adverse health-related outcomes, including mental health issues (Haghighi & Gerber, 2019), insomnia (Haghighi & Gerber, 2019), alcohol and tobacco use (Cunradi et al., 2007), low physical activity levels (Chacon-Cuberos, 2019; Fares et al., 2015; Jones et al., 2017), and safety risk behaviors such as motor vehicle risk behaviors (Norris et al., 2000). This suggests that further research should be conducted to determine whether these behavioral health risk factors are also related to academic burnout and/or engagement. Most research has neglected to include burnout as a factor when examining the relationship between stress and health outcomes, and no studies have considered engagement and its influence on both stress and health.

This study aimed to examine the association between both academic burnout and engagement concurrently to health-risk behaviors, perceived health status, and perceived academic stress. While these health-related outcomes have been evaluated independently across studies and in association with either burnout or engagement, this study allowed examination of these collective factors in the same study. Additionally, the scope of

health-risk behaviors has been expanded in this study to include those behaviors which have not previously been researched with regards to burnout or engagement, i.e., safety risk behaviors, using items from current and standardized health questionnaires. Understanding the relationship between the perceptions of health and stress, the practice of health-risk behaviors, and academic burnout and engagement will allow practitioners to better address behavioral health outcomes. If these relationships are established, prevention and treatment of burnout, perceived poor health status, and health-risk behaviors may be possible through the cultivation of engagement.

Chapter 3

Aims and Hypotheses

1. To assess the relationship between academic burnout and academic engagement among college students.

    Hypothesis 11: College students who have high levels of academic burnout will have low levels of academic engagement.

2. To examine the association between health risk behaviors, perceived health status, and academic stress on academic burnout among college students.

    Hypothesis 2.1: College students will engage in a higher frequency of risky health behaviors such as substance use, sleep deprivation, physical inactivity, safety risk behaviors, and poor mental health and have higher overall health risk behavior scores, when academic burnout levels are high.

    Hypothesis 2.2. College students will have high self-rated health scores (i.e., worse perceived health) when academic burnout levels are high.

    Hypothesis 2.3. College students with high levels of perceived stress will report high levels of academic burnout.

3. To examine the association between health risk behaviors, perceived health status, and academic stress on academic engagement among college students.

    Hypothesis 3.1: College students will be less likely to engage in risky health behaviors such as substance use, sleep deprivation, physical inactivity, safety risk behaviors, and poor mental health, and have low

overall health risk behavior scores, when academic engagement levels are high.

Hypothesis 3.2: College students will have lower self-rated health scores (i.e., better perceived health) when academic engagement levels are high.

Hypothesis 3.3.: College students with low levels of perceived stress will report high levels of academic engagement.

Chapter 4

Methods

Participants and Recruitment

Eligible study participants were required to be: 1) 18 years of age or older, 2) speak English fluently, and 3) be currently enrolled in a higher education in the United States. Participants were recruited through social media and psychology course requests. Approval from Florida Institute of Technology Institutional Review Board was obtained prior to recruitment, and all participants were required to provide informed consent prior to completing the survey. Participants were recruited through emails sent to psychology professors at Florida Institute of Technology in Melbourne, FL and Loyola University in New Orleans, LA, requesting information about the study be given to their students. They were also recruited through Facebook and Instagram social media posts.

Data Collection Procedures

Participants were directed to the survey through links or QR codes provided on social media posts and emails to psychology professors. Participants completed the survey individually online on personal computers. The online survey consisted of 94 items and took approximately 20 – 30 minutes to complete. The survey began with an informed consent form in which consent was necessary to continue with the survey. Participants verified their eligibility through the completion of a demographic questionnaire (see Appendix B). During the survey, participants were able to go back to adjust their answers to questions by using the "back" button; they were also able to decline to respond to any question. They were able to withdraw at any time if they chose. Participants were provided the option to enter a drawing to win one of two $50

gift cards. Psychology professors were able provide extra credit, etc. at their own discretion.

Measures

Participants completed the survey through the Qualtrics website. The data collected was saved on a secure server located in the Department of Psychology at Florida Institute of Technology. The components of the survey included the following (see Appendix B):

Demographics

Demographic characteristics obtained for each participant included age, sex, race, ethnicity, socioeconomic status, and student academic characteristics including classification (i.e., senior, junior, year in graduate school, etc.), enrollment status (i.e., fulltime or parttime), method of attendance (online or on-campus), and grade point average (GPA).

Student Burnout

Burnout scores were obtained using the Maslach Burnout Inventory–Student Survey (MBI-SS) (Schaufeli et al., 2002a), which was adapted from the Maslach Burnout Inventory–General Survey (MBI-GS) (Schaufeli et al., 1996) for use in students. To allow for use of MBI-GS with students, the wording of items was adapted to refer to school instead of work. For example, "I feel emotionally drained from my *work* [italics added]" was rephrased in "I feel emotionally drained from my *studies* [italics added]." For the purposes of this study, some items were adapted for readability with an American population (e.g., "at university" was changed to "at the university/school"). The MBI-SS contained three content areas: Exhaustion (EX),

Cynicism (CY), and Efficacy (EF) (Schaufeli et al., 2002a). High scores on EX and CY denoted high levels of burnout whereas low scores on EF denoted high levels of burnout. The MBI-SS was scored based on participants' rating of 15 statements on a 7-point Likert scale from 0 (never) to 6 (always). Scale scores for EX, CY, and EF were calculated and summed, with EF reversed scored, to create a total score. Both scale scores and total scores were for analysis. Validity and reliability have been demonstrated previously. Cronbach's α ranges from 0.83 to 0.88 in previous studies (Haghighi & Gerber, 2019).

Student Engagement

Engagement scores were obtained using the Utrecht Work Engagement Scale for Students (UWES-S; Schaufeli et al., 2002a), a modified version of the Utrecht Work Engagement Scale (UWES; Schaufeli et al., 2002b). Like the MBI, the UWES was adapted to replace the terms, *work* and *job* with *class* and *studies*. The UWES-S consisted of 14 items and is comprised of three subscales: Vigor (VI), Dedication (DE), and Absorption (AB) (Schaufeli et. Al, 2002a). It was scored on a 7-point Likert scale from 0 (never) to 6 (always). Subscale scores and total scores were calculated and utilized in the analyses. Validity and reliability have been determined in previous studies; Cronbach's α ranges from 0.65 to 0.79. (Schaufeli et al., 2002a).

Health Risk Behaviors

Items concerning health risks behaviors were extracted from the Youth Risk Behavior Surveillance System (YRBSS) – Standard High School Version (2021) (Center for Disease Control and Prevention (CDC), 2021). This questionnaire was utilized by the CDC to monitor health-related behaviors in American youth. As items

are intended for high school students, some modification of wording and/or choices were necessary for application to college students. Only selected items relevant to the health-related behaviors addressed in this study were utilized. A total of 29 items were selected across five subscales: safety behaviors (e.g., driving while intoxicated, riding in a car without a seatbelt, etc.), substance use, daily activity, sleep, and mental health. Four additional items were added to address caffeine use and speeding behaviors, which were not included in the YRBSS, bringing the total number of items to 33. Items on all subscales vary in format and number of response options. An overall health risk behavior score was obtained by reverse scoring physical activity, sleep, and mental health and weighting total scores across all subscales. Subscale scores was also utilized in the analyses.

Safety behaviors. Safety behaviors were measured by five items. The four items from the YRBSS included frequency of seatbelt use, frequency of drunk driving, frequency of riding in a vehicle with a drunk driver, and frequency of texting while driving. A 5th item was added using the same format as the other 4 to assess speeding behaviors. Total scores range from 0 to 25; higher scores are indicative of more unsafe behavior.

Substance use. Substance use was measured by 24 items, with scores ranging between 0 to 139, with higher scores indicative of more substance use. Substance use was, further, divided into seven tobacco items, three alcohol items, three caffeine items, two marijuana items, seven items measuring use of other substances (prescription medication, cocaine, inhalants, heroin, meth, ecstasy, and injectable substances.) The tobacco items measured cigarette use (3), use of electronic vapor

products (2), and use of other tobacco products (2), and all tobacco products (1). The caffeine items were added and modeled after the YRBSS items related to alcohol intake. The U.S. Food and Drug Administration (FDA) recommends no more 400 milligrams of caffeine a day (n.d.); this number was used to formulate items related to the extent of caffeine intake. A table of the approximate milligrams of caffeine (Mayo Clinic Staff, 2020) in various beverages was provided to aide participants in calculating caffeine intake.

Physical activity, sleep, and mental health. Physical activity was measured using two items: numbers of days in the last week in which the participant engaged in at least 60 minutes of physical activity and average screen time per day (reverse scored). The highest possible score on this subscale was 14, indicating high levels of daily activity. Sleep and mental health were measured using one item each, with a maximum score of 5. Higher scores indicated adequate but not excessive sleep duration and perceived mental health as "good."

Self-Rated Health (SRH)

Self-rated health (SRH) was measured using 4 items related to perception of health status. The most common items that have been used to measure SRH have included overall health ratings and comparisons to peers across various health domains (Jylha, 2009). Both types of items were included in the SRH measure for this study. Additionally, participants completed items related to the impact of overall health on completion of daily activities and the likelihood of future serious health problems due to current health behaviors. The overall health item was scored on a Likert scale from 1 to 5 in which "1" represents "very good" health and "5"

represents “very bad” health. Participants were asked to compare their overall health to peers as rated on a 3-point Likert scale in which “1” represents better health than peers and “3” represents worse health than peers. The influence of overall general health on completion of daily activities was scored on a 4-point Likert scale that assesses how often one’s daily activities are negatively affected by overall health ranging from “1” for “never” and “4” for “all of the time.” The likelihood of serious future health problems was assessed using a 5-point Likert scale from “1” for “strongly disagree” to “5” for “strongly agree”. An overall SRH score was calculated, wherein higher scores suggested positive perception of health and was used in the analyses.

Perceived Academic Stress

Academic stress was measured using the Perception of Academic Stress Scale (PAS), an 18-item scale used to measure perceived academic stress levels and their causes (Bedewy & Gabriel, 2015). This scale was scored on a five-point Likert scale, ranging from a score of “1” which represents “strongly disagree” to “5” which represents “strongly agree,” with the first five items reverse scored. The three components measured by this scale include stress related to academic expectations, stress related to work and examination, and stress related to academic self-perceptions. A total stress score was calculated, wherein higher score indicated greater perceived academic stress. Internal consistencies for the factors range from 0.5 to 0.6.

Research Design and Data Analyses

This study utilized a cross-sectional design. Descriptive statistics including means, standard deviations, medians, and frequencies were calculated for demographic variables and primary and secondary outcomes (i.e., burnout and its components, engagement and its components, perceived health risk and its components, health risk behaviors, and perceived academic stress). Chi Square tests were used to assess for differences between groups for categorical variables; t-tests, ANOVAs, MANOVAs, and Mann Whitney U tests were used to assess for differences between groups for continuous variables. Data was analyzed using the Statistical Package for the Social Sciences (SPSS) – version 27. All analyses were considered significant at the $p < .05$ level.

Chapter 5

Results

Participants

Demographic variables

A total of 245 students completed this study survey. Of these, 233 provided informed consent while the remaining 11 declined to participate (response rate = 95.1%). Of those who agreed to participate, one participant was not 18 years of age or older and 79 did not complete the entire survey and were excluded from the analysis. The final sample consisted of 153 participants (M_{age} = 23.34 years, *SD* = 5.81, age range: 18-76 years), including 18 men (M_{age} = 24.30 years, *SD* = 3.93, age range: 19-32 years), 127 women (M_{age} = 23.17 years, *SD* = 6.05, age range: 18-76 years), five individuals who identified as non-binary/third gender (M_{age} = 22.20 years, *SD* = 3.49, age range: 18-26), and three individuals who did not disclose their gender (M_{age} = 26.00 years, *SD* = 8.54, age range: 18-35). The majority of the participants identified as White (*n* = 121; 79.1%) and Non-Hispanic/Latino (*n* = 132; 86.3%). Most students were full-time (*n* = 137; 89.5%), attended school on-campus (*n* = 100, 65.4%), and reported a 3.5-4.0 grade point average (*n* = 104, 68.0%). Overall, most participants were undergraduate students (*n* = 88; 57.5%). Of undergraduates, most were seniors (*n* = 37; 42.0%). Of the 65 graduate students who participated (42.5%), the majority were second-year students (*n* = 22, 33.8%). See Table 1 for additional demographic information.

Student Burnout Variables

The mean student burnout score for the total sample was 37.54 (*SD* = 15.03), indicating moderate burnout. The mean exhaustion (EX) score was 17.69 (*SD* = 6.99),

suggesting moderate exhaustion. The mean cynicism (CYN) score was 8.09 (*SD* = 6.45), and the mean efficacy (EF) score was 25.05 (*SD* = 5.27), demonstrating moderate cynicism and high efficacy, respectively. See Table 2 for more information.

Student Engagement Variables

The mean student engagement score for the total sample was 38.38 (*SD* = 15.61), indicating moderate engagement. The mean vigor (VI) score was 10.60 (*SD* = 6.47), suggesting moderate vigor. The mean dedication (DE) score was 18.50 (*SD* = 5.89), and the mean absorption (AB) score was 9.27 (*SD* = 5.50), demonstrating moderate dedication and moderate absorption, respectively (see Table 2).

Health Risk Behavior Variables

The mean overall health score for the total sample was 41.98 (*SD* = 6.93), indicating low engagement in health risk behaviors, suggesting generally good health practices. The mean safety risk score was 6.07 (*SD* = 4.10), and the mean substance use score was 36.31 (*SD* = 11.70), suggesting low engagement in safety risk behaviors and substance use. The mean physical activity score was 5.89 (*SD* = 3.52), the mean sleep score was 3.91 (*SD* = 0.90), and the mean mental health score was 3.36 (*SD* = 0.83), demonstrating low engagement in physical activity, achieving between 6-7 or 9-10 hours of sleep a night, and mental health that was “sometimes” considered good, respectively (see Table 2).

Self-Rated Health (SRH) Variables

The mean SRH score for the total sample was 8.73 (*SD* = 2.50), indicating moderate perceptions of health (see Table 2).

Academic Stress

The mean academic stress score for the total sample was 49.63 (*SD* = 8.23), indicating moderate levels of academic stress (see Table 2).

Hypothesis 1

Hypothesis 1.1: College students who have high levels of academic burnout will have low levels of academic engagement.

To investigate the relationship between academic burnout and academic engagement, a chi square test of independence (with Yates' continuity correction) was conducted. Groups for both burnout and engagement were formed using the medians for the sample on these measures to identify the groups. Participants who had scores of 38 or less on the burnout measure comprised the Low Burnout group (n = 80) while those with scores of 39 and above on the measure comprised the High Burnout group (n = 73). The High Engagement group was defined as those who had scores of $\geq$38 on the Engagement measure (n = 76) and the Low Engagement group included participants with scores of 37 or less on this measure (n = 77). Results indicated that there was a significant association between academic engagement and burnout. Those in the High Burnout group were significantly more likely to report low levels of engagement (n = 53, 68.8%) than those in the Low Burnout group (n = 24, 31.2%); those in the Low Burnout group (n = 56, 73.3%) were significantly more likely to report high levels of engagement than those in the High Burnout group (n = 20, 26.3%), $\chi^2(1) = 26.03$, $p < .001$. Therefore, Hypothesis 1.1 was supported.

Hypothesis 2

Hypothesis 2.1: College students will engage in a higher frequency of risky health behaviors such as substance use, sleep deprivation, physical inactivity, safety risk behaviors and poor mental health, and have higher overall health risk behavior scores, when academic burnout levels are high.

To investigate the hypothesis that college students with high levels of academic burnout will engage in a higher frequency of health risk behaviors, independent samples t-tests, MANOVAs, and Mann Whitney U tests were conducted. Participants were categorized in one of two Burnout groups (High and Low) using the sample median score of 38 on the burnout measure to define these groups. The High Burnout group included participants who scored 39 or above (n = 73) while the Low Burnout group included participants who scored $\leq$38 on the burnout measure (n = 80).

Assumption tests suggested that there were no outliers in the overall health risk behavior scores, and overall health risk behavior scores were normally distributed. Levene's test suggested that variances in overall health risk behavior scores for students with high and low burnout were statistically equivalent, $F(150) = 3.10$, $p = .570$. An independent-samples t-test was performed to compare mean overall health risk behavior scores between students with high and low levels of burnout. Results showed that overall health risk behavior scores were not statistically different between students with high burnout (M = 41.31, SD = 7.25) and those with low burnout (M = 42.59, SD = 6.60), $t(150) = 1.13$, $p = .259$, with the difference to have a 95% CI [-0.01, -0.03]. The difference presents a small-sized effect, Cohen's d = 0.02. The hypothesis that students

with high burnout engage in more health risk behaviors than students with low burnout was not supported.

A One-Way Between-Groups MANOVA was conducted to examine the relationship between burnout level and safety risk behaviors, substance use, physical activity, and mental health. The sleep variable was excluded from this analysis as the assumption of normality and homogeneity of variance was violated. Levene's test suggests that the homogeneity of variances assumption was fulfilled for safety risk behaviors, substance use, physical activity, and mental health, $p > .05$. There was a significant difference between students in the high and low burnout groups on the combined measures, $F(4, 147) = 1724.62$, $p < .001$, partial $\eta^2 = 0.12$. When the results for the variables were considered separately, results showed there was not a significant difference between students in the high and low burnout groups on safety risk behaviors, substance use, or physical activity, $p > .05$ (see Table 3). However, there was a statistically significant difference between high and low burnout groups on mental health scores, $F(1, 150) = 17.83$, $p < .001$, partial $\eta^2 = .11$. An inspection of the mean scores indicated that participants in the High Burnout group reported higher mental health scores (more negative perceptions of mental health; $M = 3.64$, $SD = 0.09$) than those in the Low Burnout group ($M = 3.10$, $SD = 0.09$). Hypothesis 2.1 is partially supported. Due to non-normality of the sleep outcomes, a non-parametric Mann Whitney U test was performed to examine the relationship between burnout and sleep. No significant difference was found for sleep scores between students with high burnout ($Md = 3.82$, $n = 73$) and low burnout ($Md = 3.99$, $n = 79$), $U = 2672.00$, $z = -0.844$, $p = .399$.

An additional One-Way Between-Groups MANOVA analysis was conducted to examine the relationship between burnout and specific types of substance use, i.e., tobacco, alcohol, caffeine, and marijuana. There were five outliers for tobacco scores, which were removed from analysis. Levene's test suggested that the homogeneity of variances assumption was fulfilled for all variables, $p > .05$. There were no significant differences between the high and low burnout groups on any specific substance use behavior scores (see Table 3).

To explore the relationship between Exhaustion (EX) and Cynicism (CYN) and lower levels of Efficacy (EF) with overall health risk behavior scores, independent samples t-tests and MANOVAs were conducted. Participants were categorized into two groups for each variable, representing high and low levels of EX, CYN, and EF, using the median score as a cut-point. Higher EX and CYN reflect higher levels of burnout, whereas lower EF reflects higher levels of burnout. Participants who had scores of 19 or less on the EX subscale comprised the Low EX group ($n = 84$), while those with scores of 20 and above on the measure comprised the High EX group ($n = 69$). The High CYN group was defined as those who had scores of 9 or higher on the CYN subscale ($n = 72$), and the Low CYN group included participants with scores of 8 or lower on this measure ($n = 81$). Finally, the High EF group contained participants who scored 26 or above on the EF subscale ($n = 66$), and the Low EF groups contained participants who scored 25 of below ($n = 87$).

A 2 (EX) x 2 (CYN) x 2 (EF) factorial ANOVA was performed to compare mean overall health risk behavior scores between students with high and low levels of EX,

CYN, and EF. There were no significant main effects of EX, CYN, or EF or interaction effects on health risk behavior outcomes (see Table 4).

Hypothesis 2.2: College students will have high self-rated health scores (i.e., worse perceived health) when academic burnout levels are high.

To investigate the hypothesis that college students with high levels of academic burnout will report lower self-rated perceived health (SRH), an independent samples t-test was conducted. Participants were categorized into two groups of High and Low Burnout, where scores of 38 or less comprised the Low Burnout group (n = 80) and scores of 39 or above compromised the High Burnout group (n = 73).

Assumption tests suggested that there were no outliers in SRH scores, and SRH scores were normally distributed. Levene's test suggested that variances in SRH scores for students with high and low burnout were statistically equivalent, $F(151) = 3.35$, p = .066. An independent-samples t-test was performed to compare mean SRH levels between students with high and low levels of burnout. Results showed that students with high burnout had significantly higher SRH scores (M = 9.41, SD = 2.61) than students with low burnout (M = 8.12, SD = 2.24), $t(151) = 3.28$, p = .001, with the difference to have a 95% CI [0.05, 2.06]. Higher SRH scores represent more negative perceptions of health. The difference presents a medium-sized effect, Cohen's d = 0.05. The hypothesis that students with high burnout perceive their health more negatively than students with low burnout was supported.

A 2 (EX) x 2 (CYN) x 2 (EF) factorial ANOVA was performed to compare mean SRH levels between students with high and low levels of EX, CYN, and EF. Participants were categorized into two groups of High and Low using the median score of 19 to define

the High (n = 69) and Low EX (n = 84) groups, 8 to define the High (n = 72) and Low (n = 81) CYN, and 25 to define the High (n = 66) and Low EF (n = 87) groups, as previously discussed. There was a significant main effect for EX, $F(1, 145) = 5.45$, p = .021, partial η^2 =.04. Participants in the High EX group had significantly higher SRH scores (M = 9.24, SD = 0.33) than participants in the Low EX group (M = 8.14, SD = 0.33), suggesting more negative perceptions of their health. There were no significant main effects for the CYN and EF variables, or interaction effects for EX, CYN, and EF on SRH levels (see Table 5).

Hypothesis 2.3: College students with high levels of perceived academic stress will report high levels of academic burnout.

To investigate the hypothesis that college students with high levels of academic burnout would report higher academic stress, participants were categorized into two groups of high and low burnout using the median score of 38 to define the High (n = 73) and Low Burnout (n = 80) groups as previously discussed.

Assumption tests suggested that there were no outliers in academic stress scores, and the scores were normally distributed. Finally, Levene's test suggested that variances in academic stress scores for students with high and low burnout were statistically equivalent, $F(151) = 1.48$, p = .225. An independent-samples t-test was performed to compare mean academic stress levels between students with high and low levels of burnout. Results showed that students with high burnout had significantly higher academic stress scores (M = 54.37, SD = 11.60) than students with low burnout (M = 42.44, SD = 10.07), $t(151) = -6.809$, p = .001, with the difference to have a 95% CI [-15.39, -8.47]. The difference presents a large-sized effect, Cohen's d = 1.20. The

hypothesis that students with high burnout perceive more academic stress than students with low burnout was supported.

A 2 (EX) x 2 (CYN) x 2 (EF) factorial ANOVA was performed to compare mean academic stress levels between students with high and low levels of EX, CYN, and EF. Participants were categorized into two groups of High and Low EX, where scores of 20 or more comprised the High EX group (n = 69) and scores of 19 or less compromised the Low EX group (n = 84). To categorize participants into High (n = 72) and Low (n = 81) CYN groups, a median score of 8 was utilized, and a median score of 25 was used to sort participants into High (n = 66) and Low (n = 87) EF groups, as previously discussed. There was a significant main effect for EX on academic stress, $F(1,145) = 13.76$, $p < .001$, partial $\eta^2 = .09$. Students with high EX reported higher academic stress scores (M = 52.13, SD = 1.41) than students with low EX (M = 44.61, SD = 1.46). A significant main effect was also found for CYN on academic stress, $F(1,145) = 10.23$, $p = .002$, partial $\eta^2 = .07$. Students with high CYN reported higher academic stress scores (M = 51.62, SD = 1.53) than students with low CYN (M = 45.12, SD = 1.34). Additionally, EF had a significant main effect on academic stress, $F(1,145) = 6.09$, $p = .015$, partial $\eta^2 = .04$. Participants in the High EF group had lower academic stress scores (M = 45.86, SD = 1.64) than participants in the Low EF group (M = 50.88, SD = 1.20). There were no significant interactions between EX, CYN, and EF on academic stress (see Table 6). To summarize, high EX, high CYN, and low EF were associated with higher academic stress.

Hypothesis 3

Hypothesis 3.1: College students will be less likely to engage in risky health behaviors such as substance use, sleep deprivation, physical inactivity, safety risk behaviors and poor mental health, and have lower overall health risk behavior scores, when academic engagement levels are high.

To investigate the hypothesis that college students with high levels of academic engagement will engage in a lower frequency of health risk behaviors, participants were categorized into two groups of high and low engagement using the median score on the engagement scale as a cut-point. The Low Engagement group included participants who scored ≤37 or less on the Engagement measure (n = 77), while the High Engagement group included those who scored ≥38 (n = 76).

Assumption tests suggested that there were no outliers in the overall health risk behavior scores, and overall health risk behavior scores were normally distributed. Levene's test suggested that variances in overall health risk behavior scores for students with high and low engagement were statistically equivalent, $F(150) = 0.002$, $p = .963$. An independent-samples t-test was performed to compare mean overall health risk behavior scores between students with high and low levels of engagement. Results showed that students with high engagement (M = 41.53, SD = 6.85) were not significantly different from students (M = 42.42, SD = 7.02) on their overall health risk behavior scores, $t(150) = -0.79$, $p = .429$, with the difference to have a 95% CI [-3.12, 1.33]. The difference presents a small-sized effect, Cohen's d = 0.13. The hypothesis that students with high engagement are less likely to engage in health risk behaviors than students with low engagement was not supported.

A One-Way Between Subjects MANOVA was conducted to examine the relationship between engagement and safety risk behaviors, substance use, physical activity, and mental health. The sleep variable was excluded from this analysis as the assumption of normality and homogeneity of variance was violated. Levene's test suggests that the homogeneity of variances assumption was fulfilled for safety risk behaviors, substance use, physical activity, and mental health, $p > .05$. There were no significant differences between participants in the High and Low Engagement groups on safety risk behaviors, substance use or physical activity (see Table 7). However, significant differences in mental health scores were found between the High and Low Engagement groups, $F(1,144) = 14.06$, $p < .001$, partial $\eta^2 = .09$. Students with high engagement had lower mental health scores ($M = 3.12$, $SD = 0.09$) than students with low engagement ($M = 3.61$, $SD = 0.09$). Lower mental health scores reflect more positive perceptions of their mental health. Due to the violation of assumptions of normality for the sleep outcome, a Mann Whitney U test was performed to examine the relationship between engagement and sleep. A significant difference in sleep scores between students with high engagement ($Md = 4.08$, $n = 76$) and low engagement ($Md = 3.92$, $n = 77$), $U = 2708.00$, $z = -0.86$, $p = .390$ was not found. Hypothesis 3.1 was partially supported.

Additional One-Way Between Subject MANOVA analyses were conducted to examine the relationship between engagement and specific types of substance use, i.e., tobacco, alcohol, caffeine, and marijuana. There were five outliers for the tobacco outcomes, which were removed from analysis. Levene's test suggests that the homogeneity of variances assumption was fulfilled for all variables, $p > .05$. There were

no significant differences between the High and Low Engagement groups on tobacco use, alcohol use, caffeine use, or marijuana use (see Table 7).

To investigate the hypothesis that college students with high levels of Vigor (VI), Dedication (DE), and Absorption (AB) will engage in a lower frequency of overall health risk behavior scores, an ANOVA were conducted. Higher scores on the VI, DE, and AB scales reflected higher levels of engagement. Participants who had scores of 10 or less on the VI subscale comprised the Low VI group (n = 80), while those with scores of 11 and above on the measure comprised the High VI group (n = 73). The High DE group was defined as those who had scores of 20 or higher on the DE subscale (n = 80), and the Low DE group included participants with scores of 19 or lower on this measure (n = 73). Finally, the High AB group included participants who scored 10 or above on the AB subscale (n = 74), and the Low AB group was comprised of participants who scored 9 or below (n = 79).

A 2 (VI) x 2 (DE) x 2 (AB) factorial ANOVA was performed to compare mean overall health risk behavior levels between students with high and low levels of VI, DE, and AB. No significant main effects or interaction effects for these variables were detected (see Table 8).

Hypothesis 3.2: College students will have low self-rated perceived health scores (i.e., better perceived health) when academic engagement levels are high.

To investigate the hypothesis that college students with high levels of academic engagement will reported higher self-rated perceived health (SRH), participants were categorized into two groups of High and Low Engagement using the median score on the Engagement scale as a cut-point (Md = 37), placing 76 participants in the High

Engagement group (scores of 38 or higher) and 77 participants in the Low Engagement group (scores ≤37).

Assumption tests suggested that there were no outliers in SRH scores, and SRH scores were normally distributed. Levene's test suggested that variances in SRH scores for students with high and low engagement were statistically equivalent, $F(150) = 0.70$, $p = .406$. An independent-samples *t*-test was performed to compare mean SRH levels between students with high and low levels of engagement. Results showed that students with high engagement ($M = 8.35$, $SD = 2.39$) did not have significantly different SRH scores than students with low engagement ($M = 9.12$, $SD = 2.58$), $t(150) = 1.91$, $p = .059$, with the difference to have a 95% CI [-0.03, 1.57]. The difference presents a small-sized effect, Cohen's $d = 0.03$. The hypothesis that students with high engagement perceive their health as better than students with low engagement was not supported.

A 2 (VI) x 2 (DE) x 2 (AB) factorial ANOVA was performed to compare mean SRH levels between students with high and low levels of VI, DE, and AB. Participants were categorized into two groups of High and Low using the median score of 10 to define the High ($n = 73$) and Low VI ($n = 80$) groups, 19 to define the High ($n = 73$) and Low ($n = 80$) DE groups, and 9 to define the High ($n = 74$) and Low AB ($n = 79$) groups, as previously discussed. No significant main effects or interaction effects for VI, DE, and AB on SRH outcomes were found (see Table 9).

Hypothesis 3.3: College students with low levels of perceived stress will report high levels of academic engagement.

To investigate the hypothesis that college students with high levels of academic engagement will reported lower academic stress, participants were categorized into two

groups of High and Low Engagement. Participants who had scores of ≥38 on the Engagement scale comprised the High Engagement group (n = 76) and those who had scores of ≤37 comprised the Low Engagement group (n = 77).

Assumption tests suggested that there were no outliers in academic stress scores, and the scores were normally distributed. Levene's test suggested that variances in academic stress scores for students with high and low engagement were statistically equivalent, $F(151) = 0.14$, $p = .906$. An independent-samples t-test was performed to compare mean academic stress levels between students with high and low levels of engagement. Results showed that students with high engagement reported significantly lower academic stress scores (M = 43.82, SD = 11.75) than students with low engagement (M = 52.39, SD = 11.45), $t(151) = 4.57$, $p < .001$, with the difference to have a 95% CI [4.87, 12.28]. The difference presents a large-sized effect, Cohen's d = 0.74. The hypothesis that students with high engagement perceive less academic stress than students with low engagement was supported.

A 2 (VI) x 2 (DE) x 2 (AB) factorial ANOVA was performed to compare mean academic stress levels between students with high and low levels of VI, DE, and AB. Participants were categorized into two groups of High and Low VI, where scores of 11 or more comprised the High VI group (n = 73) and scores of 10 or less comprised the Low VI group (n = 80). To categorize participants into High (n = 73) and Low (n = 80) DE groups, a median score of 19 was utilized, and a median score of 9 was used to categorize participants into High (n = 74) and Low (n = 79) AB groups. There was no significant main effects or interaction effects for VI, DE, and AB on academic stress (see Table 10).

Chapter 6

Discussion

The results from our study indicate that college students in our sample reported a moderate degree of burnout. Students with high levels of burnout also reported low levels of engagement and vice versa. This finding is consistent with the literature which has shown an inverse relationship between burnout and engagement (Schaufeli et al., 2002). These results confirm the widely accepted definition of burnout as a lack of engagement and suggests that continued research be conducted to determine if correlates of burnout are similar to those of engagement but opposite in directionality.

Burnout has been linked to various risky health behaviors, including substance use (McGeary et al., 2014), sleep complaints (Haghighi & Gerber, 2019), low physical activity (Ahola et al., 2012), various mental health problems (Maslach, Schaufeli, & Leiter, 2001) and overall negative health outcomes (Dahlin et al., 2007). This study attempted to examine the relationship between these outcomes and academic burnout and engagement in a college student population. Overall, the mean health risk behavior scores of the sample indicated relatively low engagement in risky behaviors and generally healthy behavioral practices as a whole. No significant relationship was found for burnout or engagement and overall health risk behaviors, possibly explained the general healthiness of the sample. This may also be partially due to the health risk behavior outcomes employed in this study or the method used to evaluate these behaviors. Although this study used a broad, composite measure of overall health risk behavior with items derived from a well-known national survey, in contrast to other studies that have assessed single health behavior outcomes, it should be noted that each of the five health

behaviors evaluated in this study (safety risk, substance use, physical activity, sleep, and mental health), were given equal weight in their contribution to the overall health risk behavior outcomes. Some behaviors, such as sleep and physical activity, were assessed by fewer items and were more limited in scope that other health behaviors. Additionally, the time period during which some the behaviors were assessed (i.e., the past 7 days, the past 30 days, the past 12 months, in a lifetime) differed across survey items which may not accurately capture the relationship between behaviors and burnout if some behaviors were rated in reference to a more circumscribed time frame. Additionally, the analysis of subscales did not offer further information about which aspects of burnout were more likely to be related to risky health behaviors, as no significant main effects or interaction effects were found.

Of note is that burnout and engagement were not significantly linked to any specific substance use behaviors. Although this is contrary to the bulk of research (Rathmann et al., 2016; Walburg et al., 2015), a few studies have reported a lack of relationship between burnout and specific drug use behaviors (McGeary et al., 2014). Previous research in college students has found that they are at lower risk than their non-student peers for engaging in risky substance use (Skidmore et al., 2016); it, therefore, seems likely that students in this sample have found other ways to cope with stressors and that their level of burnout or engagement may have had little association with their tendency to use substances.

Unlike the association with the other health risk behaviors assessed, both burnout and engagement were significantly associated with mental health, i.e., students with higher burnout reported more negative perceptions of their mental health and those with

high engagement had less negative perceptions of their mental health. This supports findings from other studies that indicated burnout was related to negative mental health outcomes (Drybye et al., 2008; Maslach, Schaufeli, & Leiter, 2001; Salmela-Aro & Upadyaya, 2014) and that engagement was related to positive mental health outcomes (Salmela-Aro et al., 2009b; Salmela-Aro & Upadyaya, 2014). These findings suggest that high burnout levels is a reason why students should be encouraged to seek mental health services during the academic year, such that prevention of burnout may be a topic of interest to campus-based mental health clinics. Further research is also necessary to examine the relationship between mental health and health risk behaviors in the context of burnout and engagement.

Previously, Cheng et al. (2013) found a connection between self-rated health perceptions (SRH) and burnout, using the Copenhagen Burnout Inventory. The results of the current study confirmed that such a relationship exists even when using a different measure and definition of burnout. In this study, students with high burnout levels had significantly higher SRH scores (worse perceptions of their health) than those with low burnout levels. Although the differences were not significant, students with high engagement tended to have more positive perceptions of their health than those with low engagement levels. Interestingly, these results were found despite having found no significant difference in overall health risk behavior scores based on level of burnout or engagement. Of the burnout subscales, only students with High Exhaustion (EX), demonstrated lower SRH, suggesting that this association may be largely due to the EX factor. This contradicts previous findings in medical students that related SRH to both EX and Cynicism (CYN; Dahlin et al., 2007), although different measures of SRH were used

in that study. It may be that the broader definition of SRH as used in this study is more related to EX while one's general view of their health as studied by Dahlin et al. (2007) is impacted by both EX and CYN. The association found in this study between burnout/engagement and perception of health suggests that students are likely aware of the impact of burnout on their health, primarily due to the physiological exhaustion that accompanies burnout. Whether this association can be used to signal students to engage in behaviors to protect their health prophylactically, and better manage their stress, is an area that should be further explored.

Additionally, this study built on previous research by demonstrating an association between academic stress and academic burnout, much like the relationship that has been shown between work stress and work-related burnout (Maslach, Schaufeli, & Leiter, 2001). The results provide further evidence for the theory that burnout arises from an overload of demands (McGeary et al., 2014). Other research has only connected burnout to general life stress while ignoring specific academic variables (Haghighi & Gerber, 2019; Huang & Lin, 2010). These study findings additionally established an inverse relationship between engagement and academic stress, i.e., students with higher levels of engagement reported less stress. Of note is that the study survey was completed during the months of August and September, which coincided with the start of the fall semester and academic school year. It may be possible that the effects of burnout in relation to academic stress would be even more salient at other points in the semester when academic stressors may be heightened. Examination of burnout and engagement at various points in the academic calendar may help to better address the association between academic stress and burnout and engagement. For burnout, each factor

(exhaustion, cynicism, and professional efficacy) was significantly associated with academic stress, but the same was not true for engagement factors (vigor, dedication, and absorption). Whether interventions that target each component of burnout and engagement separately are associated with greater reductions in academic stress is an area for future research.

Clinical Implications

The opposite relationships between burnout and engagement and mental health, perceptions of health, and academic stress suggest that cultivation of engagement or reduction of burnout may be necessary to reduce burnout and its impact. Due to the cross-sectional design of this study, it is not possible to determine if stress, burnout, poor mental health, or negative perceptions of health is the precursor to the others. For example, burnout may precede poor mental health or poor mental health may precede burnout. More research is needed to determine the course of burnout and engagement as well as possible mechanisms for intervention.

Given the demonstrated associations between stress and burnout, it is likely that reducing stress from academics may reduce the likelihood of developing burnout and increase engagement. Academic stress may be reduced by improving time-management skills and introducing more pleasurable leisure activities (Misra & McKean, 2000) to better achieve an academic/life balance. Students who learn to better manage their time and who engage in self-care regularly may experience less academic stress and burnout. These skills may also improve mental health and overall health behaviors. Contingency management and behavioral skills training may also be effective in changing stress and performance-related behaviors. Interventions such as value clarification (engaging in

events that are meaningful and important—i.e., the value of learning vs. the focus on the final grade), mindfulness, acceptance, and behavioral change techniques, derived from Acceptance and Commitment Therapy (ACT) models, have started to receive empirical attention in reducing school-related distress in secondary education (Paliliunas et al., 2018). Whether these approaches can be useful in the context of burnout and engagement is an area that should be a focus of future study.

Limitations and Directions for Future Research

Various limitations are associated with the methodology inherent to this study. First, due to the cross-sectional design, directional influence could not be determined between health risk behaviors and burnout and engagement. Longitudinal studies will be necessary to determine causality in this area. Secondly, due to the cross-sectional design, generalizability is limited as cohort differences may influence the relationship between the variables studied. Thirdly, this study is conducted using self-report measures. Despite the probable inaccuracy of self-report measures, the YRBSS is an accepted and routinely utilized measure for health risk behaviors. The YRBSS utilized various time frames in it's items (i.e. past year, past month, past week, impacting the temporal understanding of the health behaviors investigated. Lastly, the use of a median-split to categorize participants on the burnout and engagement measure is a limitation as individuals scoring close the median were classified identically to individual scoring more distantly from the median.

Reference List

Ahola, K., Pulkki-Råback, L. Kouvonen, A., Rossi, H. Aromaa, A., & Lönnqvist, J. (2012). Burnout and behavior-related health risk factors: Results from the population-based Finnish health 2000 study. *Journal of Occupational and Environmental Medicine, 54*(1), 17-22. https://doi.org/10.1097/JOM.0b013e31823ea9d9

Alarcon, G. M., Edwards, J. M., & Menke, L. E. (2011). Student burnout and engagement: A test of the conservation of resources theory. *The Journal of Psychology, 145*(3), 211-217. https://doi.org/10.1080/00223980.2011.555432

Almeida. G. C., Souza, H. R., Almeida, P. C., Almeida, B. C., & Almeida, G. H. (2016). The prevalence of burnout syndrome in medical students. *Archives of Clinical Psychiatry (São Paulo), 43*(1), 6-10. https://doi.org/10.1590/0101-60830000000072

Aypay, A. & Eryilmaz, A. (2011). Relationships of high school student's subjective well-being and school burnout. *International Online Journal of Educational Sciences, 3*(1), 181-199.

Bakker, A. B., Schaufeli, W. B., Demerouti, E. Janssen, P. P. M., Van Der Hulst, R., & Brouwer, J. (2000). Using equity theory to examine the difference between burnout and depression. *Anxiety, Stress & Coping, 13*(3), 247-268. https://doi.org/10.1080/10615800008549265

Bask, M. & Salmela-Aro, K. (2013). Burned out to drop out: Exploring the relationship between school burnout and school dropout. *European Journal of Psychology of Education, 28*(2), 511-528. https://doi.org/10.1007/s10212-012-0126-5

Bedewy, D. & Gabriel, A. (2015). Examining perceptions of academic stress and its sources among university students: The Perception of Academic Stress Scale. *Health Psychology Open, July-December 2015*, 1-9. https://doi.org/10.1177/2055102915596714

Berndt, T. J. & Miller, K. E. (1990). Expectancies, values, and achievement in junior high school. *Journal of Educational Psychology, 82*(2), 319-326.

Bilge, F., Tuzgöl Dost, M, & Çetin, B. (2014). Factors affecting burnout and school engagement among high school students: Study habits, self- efficacy beliefs, and academic success. *Educational Sciences: Theory & Practice*, *14*(5), 1721-1727. https://doi.org/10.12738/estp.2014.5.1727

Blair, E. H., Seo, D-C., Torabi, M.R. & Kaldahl, M. A. (2004). Safety beliefs and safe behavior among midwestern college students. *Journal of Safety Research 35*(2), 131-140. https://doi.org/10.1016/j.jsr.2003.11.003

Borritz, M., Rugulies, R., Christensen, K. B., Villadsen, E., & Kristensen, T. S. (2006). Burnout as a predictor of self-reported sickness absence among human service workers: Prospective findings from three year follow up of the PUMA study. *Occupational and Environmental Medicine*, *63*, 98-106. https://doi.org/10.1136/oem.2004.019364

Bryne, B. M. (1994). Testing for the factorial validity, replication, and invariance of a measuring instrument: A paradigmatic application based on the Maslach Burnout Inventory. *Multivariate Behavioral Research, 29*(3), 289-311. https://doi..org/10.1207/s15327906mbr2903_5

Chacón-Cuberos, R., Zurita-Ortega, F., Olmedo-Moreno, E. M., & Castro-Sánchez, M. (2019). Relationship between academic stress, physical activity and diet in university students of education. *Behavioral Sciences, 9*(6), 59-72. https://doi.org/10.3390/bs9060059

Chang, Y. (2012). The relationship between maladaptive perfectionism with burnout: Testing mediating effect of emotion-focused coping. *Personality and Individual Differences, 53*(3), 635-639. https://doi.org/10.1016/j.paid.2012.05.002

Chen, J., Jiping, L., Bingrong, C., Wang, F., Luo, L., & Xu, J. (2019). Mediating effects of self-efficacy, coping, burnout, and social support between job stress and mental health among young Chinese nurses. *Journal of Advanced Nursing, 76*(1), 163-173. https://doi.org/10.1111/jan.14208

Cheng, Y., Chen, I-S., Chen, C-J., Burr, H., & Hasselhorn, H.M. (2013). The influence of age on the distribution of self-rated health, burnout and their associations with psychosocial work conditions. *Journal of Psychosomatic Research, 74*(3), 213-220. https://doi.org/10.1016/j.jpsychores.2012.12.017

Center for Disease Control and Prevention (CDC). (2021). *2021 State and Local Youth Risk Behavior Surveillance System (YRBSS).* https://www.cdc.gov/healthyyouth/data/yrbs/pdf/2021/2021-YRBS-Standard-HS-Questionnaire.pdf

Cunradi, C. B., Lipton, R., Banerjee, A. (2007). Occupational correlates of smoking among urban transit operators: A prospective study. *Substance Abuse Treatment, Prevention, and Policy, 2*, 36-42. https://doi.org/10.1186/1747-597X-2-36

Dahlin, M., Joneborg, N. & Runeson, B. (2007). Performance-based self-esteem and burnout in a cross-sectional study of medical students. *Medical Teacher, 29*(1), 43-48. https://doi.org/10.1080/01421590601175309

Dahlin, M. E. & Runeson, B. (2007). Burnout and psychiatric morbidity among medical students entering clinical training: a three year prospective questionnaire and interview-based study. *BMC Medical Education, 7*, n.p. https://doi.org/10.1186/1472-6920-7-6

De la Fuente-Solana, E. I., Gómez-Urquiza, J. L., Cañadas, G. R., Albendín-García, L., Ortega-Campos, E., & Cañadas-De la Fuente, G. A. (2017). Burnout and its relationship with personality factors in oncology nurses. *European Journal of Oncology Nursing, 30*, 91-96. https://doi.org/10.1016/j.ejon.2017.08.004

Demerouti, E., Bakker, A. B., Vardakou, I., & Kantas, A. (2003). The convergent validity of two burnout instruments: A multitrait-multimethod analysis. *European Journal of Psychological Assessment, 19*(1), 12–23. https://doi-org.portal.lib.fit.edu/10.1027/1015-5759.19.1.12

Dyrbye, L. N., Eacker, A., Durnning, S. J., Brazeau, C., Moutier, C., Massie, F. S., Satele, D., Sloan, D., & Shanafelt, T. D. (2015). The impact of stigma and personal experiences on the help-seeking behaviors of medical students with burnout. *Academic Medicine, 90*(7), 961-969. https://doi.org/10.1097/ACM.0000000000000655

Dyrbye, L. N., Thomas, M. R., Huntington, J. L., Lawson, K. L., Novotny, P. J., Sloan, J. A., & Shanafelt, T. D. (2006a). Personal life events and medical student burnout: a multicenter study. *Academic Medicine, 8*(4), 374-384. https://doi.org/10.1097/00001888-200604000-00010

Dyrbye, L. N., Thomas, M. R., Huschka, M. M., Lawson, K. L. Novotny, P. J., Sloan, J. A., & Shanafelt, T. D. (2006b). A multicenter study of burnout, depression, and quality of life in minority and nonminority US medical students. *Mayo Clinic Proceedings*, *81*(11), 1435-1442.

Drybye, L. N., Thomas, M. R., Massie, F. S., Power, D. V., Easker, A., Harper, W., Durning, S., Moutier, C., Szydlo, D. W., Novotny, P. J., Sloan, J.A. & Shanafelt, T. D. (2008) Burnout and suicidal ideation among U.S. medical students. *Annals of Internal Medicine, 149*(5), 334-341.

Drybye, L. N., Thomas, M. R., Power, D. V., Durning, S., Moutier, C., Massie, F. S., Harper, W., Easker, A., Szydlo, D. W., Sloan, J. A., Shanafelt, T. D. (2010). Burnout and serious thoughts of dropping out of medical school: A multi-institutional study. *Academic Medicine, 85*(1), 94-102. https://doi.org/10.1097/ACM.0b013e3181c46aad

Fares, J., Saadeddin, H., Al Tabosh, H., Aridi, H., El Mouhayyar, C., Koleilat, M. K., Chaaya, M., & El Asmar, K. (2015). Extracurricular activities associated with stress and burnout in preclinical medical students. *Journal of Epidemiology and Global Health, 6*(3), 177-185. https://doi.org/10.1016/j.jegh.2015.10.003

Faria, Y. d. O., Gandolfi, L., & Moura, L. B. A. (2014). Prevalência de comportamentos de risco em adulto jovem e universitário [Prevalence of risk behaviors in young university students]. *Acta Paulista de Enfermagem, 21*(6), 591-595. https://doi.org/10.1590/1982-0194201400096

Gómez-Urquiza, J. L., De la Fuente-Solana, E. I., Albendín-García, L., Vargas-Pecino, C., Ortega-Campos, E. M., & Cañadas-De la Fuente, G. A. (2017). Prevalence of Burnout Syndrome in Emergency Nurses: A Meta-Analysis. *Critical Care Nurse, 37*(5), n.p. https://doi.org/10.4037/ccn2017508

Haghighi, M. & Gerber, M. (2019). Does mental toughness buffer the relationship between perceived stress, depression, burnout, anxiety, and sleep? *International Journal of Stress Management, 26*(3), 297-305. https://doi.org/10.1037/str0000106

Haung, Y. -S. & Lin, S. H. (2010) Canonical correlation analysis on life stress and learning burnout of college students in Taiwan. *International Electronic Journal of Health Education, 13*, 145-155.

İlhan, M. & Çetin, B. (2014). An analysis of the relationship between academic burnout and classroom assessment environment. *Education and Science, 39*(176), 51-68. https://doi.org/10.15390/EB.2014.3335

Jang, H., Reeve, J. & Deci, E. L. (2010). Engaging students in learning activities: it is not autonomy support or structure but autonomy support and structure. *Journal of Education Psychology, 102*(3), 588-600. https://doi.org/10.1037/a0019682

Jiang. X. -I., Zheng, X. -Y, Yang, J., Ye, C. -P., Chen, Y. -Y., Zhang, Z. -G., & Xiao, Z. -J. A systematic review of studies on the prevalence of insomnia in university students. *Public Health, 129*(12), 1579-1584. https://doi.org/10.1016/j.puhe.2015.07.030

Jones, M., Taylor, A., Liao, Y., Intille, S. S., & Dunton, G. F. (2017). Real-time subjective assessment of psychological stress: Associations with objectively-measured physical activity levels. *Psychology of Sport and Exercise, 31*, 79-87. https://doi.org/10.1016/j.psychsport.2017.03.013

Jylha, M. (2009). What is self-rated health and why does it predict mortality? Towards a unified conceptual model. *Social Science & Medicine, 67*(3), 307-316. https://doi.org/10.1016/j.socscimed.2009.05.013

Kiuru, N. Aunola, K., Nurmi, J. -E., Leskinen, E., & Salmela-Aro, K. (2008). Peer group influence and selection in adolescents' school burnout: a longitudinal study. *Merrill-Palmer Quarterly, 54*(1), 23-55. https://doi.org/10.1353/mpq.2008.0008

Koeske, G. F. & Koeske, R. D. (1991). Student burnout as a mediator of the stress-outcome relationship. *Research in Higher Education, 32*(2), 415-431. https://doi.org/10.1007/BF00992184

Lee, R. T., & Ashford B. E. (1996). A meta-analytic examination of the correlates of the three dimensions of job burnout. *Journal of Applied Psychology, 81*(2), 123-133.

Leiter, M.P. & Durup, J. (1996). The discriminant validity of burnout and depression: A confirmatory factor analytic study. *Anxiety, Stress, & Coping, 7*(4), 357-373. https://doi.org/10.1080/10615809408249357

Leiter, M. P. & Schaufeli, W. B. (1996). Consistency of the burnout construct across occupations. *Anxiety, Stress & Coping, 9*(3), 229-243. https://doi.org/10.1080/10615809608249404

Lin, T.-L. (2013). The relationships among perceived organization support, psychological capital and employees' job burnout in international tourist hotels. *Life Science Journal, 10*(3), 2104-2112.

Luo, Y., Li, H., Plummer, V., Cross, W. M., Lam, L., Guo, Y., Yin. Y., & Zhang, J. (2019). An evaluation of a positive psychological intervention to reduce burnout among nurses. *Archives of Psychiatric Nursing, 33*(6), 186-191. https://doi.org/10.1016/j.apnu.2019.08.004

Luo, Y., Wang, Z., Zhang, H., & Chen, A. (2016) The influence of family socio-economic status on learning burnout in adolescents: Mediating and moderating effects. *Journal of Child and Family Studies, 25*, 2111-2119. https://doi.org/10.1007/s10826-016-0400-2

Maroco, J., & Campos, J. A. D. B. (2012). Defining the student burnout construct: A structural analysis from three burnout inventories. *Psychological Reports, 111*(3), 814-830. https://doi.org/10.2466/14.10.20.PR0.111.6.814-830

Maslach, C., & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Occupational Behavior, 2*, 99-113. https://doi.org/10.1002/job.4030020205

Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review Psychology, 52*, 397-422.

Mayo Clinic Staff. (2020). Caffeine content for coffee, tea, soda and more. *Mayo Clinic*. https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/caffeine/art-20049372

McGeary, C. A.., Garcia, H. A., McGeary, D. D., Finley, E. P., & Peterson, A. L. (2014). Burnout and coping: Veterans Health Administration posttraumatic stress disorder mental health providers. *Psychological Trauma: Theory, Research, Practice, and Policy, 6*(4), 390-397. https://doi.org/10.1037/a0036144

Melamed, S. (2009). Burnout and risk of regional musculoskeletal pain-a prospective study of apparently healthy employed adults. *Stress and Health, 25*(4), 313-321. https://doi.org/10.1002/smi.1265

Misra, R. & McKean, M. (2000). College student's academic stress and its relation to their anxiety, time management, and leisure satisfaction. *American Journal of Health Sciences, 16*(1), 41-51.

Moukaddam, N., Parks, K., Le, H., Khawaja, L., & Shah, A. A. (2020**).** Burnout and Suicide Among Physicians During Times of Stress. *Psychiatric Annals, 50*(12), 536-541. https://doi.org/10.3928/00485713-20201103-02

Norris, F. H., Matthews. B. A.., Riad, J. K. (2000). Characterological, situational, and behavioral risk factors for motor vehicle accidents: A prospective examination. *Accident Analysis & Prevention, 32*(4), 505-515. https://doi.org/10.1016/S0001-4575(99)00068-8

National Highway Traffic Safety Administration. (2020). *Traffic safety facts 2018 annual report: A compilation of motor vehicle crash data*. *https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812981*

Paliliunas, D., Belisle, J., & Dixon, M. R. (2018). A randomized control trial to evaluate the use of Acceptance and Commitment Therapy (ACT) to increase academic performance and psychological flexibility in graduate students. *Behavior Analysis in Practice, 11*(3), 241-253. https://doi.org/10.1007/s40617-018-0252-x

Parker, P. A. & Kulik, J. A. (1995). Burnout, self- and supervisor-rated job performance, and absenteeism among nurses. *Journal of Behavioral Medicine, 18*(6), 581-599. https://doi/org/10.1007/BF01857897

Parker, P. D. & Salmela-Aro, K. (2011). Developmental processes in school burnout: A comparison of major developmental models. *Learning and Individual Differences, 21*(2), 244-248. https://doi.org/10.1016/j.lindif.2011.01.005

Pohlmann, K., Jonas, I, Ruf, S., & Harzer, W. (2005). Stress, burnout and health in the clinical period of dental education. *European Journal of Dental Education, 9*(2), 78-84. https://doi.org/10.1111/j.1600-0579.2004.00359.x

Pomerantz, E. M., Altermatt, E. R., & Saxon, J. L. (2002). Making the grade but feeling distressed: Gender differences in academic performance and internal distress. *Journal of Educational Psychology, 94*(2), 396-404. https://doi.org/10.1037/0022-0663.94.2.396

Purvanova, R. K. & Muros, J. P. Gender differences in burnout: A meta-analysis. *Journal of Vocational Behavior, 77*(2), 168-185. https://doi.org/10.1016/j.jvb.2010.04.006

Rathmann, K. Heilmann, K., Moor, I. & Richter, M. (2016). Schulisches wohlbefinden, schulform und tabakkonsum von jugendlichen: Ergebnisse der SILNE-Studie [School wellbeing, school type and tobacco use among adolescents: Results of the SILNE-Survey]. *SUCHT, 62*(2), 383-395. https://doi.org/10.1024/0939-5911/a000458

Reis, D., Xanthopoulou, D., & Tsaousis, I. (2015). Measuring job and academic burnout with the Oldenburg Burnout Inventory (OLBI): Factorial invariance across samples and countries. *Burnout Research, 2*(1), 8-18. https://doi.org/10.1016/j.burn.2014.11.001

Ríos-Risquez, M. I., García-Izquierdo, M., Sabuco-Tebar, E. A., Carrillo-Garcia, C., & Solano-Ruiz, C. (2018). Connections between academic burnout, resilience, and psychological well-being in nursing students: A longitudinal study. *Journal of Advanced Nursing, 74*(12), 2777-2784. https://doi.org/10.1111/jan.13794

Robins, T. G., Roberts, R. M., & Sarris, A. (2018). The role of student burnout in predicting future burnout: Exploring the transition from university to the workplace. *Higher Education Research & Development, 37*(1), 115-130. https://doi.org/10.1080/07294360.2017.1344827

Rostami, Z., Abedi, M. R., & Schaufeli, W. B. (2012). Dose interest predicts academic burnout? *Interdisciplinary Journal of Contemporary Research in Business, 3*(9), 877–885.

Salmela-Aro, K., Kiuru, N., Leskinen, E., Nurmi, J.-E. (2009a). School Burnout Inventory (SBI): Reliability and validity. *European Journal of Psychological Assessment, 25*(1), 48-57. https://doi.org/10.1027/1015-5759.25.1.48

Salmela-Aro, K., Kiuru, N., & Nurmi, J.-E. (2008a). The role of educational track in adolescents' school burnout: A longitudinal study. *British Journal of Educational Psychology, 78*(4). 663-689. https://doi.org/10.1348/000709908X281628

Salmela-Aro, K., Kiuru, N., Pietikäinen, M., & Jokela, J. (2008b). Does school matter? The role of school context in adolescents' school-related burnout. *European Psychologist, 13*(1), 12-23. https://doi.org/10.1027/1016-9040.13.1.12

Salmela-Aro, K.., Savolainen, H, & Holopainen, L. (2009b). Depressive symptoms and school burnout during adolescence: evidence from two cross-lagged longitudinal studies. *Journal of Youth and Adolescence, 38*(10), 1316-1327. https://doi.org/10.1007/s10964-008-9334-3

Salmela-Aro, K. & Upadyaya, K. (2014). School burnout and engagement in the context of demands-resources model. *British Journal of Educational Psychology*, *84*(1), 137-151. https://doi.org/10.1111/bjep.12018

Santen, S. A., Holt, D. B., Kemp, J. D., & Hemphill, R. R. (2010). Burnout in medical students: Examining the prevalence and associated factors. *Southern Medical Journal, 103*(8), 758-763. https://10.1097/smj.0b013e3181e66d6d4

Schaufeli, W. B., Bakker, A. B., & Van Rhenen, W. (2009). How changes in job demands and resources predict burnout, work engagement, and sickness absenteeism. *Journal of Organizational Behavior, 30*(7), 893-917. https://doi.org/10.1002/job.595

Schaufeli, W. B., Leiter, M. P., Maslach, C., & Jackson, S. E. (1996). Maslach Burnout Inventory–General Survey. In C. Maslach, S. E. Jackson, & M. P. Leiter (Eds.), *The Maslach Burnout Inventory—Test manual* (3rd ed.). Palo Alto, CA: Consulting Psychologists Press.

Schaufeli, W. B., Martínez, I. M., Marques Pinto, A., Salanova, M., & Bakker, A. B. (2002a). Burnout and engagement in university students: A cross national survey. *Journal of Cross-Cultural Psychology, 33*(5), 464-481. https://doi.org/10.1177/0022022102033005003

Schaufeli, W. B., Salanova, M., González-Romá, V., & Bakker, A. B. (2002b). *Utrecht Work Engagement Scale-17* [Database Record]. PsycTESTS. https://doi.org/10.1037/t07164-000

Shih, S. -S. (2012). An examination of academic burnout versus work engagement among Taiwanese adolescents. *The Journal of Educational Research, 105*(4). https://10.1080/00220671.2011.629695

Shih, S. -S. (2015). The relationships among Taiwanese adolescents' perceived classroom environment, academic coping, and burnout. *School Psychology Quarterly, 30*(2), 307-320. https://doi.org/10.1037/spq0000093

Skidmore, C. R., Kaufman, E. A., & Crowell, S. E. (2016). Substance use among college students. *Child and Adolescent Psychiatric Clinics of North America, 25*(4), 735-753. https://doi.org/10.1016/j.chc.2016.06.004

Soliemanifar, O. & Shaabani, F. (2013). The relationship between of personality traits and academic burnout in university students. *Journal of Life Science and Biomedicine, 3*(1), 60-63.

U Leong, C. S. & Shing Wong, T. K. (2012). Factors influencing the sleep behavior of primary school-aged children in macao. *International Journal of Nursing Science, 1*(1), 1-8. https://doi.org/10.5923/j.nursing.20110101.01

U. S. Food & Drug Administration (FDA). (n.d.) Spilling the beans: How much caffeine is too much? *FDA.* https://www.fda.gov/consumers/consumer-updates/spilling-beans-how-much-caffeine-too-much

Upadyaya, K., & Salmela-Aro, K. (2013). Development of school engagement in association with academic success and well-being in varying social contexts: A review of empirical research. European Psychologist, 18(2), 136–147. https://doi.org/10.1027/1016-9040/a000143

Vizoso, C., Arias-Gundín, O., Rodríguez, C. (2019). Exploring coping and optimism as predictors of academic burnout and performance among university students. *Educational Psychology*, *39*(6), 768-783. https://doi.org/10.1080/01443410.2018.1545996

Walburg, V., Moncloa, D., & Mialhes, A. (2015). Burnout among high-school students and cannabis use, consumption frequencies, abuse and dependence. *Child & Youth Care Forum*, *44*(1), 33-42. https://doi.org/10.1007/s10566-014-9268-8

Walburg, V., Zakari, S. & Chabrol, H. (2014). Role of academic burnout in suicidal ideas among adolescents. *Neuropsychiatrie de l'Enfance et de l'Adolescence*, *62*(1), 28-32. https://doi.org/10.1007/s10566-014-9268-8

Watson, R. Deaary, I, Thompson. D. & Li, G. (2008). A study of stress and burnout in nursing students in Hong Kong: A questionnaire survey. *International Journal of Nursing Studies, 45*(10), 1534-1542. https://doi.org/10.1016/j.ijnurstu.2007.11.003

Yang, H.-J. (2004). Factors affecting student burnout and academic achievement in multiple enrollment programs in Taiwan's technical–vocational colleges. *International Journal of Educational Development, 24*(3), 283-301. https://doi.org/10.1016/j.ijedudev.2003.12.001

Zhang, Y., Gan, Y., & Cham, H. (2007). Perfectionism, academic burnout and engagement among Chinese college students: A structural equation modeling analysis. *Personality and Individual Differences, 43*, 1529–1540.

Table 1

Demographic Variables by Academic Burnout and Academic Engagement Status

Variable	Burnout		Engagement		Total
	Low (n=80)	High (n=73)	Low (n=77)	High (n=76)	N =153
	n (%)	n (%)	n (%)	n (%)	n (%)
Gender					
Male	9 (11.3%)	9 (12.3%)	8 (10.4%)	10 (13.2%)	18 (11.8%)
Female	69 (86.3%)	58 (79.5%)	64 (83.1%)	63 (82.9%)	127 (83.0%)
Other	2 (2.5%)	6 (8.2%)	5 (6.45%)	3 (3.9%)	8 (5.2 %)
Student Classification					
College	42 (52.5%)	46 (63.0%)	48 (62.3%)	40 (52.6%)	88 (57.5%)
Freshman	10 (8.0%)	8 (11.0%)	6 (7.8%)	12 (15.8%)	18 (11.8%)
Sophomore	6 (7.5%)	9 (12.3%)	9 (11.7%)	6 (7.9%)	15 (9.8%)
Junior	10 (8.0%)	8 (11.0%)	10 (13.0%)	8 (10.5%)	18 (11.8%)
Senior	16 (20.0%)	21 (28.8%)	23 (29.9%)	14 (18.4%)	37 (24.2%)
Graduate Student	38 (47.5%)	27 (37.0%)	29 (37.7%)	36 (47.4%)	65 (42.5%)
Year 1	23 (28.8%)	17 (23.3%)	19 (24.7%)	21 (27.6%)	40 (26.1%)
Year 3 & 4	13 (16.3%)	8 (11.0%)	9 (11.7%)	12 (15.8%)	21 (13.7%)
Year 5 -7	2 (2.5%)	2 (2.7%)	1 (1.3%)	3 (3.9%)	4 (2.6%)
Time Commitment					
Full-time	72 (90.0%)	65 (89.0%)	66 (85.7%)	71 (93.4%)	137 (89.5%)
Part-time	8 (10.0%)	8 (11.0%)	11 (14.3%)	5 (6.6%)	16 (10.5%)
Attendance Style*					
Online	12 (15.0%)	10 (13.7%)	13 (16.9%)	9 (11.8%)	22 (18.0%)
On-Campus	50 (62.5%)	50 (68.5%)	50 (64.9%)	50 (65.8%)	100 (82.0%)
GPA					
3.5 – 4.0	59 (73.8%)	45 (61.6%)	49 (63.6%)	55 (72.4%)	104 (68.0%)
2.5 – 3.4	11 (13.8%)	20 (27.4%)	20 (26.0%)	11 (14.5%)	31 (20.3%)
0.0 – 2.4	1 (1.3%)	1 (1.4%)	2 (2.6%)	0 (0.0%)	2 (1.3%)
No college GPA	9 (11.3%)	7 (9.6%)	6 (7.8%)	10 (13.2%)	16 (10.5%)
Hispanic or Latino					
Yes	7 (8.8%)	14 (19.2%)	11(14.3%)	10 (13.2%)	21 (13.7%)
No	73 (91.3%)	59 (80.8%)	66 (85.7%)	66 (86.8%)	132 (86.3%)
Race					
American Indian or Alaskan Native	1 (1.3%)	0 (0.0%)	1 (1.3%)	0 (0.0%)	1 (0.7%)
Asian	7 (8.8%)	6 (8.2%)	4 (5.2.%)	9 (11.8%)	13 (8.5%)
Black/African American	3 (3.8%)	5 (6.8%)	3 (3.9%)	5 (6.6%)	8 (5.2%)
White	66 (82.5%)	55 (75.3%)	62 (80.5%)	59 (77.6%)	121 (79.1%)
Multi-race	2 (2.5%)	5 (6.8%)	4 (5.2%)	3 (3.9%)	7 (4.6%)
No response	1 (1.3%)	2 (2.7%)	3 (3.9%)	0 (0.0%)	3 (2.0%)

Note. Only 122 responded to the Attendance Style item. GPA = grade point Average

Table 2

Descriptive Statistics for Academic Burnout, Academic Engagement, Health Risk Behaviors, Self-rated Health and Substance Use Measures

Variable	N	Min	Max	M	SD	Variance	Skewness	Kurtosis
Burnout	153	0.00	70.00	37.54	15.03	226.03	0.02	-0.45
EX	153	0.00	30.00	17.69	6.99	48.89	-0.43	-0.47
CYN	153	0.00	24.00	8.90	6.44	41.59	0.55	-0.65
EF	153	9.00	36.00	25.05	5.27	27.78	-0.34	0.25
Engagement	153	8.00	79.00	38.38	15.61	243.66	0.38	-0.21
VI	153	0.00	30.00	10.60	6.47	41.89	0.60	0.23
DE	153	5.00	30.00	18.50	5.89	34.66	-0.19	-0.79
AB	153	0.00	24.00	9.27	5.50	30.28	0.22	-0.53
Overall Health Risk	152	25.39	60.88	41.98	6.92	47.98	0.15	-0.89
Safety Risk	152	1.00	16.00	6.07	4.10	16.78	0.42	-0.89
Substance Use	153	20.00	71.00	36.31	11.70	137.01	0.58	-0.27
Tobacco Use	153	5.00	22.00	6.91	3.41	11.65	2.49	6.10
Cigarette Use	153	1.00	13.00	1.76	1.99	3.97	4.36	20.11
Vape Use	153	1.00	8.00	1.73	1.50	2.25	3.01	9.50
Other Tobacco Use	153	2.00	8.00	2.10	0.71	0.50	7.83	62.90
Alcohol Use	153	2.00	18.00	5.84	3.93	15.41	0.59	-0.26
Caffeine Use	153	3.00	21.00	10.35	5.32	28.31	0.84	-0.30
Marijuana Use	153	3.00	14.00	5.56	3.52	12.37	1.23	0.10
Physical Activity	153	2.00	12.00	5.89	2.65	7.05	0.44	-0.67
Sleep	153	1.00	5.00	3.91	0.90	0.81	-0.76	0.26
Mental Health	153	1.00	5.00	3.36	0.83	0.69	-0.27	0.24
SRH	153	4.00	16.00	8.74	2.50	6.25	0.40	-0.02
General Health	153	1.00	4.00	2.44	0.79	0.63	0.07	-0.41
Health in Comparison to Peers	153	1.00	3.00	2.05	0.69	0.48	-0.06	-0.89
Academic Stress	153	21.00	82.00	48.13	12.34	152.21	0.07	-0.36
Stress Related to Academic Expectations	153	4.00	20.00	8.96	3.44	11.85	0.69	0.30
Stress Related to Work and Examinations	153	10.00	26.00	23.06	5.93	35.21	-0.18	-0.49
Stress Related to Academic Self-Perceptions	153	6.00	28.00	16.11	5.36	28.77	0.07	-0.84

Table 3

Means, Standard Deviations, and Multivariate Analyses of Variance of Academic Burnout and Health Risk Behaviors

Health Risk Behaviors	Burnout					
	Low (n = 80)		High (n = 73)			
	M	SD	M	SD	F (1, 150)	η^2
Safety Risk	6.39	3.99	5.71	4.20	1.05	.01
Substance Use	36.67	12.19	35.30	22.74	0.16	.00
Tobacco Use	6.51	2.38	6.44	2.59	0.03	.00
Alcohol Use	6.00	4.03	5.70	3.87	0.22	.00
Caffeine Use	9.87	4.88	10.49	5.62	0.53	.00
Marijuana Use	5.17	3.08	5.52	3.63	0.39	.00
Physical Activity	6.18	2.97	5.59	2.27	1.86	.01
Mental Health	3.10	0.83	3.64	0.75	17.84***	.11

*** $p < .001$

Table 4

Factorial ANOVA Results of the Effects of Exhaustion (EX), Cynicism (CYN), and Professional Efficacy (EF) on Overall Behavioral Health Risk

Source	SS	df	MS	F
Between	179619.99	7		
EX	4.78	1	4.78	0.10
CYN	122.08	1	122.08	2.53
EF	3.80	1	3.80	0.08
EX * CYN	20.11	1	20.11	0.42
EX * EF	52.16	1	52.16	1.08
CYN * EF	28.54	1	28.54	0.59
EX * CYN * EF	45.57	1	45.57	0.95
Within	6940.53	144	48.20	
Total	275095.91	151		

Table 5

Factorial ANOVA Results of the Effects of Exhaustion (EX), Cynicism (CYN), and Professional Efficacy (EF)on Self-Rated Health (SRH)

Source	SS	df	MS	F
Between	8755.47	1		
EX	30.61	1	30.61	5.45*
CYN	1.28	1	1.28	0.23
EF	2.65	1	2.65	0.47
EX * CYN	0.29	1	0.29	0.05
EX * EF	2.10	1	2.10	0.37
CYN * EF	3.02	1	3.02	0.54
EX * CYN * EF	15.43	1	15.43	2.75
Within	815.14	145	5.62	
Total	949.54	152		

* $p < .05$

Table 6

Factorial ANOVA Results of the Effects of Exhaustion (EX), Cynicism (CYN), and Professional Efficacy (EF) on Academic Stress

Source	SS	df	MS	F
Between	236423.94	1		
EX	1426.34	1	1426.34	13.67***
CYN	1067.81	1	1067.81	10.23**
EF	635.47	1	635.47	6.09*
EX * CYN	90.82	1	90.82	0.87
EX * EF	32.57	1	32.57	0.31
CYN * EF	93.69	1	93.69	0.90
EX * CYN * EF	3.88	1	3.88	0.04
Within	15133.52	145	104.37	
Total	3777570.00	153		

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 7

Means, Standard Deviations, and Multivariate Analyses of Variance of Academic Engagement and Health Risk Behaviors

Health Risk Behaviors	Engagement				F (1, 150)	η^2
	Low (n= 77)		High (n = 76)			
	M	SD	M	SD		
Safety Risk	6.12	0.47	6.01	0.47	0.03	.00
Substance Use	35.00	1.34	37.61	1.34	1.88	.01
Tobacco Use	6.13	2.19	6.82	2.71	2.89	.02
Alcohol Use	5.84	3.93	5.85	3.94	0.00	.00
Caffeine Use	9.81	5.08	10.55	5.41	0.72	.01
Marijuana Use	5.17	3.41	5.52	3.32	0.39	.00
Physical Activity	5.55	0.30	6.24	0.30	2.54	.02
Mental Health	3.61	0.09	3.12	0.09	14.06***	.09

*** $p < .001$

Table 8

Factorial ANOVA Results of the Effects of Vigor (VI), Dedication (DE), and Absorption (AB) on Overall Behavioral Health Risk

Source	SS	df	MS	F
Between	122367.33	1		
EX	0.68	1	0.68	0.01
CYN	0.53	1	0.53	0.01
EF	19.69	1	19.69	0.40
EX * CYN	83.01	1	83.01	1.68
EX * EF	26.71	1	26.71	0.54
CYN * EF	39.59	1	39.59	0.80
EX * CYN * EF	0.90	1	0.01	0.02
Within	7127.84	144	49.50	
Total	275095.91	152		

Table 9

Factorial ANOVA Results of the Effects of Vigor (VI), Dedication (DE), and Absorption (AB) on Self-Rated Health

Source	SS	df	MS	F
Between	5149.53	1		
VI	13.25	1	13.25	0.15
DE	8.95	1	8.95	0.23
AB	0.91	1	0.91	0.70
VI * DE	1.46	1	1.46	0.63
VI * AB	0.07	1	0.07	0.92
DE * AB	0.02	1	0.02	0.96
VI * DE * AB	0.34	1	0.34	0.82
Within	892.92	144	6.20	
Total	12552.00	152		

Table 10

Factorial ANOVA Results of the Effects of Vigor (VI), Dedication (DE), and Absorption (AB) on Academic Stress

Source	SS	df	MS	F
Between	162095.30	1		
VI	233.87	1	233.87	1.76
DE	465.15	1	465.15	3.49
AB	36.32	1	36.32	0.27
VI * DE	229.28	1	229.28	1.72
VI * AB	36.73	1	36.73	0.28
DE * AB	32.38	1	32.38	0.24
VI * DE * AB	46.64	1	46.64	0.35
Within	19305.45	145	133.14	
Total	377570.00	153		

Appendix A: Letter of Information and Informed Consent

Primary Investigator:
Madeline Trahan, M.S.
Department of Psychology, Florida Institute of Technology
(E): mtrahan2018@my.fit.edu
Co-Investigator:
Vida L. Tyc, PhD.
Department of Psychology, Florida Institute of Technology

Purpose of the Study

The purpose of this study is to learn more about health-risk behaviors, academic burnout, academic engagement, and academic stress in American college students. We will ask about your feelings related to school, as well as for information about your health. This information will help us to better understand the connections between academic factors and health.

Eligibility

In order to participate, you must be 18 years of age or older, be able to read and write English fluently, and be currently enrolled in and attending higher education in the United States.

Procedures of the Study

If you are eligible, you will be asked to complete a survey online. The survey will consist of questions that ask about your demographics, feelings related to school, your impression of your health, and your practice of health-related behaviors, including motor vehicle safety behaviors, substance use, sleep, physical activity, and mental health. You will be able to adjust any of your responses by pressing the "Back" button to return to previously completed pages. We estimate that the questionnaire will take approximately 20-30 minutes to complete.

Compensation

You will be given the choice of providing your email address at the end of the survey to be entered into a drawing to win one of two $50 gift cards. Students completing this survey through SONA may also be eligible for credits at the discretion of their professors. In order to receive credit for participating, students must click through the entire survey before closing their browser.

Potential Risks and Benefits

The risks of participating in this study are minimal and unlikely. However, you will be asked questions about your health behaviors as well as your feelings related to academics which you may find stressful. You may choose to not respond to any question that makes you uncomfortable and are free to discontinue your participation at any point during the study. While it is unlikely, there is also a risk of loss of privacy. We will keep your study

records private and confidential, and all data will be de-identified and kept in a database to which only researchers have access. There will be no direct benefits to you by taking part in this study. However, the information obtained from this study may be used to help students in the future.

Discontinuation of the Study
Participation in this study is **voluntary**. You are under no obligation to participate in this study, and you are free to discontinue the study at any time without consequences to you. There is no penalty for not participating. You may refuse to answer any questions that we ask you. If you decide to withdraw from the study, the information provided by you will not be retained.

Confidentiality
Your responses will be kept confidential. No identifying information will be collected during the course of this survey. All data collected will be entered into a HIPAA-compliant database and stored on a password-protected server located in the Department of Psychology at Florida Institute of Technology. Only authorized researchers will have access to this information.

Questions?
Any questions about study participation may be directed to Madeline Trahan (Principle Investigator) at mtrahan2018@my.fit.edu.

This study has been reviewed and approved by the Institutional Review Board. If you have any ethical questions or concerns about the study, these may be directed to:

Dr. Jignya Patel, Chair for the Institutional Review Board
Institutional Review Board Office, School of Psychology
150 W University Blvd
Melbourne, Florida, 32901
(P): 321-674-8104
(E): jpatel@fit.edu

Consent
In order to keep your information confidential, your name or signature is not required. Please indicate your choice below. Should you choose to participate, you will be directed automatically to the survey.

- o I have read the information presented above about a study being conducted by Madeline Trahan (Principle Investigator) of the School of Psychology at Florida Institute of Technology. I am 18 years or older, and I understand that I may withdraw from the study at any time. I agree to participate in this study.

- o I have read the information presented about this study and I do not wish to participate in this study.

Appendix B: Study Survey

DEMOGRAPHICS – YOUTH RISK BEHAVIORS SURVEY (YRBSS) (modified)

1. How old are you?
   Participant will indicate age in text box. If less than 18, survey will conclude.

2. What is your sex?
   A. Female
   B. Male
   C. Prefer not to answer

3. In what student classification are you?
   A. Freshman
   B. Sophomore
   C. Junior
   D. Senior
   E. Graduate Student Year 1
   F. Graduate Student Year 2
   G. Graduate Student Year 3
   H. Graduate Student Year 4
   I. Graduate Student Year 5
   J. Graduate Student Year 6
   K. Graduate Student Year 7

4. Are you a full-time or part-time student?
   A. Fulltime
   B. Parttime

5. Are you an online or on-campus student? (If your university is currently online only or hybrid due to the COVID-19 pandemic but you would otherwise be an on-campus student, please indicate "on-campus".)
   A. Online
   B. On-campus

6. What is your overall grade point average (GPA)?
   A. 3.5 – 4.0
   B. 2.5 – 3.4
   C. 1.5 – 2.4
   D. 0.5 – 1.4
   E. 0.0 – 0.4
   F. No college GPA (first semester student)

7. Are you Hispanic or Latino?
   A. Yes
   B. No

8. What is your race? (Select one or more responses.)
    A. American Indian or Alaska Native
    B. Asian
    C. Black or African American
    D. Native Hawaiian or Other Pacific Islander
    E. White

MASLACH BURNOUT INVENTORY–STUDENT SURVEY *(Item order will be randomized)*
7-point frequency rating scale ranging from 0 (*never*) to 6 (*always*)

Exhaustion
1. I feel emotionally drained by my studies.
2. I feel spent (used up) at the end of a day at the university/school.
3. I feel tired when I get up in the morning and I have to face another day at the university/school.
4. Studying or attending a class is really a strain for me.
5. I feel burned out from my studies.

Cynicism
1. I have become less interested in my studies since my enrollment in college (at the university). 2. I have become less enthusiastic about my studies.
3. I have become more cynical about the potential usefulness of my studies.
4. I doubt the significance of my studies.

Professional Efficacy
1. I can effectively solve the problems that arise in my studies.
2. I believe that I make an effective contribution to the classes that I attend.
3. In my opinion, I am a good student.
4. I feel stimulated when I achieve my study goals.
5. I have learned many interesting things during the course of my studies.
6. During class, I feel confident that I am effective in getting things done.

UTRECHT WORK ENGAGEMENT SCALE FOR STUDENTS (UWES-S) *(Item order will be randomized)*
7-point frequency rating scale ranging from 0 (*never*) to 6 (*always*)

Vigor
1. When I'm studying, I feel mentally strong.
2. I can continue for a very long time when I am studying.
3. When I study, I feel like I am bursting with energy.
4. When studying I feel strong and vigorous.
5. When I get up in the morning, I feel like going to class.

Dedication
1. I find my studies to be full of meaning and purpose.

2. My studies inspire me.
3. I am enthusiastic about my studies.
4. I am proud of my studies.
5. I find my studies challenging.

Absorption
1. Time flies when I'm studying.
2. When I am studying, I forget everything else around me.
3. I feel happy when I am studying intensively.
4. I can get carried away by my studies.

SAFETY – YRBSS

1. How often do you wear a seat belt when **riding** in a car driven by someone else?
   A. Never
   B. Rarely
   C. Sometimes
   D. Most of the time
   E. Always

2. During the past 30 days, how many times did you **ride** in a car or other vehicle **driven by someone who had been drinking alcohol**?
   A. 0 times
   B. 1 time
   C. 2 or 3 times
   D. 4 or 5 times
   E. 6 or more times

3. During the past 30 days, how many times did you **drive** a car or other vehicle **when you had been drinking alcohol**?
   A. I did not drive a car or other vehicle during the past 30 days
   B. 0 times
   C. 1 time
   D. 2 or 3 times
   E. 4 or 5 times
   F. 6 or more times

If participant selects response A, he/she will be directed **TOBACCO, ALCOHOL, & SUBSTANCE USAGE – YRBSS (modified)**

4. During the past 30 days, on how many days did you **text or e-mail** while **driving** a car or other vehicle?
   A. 0 days
   B. 1 or 2 days
   C. 3 to 5 days
   D. 6 to 9 days
   E. 10 to 19 days

F. 20 to 29 days
G. All 30 days

5. During the past 30 days, on how many days did you **speed** (at least 5 miles per hour over the speed limit) while **driving** a car or other vehicle?
A. 0 days
B. 1 or 2 days
C. 3 to 5 days
D. 6 to 9 days
E. 10 to 19 days
F. 20 to 29 days
G. All 30 days

TOBACCO, ALCOHOL, & SUBSTANCE USAGE – YRBSS (modified)

The next 3 questions ask about cigarette smoking.

1. Have you ever tried cigarette smoking, even one or two puffs?
A. Yes
B. No

If participant selects response B, he/she will be directed to Question 4.

2. During the past 30 days, on how many days did you smoke cigarettes?
A. 0 days
B. 1 or 2 days
C. 3 to 5 days
D. 6 to 9 days
E. 10 to 19 days
F. 20 to 29 days
G. All 30 days

If participant selects response A, he/she will be directed to Question 4.

3. During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?
A. Less than 1 cigarette per day
B. 1 cigarette per day
C. 2 to 5 cigarettes per day
D. 6 to 10 cigarettes per day
E. 11 to 20 cigarettes per day
F. More than 20 cigarettes per day

The next 2 questions ask about electronic vapor products, such as JUUL, SMOK, Suorin, Vuse, and blu. Electronic vapor products include e-cigarettes, vapes, vape pens, e-cigars, ehookahs, hookah pens, and mods.

4. Have you ever used an electronic vapor product?

A. Yes
B. No

If participant selects response B, he/she will be directed to Question 6.

5. During the past 30 days, on how many days did you use an electronic vapor product?
A. 0 days
B. 1 or 2 days
C. 3 to 5 days
D. 6 to 9 days
E. 10 to 19 days
F. 20 to 29 days
G. All 30 days

The next 2 questions ask about other tobacco products.

6. During the past 30 days, on how many days did you use **chewing tobacco, snuff, dip, snus, or dissolvable tobacco products**, such as Copenhagen, Grizzly, Skoal, or Camel Snus? (Do not count any electronic vapor products.)
A. 0 days
B. 1 or 2 days
C. 3 to 5 days
D. 6 to 9 days
E. 10 to 19 days
F. 20 to 29 days
G. All 30 days

7. During the past 30 days, on how many days did you smoke **cigars, cigarillos, or little cigars**?
A. 0 days
B. 1 or 2 days
C. 3 to 5 days
D. 6 to 9 days
E. 10 to 19 days
F. 20 to 29 day
G. All 30 days

The next question asks about all tobacco products. Please consider cigarettes, electronic vapor products, smokeless tobacco (chewing tobacco, snuff, dip, snus, or dissolvable tobacco products), cigars (including little cigars or cigarillos), shisha or hookah tobacco, and pipe tobacco when answering this question.

8. During the past 12 months, did you ever try to quit using all tobacco products?
A. I did not use cigarettes, electronic vapor products, smokeless tobacco, cigars, shisha or hookah tobacco, or pipe tobacco during the past 12 months
B. Yes
C. No

The next 3 questions ask about drinking alcohol. This includes drinking beer, wine, flavored alcoholic beverages, and liquor such as rum, gin, vodka, or whiskey. For these questions, drinking alcohol does not include drinking a few sips of wine for religious purposes.

9. During the past 30 days, on how many days did you have at least one drink of alcohol?
   A. 0 days
   B. 1 or 2 days
   C. 3 to 5 days
   D. 6 to 9 days
   E. 10 to 19 days
   F. 20 to 29 days
   G. All 30 days

If participant selects response A, he/she will be directed to Question 12.

10. During the past 30 days, on how many days did you have **4** or more drinks of alcohol in a row, that is, within a couple of hours (if you are **female**) or **5** or more drinks of alcohol in a row, that is, within a couple of hours (if you are **male**)?
   A. 0 days
   B. 1 day
   C. 2 days
   D. 3 to 5 days
   E. 6 to 9 days
   F. 10 to 19 days
   G. 20 or more days

11. During the past 30 days, what is the largest number of alcoholic drinks you had in a row, that is, within a couple of hours?
   A. 1 or 2 drinks
   B. 3 drinks
   C. 4 drinks
   D. 5 drinks
   E. 6 or 7 drinks
   F. 8 or 9 drinks
   G. 10 or more drinks

The next 3 questions ask about caffeine use. This includes drinking coffee, caffeinated sodas (Coke, Pepsi, Dr. Pepper, etc.), caffeinated tea (black, green, etc.), and energy drinks/shots (Monster, 5-hour Energy, Rockstar, etc.). Please use this table (Mayo Clinic Staff, 2020) for reference on amount of caffeine in various beverages:

	Size in oz (ml)	Caffeine (mg)
Coffee drinks		
Brewed	8 (237)	96

Brewed, decaf	8 (237)	2
Espresso	1 (30)	64
Espresso, decaf	1 (30)	0
Instant	8 (237)	62
Instant, decaf	8 (237)	2
Teas		
Brewed black	8 (237)	47
Brewed black, decaf	8 (237)	2
Brewed green	8 (237)	28
Ready-to-drink, bottled	8 (237)	19
Soda		
Citrus (most brands)	8 (237)	0
Cola	8 (237)	22
Root beer (most brands)	8 (237)	0
Energy drinks		
Energy drink	8 (237)	29
Energy shot	1 (30)	215

12. During the past 30 days, on how many days did you have at least one drink of caffeine?

A. 0 days
B. 1 or 2 days
C. 3 to 5 days
D. 6 to 9 days
E. 10 to 19 days
F. 20 to 29 days
G. All 30 days

If participant selects response A, he/she will be directed to Question 15.

13. During the past 30 days, on how many days did you have at least **400 mg** of caffeine in one day?

A. 0 days
B. 1 day
C. 2 days
D. 3 to 5 days
E. 6 to 9 days
F. 10 to 19 days
G. 20 or more days

14. During the past 30 days, what is the largest amount of caffeine you had in one day?

A. 0 – 100 mg
B. 200 – 300 mg
C. 300 – 400 mg
D. 400 – 500 mg
E. 500 – 600 mg

F. 600 – 700 mg
G. 700 or more mg

The next 2 questions ask about marijuana use. Marijuana also is called pot or weed. For these questions, do not count CBD-only or hemp products, which come from the same plant as marijuana, but do not cause a high when used alone.

15. During your life, how many times have you used marijuana?
A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 to 99 times
G. 100 or more times

If participant selects response A, he/she will be directed to Question 17.

16. During the past 30 days, how many times did you use marijuana?
A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

The next question asks about synthetic marijuana use. Synthetic marijuana also is called Spice, fake weed, K2, or Black Mamba.

17. During your life, how many times have you used synthetic marijuana?
A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

The next question asks about the use of prescription pain medicine without a doctor's prescription or differently than how a doctor told you to use it. For this question, count substances such as codeine, Vicodin, OxyContin, Hydrocodone, and Percocet.

18. During your life, how many times have you taken prescription pain medicine without a doctor's prescription or differently than how a doctor told you to use it?
A. 0 times
B. 1 or 2 times
C. 3 to 9 times

D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

The next 6 questions ask about other substances.

19. During your life, how many times have you used **any** form of cocaine, including powder, crack, or freebase?
A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

20. During your life, how many times have you sniffed glue, breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high?
A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

21. During your life, how many times have you used **heroin** (also called smack, junk, or China White)?
A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

22. During your life, how many times have you used **methamphetamines** (also called speed, crystal meth, crank, ice, or meth)?
A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

23. During your life, how many times have you used **ecstasy** (also called MDMA or Molly)?
A. 0 times
B. 1 or 2 times

C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

24. During your life, how many times have you used a needle to inject any **illegal** substance into your body?
A. 0 times
B. 1 time
C. 2 or more times

OTHER HEALTH-RELATED QUESTIONS – YRBSS

1. During the past 7 days, on how many days were you physically active for a total of **at least 60 minutes per day**? (Add up all the time you spent in any kind of physical activity that increased your heart rate and made you breathe hard some of the time.)
A. 0 days
B. 1 day
C. 2 days
D. 3 days
E. 4 days
F. 5 days
G. 6 days
H. 7 days

2. On an average school day, how many hours do you spend in front of a TV, computer, smart phone, or other electronic device watching shows or videos, playing games, accessing the Internet, or using social media (also called "screen time")? (Do not count time spent doing schoolwork.)
A. Less than 1 hour per day
B. 1 hour per day
C. 2 hours per day
D. 3 hours per day
E. 4 hours per day
F. 5 or more hours per day

3. On an average school night, how many hours of sleep do you get?
A. 4 or less hours
B. 5 hours
C. 6 hours
D. 7 hours
E. 8 hours
F. 9 hours
G. 10 or more hours

4. During the past 30 days, how often was your mental health not good? (Poor mental health includes stress, anxiety, and depression.)

A. Never
B. Rarely
C. Sometimes
D. Most of the time
E. Always

GENERAL HEALTH

1. How would you rate your general health status?

A. Very good
B. Good
C. Fair
D. Bad
E. Very Bad

2. Compared to other students my age, I would rate my general health status as:

A. More healthy
B. As healthy
C. Less healthy

3. My overall health prevents me from doing my usual activities (self-care, recreation, work, etc.)

A. All of the time
B. Most of the time
C. Some of the time
D. Never

4. My current health practices will lead to serious health problems in the future.

A. Strongly Disagree
B. Disagree
C. Neutral
D. Agree
E. Strongly Agree

PRECIEVED ACADEMIC STRESS SCALE (PAS) *(Item order will be randomized)*
Please rate your perception about the following statements in contributing to academic stresses *1=Strongly disagree to 5=Strongly agree*

1. I am confident that I will be a successful student
2. I am confident that I will be a successful in my future career
3. I can make academic decisions easily
4. The time allocated to classes and academic work is enough
5. I have enough time to relax after work

6. My teachers are critical of my academic performance
7. I fear failing courses this year
8. I think that my worry about examinations is weakness of character
9. Teachers have unrealistic expectations of me
10. The size of the curriculum (workload) is excessive
11. I believe that the amount of work assignment is too much
12. I am unable to catch up if getting behind the work
13. The unrealistic expectations of my parents stress me out
14. Competition with my peers for grades is quite intense
15. The examination questions are usually difficult
16. Examination time is short to complete the answers
17. Examination times are very stressful to me
18. Even if I pass my exams, I am worried about getting a job

$50 VISA GIFT CARD RAFFLE

Please indicate whether you would be interested in participating in the raffle for one of two $50 Visa gift cards.

- Yes, I would like to be entered into the drawing for a $50 gift card and I agree to be contacted if I win.
- No, I would not like to be entered in the drawing for a $50 gift card.

If participant selects "No…", he/she will be directed to the end of the survey.

Please provide your email address so that you may be contacted if you win the raffle for one of two $50 Visa gift cards.

Participant will indicate email address in text box.