

ABSTRACT

Exploring Adverse Outcomes and Potential Alleviators of Burnout in Athletic Training Students

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The primary purpose of this study was to determine if increased burnout scores (i.e., EE, DP, PA) predicted negative academic outcomes (i.e., low GPA, depressive symptoms, thoughts of drop out, unprofessional clinical and cheating behaviors) in athletic training students. A theoretical model predicting the relationships between academic variables (e.g., study time), burnout scores, and adverse outcomes in dental students proposed by Atalayin et al. (2015) was adapted for use in this study. The secondary purpose of this study was to determine if physical wellness behaviors (i.e., diet quality, physical activity) and coping mechanisms related to burnout scores in a sample of athletic training students. This relationship was hypothesized based on previous literature identifying relationships between coping mechanisms and burnout scores in other samples of healthcare professionals and student samples (Cumbe et al., 2017; Guo et al., 2018; Naugle et al., 2013; Palupi & Findyartini et al., 2019). We also sought to determine if coping mechanisms and physical wellness behaviors mediate the relationship between stress and burnout in our sample of athletic training students based on findings

identified in other samples of students and healthcare providers (Raedeke & Smith, 2004; Wallace et al., 2010). Path analysis and structural equation modeling were utilized to identify if our adapted model successfully described the relationships between academic variables, burnout scores, and adverse outcomes in our sample of athletic training students. Our model successfully identified that increased study time predicted increased burnout scores in our sample of athletic training students. Additionally, increased burnout scores predicted one or more adverse outcomes of burnout in our sample. Pearson correlation coefficients identified relationships between stress, burnout, physical wellness behaviors, and coping mechanisms. Adaptive coping mechanisms and diet quality were related to reductions in burnout scores on one or more burnout subscales. Furthermore, we identified that diet quality and maladaptive coping mechanisms mediated the relationship between stress and burnout scores on one or more subscales.

Exploring Adverse Outcomes and Potential Alleviators of Burnout in Athletic Training Students

by

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A Dissertation

Approved by the Department of Health, Human Performance, and Recreation

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Submitted to the Graduate Faculty of
Baylor University in Partial Fulfillment of the
Requirements for the Degree
of
Doctor of Philosophy

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August 2021

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ACKNOWLEDGMENTS

It is difficult to put into words the amount of gratitude I have for the many individuals who have helped me on this journey. Above all, I give credit and thanks to my Lord and Savior, Jesus Christ.

To my mom, thank you for always being my biggest fan, advocate, coach, cheerleader, and best friend. You have helped me achieve the impossible – finishing and closing the chapter on my final year of education while also planning a wedding. Thank you for your unending patience with me and support while I have set out on a path to juggle as many life-altering changes as possible at once.

To my grandparents, thank you for taking the time to read through my dissertation and the extremely valuable suggestions you provided from an outside reader's perspective. Thank you for your continuous unending love and for supporting my career dreams even when the path has been daunting and lengthy.

To my fiancé, you may have joined my doctoral and dissertation journey late in the game, but I cannot express how grateful I am to have found a man who loves me, supports my goals, and has pushed me to finish strong since we first met. I am excited to close this chapter and move into this next phase of life with you.

To my mentor, Dr. Andrew Gallucci, thank you for your assistance throughout this entire doctoral process and for always pushing me to be a better researcher, writer, teacher, and clinician. There are not many opportunities that allow one to gain experience in all those areas at once. While juggling all of those responsibilities at once became overwhelming at times, your support and insight greatly impacted where I am today.

Many thanks to my dissertation committee, Drs. Leslie Oglesby, LesLee Funderburk, Sara Tomek, and Beth Lanning. The role that each one of you has played in the culmination of this project is invaluable. Whether it has been through taking one of your courses or one-on-one meetings, each of these encounters helped me tremendously to bring this project to fruition.

Finally, to the Department of Health, Human Performance, and Recreation at Baylor University, thank you for funding my dissertation and making this research possible.

DEDICATION

To my mom: The woman who has taught that anything is possible when we trust in Jesus Christ. We achieved degree three!

CHAPTER ONE

Introduction

Background

Burnout is a three-dimensional psychological syndrome that includes sensations of emotional exhaustion (EE), depersonalization (DP) from clients or patients, and a lack of personal accomplishment (PA) in response to stressful experiences both in and outside the workplace (Maslach, 1982). Burnout is widely accepted as a consequence of chronic stress (Cordes & Dougherty, 1993; Maslach et al., 1993). Freudenberg (1974) provided one of the first reports of burnout describing feelings of exhaustion, fatigue, irritability, and frustration. The 10th revision of the World Health Organization's International Statistical Classification of Diseases and Related Health Problems (ICD) classifies burnout as an "occupational phenomenon" (World Health Organization, 2019).

Burnout and Adverse Outcomes

Initial reports of burnout scores (i.e., EE, DP, PA) were limited to people-oriented occupations, which are historically referred to as human service professions (Maslach & Schaufeli, 1993). Various authors have reported burnout scores in numerous human service professionals, including social workers (Hussein, 2018) and teachers (Kokkinos, 2007). To date, the Maslach Burnout Inventory - Human Services Survey (MBI-HSS) is the most widely used quantitative measurement of burnout in human service professionals (Heinemann & Heinemann, 2017). Several adaptations to the original scale exist to measure burnout in various populations, including the MBI-HSS for medical

professionals, the MBI Educators Survey (MBI-ES), the MBI General Survey (MBI-GS), and the MBI Student Survey (MBI-SS) (Maslach et al., 1996). The creators of the MBI-HSS report normative means for each subscale of burnout (i.e., EE, DP, PA) and have established cut-off scores for each dimension that represent high levels of burnout (MBI-HSS) (Maslach & Jackson, 1996). For example, a score of 27 or higher on the EE subscale, 10 or higher score on the DP subscale, or a score of 33 or lower on the PA subscale on the MBI-HSS indicates high levels of burnout (Maslach & Jackson, 1996). Increased burnout scores have resulted in adverse outcomes in working professionals, including employee absenteeism, job turnover, and diminished job performance (Swider, 2010).

Burnout and Adverse Outcomes in Healthcare Professionals

Healthcare professionals are susceptible to burnout due to the "dedicated and committed" work they perform to care for patients (Freudenberger, 1974). For example, burnout scores have been documented in samples of physicians (Shanafelt et al., 2012), nurses (Aiken et al., 2001), physician assistants (Benson et al., 2016), dentists (Singh et al., 2016), and dental hygienists (Jeon et al., 2017). Authors of one study of physicians identified that 37.9% of the sample reported high burnout scores on the EE subscale, 29.4% on the DP subscale, and 12.4% on the PA subscale of the MBI-HSS (Shanafelt et al., 2009). Similarly, Aiken et al. (2001) identified that 43% of nurses reported high burnout scores on at least one burnout dimension. Burnout appears to have adverse consequences in the workplace. To date, researchers have described several adverse outcomes in healthcare professionals relating to increased burnout scores (i.e., leaving the profession, increased medical errors, reduced patient safety scores) (Aiken et al., 2001;

Kang et al., 2013; Kiymaz & Koç, 2018; Moloney et al., 2018; Garcia et al., 2015; Shanafelt et al., 2010; Tawfik et al., 2018; Welp et al., 2015).

Burnout and Adverse Outcomes in Athletic Trainers

Athletic trainers (ATs) are a subset of healthcare providers that are also susceptible to burnout (Clapper & Harris, 2008; Goodman et al., 2010; Hendrix et al., 2000; Judd & Perkins, 2004; Kania et al., 2009; Mazerolle et al., 2006, 2008; Oglesby et al., 2020a; Pitney et al., 2002; Walter et al., 2009). A majority of research in ATs to date has examined those who work full-time within the collegiate setting (Goodman et al., 2010; Hendrix et al., 2000; Henning & Weidner, 2008; Kania et al., 2009; Mazerolle et al., 2008; Mazerolle & Bruening, 2006; Oglesby et al., 2020b). However, researchers have also documented the onset of burnout in ATs who work as part-time certified graduate assistants (Bowman et al., 2015; Mazerolle et al., 2012; Reed & Giacobbi, 2004) and as faculty members (Judd & Perkins, 2004; Walter et al., 2009). Reports of burnout among ATs working in other employment settings (e.g., secondary schools, industrial environments, performing arts) is limited to date.

Within a recent sample of collegiate ATs, mean scores on the MBI-HSS were reported including 23.7 ($SD = 11.9$) on the EE subscale, 7.7 ($SD = 5.9$) on the DP subscale, and 38.9 ($SD = 6.3$) on the PA subscale (Oglesby et al., 2020b). Within this sample, 38.9% met cut-off scores for high levels of burnout on the EE subscale, 33% for the DP subscale, and 17.7% for the PA subscale. The potential adverse outcomes of burnout in ATs remain relatively unknown. However, attrition is thought to result from burnout in ATs (Oglesby et al., 2020a). Many factors that appear to contribute to burnout (e.g., lack of job satisfaction, work hours) in ATs have been documented as reasons why

ATs decide to leave the profession (Capel, 1990). Additionally, health-related issues (i.e., headache, high blood pressure, weight issues, fatigue, sleeplessness) have also been reported (Campbell, 1985).

Burnout and Adverse Outcomes in Healthcare Students

Research suggests that burnout is experienced as early as during the academic years before becoming a full-time healthcare professional (Brazeau et al., 2010; Deeb et al., 2018; Johnson et al., 2020a). Researchers have reported burnout scores in numerous samples of healthcare students, including medical students (Brazeau et al., 2010), physician assistants (Johnson et al., 2020a), and dental hygiene students (Deeb et al., 2018). For example, Johnson et al. (2020a) identified that 79.69% of physician assistant students in their sample reported high burnout scores on the MBI student survey (MBI-SS). Within a sample of dental hygiene students, Deeb and colleagues (2018) reported that 22% of their sample had high levels of burnout on the EE subscale, 22% on the DP subscale, and 25% on the PA subscale of the MBI-HSS (Deeb et al., 2018). Increased burnout scores on one or more dimensions have been related to adverse outcomes in students enrolled in healthcare education programs (i.e., reduced physical health, thoughts of drop out, the onset of depressive symptoms, decreased academic achievement, cheating, and dishonest clinical behaviors) (Atalayin et al., 2015; Dyrbye et al., 2010a; Dyrbye et al., 2010b; Puranitee et al., 2019). For example, the authors of one study identified increased odds of cheating behaviors among medical students who reported high levels of burnout (OR = 1.65, 95% CI = 1.35, 2.01) (Dyrbye et al., 2010a). This study also reported that medical students were more likely to engage in one or more unprofessional clinical behaviors (e.g., falsifying patient documentation, lying to a

preceptor) when burnout scores were high. While multiple authors have identified that increased burnout scores result in adverse outcomes in samples of healthcare students (Dyrbye et al., 2010a; Dyrbye et al., 2010b, Puranitee et al., 2019), only one study has proposed and tested a theoretical model explaining the predictive relationship between academic workload, burnout scores, and potential adverse outcomes (i.e., decreased academic achievement, major change intentions) (Atalayin et al., 2015). Within the study by Atalayin and colleagues (2015), the hypothesized model was found to successfully predict the relationships between academic study time, increased burnout scores, and adverse outcomes (Atalayin et al., 2015). However, to our knowledge, this model has not been tested in other samples of healthcare students.

Burnout and Adverse Outcomes in Athletic Training Students

Athletic training students also suffer from burnout (Bryant et al., 2019; Riter et al., 2008; Vineyard et al., 2021). Riter and colleagues (2008) published the first quantitative report of burnout in a sample of undergraduate athletic training students enrolled in professional programs accredited by the Commission on Accreditation of Athletic Training Education programs (CAATE). This sample had a mean burnout score of 17.0 on the EE subscale, a mean score of 13.3 on the DP subscale, and a mean score of 38.0 on the PA subscale (Riter et al., 2008). In 2019, Bryant and colleagues (2019) provided an updated report of burnout scores in a sample of athletic training students enrolled in professional programs at the graduate level. Within this sample, a mean EE score of 20.0 with scores ranging from 9 to 33, a mean DP score of 12.0 with a range from 4 to 22, and a mean PA score of 32.0 with a range of 19-34 (Bryant et al., 2019) were identified. In a more recent study, Vineyard et al. (2021) identified that 70.8% of

undergraduate students and 62.9% of graduate students reported high EE scores. Additionally, 100% of both undergraduate and graduate student samples identified high DP levels (Vineyard et al., 2021). To our knowledge, no studies have utilized a theoretical framework to test relationships between burnout scores and potential adverse outcomes.

Factors that Contribute to Burnout

Variables that have been found to contribute to increased burnout scores have been historically categorized as organizational or personal factors (Maslach & Schaufeli, 1993). Organizational factors refer to work-related variables that contribute to an individual's work environment that are not within their control (e.g., supervisor support, workload) (Maslach & Schaufeli, 1993). Personal factors are variables relating to an individual's personal life, including demographics (e.g., age, sex), physical and mental health status (e.g., illness, depression), personality traits (e.g., neuroticism, hardiness), and personal beliefs (Maslach & Schaufeli, 1993). Poor physical wellness behaviors are personal factors that appear to contribute to increased burnout scores in healthcare professionals (Boland et al., 2019; Goldberg et al., 1996; Guo et al., 2018). Physical wellness behaviors are defined as active and continuous efforts to maintain optimum physical activity levels, healthy dietary habits, and maintaining a healthy lifestyle (Roscoe, 2009). An individual's use of medical services, preventative health behaviors (e.g., exercise, dietary habits), and abstaining from drugs and alcohol are considered physical wellness behaviors (Roscoe, 2009). Additionally, coping mechanisms have been found to contribute to fluctuations in burnout scores in both students and professionals (Raedeke & Smith, 2004, Wallace et al., 2010). Lazarus and Folkman (1984) define

coping as constantly changing cognitive and behavioral efforts to manage specific external and internal demands appraised to tax or exceed a person's resources. Coping mechanisms can be classified as adaptive or maladaptive (Carver, 1997). Adaptive coping mechanisms include active coping, planning, positive reframing, acceptance, humor, religion, using emotional support, and instrumental support (Carver et al., 1989; Carver, 1997). Maladaptive coping mechanisms include self-distraction, denial, venting, negative emotion, substance use, behavioral disengagement, and self-blame (Carver, 1997). Physical wellness behaviors (i.e., diet quality, physical activity) have also been proposed as variables that influence burnout (Raedeke & Smith, 2004). Previous authors have also found that various personal factors (i.e., personality, coping mechanisms) mediate the relationship between stress and burnout scores (Kelley & Gill, 1993; Raedeke & Smith, 2001).

Factors that Contribute to Burnout in Healthcare Professionals

Organizational factors. Examples of recurrent organizational or work-related factors associated with increased burnout scores include job stress and decreased social support in the workplace (Aiken et al., 2001; Benson et al., 2016; Kang et al., 2013; Tunc & Kutanis, 2009). Multiple authors have identified job stress as a risk factor of burnout in samples of healthcare professionals, including physicians (Tunc & Kutanis, 2009), nurses (Ang et al., 2016; Van Bogaert et al., 2013), physician assistants (Benson et al., 2016), and emergency medical technicians (EMTs) (Pike et al., 2019). Decreased social support in the workplace has also been associated with increased burnout scores in samples of physician assistants (Benson et al., 2016) and dental hygienists (Jeon et al., 2017).

Personal factors. Examples of personal factors contributing to increased burnout scores in healthcare professionals include demographic variables, personality traits, and overall physical and mental health (Chui et al., 2019; Oreskovich et al., 2015; Rehder et al., 2020; Singh et al., 2018). Authors have identified that various demographic factors (i.e., age, sex, and race) account for fluctuations in burnout scores (Ang et al., 2016; Singh et al., 2016; Eden et al., 2020). While not as prevalent as demographic variables, various authors have also identified that personality traits appear to contribute to fluctuations in burnout scores (Maslach & Schaufeli, 1993). For example, neuroticism, a personality trait that includes a tendency to report mood swings or anxious thoughts, has been correlated with increased burnout scores in healthcare providers (Ang et al., 2016).

Poor physical wellness behaviors and maladaptive coping. Various authors have also identified that health professionals who report decreased physical wellness behaviors also report increased burnout scores on one or more burnout subscales (Boland et al., 2019; Goldberg et al., 1996; Guo et al., 2018). For example, Boland and colleagues (2019) identified that EMTs reporting poor diet quality had increased odds of having high burnout scores. Maladaptive coping mechanisms have also been reported in relation to increased stress and burnout scores (Mckinley et al., 2020; Rohland 2000; Wallace et al., 2010). For example, maladaptive coping mechanisms (e.g., substance use) resulted in increased burnout scores in one study of physicians (Mckinley et al., 2020). Authors of one study in a sample of counselors identified that maladaptive coping mechanisms mediated the relationship between stress and burnout scores (Wallace et al., 2010). The relationship between job stress and burnout scores partially explained how counselors coped with stressful situations (Wallace et al., 2010). Specifically, job stress was

significantly related to greater use of maladaptive coping mechanisms (i.e., self-distraction, disengagement), and, in turn, these maladaptive coping mechanisms resulted in higher burnout scores (Wallace et al., 2010).

Factors that Contribute to Burnout in Athletic Trainers

Similar to reports of burnout in other health care professionals, various organizational factors (e.g., workload, administrative support) and personal factors (e.g., social support) have been found to contribute to increased burnout scores in studies of ATs (DeFreese & Mihalik, 2016; Mazerolle et al., 2008; Naugle et al., 2013). Researchers have suggested several personal factors that have contributed to increased burnout scores in samples of ATs including sex (Naugle et al., 2013) and work-life balance issues (Mazerolle et al., 2008).

Physical wellness behaviors and maladaptive coping. Poor physical wellness behaviors also appear to contribute to increased burnout in ATs (Naugle et al., 2013). For example, the authors of one study described the relationship between ATs perceptions of wellness, burnout, and physical activity (Naugle et al., 2013). This study's findings indicated that ATs with negative perceptions of wellness and physical activity had increased burnout scores. Research pertaining to coping mechanisms employed by ATs in response to burnout is limited. To our knowledge, only one quantitative study has identified that maladaptive coping mechanisms (i.e., substance use) contribute to increased burnout scores (Oglesby et al., 2020b). Within this study, ATs reporting frequent binge drinking (i.e., a maladaptive coping strategy) demonstrated high burnout scores (Oglesby et al., 2020b). To date, no studies have explored if maladaptive coping

mechanisms mediate the relationship between stress and burnout in ATs as identified in a previous sample of healthcare providers (Wallace et al., 2010).

Factors that Contribute to Burnout in Healthcare Students

Several studies in healthcare student samples have identified personal factors that contribute to increased burnout scores (i.e., personality traits, demographic variables, physical health) (Deeb et al., 2018; Dyrbye et al., 2009; Frajerman et al., 2019; Johnson et al., 2020b; Mafla et al., 2015; Shanafelt et al., 2009; Singh et al., 2016). For example, increased reports of illness (e.g., cold, flu) (Dyrbye et al., 2009; Frajerman et al., 2019) and depressive symptoms have been related to increased burnout scores (Deeb et al., 2018; Dyrbye et al., 2008). Additionally, several academic factors have been found to contribute to increased burnout scores in samples of healthcare students, including increased time devoted to studying and increased time spent at clinical education (i.e., assisting with direct patient care) (Dyrbye et al., 2009; Singh et al., 2016). For example, medical students staying for overnight patient calls during clinical learning opportunities reported increased burnout scores (Dyrbye et al., 2009). Additionally, lack of faculty support has also been found to contribute to increased burnout scores (Dyrbye et al., 2009).

Poor wellness behaviors and maladaptive coping mechanisms. Students reporting poor physical wellness behaviors have been found to have increased burnout scores (Cecil et al., 2014; Weerasinghe et al., 2020). For example, a relationship between poor diet quality and increased burnout scores was identified in a sample of medical students ($p = .0287$) (Weerasinghe et al., 2020). Reports of maladaptive coping mechanisms have

also been related to increased burnout scores in healthcare student samples (Palupi & Findyartini, 2019). For example, one study of first-year medical students revealed a significant positive correlation with maladaptive and dysfunctional coping and increased burnout symptoms such as increased substance use (Palupi & Findyartini, 2019). Additionally, students with high levels of burnout also report increased substance use (Cecil et al., 2014). To our knowledge, no studies have identified the potential mediating relationship of maladaptive coping mechanisms between stress and burnout in healthcare students as identified in a previous sample of healthcare providers (Wallace et al., 2010).

Factors that Contribute to Burnout in Athletic Training Students

Researchers have identified that increased stress (Bryant et al., 2019; Vineyard et al., 2021), increased clinical education hours (Vineyard et al., 2021), and sex (Riter et al., 2008; Vineyard et al., 2021) contribute to increased burnout scores in samples of athletic training students. Additionally, qualitative results in one sample of athletic training students revealed that students reported time expectations, lack of personal time, and a lack of social support as contributors to burnout (Mazerolle & Pagnotta, 2011). While previous researchers have identified that maladaptive coping mechanisms and poor physical wellness behaviors contribute to increased burnout, this finding has yet to be established in athletic training students.

Alleviating Factors of Burnout

A majority of burnout literature to date has focused on the prevalence of burnout and factors that contribute to increased burnout scores. However, several authors provide recommendations for alleviating or preventing burnout in healthcare professionals (i.e.,

increasing social support, reducing workloads) (Appelbaum et al., 2019; Deckard et al., 1994; Lorenz & Guirardello, 2014; Moloney et al., 2018; Reith, 2018).

Alleviating Factors of Burnout in Healthcare Professionals

Several organizational or work-related factors have been found to contribute to decreased burnout scores among studies of healthcare professionals include reducing work hours (Benson et al., 2016), increased support from supervisors (Benson et al., 2016; Lorenz & Guirardello, 2014), and fair adjustment of salaries (Deckard et al., 1994; Orkibi, 2016; Pavlakis et al., 2010). Additionally, several studies have identified that increased social support reduces burnout scores in healthcare providers (Boland et al., 2019; Gorter, 2005; Hamama et al., 2019).

Physical wellness behaviors and adaptive coping. Reports of physical wellness behaviors have also been related to decreases in burnout scores in healthcare professionals. Several researchers have found that healthcare professionals with improved physical wellness behaviors (e.g., increased physical activity, good dietary habits, decreased substance use) had reduced burnout scores on one or more burnout subscales (Chang & Chan, 2015; Guo et al., 2018; Kotb et al., 2014; Lebensohn et al., 2013). For example, Guo and colleagues (2018) found that for every 1-point increase in reported frequency of exercise, a -.285-point reduction in burnout scores on the EE subscale was found in a sample of nurses ($p < .001$). Healthcare professionals that report adaptive coping mechanisms appear to have reduced burnout scores (Cumbe et al., 2017). For example, reports of adaptive coping mechanisms (e.g., reliance on social support) were related to reduced burnout scores in a sample of nurses (Cumbe et al., 2017).

Additionally, one study by Wallace et al. (2010) identified that adaptive coping mechanisms (i.e., humor, acceptance) mediated the relationship between stress and burnout in one sample of counselors.

Alleviating Factors of Burnout in Athletic Trainers

Potential methods to alleviate burnout in ATs include setting boundaries in the workplace and prioritizing tasks (Mazerolle, Pitney, et al., 2011). Consistent with reports in nurses and physicians (Hamama et al., 2019), increased social support from friends and family has also been found to contribute to a reduction in burnout scores in ATs (DeFreese & Mihalik, 2016; Goodman et al., 2010; Hendrix et al., 2000). Similar to other samples of healthcare professionals, physical wellness behaviors and adaptive coping mechanisms also have been found to reduce burnout scores in AT professionals (Naugle et al., 2013; Oglesby et al., 2021; Reed & Giacobbi, 2004). ATs reporting increased physical wellness behaviors also appear to have decreased burnout reports (Naugle et al., 2013). For example, the authors of one study described a significant inverse relationship between ATs perceptions of wellness and overall burnout symptoms (Naugle et al., 2013). ATs reporting adaptive coping mechanisms (i.e., planning, instrument support, religious support) (Oglesby et al., 2021; Reed & Giacobbi, 2004) and physical wellness behaviors (i.e., physical activity) also appear to have reduced burnout scores (Naugle et al., 2013). For example, one qualitative study identified that ATs rely on religious beliefs, planning, and instrumental support (adaptive coping strategies) to cope with burnout (Reed & Giacobbi, 2004). Additionally, one recent study by Oglesby et al. (2021) identified that spiritual well-being (i.e., an adaptive coping mechanism) related to decreased burnout scores in one sample of ATs employed in the collegiate setting.

However, the amount of literature available identifying adaptive coping mechanisms in response to decreased burnout scores in ATs is lacking compared to research within other healthcare professions. Additionally, no studies have identified the potential mediating role of adaptive coping mechanisms on the relationship between stress and burnout in ATs, as seen in other healthcare professionals (Wallace et al., 2010).

Alleviating Factors of Burnout in Healthcare Students

Most of the literature to date within healthcare student samples has focused on the prevalence of burnout and risk factors that contribute to increased burnout scores (Deeb et al., 2018; Dyrbye et al., 2009; Dyrbye et al., 2010a; Dyrbye et al., 2010b; Frajerma et al., 2019; Johnson et al., 2020b; Mafla et al., 2015; Shanafelt et al., 2009; Singh et al., 2016). To date, there are only a few published studies that have proposed or investigated methods to alleviate or prevent burnout in healthcare students (Boland et al., 2019; Johnson et al., 2020a; Skodova & Lajciakova, 2013). For example, Skodova & Lajciakova (2013) discovered that an intervention focusing on increasing self-esteem significantly reduced burnout scores following the intervention. Additionally, increasing student education on physical wellness has also been suggested as a potential mitigator of burnout (Johnson et al., 2020a). Authors of one study of burnout in a sample of physician assistant students reported that over 70% of respondents were interested in a wellness education program that focused on methods to cope with burnout and stress (Johnson, et al., 2020a). To our knowledge, no studies have identified the potential mitigating role that adaptive coping mechanisms have on burnout scores in healthcare students, as have been seen in a sample of healthcare providers (Wallace et al., 2010).

Alleviating Factors of Burnout in Athletic Training Students

To date, few studies in athletic training students have identified alleviators of burnout (Bryant et al., 2019; Mazerolle & Pagnotta, 2011). Qualitative reports reveal promising insight into the role of physical wellness behaviors and coping mechanisms to combat burnout in athletic training students (Bryant et al., 2019; Mazerolle & Pagnotta, 2011). In one qualitative study in undergraduate athletic training students, participants reported utilizing sleep and time management skills to alleviate burnout symptoms (Mazerolle & Pagnotta, 2011). Additionally, Bryant et al. (2019) identified that students relied on prioritizing personal time and support from others to mitigate burnout through qualitative reports. These findings indicate that wellness behaviors such as improving diet quality, sleep quality, and increasing physical activity may be possible methods to alleviate burnout in athletic training students, similar to findings identified in samples of healthcare students (Chang & Chan, 2015; Dyrbye et al., 2017).

Adaptive coping mechanisms and physical wellness behaviors. To date, only two qualitative reports have explored coping mechanisms in samples of athletic training students. For example, authors of one study within undergraduate athletic training students identified that students prioritized seeking social support, increasing sleep, exercising, and practicing time management strategies to cope with stress and burnout (Mazerolle et al., 2015). Additionally, authors of another qualitative study of graduate students identified that students prioritized seeking social support, exercising, and prioritizing personal time to mitigate sensations of burnout (Bryant et al., 2019). However, no studies have quantitatively established the impacts of coping mechanisms and physical wellness behaviors on burnout scores in athletic training students.

Furthermore, no studies have identified if adaptive coping mechanisms mediate the relationship between stress and burnout in athletic training students, as seen in previous samples of healthcare provider and student samples (Raedeke & Smith, 2004; Wallace et al., 2010). One study in a sample of student-athletes identified that positive coping mechanisms mediated the relationship between stress and burnout (Raedeke & Smith, 2004). Student-athletes who reported positive coping behaviors perceived lower stress than those reporting negative coping behaviors (Raedeke & Smith, 2004). Furthermore, coping mechanisms were found to mediate the relationship between stress and all three burnout subscales (Raedeke & Smith, 2004). These findings may be relevant to athletic training students since many are placed at sports-related clinical education sites where they work with student-athletes daily. Additionally, it is plausible that athletic training students that use adaptive coping mechanisms may have reduced burnout scores and that adaptive coping mechanisms mediate the relationship between stress and burnout, as previously seen in a sample of healthcare professionals (Wallace et al., 2010). Further exploration of the potential relationships between stress, burnout, and coping mechanism may be helpful in identifying methods to reduce the onset of burnout in athletic training students and the possible adverse outcomes that may be related to the onset of burnout in athletic training students.

Theoretical Framework

A theoretical framework proposed by Atalayin et al. (2015) describing the relationships between academic predictors (e.g., study time), burnout scores, and adverse outcomes in a sample of dental students was adapted for use in our study to determine if academic variables predicted increased burnout scores and if in turn, increased burnout

scores predicted adverse outcomes in our sample of athletic training students. The theoretical framework proposed by Atalayin et al. (2015) used path analysis within a structural equation modeling (SEM) framework to explain the complex relationships between academic variables, burnout, and potential outcomes. The authors proposed that academic variables (e.g., academic course load) predict increased burnout scores and that increased burnout scores predict adverse outcomes (e.g., thoughts of drop out, reduced academic achievement) in students. While the model proposed by Atalayin et al. (2015) explained the relationship between academic variables, burnout, and adverse consequences in a study of dental students, this model has not been tested in other studies of healthcare student populations, including athletic training students. Therefore, we adapted and tested the model proposed by Atalayin et al. (2015) to determine if burnout scores predicted adverse outcomes in our sample of athletic training students. Our proposed model included academic study time as a predictor of increased burnout scores similar to the model proposed by Atalayin et al. (2015). Additionally, burnout scores (i.e., EE, DP, and PA) and potential outcomes of burnout (i.e., onset of depressive symptoms, thoughts of drop out, cheating behaviors, unprofessional clinical burnout) were the outcome variables that informed the model. While thoughts of drop out and academic achievement were maintained in our model similar to the Atalayin et al. (2015) study, we also entered other potential adverse outcome variables (i.e., depressive symptoms, cheating behaviors, unprofessional clinical behaviors) that have been identified as outcomes predicted by increased burnout scores in other studies of healthcare student samples (Dyrbye et al., 2010a; Dyrbye et al., 2010b, Puranitee et al., 2019).

Statement of the Problem

Burnout is prevalent in athletic training students. While studies have identified the consequences of burnout (i.e., thoughts of drop out, decreased academic achievement, depressive symptoms, unprofessional behaviors) in other studies of healthcare students (Atalayin et al., 2015; Dyrbye et al., 2010a; Dyrbye et al., 2010b; Puranitee et al., 2019), these adverse outcomes have yet to be identified in relation to increased burnout scores in athletic training students. Additionally, no studies have utilized a theoretical framework to analyze further the predictive relationship that increased burnout scores have on potential adverse outcomes that have been identified in previous samples of healthcare student populations (Atalayin et al., 2015; Dyrbye et al., 2010a; Dyrbye et al., 2010b; Puranitee et al., 2019). Studies investigating potential alleviators of burnout symptoms in athletic training students remain limited. Previous research has identified that physical wellness behaviors and adaptive coping mechanisms contribute to decreased burnout scores in healthcare students and professionals (Cecil et al., 2014; Palupi & Findyartini, 2019; Wallace et al., 2010). However, the relationships between physical wellness behaviors, coping mechanisms, and burnout scores have yet to be identified in athletic training students.

Statement of Purpose

The primary purpose of this study was to determine if academic variables predicted increased burnout scores (i.e., EE, DP, PA) and if increased burnout scores, in turn, predict adverse outcomes (i.e., low GPA, depressive symptoms, thoughts of drop out, unprofessional behaviors, cheating behaviors) in athletic training students. To assess this, we adapted and tested a theoretical model proposed by Atalayin et al. (2015) to

determine if the model helped explain the complex relationships among academic predictors, burnout scores, and adverse outcomes in our sample of athletic training students. The secondary purpose of this study is to determine if physical wellness behaviors and coping mechanisms influence reports of burnout and stress in our sample of athletic training students. We also sought to determine if coping mechanisms and physical wellness behaviors mediate the relationship between stress and burnout scores in our sample of athletic training students.

Statement of Significance

Results of the present study will add to the growing body of burnout literature related to athletic training students. We sought to explore if academic study time predicted increased burnout scores (i.e., EE, DP, and PA) and if in turn, increased burnout scores predicted adverse academic outcomes (e.g., decreases in GPA, thoughts of drop out, unprofessional clinical behaviors, cheating behaviors, the onset of depressive symptoms) in athletic training students. While these behaviors have been identified in students reporting burnout symptoms in other healthcare student samples (Atalayin et al., 2015; Dyrbye et al., 2010a; Dyrbye et al 2010b; Puranitee et al., 2019), these findings have yet to be identified in athletic training students. We explored the relationships between academic variables (i.e., study time, clinical education time), increased burnout scores, and potential adverse outcomes by adapting and testing a theoretical model proposed by Atalayin et al. (2015) that previously identified that study time predicted increased burnout scores, and, in turn, increased burnout scores predict adverse outcomes in a sample of dental students. Additionally, we sought to determine if coping mechanisms and physical wellness behaviors are related to burnout scores and if these

variables mediate the relationship between stress and burnout scores in athletic training students. Identifying potential alleviators of burnout, such as physical wellness behaviors and adaptive coping mechanisms, will help determine potential future intervention methods to alleviate burnout symptoms in athletic training students and the potential adverse outcomes associated with increased burnout scores.

Research Questions

1. Does our adapted theoretical model explain relationships between academic workload (i.e., study time), burnout scores, and adverse academic outcomes in our sample of athletic training students?
2. Does a correlation exist between stress and coping mechanisms in our sample of athletic training students?
3. Does a correlation exist between coping mechanisms and burnout scores (i.e., EE, DP, PA) in our sample of athletic training students?
4. Do coping mechanisms mediate the relationship between stress and burnout scores (i.e., EE, DP, PA) in our sample of athletic training students?
5. Does a correlation exist between stress and physical wellness behaviors in our sample of athletic training students?
6. Does a correlation exist between wellness behaviors and burnout scores (i.e., EE, DP, PA) in our sample of athletic training students?
7. Do physical wellness behaviors mediate the relationship between stress and burnout scores (i.e., EE, DP, PA) in our sample of athletic training students?

Hypotheses

H1. Our adapted theoretical model based on findings from Atalayin et al. (2015) will identify that increased burnout scores in athletic training students will predict adverse outcomes (i.e., the onset of depressive symptoms, cheating behaviors, dishonest clinical behaviors, thoughts of dropout, decreased academic achievement).

H2. A correlation will exist between stress and coping mechanisms in our sample of athletic training students.

H3. A correlation will exist between coping mechanisms and burnout scores (i.e., EE, DP, PA) in our sample of athletic training students.

H4. Coping mechanisms will mediate the relationship between stress and burnout scores (i.e., EE, DP, PA) in our sample of athletic training students.

H5. A correlation will exist between stress and physical wellness behaviors in our sample of athletic training students.

H6. A correlation will exist between physical wellness behaviors and burnout scores (i.e., EE, DP, PA) in our sample of athletic training students.

H7. Physical wellness behaviors will mediate the relationship between stress and burnout scores in our sample of athletic training students.

Limitations of the Study

The study was subject to the following limitations:

1. As some of the survey items asked about the participants' potential negative behaviors, and the social desirability of these behaviors, (i.e., unprofessional clinical behaviors, cheating behaviors, substance use), a response bias may have been present, resulting in students not being willing to disclose these behaviors.

2. Due to the cross-sectional nature of this study, causal inferences cannot be made between the relationships of interest.

3. Some components of the survey utilized short-scale input in respect to survey length. Longer questionnaires may have been more beneficial in capturing some aspects of the students' experience (i.e., severity of depressive symptoms, substance use).

4. Because of the high percentage of female participants within this study, caution should be taken when inferring results of this study to the athletic training student population as a whole.

Delimitations of the Study

The study was subject to the following delimitation:

1. Each participant was currently enrolled in a graduate athletic training education program accredited by the Commission of Accreditation on Athletic Training Education (CAATE).

Terminology

Burnout. Burnout is a psychological syndrome involving symptoms of increased emotional exhaustion (EE), increased depersonalization (DP), and decreased sense of personal accomplishment (PA) in the workplace (Maslach, 1982).

Coping. Continually changing cognitive and behavioral efforts to manage specific external and or internal demands that are appraised as exceeding a persons resources (Folkman & Lazarus, 1984).

Adaptive coping mechanisms. Coping mechanisms that are classified as adaptive are behaviors that are helpful in combating stress and include active coping, planning, positive reframing, acceptance, humor, religion, using emotional support, and instrumental support (Carver et al., 1989; Carver, 1997).

Maladaptive coping mechanisms. Coping mechanisms that are classified as maladaptive behaviors are thought of as harmful approaches to combating stress and include self-distraction, denial, venting, negative emotion, substance use, behavioral disengagement, and self-blame (Carver, 1997).

Physical wellness. Active and continuous effort to maintain optimum levels of physical activity, focusing on nutrition habits and maintaining healthy lifestyle factors (e.g., use of medical services, preventative health behaviors, abstaining from drugs and alcohol) (Roscoe, 2009).

Journal Selection

Two manuscripts will be prepared from this research project's contents to satisfy the manuscript dissertation format. The first manuscript will discuss the potential of increased burnout scores and the possible adverse outcomes (i.e., thoughts of drop out, low GPA, unprofessional clinical behaviors, cheating behaviors) that may result from increased burnout scores in our sample of athletic training students. These relationships will be tested by adapting and testing a theoretical model proposed by Atalayin et al. (2015), which identified that increased burnout scores predicted adverse outcomes in a sample of dental students. The second manuscript will report the correlations among stress, burnout, physical wellness behaviors, and coping mechanisms. Additionally, the

potential mediating role that coping mechanisms and physical wellness behaviors have on the relationship between stress and burnout in our sample of students. These studies will provide important information to athletic training educators about the potential adverse outcomes of burnout in athletic training students and possible methods to alleviate burnout. Therefore, all manuscripts will be prepared for submission to the Athletic Training Education Journal (ATEJ).

CHAPTER TWO

Review of Literature

Burnout

Prolonged exposure to chronic workplace stress led to the initial description of the burnout phenomenon in the early 1970s (Heinemann & Heinemann, 2017). Descriptions of burnout symptoms include exhaustion from excessive demands made in the workplace and the depletion of resources necessary to complete day-to-day tasks (Freudenberger, 1974). Burnout is considered a psychological syndrome consisting of three dimensions: emotional exhaustion, depersonalization, and reduced personal accomplishment (Maslach, 1982). Emotional exhaustion (EE) is described as emotional overload, overextension, and being overwhelmed by the demands of life and the workplace (Maslach, 1982). An example of emotional exhaustion in the workplace would be a clinician feeling helpless about the demands of their patient load. Descriptions of depersonalization (DP) include developing a low opinion of others, detachment from others, or negative feelings towards others (Maslach, 1982). An example of DP would be a clinician referring to a patient by their injury instead of utilizing the patient's name. Lastly, personal accomplishment (PA) descriptions include inadequacy in the workplace, decreased ability to relate to others, and self-imposed thoughts of failure (Christina Maslach, 1982). An example of having reduced PA symptoms would be a clinician expressing feelings that they cannot effectively provide care for their patients.

Measuring Burnout

To date, the Maslach Burnout Inventory (MBI) Human Services Survey (MBI-HSS) is the most widely used quantitative measurement of burnout in human service professionals (Heinemann & Heinemann, 2017). Several adaptations to the original scale exist to measure burnout in various populations, including the MBI-HSS for medical professionals, the MBI Educators Survey (MBI-ES), the MBI General Survey (MBI-GS), and the MBI-GS for students (Maslach et al., 2016), MBI general survey, human services survey, educators survey, and a student survey (Maslach et al., 1996). The MBI-HSS measures all three dimensions of burnout (i.e., EE, DP, and PA). EE is measured on a scale ranging from 0 to 54. Higher scores on the EE subscale indicate increased levels of burnout. DP is measured on a scale of 0 to 30. Similar to the EE scale, increased DP scores represent increased levels of burnout. The PA subscale is measured on a scale of 0 to 48. Decreased scores on the PA subscale indicate higher levels of burnout. The authors of the MBI (Maslach et al., 1996) provide normative scores for low, moderate, and high levels of burnout (EE, DP, PA) (Maslach et al., 1996). Scores of 27 or higher on EE, 10 or higher on DP, and 33 or lower on PA scales represent high burnout (Maslach et al., 1996). Average burnout scores range from 19 to 26 for EE, 6 to 9 for DP, and 39 to 44 for PA scales (Maslach et al., 1996). Low levels of burnout include scores of 18 or less on EE, 5 or less on DP, and above 40 on the PA scale (Maslach et al., 1996).

Burnout in Human Service Professionals

Initial reports of burnout were limited to people-oriented occupations, which are historically referred to as human service professions (Maslach & Schaufeli, 1993). Various authors have reported burnout scores in numerous human service professionals,

including social workers (Hussein, 2018) and teachers (Kokkinos, 2007). For example, the authors of one study identified a mean EE score of 21.75 ($SD = 0.22$), a mean DP score of 5.10 ($SD = 0.10$), and a mean PA score of 32.5 ($SD = 0.13$) in a study of social workers (Hussein, 2018). Additionally, high EE scores ($M = 30.8$, $SD = 9.10$) were found in a study of teachers (Kokkinos, 2007). The mean DP score for this sample was 4.0 ($SD = 3.80$), and the mean PA score was 38.7 ($SD = 5.94$) (Kokkinos, 2007).

Burnout and Adverse Outcomes in Healthcare Professionals

Healthcare professionals represent a subset of human service professionals susceptible to burnout due to the “dedicated and committed” care they provide to patients (Freudenberger, 1974). To date, authors have detailed burnout scores in physicians (Shanafelt et al., 2012), nurses (Aiken et al., 2001), dentists (Singh et al., 2016), and dental hygienists (Jeon et al., 2017). Authors of one study of physicians identified that 37.9% of the sample reported high burnout scores on the EE subscale, 29.4% on the DP subscale, and 12.4% on the PA subscale of the MBI-HSS (Shanafelt et al., 2009). Similarly, Aiken et al. (2001) identified that 43% of nurses reported high burnout scores on at least one burnout dimension.

Continued study of burnout in healthcare providers is imperative due to the adverse outcomes associated with its onset, such as intentions to leave the profession onset, medical errors, and decreased physical and mental health (Aiken et al., 2001; Garcia et al., 2015; Moloney et al., 2018). For example, in one study, researchers identified that 43.2% of nurses in the sample that reported increased burnout scores had intentions to leave their current job, indicating retention concerns (Aiken et al., 2001). Another study found that for every 1-point increase in overall burnout scores, a .351-

point rise in nurses' intentions to leave their current organization occurred ($p < .001$) (Moloney et al., 2018). Additionally, Garcia and colleagues (2015) identified that increased burnout scores on the DP subscale predicted the likelihood of psychiatrists' intention of leaving their job within the next two years ($b = .041$; $p = .07$). Reports of fatigue, frequent headaches, illness, GI disorders, sleeplessness, shortness of breath, frustration, anger, cynicism, and depression are described in healthcare professionals with increased burnout scores (Ahola & Hakanen, 2007; Freudenberg, 1974; Szigethy, 2014; Thun et al., 2014; Tourigny et al., 2010). Thun et al. (2014) found a significant correlation between calling in sick to work and increased burnout scores on the EE ($r = .26$, $p < .001$) and DP ($r = .10$, $p < .001$) subscales in a study of physicians. Additionally, Lu (2008) found a significant correlation between reports of coughs, colds, and being sick (e.g., common cold, flu) in the past 12 months with increased burnout scores. Increased reports of burnout have also been related to mental health concerns, with high reports of depressive symptoms described in studies of dentists (Ahola & Hakanen, 2007), nurses (Tourigny et al., 2010), and physicians (Wurm et al., 2016).

Burnout and Adverse Outcomes in Athletic Trainers

Athletic trainers are healthcare providers that are also susceptible to burnout (Clapper & Harris, 2008; Hendrix et al., 2000; Kania et al., 2009; Oglesby et al., 2020a; Oglesby et al., 2020b, Oglesby et al., 2021; Walter et al., 2009). ATs are healthcare professionals who collaborate with physicians to provide services comprising of prevention, emergency care, clinical diagnosis, therapeutic intervention, and rehabilitation of injuries and medical conditions (NATA, n.d.). To date, most studies that have identified burnout in the athletic training profession have been within ATs working

at National Collegiate Athletic Association (NCAA) institutions (Goodman et al., 2010; Hendrix et al., 2000; Henning & Weidner, 2008; Kania et al., 2009; Mazerolle et al., 2008; Mazerolle & Bruening, 2006; Oglesby et al., 2020b; Pitney, 2006; Pitney et al., 2002). For example, Oglesby et al. (2020b) recently published a study on ATs working within collegiate institutions. Researchers found a mean EE score of 23.7 ($SD = 11.9$), a mean score of 7.7 ($SD = 5.9$), and a mean score of 38.9 ($SD = 6.3$) among the participants. Additionally, 38.9% of this sample met cut-off scores for high levels of burnout on the EE subscale, 33% for the DP subscale, and 17.7% for the PA subscale. These findings represent similar rates of high burnout detailed in samples of physicians (Shanafelt et al., 2009), nurses (Aiken et al., 2001), and physician assistants (Benson et al., 2016). ATs working as part-time graduate assistants in NCAA institutions also report burnout (Bowman et al., 2015; Mazerolle et al., 2012; Reed & Giacobbi, 2004). Graduate assistant ATs are considered at risk of burnout due to the time necessary to complete clinical, academic, and administrative duties as both a clinician and a graduate student (Mazerolle et al., 2012). Additionally, ATs working as faculty members and program directors of athletic training education programs are also at risk of experiencing increased burnout (Judd & Perkins, 2004; Walter et al., 2009). Diminished physical health has been associated with increased burnout scores in ATs, similar to findings in other healthcare providers (Ahola & Hakanen, 2007; Freudemberger, 1974; Lu, 2008; Thun et al., 2014; Wurm et al., 2016). For example, two reports describe diminished physical health relating to burnout, including headaches, high blood pressure, weight issues, fatigue, indigestion, and sleeplessness within ATs (Campbell et al., 1985; Gieck, 1986).

Burnout and Adverse Outcomes in Healthcare Students

Multiple authors have also identified burnout symptoms as early as during the academic years before entering the workforce as a healthcare professional (Brazeau et al., 2010; Deeb et al., 2018; Johnson et al., 2020a). To date, descriptions of burnout have been reported by authors of studies within medical (Brazeau et al., 2010), physician assistant (Johnson et al., 2020a), and dental hygiene students (Deeb et al., 2018). For example, authors of one study of burnout in 125 medical students revealed a mean EE score of 24.2 ($SD = 10.92$), a mean DP score of 10.2 ($SD = 6.51$), and a mean PA score of 36.1 ($SD = 7.46$) on the MBI-HSS (Brazeau et al., 2010). Similarly, a mean score of 20.91 ($SD = 6.620$) and a DP score of 11.9 ($SD = 7.14$) were identified on the MBI student survey scale in a study within 320 physician assistant students (Johnson et al., 2020). Another study within dental students identified that 34% of the sample met the cut-off for high EE levels, 17% for DP, and 22% for PA (Deeb et al., 2018). These percentages are similar to reports within healthcare professionals (Aiken et al., 2001; Benson et al., 2016; Shanafelt et al., 2009). Authors have identified adverse outcomes in healthcare students' when increased burnout scores are reported. For example, the authors of one study identified increased odds of cheating and decreased altruistic values among medical students (Dyrbye et al., 2010a). Additionally, medical students reporting burnout were more likely to engage in one or more unprofessional behaviors ($OR = 1.89$, 95% $CI = 1.59, 2.24$) (Dyrbye et al., 2010a). These behaviors included omission of physical examination findings on patient documentation and cheating behaviors. Thoughts of drop out are also reported in medical students reporting higher burnout (Dyrbye et al., 2010b). A 7% increase in the odds of serious thoughts of dropping out during the following year

was identified in medical students reporting high EE and DP scores (Dyrbye et al., 2010b). Additionally, reports of increases in depressive symptoms and suicidal ideation in students reporting high burnout were reported in studies of medical students (Dyrbye et al., 2008; Puranitee et al., 2019) and dental students (Deeb et al., 2018). For example, Dyrbye and colleagues (2008) identified that medical students who reported increased burnout scores were at higher risk of suicidal ideation than those who did not report high burnout (OR= 3.46, 95% CI = 2.55, 4.69) (Dyrbye et al., 2008).

Burnout and Adverse Outcomes in Athletic Training Students

Athletic training students are also susceptible to burnout (Bryant et al., 2019; Riter et al., 2008). The first quantitative report of burnout in a sample of undergraduate athletic training students enrolled in professional athletic training education programs accredited by the Commission on Accreditation of Athletic Training Education (CAATE) was reported by Riter et al. (2008). Authors of this study identified a mean EE score of 17.0, a mean score of 13.3 for DP, and a mean score of 38.0 for PA on the MBI-HSS. Additionally, authors of another study within a sample of athletic training students enrolled in professional athletic training education programs at the master's degree level reported a mean EE score of 20.0 with a range of 9 to 33, a mean score of 12.0 with a range of 4 to 22 for DP, and a mean score of 32.0 with a range of 19 to 34 for PA in a sample of 41 students (Bryant et al., 2019). These findings reveal high DP and PA scores compared to normative values for the MBI-HSS (Maslach & Schaufeli, 1993). In a more recent report, researchers identified burnout scores in a sample of undergraduate and graduate athletic training students enrolled in athletic training programs and found that 70.8% of undergraduate students and 62.9% of graduate students reported high EE scores

(Vineyard et al., 2021). Additionally, the authors identified that 100% of undergraduate and graduate students reported high DP levels (Vineyard et al., 2021). The Vineyard and colleagues' study (2021) is the first to report the overall percentages of students meeting cut-offs for high burnout levels on the MBI-HSS in a sample of athletic training students. Undergraduate students had a mean EE score of 34.0, 17.0 on the DP subscale, and 39.0 on the PA subscale. In contrast, the graduate students represented in this sample had a mean EE score of 31.0, 16.0 on the DP subscale, and 39.0 on the PA subscale. However, both samples identified increased burnout scores on the EE and DP subscales compared to the two previous reports of burnout scores provided by Riter et al. (2009) and Bryant et al. (2019). With exception to the Vineyard et al. (2021) study, authors have sampled athletic training students within small samples at singular universities, limiting the ability to capture the rate of burnout within the national athletic training student population as a whole (Riter et al., 2008; Bryant et al., 2019). Additionally, little is known about burnout's potential adverse outcomes in athletic training students.

Factors that Contribute to Burnout

Maslach and Schaufeli provided a historical account of burnout and categorized factors contributing to burnout as either organizational or personal factors (Maslach & Schaufeli, 1993). Factors such as job satisfaction, job stress, job expectations, relationships with coworkers and supervisors, relationships with clients and patients, and position type are described as organizational or work-related factors that may lead to increased or decreased burnout scores (Maslach & Schaufeli, 1993). Alternatively, factors such as age, sex, age, marital status, and personality traits are described as personal or individual characteristics that can impact burnout scores (Maslach &

Schaufeli, 1993). Physical wellness behaviors (i.e., diet quality, physical activity) and coping mechanisms (i.e., adaptive, maladaptive) have also been identified as personal factors that have been found to influence burnout scores in samples of students and professionals (Raedeke & Smith, 1986; Wallace et al., 2010). Furthermore, coping mechanisms have been found to mediate the relationship between stress and burnout in samples of students and professionals, indicate that coping mechanisms at least partially explain the relationship between stress and burnout scores in these samples (Raedeke & Smith, Wallace et al., 2010).

Poor physical wellness behavior. Physical wellness behaviors (i.e., diet quality, physical activity) also appear to influence burnout scores (Boland et al., 2019; Mercedes et al., 2020; Oreskovich et al., 2015; Rudman & Gustavsson, 2012). Physical wellness is defined as an active and continuous effort to maintain optimum physical activity levels, focusing on nutrition habits and maintaining a healthy lifestyle (e.g., use of medical services, preventative health behaviors, abstaining from drugs and alcohol) (Roscoe, 2009). Physical wellness behaviors (i.e., diet quality, physical activity) have also been described as coping behaviors that individuals utilize in response to stress and burnout (Raedeke & Smith, 2004).

Coping mechanisms. Authors have described the use of maladaptive coping strategies as contributors to burnout symptoms (Mckinley et al., 2020; Rohland 2000). Coping is defined as continuously changing cognitive and behavioral efforts to manage specific external and internal demands appraised to tax or exceed a person's resources (Folkman & Lazarus, 1984). Various methods exist to categorize coping behaviors.

Examples of classification of coping strategies include labeling coping behaviors as either emotion and problem-focused coping, approach and avoidance coping, or adaptive and maladaptive coping (Skinner et al., 2013). Due to the confusion that may arise between differing terminologies that are used to refer to coping behaviors, a recommendation exists for future research to label coping mechanisms as helpful or harmful behaviors (adaptive vs. maladaptive) (Skinner et al., 2013). Maladaptive coping mechanisms include self-distraction, denial, venting, negative emotion, substance use, behavioral disengagement, and self-blame (Carver, 1997).

Factors that Contribute to Burnout in Healthcare Professionals

Organizational/work-related factors. To date, many researchers have described organizational factors relating to increased burnout in samples of healthcare professionals (Aiken et al., 2001; Ang et al., 2016; Benson et al., 2016; Garcia et al., 2015; Jeon et al., 2017; Moloney et al., 2018; Nishimura et al., 2014; Pike et al., 2019; Shanafelt et al., 2015; Shanafelt et al., 2012; Spooner-Lane & Patton, 2007; Van Bogaert et al., 2013; Welp et al., 2015). For example, authors have described high workloads (e.g., total hours worked, patient loads, back-to-back nights on-call) in relation to increased burnout symptoms in physicians (Nishimura et al., 2014; Shanafelt et al., 2015), nurses (Ang et al., 2016; Van Bogaert et al., 2013), physician assistants (Benson et al., 2016), and EMTs (Pike et al., 2019). In another study, Ang et al. (2016) found that individuals reporting three or more nights of on-call work in a row had a 1.52-point increase in the odds of exhibiting high burnout scores on the EE subscale of the MBI-HSS ($p = .004$).

Additionally, role ambiguity, the description of conflict that occurs when there are conflicting demands between tasks of a job and an individual's resources, have been related to increased burnout scores in one study of nurses (Spooner-Lane & Patton, 2007). Within this study, the authors noted that for every 1-point increase in reported role ambiguity, a 0.21-point decrease in burnout scores on the PA subscale was reported ($p = .004$). Another study reported that increased descriptions of role conflict were correlated with increased EE scores ($r = .330, p = .001$) and PA scores ($r = .481, p = .001$) in a sample of nurses (Dasgupta, 2012). Similar results were reported by authors of a study in a sample of nurses and physicians that identified a significant correlation between role conflict and increases in burnout scores on the EE ($r = .483, p < .001$), DP ($r = .403, p < .001$), and PA subscales ($r = .340, p < .001$) (Tunc & Kutanis, 2009).

Personal factors. Burnout research has primarily focused on work-related or organizational risk factors (Maslach & Schaufeli, 1993). However, researchers have also identified personal or individual characteristics associated with increased burnout scores among healthcare professionals (Ang et al., 2016; McManus et al., 2004; Netemeyer et al., 1996; Shanafelt et al., 2015; Shanafelt et al., 2016; Singh et al., 2016). Previous authors have identified that various demographic variables (i.e., age, sex, and race) relate to fluctuations in burnout reports (Ang et al., 2016; Singh et al., 2016; Eden et al., 2020). For example, Ang and colleagues (2016) found that male nurses were 1.58 times more likely to experience high DP levels than female nurses (95% CI = 1.10, 2.27, $p = .004$). Singh and colleagues (2016) reported similar findings in one sample of dentists, which found that male respondents reported more burnout symptoms than their female colleagues. Alternatively, Eden and colleagues (2020) found conflicting results in one

study of physicians. This study identified that female physicians reported increased EE scores compared to male physicians ($p < .001$). Maslach et al. (2001) discussed the fluctuation of sex differences in the burnout literature. Their remarks discussed that trends indicate that females tend to report higher EE scores while males tend to report higher DP scores. Maslach and colleagues (2001) postulate that these findings may relate to gender stereotypes. However, they also mention that this may result from confounding relationships between sex and occupation type (e.g., police officers are more likely to be male, nurses are more likely to be female). Authors of one meta-analysis studied the inconsistent results between burnout scores in males and females (Purvanova et al., 2010). The authors' analyzed the differences in burnout scores based on sex within 183 studies and found that males overall reported higher levels of DP ($\delta = .10$) while females reported higher EE ($\delta = -.19$). Contrastingly, the authors noted that no significant differences were found in male-typed vs. female-typed occupations. Additionally, work-family conflict, defined as the time spent performing work responsibilities interference with time spent with family (Netemeyer, et al., 1996)., has been found to contribute to increased burnout scores in healthcare professionals (Dyrbye et al., 2011; Innstrand et al., 2011).

While not as prevalent as demographic variables, various authors have also identified personality variables as factors contributing to increased burnout scores (Maslach & Schaufeli, 1993). Authors identified that personality traits were related to increased burnout scores on one or more dimensions of burnout in studies of healthcare professionals (Ang et al., 2016; McManus et al., 2004). For example, reports of increased neuroticism were related to increased burnout reports by authors of studies within

samples of physicians (McManus et al., 2004) and nurses (Ang et al., 2016). Within physicians, McManus and colleagues (2004) identified correlations between increased burnout scores on the EE subscale and increased neuroticism ($r = .233, p < .001$). Additionally, correlations between DP scores and neuroticism were also identified ($r = .103, p = .001$). Similarly, Ang and colleagues (2016) identified associations between neuroticism and burnout scores in one sample of nurses. Increased neuroticism scores resulted in increased odds of high levels of PA burnout ($OR = 3.93, p < .0005$). Additionally, increased neuroticism scores led to increased odds of high DP ($OR = 3.44, p < .001$).

Poor physical wellness behaviors. Various authors have also identified that health professionals who report decreased health and wellness behaviors also report increased burnout levels on one or more burnout subscales. For example, Boland and colleagues (2019) determined that reporting poor diet quality increased the likelihood of having increased burnout in a sample of EMTs. However, this study did not explore the effects of diet quality on each dimension of burnout. Authors of another study within physicians identified that individuals reporting a lower frequency of healthy eating behaviors had increased burnout scores ($p < .005$) (McClafferty et al., 2018). One author identified a significant relationship between low levels of exercise and increased burnout scores ($p = .0003$) (Goldberg et al., 1996). Similar findings were reported by authors studying burnout rates in a sample of nurses (Guo et al., 2018). The authors of this study identified that infrequent exercise was a primary predictor of increased EE scores (Guo et al., 2018).

Maladaptive coping behaviors. Maladaptive coping mechanisms (e.g., substance use) have been found to contribute to increased burnout scores in several studies within healthcare professionals (Boland et al., 2019, McKinley et al., 2019, Oreskovich et al., 2015). For example, one set of authors reported that physicians used maladaptive coping strategies, including self-distraction, self-blame, denial, disengagement, substance use, and venting in response to burnout (McKinley et al., 2019). Within this study, authors identified that males were more likely to report substance use in response to burnout than their female colleagues (McKinley et al., 2019). Additionally, EMTs reporting increased alcohol or substance use were 4.57 times more likely to be “burned-out” (95% CI = 1.30, 16.0) (Boland et al., 2019). Similar findings were identified in a study of physicians (Oreskovich et al., 2015). The authors of this study found that individuals who reported increased alcohol abuse also reported high levels of burnout on the EE and DP subscales ($p < .001$) (Oreskovich et al., 2015). One study by Wallace et al. (2010) also identified that reports of maladaptive coping mechanisms mediated the relationship between stress and burnout scores in one sample of counselors. Within this study, a significant relationship between stress and burnout was identified. Furthermore, the maladaptive coping mechanisms of self-distraction and behavioral disengagement were found to mediate the relationship between stress and burnout (Wallace et al., 2010). Increased stress was positively related to reports of self-distraction and behavioral disengagement coping strategies. In turn, increased self-distraction and behavioral disengagement resulted in increased burnout scores (Wallace et al., 2010). The study utilized the brief-COPE (Carver, 1997), a widely utilized tool to measure coping mechanisms individuals utilize in response to stress, to measure coping mechanisms. While the Wallace et al.

(2010) study identified the mediating relationship between each coping subscale on the brief-COPE, it did not identify if increased use of overall maladaptive or adaptive coping mechanism scores mediated the relationship between stress and burnout.

Factors that Contribute to Burnout in Athletic Trainers

Similar to reports of burnout within other healthcare professionals, organizational and personal factors have been related to increased burnout scores in ATs (DeFreese & Mihalik, 2016; Mazerolle et al., 2008, Naugle et al., 2013). Examples of organizational or work-related factors contributing to burnout in ATs include workplace relationships (Kania et al., 2009) and travel responsibilities (Mazerolle et al., 2012). Alternatively, personal or individual characteristics relating to increased burnout scores in samples of ATs include decreased social support (DeFreese & Mihalik, 2016), poor physical health (Campbell et al., 1985), and poor coping behaviors (i.e., substance use) (Oglesby et al., 2020b).

Organizational/work-related factors. Multiple authors have identified poor relationships between supervisors and increased burnout scores in other healthcare providers (Benson et al., 2016; Lorenz & Guirardello, 2014). Besides the traditional supervisory relationships that other healthcare professionals have in the workplace, ATs also interact frequently with athletic coaches. For example, the authors of one study identified a positive correlation between pressures from a coach to return an athlete to activity too soon after an injury or illness and EE scores in ATs ($r = .247, p < .0010$) (Kania et al., 2009). Based on the size of the NCAA institution an AT works for, they may be responsible for medical care for more than one sport. Kania and colleagues

(2009) identified a significant positive correlation between ATs reports of the increased number of sports they were responsible for and DP symptoms ($r = .214, p = .01$).

Personal factors. Multiple authors report that female ATs have higher burnout scores than their male colleagues (Naugle et al., 2013; Walter et al., 2009). For example, Walter et al. (2009) identified that female ATs serving as program directors of academic programs reported higher EE burnout symptoms than their male colleagues. The authors suggested that females may be more susceptible to burnout due to the possibility of having increased pressure to perform duties outside of the workplace that are historically considered female-specific roles, including engaging in household duties or attending to children. Naugle et al. (2013) also identified that women reported higher levels of burnout than their male colleagues. However, the authors of this study also noted that females reported fewer total work hours than their male colleagues. Contrastingly, Capel et al. (1986) reported higher levels of burnout symptoms in male ATs compared to female ATs.

Walter and colleagues (2009) also identified correlations between increased age and increased burnout on the EE ($r = -.263, p < .001$) and DP ($r = .320, p = .007$) subscales. ATs who report increased stress also report increased burnout on the EE and DP subscales (DeFreese & Mihalik, 2016). For every 1-point increase in perceived stress reported by ATs, a .47-point increase in burnout scores was reported. The authors of this study utilized each burnout subscale score to create a global burnout score, limiting the ability to identify the impact of stress on each subscale of burnout. Similarly, Hendrix and colleagues (2010) found a significant positive correlation between perceived stress and burnout scores on the EE subscale ($r = .43, p < .05$) and increased scores on the DP

subscale ($r = -.27, p < .05$). Additionally, work-family conflict is also described as a predictor of burnout in samples of ATs (Mazerolle et al., 2008; Oglesby et al., 2020b).

Poor physical wellness behaviors. While multiple authors report the impacts of poor wellness behaviors in other healthcare providers, less is known about the relationship between physical wellness behaviors and burnout in ATs. However, one study within ATs described the relationship between ATs perceptions of wellness, burnout, and physical activity (Naugle et al., 2013). This study's findings indicated that ATs with decreased perceptions of wellness and physical activity had increased burnout scores. However, Naugle and colleagues (2013) utilized a different scale to measure burnout, the Copenhagen Burnout Inventory (Kristensen et al., 2005), limiting the ability to make comparisons to other studies that utilize the MBI.

Maladaptive coping behaviors. Capel (1990) first suggested that alcohol was a potential coping mechanism utilized by ATs in response to burnout. Authors of another recently published study of alcohol use in a sample of ATs identified that over 46.3% of collegiate ATs admitted to having at least one binge-drinking episode (Oglesby et al., 2020b). Within this study, the authors described increased burnout scores on the EE subscale ($b = .008, p = .023$) and DP subscale ($b = -.016, p = .02$) in AT's reporting increases in binge drinking behaviors (Oglesby et al., 2020b). While maladaptive coping mechanisms (i.e., substance use) have been found to influence burnout scores in samples of ATs (Oglesby et al., 2020), the potential mediating relationship between maladaptive coping mechanisms between stress and burnout scores in samples of ATs has yet to be identified.

Factors that Contribute to Burnout in Healthcare Students

Literature identifying contributing factors of increased burnout in healthcare students is less extensive than what is available in healthcare professionals. However, several studies describe personal or academic characteristics that contribute to increased burnout scores (Deeb et al., 2018; Dyrbye et al., 2009; Dyrbye et al., 2010a; Frajerma et al., 2019; Johnson et al., 2020a; Mafla et al., 2015; Shanafelt et al., 2009; Singh et al., 2016). Examples of academic factors that contribute to increased burnout scores include increased study workload (Dyrbye et al., 2009; Singh et al., 2016), reports of lack of confidence in a student's ability to learn new skills (Costa et al., 2012), lack of enjoyment in coursework (Costa et al., 2012), excessive amounts of student activities (Costa et al., 2012), year in an educational program (Frajerma et al., 2019; Johnson et al., 2020a; Mafla et al., 2015; Valero-Chillerón et al., 2019), and negative patient interactions in clinical education (Valero-Chillerón et al., 2019). Examples of personal factors that have been found to contribute to increased burnout scores include sex (Johnson et al., 2020; Singh et al., 2016), age (Johnson et al., 2020a), reports of having recent adverse life events (e.g., illness) (Dyrbye et al., 2006), and poor overall physical and mental health (Deeb et al., 2018; Dyrbye et al., 2008).

Academic factors. Healthcare students have the stress of classes coupled with clinical education requirements, where they gain necessary hands-on experience working with patients (Dyrbye et al., 2009). Some students report increased burnout scores when the demands of clinical education become too much (Dyrbye et al., 2009). For example, the authors of one study found that medical students who had clinical education obligations that included overnight patient calls had increased odds of reporting high

burnout scores ($OR = 1.69, p < .02$) (Dyrbye et al., 2009). In this same study, medical students that were placed at hospital wards for their clinical education sites had increased burnout compared to students who were placed in outpatient or intensive care clinical education rotations ($OR = 1.48, p < .02$) (Dyrbye et al., 2009). Additionally, the authors of one systematic review identified that increased workload in dental students contributed to increased burnout scores on one or more burnout subscales (Singh et al., 2016).

The year of study within an education program also appears to contribute to increased burnout scores (Mafla et al., 2015; Valero-Chillerón et al., 2019). Within a sample of nursing students, authors identified that students who had been in their education program longer had increased burnout scores compared to students in earlier stages of the education program ($p = .027$) (Valero-Chillerón et al., 2019). Additionally, Mafla and colleagues (2015) identified increased burnout scores in 1st-year students compared to all other students in one sample of dental students ($p < .0001$). Academic stressors also appear to contribute to increased burnout scores in nursing students, including student reports of having feelings of lack of competence ($p = 0.001$) and having to give bad news to patients during clinical education ($p = 0.01$) (Valero-Chillerón et al., 2019). Similarly, authors of one study of medical students identified academic stressors reported by students (i.e., feeling as if they do not have confidence in their clinical skills, feeling overwhelmed by course activities, lack of pleasure from coursework) increased the odds of having high burnout scores (Costa et al., 2012).

Personal factors. Personal factors or individual characteristics that have been found to contribute to increased burnout scores include reports of recent adverse significant life events (e.g., major illness in the past 12 months) (Dyrbye et al., 2009;

Frajerma et al., 2019), geographic location (Frajerma et al., 2019), and sex (Johnson et al., 2020a; Mafla et al., 2015; Singh et al., 2016). Conflicting findings have been identified in healthcare student samples when comparing sex and burnout scores (Johnson et al., 2020a; Mafla et al., 2015; Singh et al., 2016). While female students were found to have increased burnout scores on one or more dimensions of burnout in a sample of physician assistant students (Johnson et al., 2020a), male students were more likely to have increased burnout scores in a sample of dental students (Singh et al., 2016).

Another personal factor that has been found to contribute to increased burnout scores is an individual's physical and mental health (Bassols et al., 2015; Deeb et al., 2018; Dyrbye et al., 2006, Dyrbye et al., 2008). For example, authors of a study within medical students identified increased adverse life events (e.g., experiencing a significant illness) resulted in increased odds of having high burnout ($OR = 2.594, p = .002$) (Dyrbye et al., 2006). Geographic location also appears to influence burnout scores (Frajerma et al., 2019; Lin et al., 2019). For example, authors of a systematic review of medical students identified that burnout scores fluctuated somewhat between students sampled in North America, Asia, Oceania, the Middle East, and South and Central America (Frajerma et al., 2019). The authors identified that burnout scores were highest in Oceania and the Middle East. Alternatively, students from South and Central America had the lowest burnout scores. However, when looking at the geographic location within the USA, authors of another sample of medical trainees were unable to identify a relationship between geographic location (Midwest, Northeast, South, West) and increased burnout scores ($p = .22$) (Lin et al., 2019).

Physical wellness behaviors. Students reporting decreased physical wellness behaviors also report increased burnout (Cecil et al., 2014; Weerasinghe et al., 2020). For example, the authors of one study within a sample of medical students identified a significant relationship between diet changes and increased burnout scores ($p = .02$) (Weerasinghe et al., 2020). Of the dietary changes reported, over 80% of students with increased burnout scores reported missing meals, reducing fruit and vegetable intake, and eating fast food more often (Weerasinghe et al., 2020). Additionally, Cecil and colleagues (2014) found a significant relationship between medical students who reported low levels of exercise and increased burnout scores on the EE subscale of the MBI-HSS (Cecil et al., 2014).

Maladaptive coping strategies. Maladaptive coping strategies in response to increased burnout scores are also described in samples of healthcare students (Jackson et al., 2016; Palupi & Findyartini, 2019; Cecil et al., 2014). For example, the authors of one study of medical students identified that 32.4% of the participants met the criteria for alcohol dependence (Jackson et al., 2016). Students who reported increased substance use also had increased burnout on the EE and DP subscales of burnout (Jackson et al., 2016). Additionally, increases in substance use contributed to increased burnout scores on the PA subscale within one medical student sample (Cecil et al., 2014). For every 1-point increase in binge drinking score, a 0.14-point increase in burnout scores on the PA subscale was seen in this sample of medical students (Cecil et al., 2014). Authors of another study within medical students found that greater use of maladaptive coping behaviors (i.e., venting, denial, substance use, behavioral disengagement, self-distraction, and self-blame) contributed to increased burnout on the EE and DP scores (Palupi &

Findyartini, 2019). For every 1-point increase in EE, a 0.403-point increase in maladaptive coping was identified ($p < .001$) (Palupi & Findyartini, 2019). Similarly, for every 1-point increase in DP, a 0.372-point increase in maladaptive coping behaviors was seen (Palupi & Findyartini, 2019). Another study within a sample of nursing students identified a significant relationship between the use of maladaptive coping mechanisms and increased burnout scores (Rees et al., 2016). To our knowledge, no studies have identified the potential mediating role that maladaptive coping mechanisms have on the relationship between stress and burnout in healthcare students as identified in healthcare providers (Wallace et al., 2010).

Factors that Contribute to Burnout in Athletic Training Students

Similar to reports within other healthcare student samples (Dyrbye et al., 2009, 2010; Singh et al., 2016), Athletic training students also report increased demands of academic course loads and clinical education as contributors to burnout scores (Bryant et al., 2019; Mazerolle & Pagnotta, 2011). To date, authors have found that variables such as program year, sex, social support, and leisure time contribute to increased burnout scores in samples of athletic training students (Bryant et al., 2019; Mazerolle & Pagnotta, 2011; Riter et al., 2008). For example, in one study within athletic training students enrolled in baccalaureate professional programs, EE scores fluctuated between different time points within the semester (Riter et al., 2008). Students who were in their fourth semester or more within their program had higher levels of EE ($M = 30.9$) and DP ($M = 13.3$) compared to the remainder of students within the sample (Riter et al., 2008). This study also identified that female students had higher burnout scores on the EE subscale ($M = 20.4$) compared to their male counterparts ($M = 13.27$) ($p < .001$) (Riter et al.,

2008). Additionally, Vineyard et al. (2021) identified that female undergraduate athletic training students had a 2.10-point reduction in burnout scores compared to their male counterparts on the DP subscale ($p < .05$). Qualitative reports of burnout in one sample of athletic training students identified three contributors to increased burnout reports, including increased time expectations of students, feelings of having no personal time, and lack of social support (Mazerolle & Pagnotta, 2011). Authors have also identified that stress contributes to burnout (Bryant et al., 2019; Mazerolle & Pagnotta, 2011; Vineyard et al., 2021). For example, the authors of one study identified that increased stress resulted in increased burnout scores on the EE subscale ($b = 3.34, p < .001$) and DP subscale ($b = 0.98, p < .01$) in graduate athletic training students (Vineyard et al., 2021). In the undergraduate sample, increased stress predicted increased burnout on the EE subscale ($b = 3.11, p < .001$). (Vineyard et al., 2021). While poor physical wellness behaviors and maladaptive coping mechanisms have been related to increased burnout scores in other samples of healthcare students (Jackson et al., 2016; Palupi & Findyartini, 2019; Cecil et al., 2014), this relationship has yet to be identified in AT students. Additionally, no studies have identified the potential mediating role of maladaptive coping mechanisms on the relationship between stress and burnout in athletic training students.

Factors that Alleviate Burnout

While an abundance of literature is available identifying factors contributing to increased burnout, less research has been published on alleviating burnout. To date, several published studies have identified organizational or work-related factors (i.e., workload) and personal factors (i.e., demographic variables, personality traits) that have

been related to reductions in burnout scores on one or more dimension of burnout (Appelbaum et al., 2019; Deckard et al., 1994; Lorenz & Guirardello, 2014; Moloney et al., 2018, 2018; Reith, 2018; Shanafelt et al., 2015).

Factors that Alleviate Burnout in Healthcare Providers

Organizational factors. Several organizational factors have been related to reduced burnout scores in samples of healthcare professionals, including reductions in workload (Benson et al., 2016), increased support from supervisors (Benson et al., 2016; Lorenz & Guirardello, 2014), and fair adjustment of salaries (Deckard et al., 1994; Orkibi, 2016; Pavlakis et al., 2010). In a study of physician assistants, a correlation between increased control over one's workload and reductions in burnout scores on the EE ($r = -.281, p < .01$), DP ($r = -.405, p < .01$), and PA ($r = .232, p < .01$) subscales was seen (Benson et al., 2016). Additionally, reports of improved satisfaction with support provided by an employee's supervisor also resulted in decreased burnout scores on the EE subscale ($r = -.026, p < .01$) (Benson et al., 2016). Similarly, Shanafelt et al. (2015) found that increases in employees' satisfaction with their organization's leadership resulted in a 3.3% decrease in the likelihood of high burnout scores in one study of physicians (Shanafelt et al., 2015).

Personal factors. Several factors relating to an individual's personal life (i.e., social support, personality traits) have been found to contribute to decreased burnout scores (Boland et al., 2019; Chang & Chan, 2015; Gorter, 2005; Hamama et al., 2019; Kotb et al., 2014; McManus et al., 2004; Vidotti et al., 2018). For example, decreased burnout scores on one or multiple burnout subscales have been associated with reports of

increased social support in an individual's personal life (Boland et al., 2019; Gorter, 2005; Hamama et al., 2019). Several personality traits, including extraversion, conscientiousness, and agreeableness, have also been found to contribute to decreases in burnout scores on one or multiple burnout dimensions in samples of physicians (McManus et al., 2004) and nurses (Garrosa et al., 2008). Extraversion is a personality trait associated with increased enjoyment in being social, whereas agreeableness is a personality trait associated with being cooperative, polite, and kind (McManus et al., 2004). Conscientiousness is a personality trait reflecting a tendency to be organized and responsible (McManus et al., 2004). For example, McManus and colleagues (2004) found a significant relationship between the personality traits of agreeableness ($r = -.094, p < .001$), conscientiousness ($r = -.129, p < .001$), extraversion ($r = -.262, p < .001$), and decreased burnout scores on the EE subscale. Additionally, agreeableness ($r = -.322, p < .001$), conscientiousness ($r = -.165, p < .001$), and extraversion ($r = -.137, p < .001$) were associated with decreased burnout scores on the DP subscale (McManus et al., 2004).

Physical wellness behaviors. Reports of physical wellness behaviors have also been found to contribute to decreased burnout scores in healthcare professionals. Several researchers have found that healthcare professionals with improved physical wellness behaviors (e.g., increased physical activity, good dietary habits, decreased substance use) report decreases in burnout scores on at least one burnout subscale (Chang & Chan, 2015; Guo et al., 2018; Kotb et al., 2014; Lebensohn et al., 2013). For example, Guo and colleagues (2018) found that for every 1-point increase in reported frequency of exercise, a -.285-point reduction in burnout scores on the EE subscale was found in a sample of nurses ($p < .001$) (Guo et al., 2018). Additionally, Gorter et al. (2000) found a significant

difference between the percentage of respondents reporting healthy eating habits during the workday and reports of high burnout scores on one or multiple burnout subscales ($p < .005$). Within this sample, only 29% of respondents recorded high burnout scores on at least one subscale when they also documented healthy eating habits during the workday (Gorter et al., 2000).

Adaptive coping mechanisms. Adaptive coping mechanisms have also been found to contribute to decreased burnout scores in healthcare professionals (Cumbe et al., 2017; Boland et al., 2019). For example, Cumbe and colleagues (2017) identified that oncologists who utilized adaptive coping strategies (i.e., active coping, planning, positive reframing, acceptance, humor, religion, using emotional support, and instrumental support) had decreased burnout scores on the PA subscale of burnout ($p < .05$). Additionally, adaptive coping mechanisms have also been associated with reduced odds of reporting high burnout scores in one sample of EMS professionals (OR = 1.26, 95% CI = 0.43, 3.64, $p < .05$) (Boland et al., 2019). Wallace et al. (2010) also identified that reports of adaptive coping mechanisms mediated the relationship between stress and burnout scores in one sample of counselors. Within this study, a significant relationship between stress and burnout was identified. Furthermore, the adaptive coping mechanisms planning and humor were found to mediate the relationship between stress and burnout (Wallace et al., 2010).

Factors that Alleviate Burnout in Athletic Trainers

Several authors have identified factors that contribute to decreased burnout scores in AT professionals (Campbell et al., 1985; Gieck, 1986; Hendrix et al., 2000;

Naugle et al., 2013; Oglesby et al., 2020b). Factors that contribute to decreased burnout scores in samples of ATs include organizational and work-related factors (e.g., establishing workplace boundaries, support from supervisors) and personal factors or individual characteristics (e.g., increasing time with family and friends, increasing personal wellness behaviors) (DeFreese & Mihalik, 2016; Goodman et al., 2010; Hendrix et al., 2000; Mazerolle et al., 2011, 2015; Naugle et al., 2013; Walter et al., 2009).

Organizational/work-related factors. To date, organizational or work-related factors have been suggested to alleviate burnout in ATs by multiple authors (Mazerolle & Pagnotta 2011; Mazerolle, Pitney, et al., 2011). Recommendations to alleviate burnout include establishing boundaries within the workplace and prioritizing tasks (Mazerolle & Pagnotta 2011; Mazerolle, Pitney, et al., 2011). Additionally, head ATs promotion of work-life balance with their employees has been recommended as a potential alleviator of burnout in AT work settings (Mazerolle et al., 2015).

Personal factors. Authors of several studies also describe personal factors that contribute to decreased burnout scores in samples of ATs including increased social support and physical wellness behaviors (DeFreese & Mihalik, 2016; Goodman et al., 2010; Hendrix et al., 2000; Naugle et al., 2013). For example, one study found a relationship between reports of increased social support and decreased burnout scores in one sample of ATs ($r = -.25, p < .001$) (DeFreese & Mihalik, 2016). Authors of a more recent study within collegiate ATs identified that increased social support was related to decreased burnout on the EE subscale ($b = -0.172, p < .001$) and PA subscale ($b = 0.113, p < .001$) (Oglesby et al., 2020b). The study by Defreese & Mihalik (2016) summed

scores on the three burnout dimensions and labeled this combined score “global burnout,” whereas the Oglesby et al. (2020) study reported the impacts of social support on each burnout subscale, limiting the ability to make direct comparisons between the two studies.

Physical wellness behaviors. ATs reporting improved physical wellness behaviors also appear to have decreased burnout scores (Naugle et al., 2013). A relationship between perceptions of wellness and overall burnout scores was reported in one sample of ATs ($r = -.51, p = .01$) (Naugle et al., 2013). Additionally, the ATs who reported increased physical activity levels had decreased burnout scores ($r = -.12, p = .05$). This finding is similar to reports of increased physical activity and reduced burnout scores in nurses and physicians (Chang & Chan, 2015; Kotb et al., 2014). However, Naugle and colleagues (2013) utilized a different scale to measure burnout symptoms (i.e., Copenhagen Burnout Inventory), limiting the ability to make comparisons across studies within healthcare professionals that utilized the MBI (Chang & Chan, 2015; Kotb et al., 2014).

Adaptive coping mechanisms. Adaptive coping mechanisms have also been identified in response to reduced burnout in ATs (Mazerolle et al., 2012; Oglesby et al., 2021; Reed & Giacobbi, 2004). For example, authors of one qualitative study of burnout within graduate assistant ATs identified that ATs reported turning to religion as a way to cope with burnout (Mazerolle et al., 2012). Additionally, one qualitative study within a sample of certified ATs working as graduate assistants for collegiate sports reported that those reporting relying on their religious beliefs (an adaptive coping strategy) had a

reduced sense of burnout (Reed & Giacobbi, 2004). One recent study within a sample of ATs employed in the collegiate setting identified that spiritual well-being (i.e., a form of adaptive coping strategy) was related to improved burnout scores on all three subscales of the MBI-HSS (Oglesby et al., 2021).

Factors that Alleviate Burnout in Healthcare Students

A majority of burnout research within healthcare students to date focuses on the prevalence of burnout factors that contribute to increased burnout scores (Deeb et al., 2018; Dyrbye et al., 2008, Dyrbye et al., 2009; Frajerman et al., 2019; Johnson et al., 2020a; Mafla et al., 2015; Shanafelt et al., 2009; Singh et al., 2016). To date, recommendations for alleviating burnout in healthcare students include psychosocial training, increasing social support, and designing educational programs focusing on improving wellness behaviors (Johnson et al., 2020b; Popa-Velea et al., 2017; Skodova & Lajciakova, 2013). Authors of one study within psychology and nursing students reported that an intervention focusing on improving self-esteem reduced burnout scores (Skodova & Lajciakova, 2013). Burnout scores dropped three points in psychology students and sixteen nursing students' points following the intervention (Skodova & Lajciakova, 2013). Additionally, increased social support has also been found to contribute to decreases in burnout scores in studies of medical (Dyrbye et al., 2009) and dental students (Singh et al., 2016). For example, one study found that increases in student's satisfaction with the faculty support offered was associated with decreased odds of burnout in a sample of medical students (Dyrbye et al., 2009).

Physical wellness behaviors and adaptive coping mechanisms. Healthcare students reporting improved physical wellness behaviors also appear to have reduced burnout scores on one or more burnout scales (Cecil et al., 2014; Dyrbye et al., 2017). For example, practicing physical wellness behaviors such as increasing aerobic and strengthening exercises were found to contribute to reductions in burnout scores in two studies within medical students (Cecil et al., 2014; Dyrbye et al., 2017). In one of these studies, the researchers identified that students with reduced EE scores reported regular exercise compared to those with increased EE scores (53.1% vs. 60.8%, $p < .001$) (Cecil et al., 2014). The researchers also suggested a potential relationship between improved diet quality and decreased burnout symptoms (Cecil et al., 2014). Additionally, increasing student education on physical wellness behaviors has also been suggested as a potential method to alleviate burnout (Johnson et al., 2020a). Authors of one study of burnout in a sample of physician assistant students reported that over 70% of respondents were interested in a wellness education program that focused on coping methods to alleviate burnout and stress (Johnson et al., 2020a). Additionally, adaptive coping (i.e., active coping, planning, use of instrumental support, emotional support, positive reframing, acceptance, religion, and humor) has been associated with decreased burnout scores on the DP scale in one sample of students (Palupi & Findyartini, 2019). To our knowledge, no studies have identified if adaptive coping mechanisms mediate the relationship between stress and burnout in healthcare students as identified in a previous sample of healthcare professionals (Wallace et al., 2010).

Factors that Alleviate Burnout in Athletic Training Students

To date, burnout research in samples of athletic training students has emphasized the presence of burnout and factors that contribute to burnout scores (Bryant et al., 2019; Riter et al., 2008; Vineyard et al., 2021). However, less is known about factors that may alleviate burnout scores in ATs. One qualitative report of athletic training students' perceptions of burnout identified that students reported relying on social support, getting enough sleep, exercise, and time management skills to combat the demands of academic and clinical responsibilities (Mazerolle et al., 2015). However, quantitative analyses of the relationships between coping mechanisms and burnout in athletic training students have not yet been examined.

Adaptive coping mechanisms and physical wellness behaviors. Only two qualitative studies have reported on the coping mechanisms used by athletic training students. The authors of one study within undergraduate athletic training students reported that seeking social support, sleep, exercise, and time management strategies were identified by athletic training students to reduce their overall sense of burnout (Mazerolle et al., 2015). Additionally, authors within one sample of graduate students determined that students reported seeking social support, exercising, and prioritizing personal time to mitigate sensations of burnout (Bryant et al., 2019). However, no studies to date have quantitatively established the impacts of coping mechanisms and physical wellness behaviors on burnout scores in athletic training students). Furthermore, no studies have identified if adaptive coping mechanisms mediate the relationship between stress and burnout in athletic training students. However, authors of one study in a sample of student-athletes identified that coping mechanisms mediated the relationship between

stress and burnout (Raedeke & Smith, 2004). Furthermore, the authors of this study suggested that exercise and diet quality are forms of coping mechanisms employed by students in response to stress and burnout (Raedeke & Smith, 2004). Student-athletes who reported helpful coping behaviors perceived lower stress than those reporting harmful coping behaviors (Raedeke & Smith, 2004). These findings may be relevant to athletic training students since many clinical education sites that athletic training students are placed at are high school or collegiate sports settings. While athletic training students do not participate in athletic activities, they are exposed to similar schedules and potential stressors (i.e., interactions with sports coaches, competitive environments) as student-athletes. Athletic training students also often work with student-athletes daily. Raedeke & Smith (2004) utilized a different subscale to measure coping behaviors than the study by Wallace et al. (2004), the coping section of the Miller and Smith (1982) Stress Audit Questionnaire. This scale included 12 items with higher scores indicating greater use of helpful coping mechanisms (i.e., improved diet quality, increased organizational skills, seeking social support). Additionally, this study utilized a different scale to measure burnout, the Athlete Burnout Questionnaire (Raedeke & Smith, 2001). These differences in methodologies limit the ability to make direct comparisons between the findings seen in samples of healthcare professionals (Wallace et al., 2010). Therefore, future research should seek to identify if coping mechanisms mediate the relationship between stress and burnout in healthcare students, including athletic training students. Future studies should also utilize the brief-COPE and MBI scales that are more frequently utilized in the literature relating to healthcare professionals, stress, burnout, and coping mechanisms. It is plausible that athletic training students that use adaptive coping mechanisms may have

reduced burnout scores and that adaptive coping mechanisms mediate the relationship between stress and burnout, as seen in a previous sample of healthcare professionals (Wallace et al., 2010). Further exploration of the potential relationships between stress, burnout, and coping mechanism may help identify methods to reduce the onset of burnout in athletic training students and the possible adverse outcomes that may be related to the onset of burnout in athletic training students. Furthermore, since physical wellness behaviors have been suggested as positive coping mechanisms to combat stress and burnout in previous literature (Raedeke & Smith, 2004), exploration of the potential mediating relationship that physical wellness behaviors have on stress and burnout in athletic training students may also be a possible method to alleviate burnout and avoid the adverse outcomes associated with its onset.

Theoretical Framework

While several studies have identified relationships between potential adverse outcomes relating to increased burnout scores in studies of healthcare students (i.e., the onset of depressive symptoms, unprofessional clinical behaviors, cheating behaviors, decreased academic achievement) (Dyrbye et al., 2010a; Dyrbye et al., 2010b; Puranitee et al., 2019), only one study has proposed and tested a theoretical model to explain further the relationship between academic variables (i.e., course workload), burnout scores, and adverse outcomes associated with burnout (Atalayin et al., 2015). The authors of this study theorized that academic stressors (i.e., course workload) predicted increased burnout scores in a sample of dentists. Additionally, the authors predicted that increased burnout scores predicted adverse outcomes in a sample of dental students (i.e., decreased academic achievement, major change intentions) (Atalayin et al., 2015). The authors

tested the hypothesized relationships between academic variables, burnout scores, and potential outcomes by using path analysis in a structural equation model (SEM) framework. The theoretical model proposed by Atalayin et al. (2015) successfully identified that academic course load predicted increased burnout scores and that increased burnout scores predicted adverse outcomes in their sample of dental students (Atalayin et al., 2015). The findings by Atalayin et al. (2015) provided insight into the series of relationships between variables proposed to cause burnout (e.g., increased workload) and variables that have been proposed to be effects of burnout (e.g., decreased academic achievement). By testing the theorized model in a SEM framework, the authors were able to test the feasibility of the model and provide further insight into the potential causal relationships between increased burnout scores and adverse outcomes. While this model shed light on the predictive relationships between academic workload, burnout scores, and adverse outcomes in dental students, this model has yet to be tested in other samples of healthcare students, including athletic training students. Atalayin et al. (2015) found that the theorized model successfully identified that increased burnout predicted decreased academic achievement and major change intentions. However, there are other adverse outcomes (i.e., cheating behaviors, unprofessional clinical behaviors, the onset of depressive symptoms) that have identified within previous literature (Dyrbye et al., 2010a; Dyrbye et al., 2010b, Puranitee et al., 2019) that may be beneficial additions within the hypothesized outcomes identified by Atalayin et al. (2015). Therefore, adaptation of this model within other healthcare student samples, including athletic training students, would provide further evidence supporting the assumption that increased academic workload within healthcare students results in increased burnout

scores which ultimately results in various adverse outcomes within students.

Additionally, the supporting evidence that increased burnout scores predict adverse outcomes in healthcare student samples highlights the continued need to identify and assess potential methods to alleviate burnout scores in healthcare students. Previous studies have identified the influential role that adaptive coping mechanisms and physical wellness behaviors have on reducing burnout scores in other healthcare samples (Cecil et al., 2014; Cumbe et al., 2017; Boland et al., 2019; Wallace et al., 2010). However, these findings have not been established in AT students to date. Therefore, future burnout research in athletic training students should explore the adverse outcomes associated with burnout in athletic training students and the potential methods to alleviate or prevent the onset of burnout.

CHAPTER THREE

Methods

Study Purpose and Design

This study's primary purpose was to determine if increased burnout scores predict adverse outcomes (i.e., decreased academic achievement, thoughts of drop out, unprofessional clinical behaviors, cheating behaviors, the onset of depressive symptoms) in athletic training students by adapting and testing a theoretical model proposed by Atalyain et al. (2015). The model tested by Atalayin et al. (2015) identified that increased academic workload predicted increased burnout scores. In turn, increased burnout scores predicted adverse outcomes in a sample of dental students. This study's secondary purpose was to identify the relationships between stress, burnout, coping mechanisms, and physical wellness behaviors and determine if physical wellness behaviors and coping mechanisms mediate the relationship between stress and burnout scores in athletic training students. To address our research questions, we utilized a cross-sectional observational study by creating an online survey in Qualtrics (Provo, UT). The survey was constructed using previously validated survey instruments and previously used survey questions from published studies. After Baylor University's IRB review board classified this study as exempt, we began recruitment by distributing emails to program directors of professional graduate-level athletic training education programs accredited by the Commission of Accreditation on Athletic Training Education (CAATE). These email addresses were obtained within the CAATE database of programs that provides

public access to program directors contact information. The recruitment email informed the program directors of the purpose of the study and asked for their assistance in distributing the recruitment request to their graduate athletic training students. The initial email was sent at the beginning of March 2021 and a follow-up email was sent two weeks after the initial email. The data was collected for a total of one month and was concluded in April of 2021. The first page of the Qualtrics survey informed participants of the anonymous nature of the study and that continuing to the first page of questions served as consent to participate in the study. We aimed to obtain 350 participants for this study. This number was established by utilizing the most recent CAATE Annual Analytic Report from the 2017-2018 academic school year. This report identified that the total graduate-level student population size of all accredited master's degree programs was 3,239 (Traylor, 2018). This most up-to-date population number of graduate athletic training students, a confidence interval of 95%, and a margin of error of .05 were entered into an equation to calculate the ideal sample size for this study. This equation and methodology for selecting a target sample size were recommended by Qualtrics, the survey platform company that was utilized for this study (Smith, 2020). The output indicated that a sample of 344 students would provide a sample size representative of the total graduate athletic training student populations. Three hundred and seventy-four students enrolled in master's level athletic training programs accredited by the CAATE initiated our survey. Participants who were not currently enrolled in a CAATE accredited program or those not completing the survey portions required for statistical analyses were excluded from the study resulting in 54 partial responses being removed from the final analysis. This adjustment resulted in 320 student responses that were utilized in data

analysis and a completion rate of 85%. Post-hoc power was calculated by inputting the final sample size and the statistical methods that were utilized for this study (i.e., correlations, chi-square tests, t-tests, regression), and an error probability of 0.05 into G*Power (Faul et al., 2007). These parameters indicated a predicted effect size of 0.85-0.99 depending on the type of statistical test used, indicating a large effect size (Cohen, 1988).

Instrumentation

Demographics

The first section of the survey included demographic questions used to determine the participant's age, sex, race, geographic location, relationship status, and factors related to the professional athletic training program environment (e.g., the average number of hours in clinical education outside of the classroom, the average number of study hours per week, current clinical site placement, year of schooling). These questions were derived from previously established studies related to athletic training student retention (Bowman et al., 2015), clinical experience (Carr et al., 2016), college student academic success (Dixson et al., 2018), and graduate athletic training student's selection of degree programs (Dearie et al., 2020; Ostrowski & Ladevaia, 2014).

Burnout

The Maslach Burnout Inventory–Human Services Survey (MBI-HSS) (Maslach & Jackson, 1986) is the most widely used scale for measuring burnout in healthcare professionals (Heinemann & Heinemann, 2017). The MBI-HSS is a 22-item scale that measures the three constructs of burnout (i.e., EE, DP, and PA). Nine items of the survey

measure EE, five measure DP, and eight measure PA constructs. Responses for each item are provided on a 7-point Likert scale ranging from "Never" to "Every day." Items within the scale are grouped into the EE, DP, and PA scales. Then, scores are summed to create a score for each dimension of burnout. An individual is considered to be suffering from a high level of burnout if their scores exceed 27 for EE, 10 for DP, or score below 33 for PA (Maslach & Jackson, 1996). The three subscales of the MBI-HSS have reported internal reliability coefficients of .89 (EE), .77 (DP), and .74 (PA) (Lee & Ashforth, 1996).

Stress

The Perceived Stress Scale 4 (PSS-4), an abbreviated four-item scale measuring stress was utilized to assess student stress levels (Cohen & Williamson., 1988). A study evaluating the psychometric properties of the PSS-4 identified a Cronbach's alpha of .82 (Mitchell et al., 2008). Additionally, test-retest reliability measures indicated that one-factor structuring accounted for 65.2% of the variance. Questions within the PSS-4 include "In the last month, how often have you felt that you were unable to control the important things in life," "In the last month, how often have you felt confident about your ability to handle your personal problems," "In the last month, how often have you felt that things were going your way?," and "In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?". Each question includes a scale ranging from 0-4. The 0 option = "never." 1 = "almost never," 2 = "sometimes," 3 = "fairly often," 4 = "very often" for questions 1 and 4. However, for questions 2 and 3, while the same options are listed, the scoring is reversed. Responses to each item are then summed to create a total stress score (Cohen & Williamson., 1988).

Adaptive and Maladaptive Coping Mechanisms

The brief COPE is a 28-item self-report scale that assesses the frequency to which individuals utilize various coping strategies in response to multiple stressors (Carver, 1997). While much of the literature using the brief COPE is tailored towards stress, it is established that a cyclic relationship exists between stress and the dimension of burnout (McManus et al., 2004). Additionally, the brief COPE has been utilized in previous studies that have related coping mechanisms to burnout, including medical student populations (Wachholtz & Rogoff, 2013). Each question within the brief COPE addresses specific coping mechanisms where the participant will rate how frequently they utilize the behavior on a scale of "1" to "4" with 1 being "I haven't been doing this at all" to 4 describing "I've been doing this a lot" (Carver, 1997). Total scores indicating the frequency of using adaptive and maladaptive coping strategies were created by summing the responses for each coping behavior that is considered adaptive or maladaptive. The maximum score for adaptive coping was 64, and the maximum score for maladaptive coping mechanisms was 48 (Carver, 1997). Each individual coping scale within the brief COPE has internal consistency measures of greater than .60 except for acceptance ($\alpha = 0.53$), denial ($\alpha = 0.58$), and behavioral disengagement ($\alpha = 0.54$). The lower reliabilities for each scale are expected because each subscale only includes two questions (Carver, 1997). However, an alpha coefficient over .50 is considered minimally acceptable for internal consistency measures (Nunnally, 1978).

Adverse Outcomes of Burnout

Thoughts of drop out. Two questions specific to students' thoughts of drop out from their athletic training education program were adapted from a previous study assessing drop out intentions in samples of healthcare students (Dyrbye et al., 2010b). The authors of this study stated that their questions were reviewed by experts in the Mayo Survey Research Center and approved to adequately assess students' intent to drop out of medical school. The first question was a dichotomous variable asking students if they had ever had thoughts of dropping out of their education program with answer choices including “yes” or “no”. A follow-up question asked students to indicate the seriousness of these thoughts on a scale of “0” to “5”, with “0” indicating no thoughts of drop out and “5” indicating serious thoughts of drop out.

Decreased academic achievement. (GPA). Students were asked to self-report their current grade point average (GPA) to assess academic achievement. Similar to a study within dental students, students' self-reported GPA was assessed on an interval scale (Atalayin et al., 2015). Answer choices included "lower than 2.0", “2.0-2.49”, “2.5-2.99”, “3.0-3.49”, “3.5-3.99”, and “4.0 or higher”.

Cheating and dishonest clinical behaviors. Questions relating to cheating and dishonest clinical behaviors were adapted from studies reporting dishonest cheating behaviors in medical students (Dyrbye et al., 2010a; Sierles & Hendrickx, 1980). Questions related to cheating assessed if students had ever copied off another student or allowed a student to copy off them. Students were asked if they had ever taken credit for another person’s work. Dishonest clinical behaviors were assessed by asking if students

had ever lied to their preceptor or falsified patient records. Each “yes” to a dishonest clinical behavior was combined and converted into a variable that included coding for no reports of dishonest clinical behaviors as "0", one report of cheating or dishonest clinical behavior as "1", and two reports of cheating or dishonest clinical behaviors being recorded as "2".

Depressive symptoms. The two-item PRIME MD scale was used to screen for depressive symptoms. This scale was previously used in studies of burnout in medical students (Dyrbye et al., 2010a). Answers were coded as "0"—no reports of depressive symptoms, “1”—responded yes to one depressive symptom, and “2”—responded yes to two depressive symptoms." Reporting one or more answers of “yes” to a depressive symptom resulted in a positive screen for depressive symptoms (Dyrbye et al., 2010a).

Physical Wellness Behaviors

Physical activity. The International Physical Activity Questionnaire- Short Form (IPAQ-SF) is a measure that assesses the types of the intensity of physical activity and sitting time of individuals during their daily routines within the past seven days (Craig et al., 2003). This scale consists of four items and is recommended as a cost-effective method to assess physical activity in various populations (Craig et al., 2003). Items assessed both the duration of physical activity and intensity. Intensity was measured utilizing metabolic equivalents (METs), including moderate physical activity (MPA = 4.0 METs), vigorous physical exercise (VPA=8.0 METs), and low physical activity (LPA=3.3 METs). A recent systematic review identified that the IPAQ-SF has high reliability with alphas ranging from 0.66-0.88 (Lee et al., 2011).

Diet quality. The Rapid Eating Assessment for Patients – Short Form (REAP-S) is a scale evaluating dietary behaviors, including 14 questions assessing the frequency of intake for various food groups (Gans et al., 2006). The REAP-S is considered a feasible survey validated against lengthier scales such as the Healthy Eating Index (Gans et al., 2006). Each question assesses the frequency of food intake with responses categorized as 0-1 times = "rarely/never", 1-6 times = "sometimes" and more than six times = "usually/often" (Gans et al., 2006). The responses of each question are then summed to create a combined measure of overall diet quality with increased scores indicating improved diet quality and decreased scores indicating reduced diet quality. Adequate test-retest reliability has been reported for this scale ($r = 0.86$) in diverse samples (Kurka et al., 2014).

Data Processing and Analysis

All data from the survey was collected in Qualtrics and exported into an SPSS data file for analysis. The data was stored on a secure server within Baylor University's BOX folder. All statistical analyses were performed using SPSS 27.0 and AMOS 27.0. The specific data analysis plan for each hypothesis is listed below. For all hypotheses, measures of mean, SD, range, skewness, and kurtosis were used to examine the distribution and central tendency of responses.

Hypothesis 1. Path analysis was used to estimate the impact of workload (i.e., average study time per week, clinical hours per week) on burnout scores (i.e., EE, DP, PA) and determine if the adapted theoretical model by Atalayin et al. (2015) successfully described the relationships between, academic variables, burnout, and potential adverse outcomes in our sample of athletic training students. Additionally, path analysis

identified if increased burnout scores predict potential adverse outcomes of burnout (i.e., thoughts of drop out, decreased academic achievement, cheating behaviors, dishonest clinical behaviors, and depressive symptoms). Overall model fit was assessed utilizing Chi-square (χ^2), fit indices, comparative fit index (CFI), incremental fit index (IFI), the goodness of fit index (GFI), and normed fit index values (NFI). The methods utilized were adapted from a similar study within a sample of dental students that utilized path analysis in an SEM framework to test a theoretical model that determined the predictive relationships between academic variables on burnout and potential adverse outcomes of burnout (Atalayin et al. 2015). Our adapted model with predicted relationships between the variables of interest is graphically displayed in figure 4.1.

Hypothesis 2. Pearson product-moment correlation analyses were used to examine the relationships between stress and coping mechanisms (i.e., adaptive coping, maladaptive coping) in athletic training students.

Hypothesis 3. Pearson product-moment correlation analyses were utilized to examine if a relationship exists between coping mechanisms (i.e., adaptive coping, maladaptive coping) and burnout scores (i.e., EE, DP, PA).

Hypothesis 4: Mediation analyses were run in the PROCESS macro within SPSS to determine if coping mechanisms (i.e., adaptive coping, maladaptive coping) mediated the relationship between stress and burnout in our sample of athletic training students. Mediation analysis was run using an SPSS macro, PROCESS v3.4 (model 4), using 5000 bootstrap samples for bias correction and 95% confidence intervals (Hayes, 2017, model

4). Our predicted mediating relationship of physical wellness behaviors between stress and burnout is visually represented in figure 5.2.

Hypothesis 5. Pearson product-moment correlation analyses were used to examine the relationships between stress and physical wellness behaviors (i.e., diet quality, physical activity) in athletic training students.

Hypothesis 6. Pearson product-moment correlation analyses were utilized to examine if a relationship exists between physical wellness behaviors (i.e., diet quality, physical activity) and burnout scores (i.e., EE, DP, PA) in our sample of athletic training students.

Hypothesis 7: Mediation analyses were run in the PROCESS macro within SPSS to determine if physical wellness behaviors (i.e., diet quality, physical activity) mediated the relationship between stress and burnout in our sample of athletic training students. Mediation analyses were performed in the SPSS macro, PROCESS v3.4 (model 4), using 5000 bootstrap samples for bias correction and 95% confidence intervals (Hayes, 2017, model 4). Our predicted mediating relationship of physical wellness behaviors between stress and burnout is visually represented in figure 5.2.

CHAPTER FOUR

Burnout and Adverse Outcomes in AT Students

Abstract

Context: Burnout is a psychological syndrome consisting of increased emotional exhaustion (EE), depersonalization (DP), and decreased personal accomplishment (PA). Adverse outcomes (i.e., thoughts of drop out, decreased academic achievement, depressive symptoms, cheating behaviors, unprofessional behaviors) have been related to increased burnout (i.e., EE, DP, PA) in student populations. Atalayin et al. (2015) proposed a theoretical model predicting adverse outcomes of burnout. However, this model has not been tested in samples of athletic training students. Objective: To test a theoretical model that describes relationships between academic variables, burnout, and associated adverse outcomes in athletic training students. Design: Cross-sectional study. Setting: Web-based survey. Participants: Students enrolled in CAATE accredited professional graduate athletic training programs. Interventions: A survey assessed demographics, academic variables, burnout scores, and potential adverse outcomes. Main Outcome Measures: Pearson correlations identified relationships between variables of interest. Structural equation modeling identified relationships between variables and model fit. Results: This sample contained 320 graduate athletic training students. Students were primarily female, Caucasian, and single. At least 18% of students had high burnout on one or more scales. Significant correlations existed between burnout scores and thoughts of drop out, cheating behaviors, unprofessional clinical behaviors, and

depressive symptoms. Fit indices indicated that the theoretical model successfully described relationships between burnout and adverse outcomes in athletic training students. Specifically, increased EE scores were predictive of depressive symptoms and increased thoughts of drop out. High DP scores predicted unprofessional clinical behaviors. Decreased PA scores were also predictive of depressive symptoms.

Conclusions: Increased study time relates to increased EE in our sample of athletic training students. Additionally, increased scores on one or more burnout dimensions related to increased reports of adverse outcomes. Athletic training educators should be aware of the potential adverse outcomes related to burnout in this sample of AT students. Our findings point to the need to identify potential interventional methods to alleviate burnout symptoms in athletic training students.

Key Points

- Our sample of athletic training students reported decreased burnout scores compared to previous reports within AT students.
- Relationships between increased burnout and adverse outcomes (i.e., depressive symptoms, cheating behaviors, unprofessional clinical behaviors, thoughts of drop out) were identified.
- The theoretical model tested successfully described the relationships between burnout and adverse outcomes in athletic training students.

Introduction

Burnout, the psychological syndrome consisting of symptoms of emotional exhaustion (EE), depersonalization (DP), and decreased personal accomplishment (PA),

has been extensively studied among healthcare professionals (e.g., physicians, nurses, physician assistants) (Aiken et al., 2001; Benson et al., 2016; Shanafelt et al., 2010). To date, the Maslach Burnout Inventory – Human Services Survey (MBI-HSS) is thought to be the most widely used quantitative measurement of burnout in healthcare professionals (Heinemann & Heinemann, 2017). Various personal factors (e.g., demographics, personality traits, behaviors) have been related to increased burnout in healthcare providers. Sex is one of the primary demographic variables identified that has been found to impact burnout scores in healthcare professionals. However, conflicting findings exist (Ang et al., 2016, Boland et al., 2019). For example, one study identified females to have higher burnout scores than males (Eden et al., 2020). However, another study identified that males reported higher burnout scores (Ang et al., 2016). Organizational factors (e.g., increased workload, reduced support from supervisors) have also been documented in relation to increased burnout scores in healthcare professionals (Aiken et al., 2001; Benson et al., 2016). Adverse outcomes (e.g., attrition, medical errors) have been documented in healthcare professionals reporting increased burnout scores on one or more burnout scales (i.e., EE, DP, PA) (Aiken et al., 2001; Moloney et al., 2018; Shanafelt et al., 2010). For example, nurses with high levels of burnout reported intentions to leave their current job (Aiken et al., 2001; Moloney et al., 2018). Additionally, burnout has been associated with increased medical errors in a sample of physicians (Shanafelt et al., 2010).

Burnout in Athletic Trainers

Athletic trainers (ATs) are a subset of healthcare providers susceptible to burnout (Kania et al., 2009; Oglesby et al., 2020). Similar to studies in other healthcare professionals, organizational factors (e.g., workload, support) and personal factors (e.g.,

demographic variables) have been found to influence burnout scores in samples of ATs (Kania et al., 2009; Naugle et al., 2013; Walter et al., 2009). For example, multiple studies identify that female ATs have higher burnout scores than their male counterparts (Naugle et al., 2013; Walter et al., 2009). Increased age has also been associated with increased burnout in one sample of ATs (Walter et al., 2009). To date, few studies have explored the potential adverse outcomes from increased burnout scores in ATs.

However, two studies describe outcomes of diminished physical health (i.e., including headaches, high blood pressure, weight issues, fatigue, indigestion, and sleeplessness) in those with increased burnout scores (Campbell et al., 1985; Gieck, 1986). Additionally, ATs list causes of burnout (e.g., workload, lack of job satisfaction, and insufficient salary) as reasons for leaving the AT profession, indicating potential retention concerns (Capel, 1990).

Burnout in Healthcare Students

Burnout is prevalent at various levels, even during the academic years before entering the workforce as a healthcare professional (Brazeau et al., 2010; Deeb et al., 2018; Johnson et al., 2020b). For example, at least 17% of a sample of dental students reported high EE scores in one study (Deeb et al., 2018). Additionally, mean burnout scores in one sample of medical students indicated moderate levels of burnout on each subscale (i.e., EE, DP, and PA). (Brazeau et al., 2010), Moderate burnout scores were also reported in a sample of physician assistant students (Johnson et al., 2020b).

Literature identifying factors associated with increased burnout in healthcare students is less extensive than that of healthcare professionals. However, some demographic variables (e.g., sex, age, relationship status) and academic variables (e.g., increased

number of study hours, increased time spent in clinical education, and increased years of study) have been related to increased burnout scores in samples of healthcare students (Atalayin et al., 2015; Dyrbye et al., 2010a; Dyrbye et al., 2010b). Increased burnout scores have also predicted adverse outcomes in healthcare students (e.g., increased depressive symptoms, unprofessional behaviors, cheating behaviors, thoughts of drop out, reduced academic achievement) (Atalayin et al., 2015; Dyrbye et al., 2010a; Dyrbye et al., 2010b; Puranitee et al., 2019). Authors of one study identified that medical students who had increased burnout scores were more likely to document unprofessional clinical behaviors (Dyrbye et al., 2010a). These behaviors included omission of physical examination findings on patient documentation and cheating. Additionally, thoughts of drop out were seen in medical students who reported increased burnout (Puranitee et al., 2019).

Burnout in Athletic Training Students

Students enrolled in master's level professional athletic training programs are also susceptible to burnout (Bryant et al., 2019; Riter et al., 2008; Vineyard et al., 2021). To our knowledge, only two published studies have examined the prevalence of burnout in graduate athletic training students (Bryant et al., 2020; Vineyard et al., 2021). A recent study by Vineyard et al. (2021) found that 70.8% of undergraduate students and 62.9% of graduate students had high EE scores. Additionally, 100% of both undergraduate and graduate student samples identified high DP levels (Vineyard et al., 2021).

Demands of academic course loads and the added responsibilities of participating in clinical education have been suggested as contributors to increased burnout scores in athletic training students (Bryant et al., 2019; Mazerolle & Pagnotta, 2011). Additionally,

the increased time within the education program has been associated with increased burnout scores among athletic training students (Riter et al., 2008). Recently, Vineyard et al. (2021) identified that increased clinical hours, being female, and increased class workload stress resulted in increased burnout scores. However, to our knowledge, no published studies have identified potential adverse outcomes of burnout within athletic training students.

Theoretical Framework

Atalayin et al. (2015) proposed a theoretical framework to explain how academic variables (i.e., academic workload) predict burnout and that increased burnout predicts adverse outcomes in healthcare students. The authors used path analysis within a structural equation modeling (SEM) framework to identify if the model successfully explained the proposed chains of relationships between academic variables, burnout, and adverse outcomes. While the model proposed by Atalayin et al. (2015) successfully explained the relationship between academic variables, burnout, and adverse consequences in a sample of dental students, this model has not been tested in other samples of healthcare student populations, including athletic training students. Therefore, the purpose of this study was to identify if a theoretical model adapted from Atalayin and colleagues (2015) was able to predict burnout scores and adverse outcomes in our sample of athletic training students. Our proposed adapted model included an academic variable (i.e., study time) as a predictor of increased burnout scores similar to the model proposed by Atalayin et al., (2015). We also added clinical education time as a hypothesized predictor of burnout scores in our adapted model due to the demands of a clinical caseload in addition to traditional academic demands experienced by athletic training

students. Additionally, burnout scores (i.e., EE, DP, and PA) and potential outcomes of burnout (i.e., depressive symptoms, thoughts of drop out, cheating behaviors, unprofessional clinical behaviors) were the outcome variables that informed the model. While thoughts of drop out were maintained in our model similar to the Atalayin et al. (2015) study, we also entered other variables (i.e., depressive symptoms, cheating behaviors, unprofessional clinical behaviors) that have been predicted by increased burnout scores in other samples of healthcare students (Atalayin et al., 2015; Dyrbye et al., 2010a; Dyrbye et al., 2010b; Puranitee et al., 2019). Our theoretical model adapted from Atalayin et al. (2015) for use in this study is displayed in figure 4.1.

Methods

Participants

Three hundred and seventy-four students enrolled in master's level athletic training programs accredited by the CAATE initiated our survey. Participants who were not currently enrolled in a CAATE accredited program or those who did not complete the survey portions required for statistical analyses were excluded from the study resulting in the removal of 54 partial responses from the final analysis. This adjustment resulted in 320 student responses utilized in data analysis and a completion rate of 85%. This study was submitted to the Institutional Review Board (IRB) from the sponsoring institution, Baylor University, and was classified as exempt.

Procedures

We recruited athletic training students to participate in the study by emailing program directors of CAATE accredited professional master's level programs. This

process resulted in 196 programs that were contacted. Program directors of athletic training programs were contacted at their publicly accessible email addresses. The email provided background information on the study and requested that the program director forward a recruiting email to their students, including a link to the survey. The online survey contained 98 questions. The survey was generated in Qualtrics (Provo, UT) utilizing previously validated survey instruments outlined below. Two weeks after the initial email to program directors, a follow-up email was sent, asking them to remind students about participation in the study.

Questionnaire

The online questionnaire was composed of various scales that measured each of the following variables of interest for this study. Each survey component is described in further detail below.

Demographic and situational factors. Demographic questions included personal and situational factors, including sex, year in school, ethnicity, relationship status, and NATA district. The student's level of education was assessed by asking, "What year are you in your master's-level professional athletic training program?" Responses for this question included "1st-year graduate student" or "2nd or 3rd-year graduate student" or "undergraduate student enrolled in a "3+2 education program" options (Dearie et al., 2020; Ostrowski & Ladevia, 2014). Relationship status was assessed by asking, "what is your current relationship status?" answer choices included "single" or "seriously dating or a committed relationship." The average number of hours spent at the student's current clinical site each week and average hours studying per week were both assessed on a six-

point Likert scale with answer choices including "0-10", "10-15", "15-20", "20-25", "25-30", "30+" (Carr et al., 2016). Lastly, students were asked to self-report their current grade point average (GPA) to assess academic achievement. Answer choices included "lower than 2.0", "2.0-2.49", "2.5-2.99", "3.0-3.49", "3.5-3.99", "4.0 or higher." Decreased GPA has been associated with increased burnout scores in a previous sample of dental students (Atalayin et al., 2015).

Burnout. The Maslach Burnout Inventory-Health Human Services Edition (MBI-HHS) assessed burnout among participants (Maslach & Jackson, 1986). The MBI-HHS is the most widely used measure of burnout among healthcare professionals and students in the literature. The MBI is a 22-item scale that measures the three constructs of burnout (i.e., EE, DP, and PA) as described by Maslach & Jackson (1986). Nine items of the survey measured EE, five measured DP, and eight measured PA constructs. The EE scale includes statements such as "I feel emotionally drained from my work." The DP scale includes statements such as "I feel I treat some patients as if they were impersonal objects." Lastly, the PA scale includes statements such as "I feel I am positively influencing other people's lives through my work." Responses for each item are provided on a 7-point Likert scale ranging from "Never" to "Every day." Item scores were summed to create a score for each dimension of burnout (Maslach & Jackson, 1986). Higher scores on the EE and DP burnout scales indicate increased burnout, whereas decreased scores on the PA subscale represent increased burnout (Maslach & Jackson, 1986).

Potential Outcomes of Burnout

Dishonest clinical behaviors and cheating behaviors. Questions relating to cheating and dishonest clinical behaviors were adapted from a previous study within medical students (Dyrbye et al., 2010b). Questions related to cheating assessed if students had ever copied off another student or allowed a student to copy off them. Students were asked if they had ever taken credit for another person's work. Dishonest clinical behaviors were assessed by asking if students had ever lied to their preceptor or falsified patient records. Each "yes" to a dishonest clinical behavior was combined and converted into a variable that included coding for no reports of dishonest clinical behaviors as "0", one report of cheating or dishonest clinical behavior as "1", and two reports of cheating or dishonest clinical behaviors being recorded as "2".

Thoughts of drop out. Questions specific to students' thoughts of drop out from their athletic training education program were adapted from a previous study assessing drop out intentions in samples of healthcare students (Dyrbye et al., 2010a). Two questions were asked regarding drop out. The first question was dichotomous, asking students to answer "yes" or "no" to ever having thoughts of dropping out from their current academic program. A second question asked students to indicate the seriousness of these thoughts on a scale of 0-5, with "0" indicating no thoughts of drop out and "5" indicating serious thoughts of drop out.

Depressive symptoms. The two-item PRIME MD scale was used to screen for depressive symptoms. This scale was previously used in burnout studies in medical students (Dyrbye et al., 2010a). Answers were coded as "0 – no reports of depressive

symptoms, 1 – responded yes to one depressive symptom, and 2 – responded yes to two depressive symptoms" Reporting one or more answers of “yes” to a depressive symptom resulted in a positive screen for depressive symptoms (Dyrbye et al., 2010a).

Statistical Analysis

Statistical analyses were conducted using SPSS and AMOS version 27 (IBM) programs. Pearson product-moment correlations were utilized to test the relationships between variables. T-tests and one-way ANOVA were used to determine if the independent variables of sex, relationship status, and program year resulted in significant differences in burnout scores. Listwise deletion was utilized to address missingness in surveys that were determined incomplete. Linearity and homogeneity of variance assumptions were assessed by visual analysis of Q-Q and P-P plots for variables of interest. Path analysis was used to estimate the impact of workload (i.e., average study time per week, clinical hours per week) on burnout scores (i.e., EE, DP, PA). Additionally, path analysis identified if increased burnout scores predicted potential adverse outcomes of burnout (i.e., thoughts of drop out, decreased academic achievement, cheating behaviors, dishonest clinical behaviors, and depressive symptoms). Overall model fit was assessed utilizing Chi-square (χ^2), fit indices, comparative fit index (CFI), incremental fit index (IFI), the goodness of fit index (GFI), and normed fit index (NFI).

Results

Demographics

Three hundred and twenty participants were included in the final analysis. The mean age of students was 23.83 ($SD = 2.517$). Students were primarily female ($n = 241$, 75.3%) and Caucasian ($n = 249$, 77.8%). Most students were single or never married ($n = 177$, 55.3%). All 10 NATA districts were represented. A breakdown of districts represented and demographic data is further described in table 4.1. Mean burnout scores for EE, DP, and PA were 24.33 ($SD = 10.01$), 5.25 ($SD = 4.38$), and 38.20 ($SD = 6.14$) respectively. A total of 128 students had high EE (40%). Low PA scores, indicating increased burnout, were seen in 67 students (20.94%). Lastly, high DP scores were identified in 60 students (18.75%).

Burnout Differences Among Demographic Variables

T-tests revealed a significant difference in PA scores between those in a significant relationship 39.20 ($SD = 5.384$) and those who were single 37.40 ($SD = 6.59$, $p = .012$). Relationship status did not result in a significant difference in EE scores ($p = .965$) or DP scores ($p = .257$).

One-way ANOVA testing revealed that PA scores were significantly different based on a student's program year classification ($p = .007$). Tukey-Kramer post-hoc testing identified that a mean decrease of 2.087 points (95% CI, -3.76, -.42) on the PA scale was reported by graduate students in the first year of their program. Program year classification did not result in significant differences between EE ($p = .367$) and DP scores ($p = .693$).

Bivariate Relationships Between Burnout, Academic Variables, and Potential Outcomes

Pearson product-moment correlations were utilized to identify relationships between burnout, workload, academic achievement, cheating, unprofessional clinical behaviors, depressive symptoms, and thoughts of drop out. DP scores were significantly positively correlated with seriousness of drop out thoughts ($r = .131, p = .019$), depressive symptoms ($r = .315, p < .001$), cheating behaviors ($r = .124, p = .033$), and unprofessional clinical behaviors ($r = .150, p < .001$). EE scores were significantly positively correlated with the number of study hours ($r = .139, p = .013$), the seriousness of drop out thoughts ($r = .310, p < .001$), depressive symptoms ($r = .489, p < .001$), cheating behaviors ($r = .154, p < .001$), and DP scores ($r = .523, p < .001$). Lastly, PA scores were significantly negatively correlated with depressive symptoms ($r = -.169, p < .001$), cheating behaviors ($r = -.135, p = .016$), and EE scores ($r = -.129, p = .021$). These relationships are explained in further detail in table 4.2.

Outcomes of Burnout

Our theoretical model was tested utilizing structural equation modeling (SEM) using maximum likelihood estimation. The predicting variables of burnout (i.e., study time, clinical education time) were entered as exogenous variables. In contrast, the endogenous variables included EE, DP, PA, and potential outcomes (i.e., depressive symptoms, cheating behaviors, thoughts of drop out, academic achievement, and unprofessional behaviors). All variables were assumed to be normally distributed based on ocular analysis of P-P charts and had relatively minimal skewness and kurtosis. Additionally, each variable included three or more ordinal levels indicating that any failure to address the ordinality of the data is likely negligible. Initial fit indices indicated

that the clinical education time variable was insignificant and detracted from the model's overall fit. Therefore, this variable was removed from our final model. A predictive relationship between burnout and GPA was also not identified in our model. Therefore, fit indices recommended the removal of this path to improve overall model fit. All other paths depicting the relationships between burnout scores and adverse outcomes were maintained in the final model. Our final parsimonious model is depicted in figure 4.2. The final model was accepted as adequate based on absolute fit values (χ^2) and other measures of relative fit including: χ^2 (16, n = 320) = 20.888 and p = .183, GFI = .984, adjusted GFI = .964, RMSEA = .031 (.000; .065), CFI = .983, Tucker-Lewis Index = .970, IFI = .983, NFI = .932. Increased study hours predicted increased EE scores (β = .139, p = .012). Increased EE scores predicted adverse outcomes including increased depressive symptoms (β = .475, p < .001) and increased thoughts of drop out (β = .310, p = .005). Additionally, the path between DP and unprofessional clinical behaviors was statistically significant (β = .156, p = .004). Lastly, the path between PA and depression (β = -.107, p = .028) was significant. All the relationships between variables entered in the model were direct relationships only. Any indirect or mediating relationships between variables included in the model were statistically insignificant (p < .05).

Discussion

The purpose of this study was to identify if a theoretical model adapted from Atalayin and colleagues (2015) was able to predict relationships between academic variables, burnout scores, and adverse outcomes in our sample of athletic training students. Our findings indicated that the overall percentage of athletic training students that had high levels of burnout was lower in our sample compared to previous findings

(Vineyard et al., 2021). To our knowledge, only one other study has documented burnout scores utilizing the MBI-HSS (Bryant et al., 2020). However, this study did not identify the percentage of students exhibiting high burnout scores (Bryant et al., 2020). Increased burnout scores on the EE and DP scales were reported in Bryant and colleagues (2019) compared to our sample, indicating increased burnout in their sample. One reason for the discrepancy in burnout scores between the studies mentioned above may be the academic and clinical changes related to the COVID-19 pandemic over the past year. A recent article by Hall and colleagues (2020) highlights the significant disruption of day-to-day routines, changes to scheduled clinical education rotations, and physical distancing requirements that have significantly impacted medical education over the past year. Athletic training education programs have also endured the same challenges, which may have impacted students' feelings of burnout due to disrupted schedules and a changing academic environment. However, the impact of COVID-19 on burnout was outside of the scope of this study.

Our findings also identified a significant difference in PA scores between single students and those in a committed relationship. The increase in personal accomplishment seen may be due to the increased social support individuals may perceive from their relationship with their significant other. Previous studies within healthcare student samples have identified the importance of social support in reducing burnout scores (Boland et al., 2019; Mazerolle & Pagnotta, 2011). These findings suggest that increased social support may be a potential alleviator of burnout and should be further explored.

Outcomes of Burnout

Our proposed theoretical model testing the relationships between academic variables, burnout symptoms, and outcomes of burnout was deemed successful based on the adequate measures of absolute and relative fit identified. Measures of absolute and relative fit met normative values (Kline, 2005), indicating that our model adequately fit the data and successfully described relationships between academic study time, burnout scores, and adverse outcomes in our sample of athletic training students. These findings suggest that the theoretical model that we adapted from Atalayin et al. (2015) was successful in describing the hypothesized relationships between our variables of interest. Additionally, our adapted model identified that increased burnout scores (i.e., EE, DP, PA) predicted at least one or more adverse outcomes (i.e., depressive symptoms, thoughts of drop out, and unprofessional clinical behaviors). Specifically, within our final model, EE scores were predictive of depressive symptoms in our sample of athletic training students. Additionally, reduced PA predicted depressive symptoms in our sample of athletic training students. These findings support the relationship between burnout and depressive symptoms identified by Puranitee et al. (2019), which revealed a significant positive relationship between depressive symptoms and burnout in medical students. Compared to previous reports of depressive symptoms in healthcare students (Dyrbye et al., 2010a), our sample had a higher percentage of depressive symptoms. However, this may be due to our large percentage of female students. Females have been found to report depressive symptoms more often than their male counterparts (Salk et al., 2017). Our findings also indicated that EE symptoms predicted the severity of drop out thoughts in our sample of athletic training students. These reports support findings within a sample of

medical students that identified that burnout scores predicted thoughts of drop out (Dyrbye et al., 2010b). Increased DP was found to result in unprofessional clinical behaviors in athletic training students. This finding is similar to a study within medical students indicating that students with increased burnout scores were more likely to report engaging in one or more unprofessional behaviors than those with decreased burnout scores (Dyrbye et al. 2010a). While our findings identified that our proposed theoretical model successfully explained the relationships between burnout and adverse outcomes, neither our model nor the Atalayin et al. (2015) model accounted for potential alleviators of burnout. Due to the adverse outcomes identified concerning burnout scores in our sample of athletic training students, future research should seek to identify potential alleviators of burnout to lessen the risk of adverse outcomes.

Limitations

This study was limited to a one-time cross-sectional sampling of burnout and outcomes of burnout in a sample of athletic training students. While SEM analysis helped identify predictive relationships between burnout and adverse outcomes, it did not allow for causal inferences to be made between these relationships. Although the academic impacts of COVID-19 may have played a role in student responses, these findings were not assessed with respect to survey length. Furthermore, a response bias may have been present, resulting in students experiencing burnout not completing this survey.

Additionally, recall bias may have been present. Athletic training students may not have wanted to report that they performed cheating or dishonest clinical behaviors even though they were told the survey would remain anonymous. To achieve brevity within this study, some components of the survey utilized short-scale input. In contrast, longer

questionnaires may have been more beneficial in capturing some aspects of the student's experience, such as the severity of depressive symptoms. The two-item screen utilized in this study is sensitive in detecting depressive symptoms but cannot quantify the severity of these symptoms. Additionally, because our sample was largely female, our ability to make inferences to the entire athletic training student population is limited. Furthermore, our relatively high percentage of students reporting depressive symptoms may have been because of the disproportionate number of females in this sample. Previous literature suggests that females report depressive symptoms more frequently than their male counterparts (Salk et al., 2017).

Future Directions

Due to the conflicting burnout prevalence findings between this study and previous studies within athletic training students, future research should consider longitudinal approaches to assess differences in burnout to identify factors that may impact these scores over time. Furthermore, while this study highlights some consequences of burnout in athletic training students, other consequences of burnout and methods to alleviate burnout in athletic training students remain unknown. Additionally, future studies among athletic training students should seek to identify potential intervention methods that may provide students with information and resources to manage stress better and avoid burnout.

Conclusion

Evidence points to the development of burnout as early as during the academic years before entering the workforce as a healthcare professional (Brazeau et al., 2010; Deeb et al., 2018; Johnson et al., 2020a). While adverse consequences of burnout have

been previously identified in other samples of healthcare students (Atalayin et al., 2015; Dyrbye et al., 2010a, Dyrbye et al., 2010b; Puranitee et al., 2019). To our knowledge, no studies within athletic training students have identified consequences of burnout. We adapted a theoretical model proposed by Atalayin et al. (2015) to identify the relationships between academic variables, burnout symptoms, and potential consequences. Identifying a theoretical model to explain the relationships between burnout and adverse consequences is helpful to understand the predictive relationships between these measures fully. While testing a theoretical model in an SEM framework does not allow us to make causal inferences on the relationship between variables, it does allow for more concrete evidence on the predictive relationships of these variables to be formed. Our findings indicated that increased burnout scores on at least one dimension of burnout predicted adverse consequences, including unprofessional clinical behaviors, thoughts of drop out, and depressive symptoms in our sample of athletic training students. These findings suggest that athletic training educators should be aware of the presence of burnout in athletic training students and its potential impacts on academic honesty, retention, professionalism, and overall well-being. Due to the adverse consequences of burnout in athletic training students identified in this study, researchers should continue to emphasize the study of burnout in athletic training students and identify possible methods to alleviate burnout symptoms.

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Tables and Figures

Figure 4.1

Theoretical model adapted from Atalayin et al. (2015)

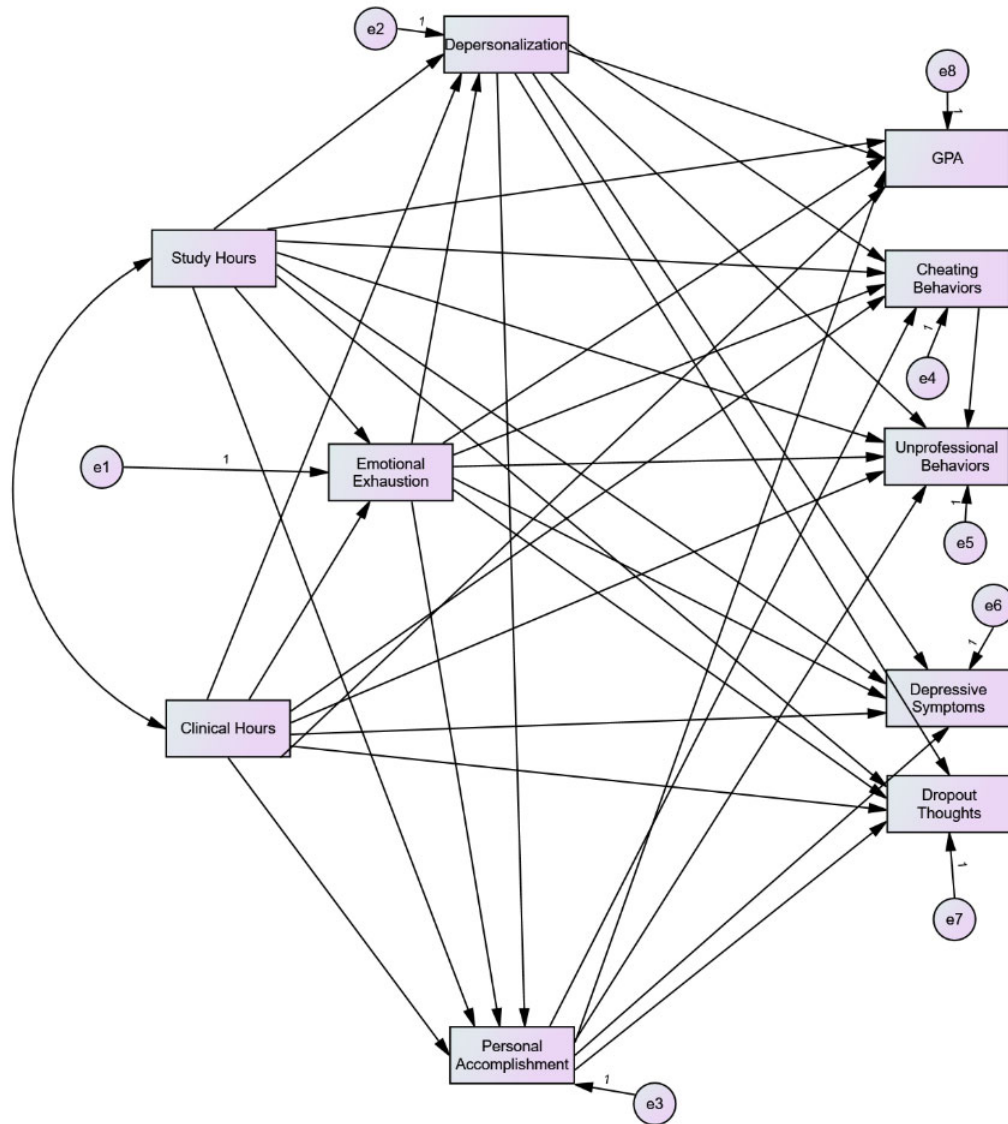
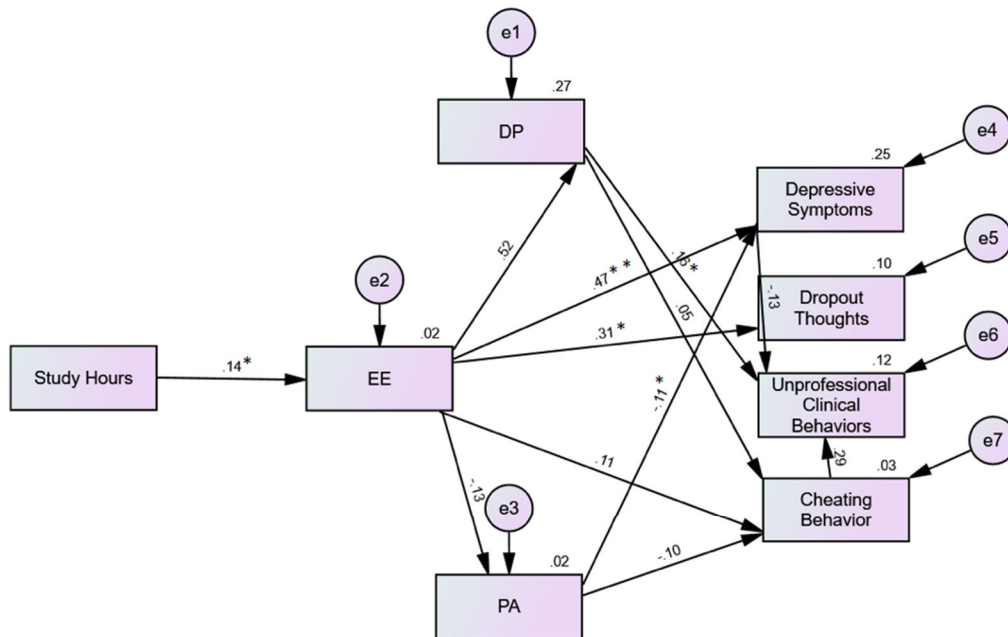


Figure 4.2

Final parsimonious model



Note. $N=320$ * $p < .05$, ** $p < .001$

Table 4.1

<i>Demographics of the sample</i>	
Demographic Variables	<i>n (%)</i>
Sex	
Male	79 (24 %)
Female	241 (75 %)
Race	
Caucasian	249 (71 %)
Hispanic	34 (10 %)
African American	21 (6 %)
Asian/Pacific Islander	20 (6 %)
Multiracial	7 (2 %)
American Indian	6 (2 %)
Program Year	
1st-year graduate student	161 (50%)
2nd or 3 rd -year graduate student	134 (42 %)
Undergraduate enrolled in a combined 3+2 program	25 (8 %)
Relationship Status	
Single, never married	177 (55 %)
Serious dating, married, or committed relationship	143 (44 %)
Weekly Clinical Hour Average	
0-10 hours per week	14 (4 %)
10-15 hours per week	23 (7 %)
15-20 hours per week	53 (16 %)
20-25 hours per week	62 (19 %)
25-30 hours per week	64 (20 %)
30+ hours a week	104 (32 %)
Weekly Study Hour Average	
0-5 hours per week	25 (7%)
5-10 hours per week	134 (42 %)
10-15 hours per week	82 (26 %)
15-20 hours per week	49 (15 %)
20-25 hours per week	15 (5 %)
25+ hours a week	15 (5 %)
NATA District	
1 (CT, ME, MA, NH, RI, VT)	9 (2 %)
2 (DE, NJ, NY, PA)	49 (15 %)
3 (DC, MD, NC, SC, VA, WV)	38 (11 %)
4 (IL, IN, MI, MN, OH, WI)	68 (21 %)

Demographic Variables (cont.)	<i>n</i> (%)
5 (IA, KS, MO, NE, ND, OK, SD)	39 (12 %)
6 (AK, TX)	49 (15 %)
7 (AZ, CO, NM, UT, WY)	13 (4%)
8 (CA, Guam, American Samoa, HI, NV)	6 (2 %)
9 (AL, FL, GA, Puerto Rico, Virgin Islands, KY, LA, MS, TN)	25 (8 %)
10 (AK, ID, MT, OR, WA)	25 (7 %)
GPA	
2.0-3.49	103 (32 %)
3.5-3.99	186 (58 %)
4.0 or higher	31 (9 %)
Unprofessional Clinical Behaviors Reported	
None	260 (81 %)
Admitted one unprofessional behavior	43 (13 %)
Admitted two unprofessional behaviors	17 (5 %)
Cheating Behaviors Reported	
None	255 (79 %)
One cheating behavior reported	60 (18 %)
Two cheating behaviors reported	5 (2 %)
Thoughts of Drop out	
No	178 (55 %)
Yes	142 (44 %)
Positive Depressive Symptom Screen	
No	93 (29 %)
Yes	227 (71 %)
High Emotional Exhaustion	128 (40%)
High Depersonalization	67 (21%)
High Personal Accomplishment	60 (19%)

Table 4.2

Bivariate correlations between academic variables, burnout, and outcomes

Variable	1	2	3	4	5	6	7	8	9	10
1. GPA										
2. Clinical Hour Average Per Week	-0.03									
3. Study Hour Average Per Week	0.00	-0.03								
4. Seriousness of drop out thoughts	-0.07	-0.04	-0.02							
5. Depression symptoms	0.02	-0.02	0.08	.170**						
6. Cheating Behaviors	-0.05	-0.02	-0.07	0.09	0.09					
7. Unprofessional Clinical Behaviors	-0.10	0.02	-0.07	-0.04	-0.06	.312**				
8. Depersonalization	-0.01	0.09	-0.03	.131*	.315**	.124*	.150**			
9. Emotional Exhaustion	0.06	0.00	.139*	.310**	.489**	.154**	0.00	.523**		
10. Personal Accomplishment	-0.03	0.10	0.06	-0.09	-.169**	-.135*	-0.11	-0.11	.129*	

Note. N=320 *p < .05, ** p < .001

CHAPTER FIVE

Potential Alleviators of Burnout in AT Students

Abstract

Context: Burnout is a psychological syndrome consisting of increased emotional exhaustion (EE), depersonalization (DP), and decreased personal accomplishment (PA). Chronic stress contributes to the onset of burnout. Adaptive coping mechanisms (i.e., proactive stress management) and physical wellness behaviors (i.e., diet quality, physical activity) reduce burnout in healthcare students. In contrast, maladaptive coping mechanisms (i.e., unproductive stress management) increase burnout scores.

Additionally, coping mechanisms appear to mediate the relationship between stress and burnout. However, these relationships have not been defined in athletic training students.

Objective: To determine the relationships between stress, burnout, coping, and physical wellness behaviors and to determine if coping and physical wellness mediated the relationship between stress and burnout in athletic training students. Participants: Students enrolled in professional athletic training master's degree programs.

Interventions: A survey assessed demographic information, student stress, coping behaviors, physical wellness behaviors, and burnout. Main Outcome Measures: Pearson correlation coefficients determined the relationships between stress, burnout, physical wellness behaviors, and coping mechanisms. Mediation analyses were conducted in the PROCESS macro within SPSS. Results: Increased stress was correlated with increased burnout scores on all three subscales. Improved diet quality was correlated with

increased PA scores and decreased EE scores. Increased adaptive coping was correlated with improved PA scores. Maladaptive coping correlated with increased burnout scores on all three subscales. The relationship between stress and PA was mediated by diet quality. Additionally, the relationship between stress and EE was mediated by maladaptive coping strategies. Conclusions: Stress was related to burnout in our sample of athletic training students. Increased use of adaptive coping mechanisms and improved diet quality resulted in reduced burnout on one or more burnout dimensions. Both maladaptive coping mechanisms and diet quality explained a proportion of the relationship between stress and burnout in our sample of athletic training students.

Key Points

- Athletic training students reporting increased stress report increased burnout
- Adaptive coping mechanism and improved physical wellness behaviors relate to decreased burnout in athletic training students
- Diet quality and maladaptive coping mechanisms mediated the relationship between stress and burnout in athletic training students

Introduction

Burnout is a psychological syndrome representing feelings of emotional exhaustion (EE), depersonalization (DP), and decreased personal accomplishment (PA) (Maslach & Jackson, 1996). Burnout is thought to develop in response to chronic stress (Raedeke & Smith, 2001). The presence of burnout has been reported within many samples of healthcare professionals (i.e., physicians, nurses, physician assistants) (Aiken et al., 2001; Benson et al., 2016; Shanafelt et al., 2010). Within one study of nurses, researchers found that 43.2% reported high levels of burnout (Aiken et al., 2001). Additionally, moderate to high levels of burnout were seen in 64% of a sample of physician assistants (Benson et al., 2016).

While most of the literature within healthcare professionals has focused on the prevalence of burnout and its consequences, several authors have identified potential alleviators of burnout, including physical wellness behaviors and adaptive coping mechanisms (Cumbe et al., 2017; Guo et al., 2018). Habits such as maintaining an optimum level of physical activity and a focus on good nutrition are defined as positive physical wellness behaviors (Roscoe, 2009). In one sample of nurses, those who reported increased physical activity had significantly reduced EE compared to those reporting lower levels of physical activity (Guo et al., 2018).

Coping strategies have also been found to influence burnout scores in healthcare professionals (Cumbe et al., 2017; Hutchinson et al., 2014; McKinley et al., 2021). Coping is defined as continually changing cognitive and behavioral efforts to manage specific external and or internal demands that are appraised as exceeding a person's resources (Folkman & Lazarus, 1984). Research suggests that there are two types of

coping mechanisms categories: adaptive and maladaptive (Carver, 1997; Skinner et al., 2013). Adaptive strategies are those that involve challenging a problem with direct behavior changes to combat stress. Adaptive coping mechanisms have been found to decrease burnout scores in healthcare samples. For example, Cumbe et al. (2017) identified that increased adaptive coping mechanisms (e.g., reliance on social support) resulted in decreased burnout scores in one study of nurses. Acceptance, an adaptive coping mechanism, was also correlated with decreased burnout scores in one study of physicians (Hutchinson et al., 2014). In contrast, maladaptive coping mechanisms (e.g., substance use) resulted in increases in burnout scores in one sample of physicians (Mckinley et al., 2020). Coping mechanisms have also been identified as a mediator (a variable that better explains the relationship between two variables rather than just the relationship between the two variables alone) between stress and burnout scores (Raedeke & Smith, 2001; Wallace et al., 2010).

Certified athletic trainers (ATs) also report burnout. One recent study identified that 38.9% of a sample of ATs employed in the collegiate setting reported high EE scores (Oglesby et al., 2020). Additionally, 33% reported high levels of DP, and 17.7% reported high PA (Oglesby et al., 2020). Most of the literature surrounding burnout in ATs has focused on the prevalence of burnout; however, a few studies have identified potential methods to alleviate burnout (i.e., improving social support, increasing physical activity, spiritual well-being) (DeFreese & Mihalik, 2016; Goodman et al., 2010; Hendrix et al., 2000; Naugle et al., 2013; Oglesby et al., 2021). For example, Defreese & Mihalik, 2016, identified that for every 1-point increase in increased social support reported in one sample of ATs, a .25-point reduction in burnout scores was seen. Additionally, the

authors of one study within a sample of ATs indicated that a significant negative correlation between burnout and physical activity was identified (Naugle et al., 2013). Within this sample, ATs reporting increased physical activity levels had decreased burnout scores (Naugle et al., 2013).

Burnout in Healthcare Students

Burnout has also been identified in samples of students completing educational programs to become healthcare professionals (i.e., medical students, physician assistant students, dental students). Several studies have identified methods to alleviate or reduce burnout (i.e., wellness programs, increased social support) in healthcare students to date (Johnson et al., 2020b; Popa-Velea et al., 2017). For example, authors of a study within a sample of physician assistant students identified that perceived social support held a significant inverse correlation with burnout scores (Popa-Velea et al., 2017). Medical students in this sample reporting increased perceived social support had decreased burnout scores. Authors of a burnout study within a sample of physician assistant students identified that 70% of respondents were interested in a wellness education program that focused on methods to alleviate burnout and stress (Johnson et al., 2020a). To our knowledge, no studies to date have identified the relationship between physical wellness behaviors, coping mechanisms, and burnout scores.

Burnout in Athletic Training Students

Students enrolled in athletic training education programs are also susceptible to burnout (Bryant et al., 2019; Riter et al., 2008). To our knowledge, only two published studies have examined burnout scores (i.e., EE, DP, PA) in athletic training students

(Bryant et al., 2020; Vineyard et al., 2021). One of these studies found that 70.8% of undergraduate students and 62.9% of graduate students reported high EE scores (Vineyard et al., 2021). Additionally, 100% of both undergraduate and graduate student samples identified high DP levels (Vineyard et al., 2021). While the Bryant and colleagues (2020) study did not identify the overall percentage of students reporting high levels of burnout, mean scores identified high levels of burnout within their sample were reported. Students within this sample reported that the stress of meeting program expectations contributed to their sense of burnout (Bryant et al., 2019). Within the Vineyard et al (2021) study, increased clinical hours and intentions to not enter the athletic training profession upon graduation held relationships with increased burnout on one or more dimensions. To date, literature focusing on alleviating burnout symptoms in athletic training students is limited. However, an increased sense of social support was identified as an alleviator of burnout symptoms in the Bryant et al. (2019) study. To our knowledge, no quantitative studies have identified the impact of physical wellness behaviors and coping mechanisms on stress and burnout scores in athletic training students to date. Due to the mitigating role of physical wellness behaviors and adaptive coping mechanisms seen in samples of healthcare professionals (Cumbe et al., 2017; Guo et al., 2018; Hutchinson et al., 2014), identifying if these relationships also exist in athletic training students may be beneficial in reducing burnout scores. Therefore, the purpose of this study was to identify the relationships between stress, burnout, physical wellness behaviors, and coping mechanisms in a sample of athletic training students. We also sought to determine mediating role of coping and wellness on stress and burnout.

Methods

Participants

Three hundred and seventy-four students within professional master's level athletic training programs accredited by the Commission on Accreditation of Athletic Training Education (CAATE) initiated our survey. Students not currently enrolled in a CAATE accredited program and those who did not complete portions of the study identifying variables of interest (i.e., burnout, stress, physical wellness behaviors, coping mechanisms) were removed from the final analyses. The final number of survey responses analyzed was 320, indicating an 85% completion rate. This study was submitted to and classified as exempt by the Institutional Review Board (IRB) from the sponsoring institution.

Procedures

Athletic training students were recruited via email. We contacted current program directors of CAATE accredited professional master's level athletic training programs utilizing their publicly accessible email addresses. We encouraged the program directors to forward an email to their students currently enrolled in their programs requesting they consider participating in the current research study. This email included information on the study and a link that would direct the student to the anonymous survey. Programs were emailed at the beginning of the study and two weeks after the initial contact for follow-up. All survey questions were asked within an electronic survey system (Qualtrics, Provo UT).

Questionnaire

The online questionnaire was composed of various scales that measured each of the variables of interest for this paper. Demographic questions included sex, ethnicity, year in education program, and NATA district. The complete survey entailed 98 questions. The relevant portions of the survey are described in further detail below.

Burnout. The Maslach Burnout Inventory-Health Human Services Edition (MBI-HHS) was utilized to measure burnout (Maslach & Jackson, 1986). This scale contains 22 items that measure EE, DP, and PA (Maslach & Jackson, 1986). Sums of each question were generated for each dimension of burnout (i.e., EE, DP, PA) (Maslach & Jackson, 1986). High scores on the EE and DP burnout scales reflect increased levels of burnout. Alternatively, reduced PA scores represent increased levels of burnout due to PA being considered a positive attribute (Maslach & Jackson, 1986). Normative scores indicating high levels of burnout include scores of 27 or higher for EE, 10 or more for DP, and scores below 33 for PA (Maslach & Jackson, 1986).

Adaptive and maladaptive coping mechanisms. The brief COPE is a 28-item self-report scale that assesses the frequency to which individuals utilize various coping strategies in response to multiple stressors (Carver, 1997). Coping mechanisms included in the adaptive coping subscale are active coping, planning, positive reinterpretation, acceptance, humor, religion, instrumental support, and emotional support (Skinner et al., 2013). Active coping is described as a conscientious effort to reduce stress (Ab Latif, 2016). Positive reframing measures how an individual interprets a problem (Ab Latif, 2016). In contrast, maladaptive coping mechanisms include self-distraction, denial,

venting, substance use, behavioral disengagement, and self-blame. Behavioral disengagement refers to how an individual avoids solving a problem (Ab Latif, 2016). Self-distraction measures the degree to which an individual diverts their attention to deal with a problem (Ab Latif, 2016). Scores for coping responses are calculated by summing scores for the 12 items on the maladaptive coping subscale and the 16 items on the adaptive coping subscale. Each question describing a coping behavior within the brief COPE includes scores of "1" to "4", with one being "I haven't been doing this at all" to 4 describing "I've been doing this a lot" (Carver, 1997). Scores indicating the frequency of using adaptive and maladaptive coping strategies were created by summing the responses for each coping behavior that is considered adaptive or maladaptive. The maximum score for adaptive coping was 64, and the maximum score for maladaptive coping mechanisms was 48 (Carver, 1997). The brief COPE has been found to have high internal consistency for all measures except scales measuring acceptance, denial, and behavioral disengagement coping (Carver, 1997).

Physical activity. The International Physical Activity Questionnaire- Short Form (IPAQ-SF) is a measure that assesses the types of the intensity of physical activity and sitting time of individuals during their daily routines within the past seven days (Craig et al., 2003). This scale consists of four items and is recommended as a cost-effective method to assess physical activity in various populations (Craig et al., 2003). Items assess both the duration of physical activity and intensity. Intensity is measured utilizing metabolic equivalents (METs), including moderate physical activity (MPA = 4.0 METs), vigorous physical activity (VPA=8.0 METs), and low physical activity (LPA=3.3 METs).

Diet quality. The Rapid Eating Assessment for Patients – Short Form (REAP-S) scale evaluates dietary behaviors, including 14 questions assessing the frequency of intake for various food groups (Gans et al., 2006). The REAP-S is considered a feasible survey validated against lengthier scales such as the Healthy Eating Index (Gans et al., 2006). Each question assesses the frequency of food intake with responses categorized as 0-1 times = "rarely/never", 1-6 times = "sometimes" and more than six times = "usually/often" (Gans et al., 2006).

Statistical Analysis

Statistical analyses were conducted using SPSS version 27 (IBM). Listwise deletion was utilized to address missingness in surveys that were determined incomplete. Linearity and homogeneity of variance assumptions were assessed by visual analysis of Q-Q and P-P plots for variables of interest. Pearson product-moment correlations were run to determine the relationships between variables of interest. Mediation analyses were run in the PROCESS macro within SPSS. Mediation analysis was run using an SPSS macro, PROCESS v3.4 (model 4), using 5000 bootstrap samples for bias correction and 95% confidence intervals (Hayes, 2017, model 4).

Results

Demographics

Our final sample was comprised of 320 graduate athletic training students. The mean age of the students in the sample was 23.83 (SD = 2.52). A majority of students were female (n=241, 75.3%) and Caucasian (n=249, 77.8%). All 10 NATA districts were represented. The predominant district was district 4 (IL, IN, MI, MN, OH, WI), with 21%

of respondents reporting that this district was where their academic program resided. A full list of districts represented and demographic data is further described in table 5.1.

Stress and burnout scores. The mean stress score reported was 7.54 (\pm 3.01). Burnout score means for EE, DP, and PA were 24.33 (SD = 10.01), 5.25 (SD = 4.38), and 38.20 (SD = 6.14) respectively. A total of 128 students reported high EE (40%). High DP scores were reported by 67 students (20.94%). Lastly, high PA scores were reported in 60 students (18.75%). Stress and burnout scores are further depicted in table 5.2.

Coping mechanisms. Of the adaptive coping mechanisms reported by students, the most -reported coping strategies were adaptive coping strategies (98%), planning (96%), positive reframing (96%), and acceptance coping (96%). The most reported maladaptive coping strategies included self-distraction (96%), self-blame (95%), and venting (88%). The mean score of the use of combined adaptive coping mechanisms on the Brief-COPE was 40.54 (\pm 8.41). Adaptive coping mechanism sums generate a scale range from 16-64, with higher scores indicating frequent use of adaptive coping mechanisms and lower scores indicating infrequent use. Maladaptive coping strategy use had a mean score of 23.43 (\pm 5.48). The combination of individual maladaptive coping strategies results in a score range of 12-48, with increased scores indicating increased use of maladaptive coping strategies and decreased scores indicating infrequent use of maladaptive coping strategies. The coping mechanisms utilized and the sum of adaptive and maladaptive coping scores are further depicted in tables 5.1-5.2.

Physical wellness behaviors. A sum of an individual's average metabolic equivalent for a week was measured utilizing the IPAQ-Short form. A MET is a multiple

of an individual's estimated resting energy expenditure. The mean total MET per week reported by athletic training students was 2683.25 (\pm 2210.64). For reference, an average of over 3000 MET minutes per week classifies as having a "high" level of physical activity. Average MET values of 600-2999 per week indicate moderate physical activity levels (Forde, 2018). One hundred one athletic training students reported high levels of physical activity per week (31%). One hundred seventy-nine athletic training students reported moderate physical activity levels (56%), and forty students reported low physical activity levels (12%). The mean diet quality score in our sample of athletic training students was 28.65 (\pm 4.26).

Bivariate Correlations Between Stress, Coping, and Physical Wellness

Pearson product-moment correlational analyses were utilized to identify relationships between reports of EE, DP, PA, diet quality, physical activity, adaptive and maladaptive coping mechanisms. A significant positive correlation between diet quality and physical activity (Total MET) was identified ($r = .194, p < .001$). Stress and overall diet quality held a significant inverse relationship ($r = -.152, p < .001$). Significant correlations between diet quality and EE ($r = -.150, p < .001$) and diet quality and PA ($r = .150, p < .001$) were also identified. Stress was significantly correlated with all burnout dimensions (DP $r = .245, p < .001$, EE $r = .552, p < .001$, PA $r = -.209, p < .001$). A significant positive correlation between stress and maladaptive coping mechanisms was also identified ($r = .619, p < .001$). Diet quality and maladaptive coping mechanisms also had a significant negative correlation ($r = -.181, p < .001$). A significant relationship between maladaptive coping mechanisms was seen with each burnout dimension (DP $r = .409, p < .001$, EE $r = .523, p < .001$, PA $r = -.117, p = .035$). In contrast, adaptive coping

mechanisms were only significantly correlated with PA scores ($r = .257, p < .001$). The relationship between the variables of interest are described in further detail in table 5.3.

Mediation Analyses

Mediation analyses were conducted to examine the impact of coping mechanisms on the relationship between stress and burnout. The predicted relationships and their paths are based on previous literature (Raedeke & Smith., 2004; Wallace et al., 2010) and are represented in figure 5.1. Mediation analyses determined that only diet quality and maladaptive coping mechanisms mediated the relationship between stress and burnout. Table 5.4 identifies the beta coefficients, t values, and confidence intervals for the indirect, total, and direct effects of the two models, where mediation was confirmed following path analysis. These results are also discussed in more detail below.

Diet quality as a mediator between stress and PA. Diet quality mediated the relationship between stress and PA scores, indirect effect $b = -0.037, [-0.098, -0.001]$. The direct effect of stress on PA scores was $b = -0.389 [-0.610, -0.167]$ after controlling for the mediation effect. The presence of diet quality significantly decreased the relationship between stress and PA scores. Stress was significantly correlated with diet quality, and diet quality was significantly correlated with PA scores. The proportion of the total effect of stress on burnout that operates indirectly by the mediating effect of diet quality is 8%. The relationship between stress, PA, and diet quality is depicted in Figure 5.2.

Maladaptive coping as a mediator between stress and EE. Maladaptive coping mediated the relationship between stress and EE scores, indirect effect $b = 0.605, [0.357, 0.855]$. The direct effect of stress on EE scores was $b = 1.237 [-.861, 1.61]$, after

controlling for the mediation effect. The presence of maladaptive coping significantly decreased the relationship between stress and EE scores. Stress was significantly positively correlated with maladaptive coping, and maladaptive coping was significantly related to EE. The proportion of the total effect of stress on burnout that operates indirectly through the mediating effect of maladaptive coping is 32.8%. The relationship between stress, EE, and coping mechanisms is depicted in figure 5.3.

Discussion

Our sample represented 320 athletic training students that were primarily female and Caucasian. All 10 of the National Athletic Trainers' Association (NATA) districts were represented in our sample. While our sample was heavily female, the current makeup of the national athletic training student body is majority female, with over sixty percent of students enrolled in professional masters athletic training education programs reporting being of female sex within the most recent CAATE analytic report (Traylor, 2018). To our knowledge, our study is the first report within athletic training students that measured stress utilizing the validated PSS-4 scale, limiting our ability to make comparisons to previous stress reports in athletic training students. However, the mean stress score identified in our sample closely aligned with a recent report of stress within medical students (Guo et al., 2021).

Forty percent of AT students reported high EE in our samples. This finding is similar to one sample of dental students (Deeb et al., 2018). This percentage is also similar to a recent sample of certified AT professionals demonstrating high EE scores (Oglesby et al., 2020). However, high percentages of EE were lower than a previous study of athletic training students (Vineyard et al., 2021). The one other published

burnout study in graduate athletic training students by Bryant et al. (2019) did not report the percentage of students that had high burnout scores, limiting our ability to make direct comparisons. Our percentage of athletic training students reporting high DP is also much lower than the finding reported by Vineyard et al. (2021). This percentage is also lower than a recent study of certified AT professionals (Oglesby et al., 2020). In contrast, our percentage of high PA scores was similar to that of a recent study within certified ATs (Oglesby et al., 2020) and athletic training students (Vineyard et al., 2021).

Coping Mechanisms

Of the coping mechanisms identified, the top five adaptive coping mechanisms utilized by athletic training students were reframing, active coping, acceptance coping, planning coping, and support coping. We identified that the sum score of adaptive coping behaviors held a significant positive relationship with PA. Our findings support those within a sample of medical students that identified a significant negative correlation between burnout scores and adaptive coping mechanisms (Palupi & Findyartini et al., 2019). In contrast, our study identified that maladaptive coping mechanisms were significantly positively related to increased EE and negatively related to PA in our sample. Similar findings were identified in the Palupi and Findyartini (2019) study that identified a positive correlation between maladaptive coping mechanisms with EE and maladaptive coping mechanisms and cynicism scores. These findings suggest that students who utilize adaptive coping mechanisms have decreased burnout scores. Our findings support previous research that indicates that adaptive coping mechanisms are protective against increased burnout scores (Palupi & Findyartini, 2019).

Mediation analyses. We utilized mediation to identify if coping mechanisms impact the relationship between stress and burnout in athletic training students, similar to findings that have been reported in samples of athletes and healthcare providers (Raedeke & Smith, 2004). Our findings indicated that maladaptive coping mechanisms mediated the relationship between stress and EE burnout scores. Students who reported increased stress reported increased maladaptive coping behaviors and, in turn, reported increased EE scores. These findings suggest that maladaptive coping significantly describes a percentage of the relationship between stress and burnout. Increased stress results in increased use of maladaptive coping mechanisms leading to increased EE burnout scores. These findings further establish the detrimental role that maladaptive coping mechanisms have on burnout. These findings are consistent with results found in a sample of healthcare professionals that identified a mediating relationship of maladaptive coping mechanisms between stress and burnout (Wallace et al., 2010).

Physical Wellness Behaviors

Athletic training students within this sample reported moderate levels of physical activity per week. The mean MET score identified in our study is higher than reports within medical, nursing, and radiography students (Mahony et al., 2018). However, our sample of athletic training students had similar mean MET scores as physiotherapy students (Mahony et al., 2018). One of the potential reasons for increased scores within physiotherapy students and our sample is the amount of coursework and emphasis within these programs. Both physiotherapy and athletic training degree programs entail coursework focusing on orthopedic exercise and rehabilitation. Athletic training students within our sample also appeared to have adequate diet quality with similar scores to

normative values identified for adults consuming a typical omnivorous diet (Johnston et al., 2018). Our findings also suggest that improved diet quality relates to reduced burnout scores in our sample of athletic training students. We also identified a significant negative relationship between diet quality and maladaptive coping. However, to our knowledge, diet quality has not been previously assessed in relation to burnout in samples of healthcare students or ATs, limiting our ability to make comparisons to previous studies. We failed to identify relationships between physical activity and burnout which has been previously identified in another sample of healthcare students (Cecil et al., 2014). One reason for this finding may be due to differing methodologies utilized between these two studies. The study by Cecil and colleagues (2014) utilized the full version of the IPAQ and categorized high versus low physical activity compared to our use of a continuous variable to measure physical activity. Therefore, future research should continue to explore the potential relationships between exercise and burnout in healthcare student samples, including athletic training students.

Mediation analyses. Our results indicated that diet quality mediated the relationship between stress and PA. The indirect effect of diet quality between stress and burnout explained a significant percentage of the total relationship between stress and burnout. Students who reported improved diet quality had reduced stress and, in turn, reported improved PA. In contrast, students who reported worse diet quality had increased stress and, in turn, reported decreased PA scores. In contrast, physical activity was not found to mediate the relationship between stress and burnout. To our knowledge, no previous studies have identified a mediating role of diet quality between stress and burnout, limiting our ability to make direct comparisons. While our findings indicated a

mediating role of diet quality, the overall percentage of the total relationship between stress and burnout explained by diet quality was small. This indicates that other variables likely play a role in the relationship between stress and burnout. However, we can infer that improved diet quality may be a method to alleviate burnout in athletic training students due to the significant positive correlation identified between improved diet quality and improved PA burnout scores.

Limitations

This study was limited to a one-time cross-sectional sampling of burnout and consequences of burnout in a sample of athletic training students. A response bias may have been present. Students who were experiencing high burnout may not have taken the time to complete this survey. Additionally, because our survey asked questions about behaviors that may be socially undesirable (i.e., substance use), students may not have wanted to truthfully answer even though they were informed that the survey was anonymous. Due to the number of variables assessed in this study, some survey components utilized truncated scales in respect of brevity. While these scales have demonstrated adequate reliability compared to the full scales, it is possible that a longer scale may have more adequately assessed coping and physical wellness behaviors. Additionally, since our survey entailed questions asking participants to recall their behaviors over the past month, a recall bias may have altered participants' responses. Due to the number of questions in our study, respondents may have become fatigued and either answered questions incorrectly or discontinued the survey. Lastly, readers should factor in the potential impacts that the COVID-19 pandemic has had on the educational environment, which may have also influenced our findings.

Future Directions

Future research should consider longitudinal approaches to assess differences in burnout scores among athletic training students and factors that may impact these scores over time to determine causal relationships between stress, burnout, coping, and physical wellness behaviors. Additionally, while this study identified significant relationships between coping mechanisms and diet quality with stress and burnout, other variables may likely be potential alleviators of burnout that were not identified in this study. While this study established relationships between stress, burnout, coping mechanisms, and diet quality, interventional studies are needed to understand further the impact of physical wellness behaviors and coping mechanisms on burnout scores in athletic training students. Additionally, due to the conflicting findings identified between this study and others regarding physical activity and its relationship with burnout, future research should continue to study these relationships in other healthcare student samples, including athletic training students.

Conclusions

While it is known that burnout is prevalent in athletic training students (Bryant et al., 2019; Vineyard et al., 2021), there is a lack of information regarding how to alleviate or reduce burnout in athletic training students. To date, few studies have identified methods to alleviate burnout. Our study identified significant relationships between adaptive coping mechanisms and improved PA, indicating that the use of adaptive coping may have a protective effect against burnout onset in athletic training students. Additionally, we identified that maladaptive coping mechanisms held a mediating role in the stress EE relationship. This finding suggests that a direct relationship exists between

coping and burnout. Our findings indicate that coping mechanism play a role in the relationship between stress and burnout. Correlational analyses indicated that the use of maladaptive coping mechanisms negatively impacted stress and burnout, while adaptive coping mechanisms improve burnout scores. Additionally, diet quality and maladaptive coping explain a percentage of the total relationships between stress and burnout on at least one dimension. This finding indicates that these variables explain a significant proportion of the relationship between stress and burnout. While we did not identify a relationship between physical activity, stress, and burnout, we did identify significant relationships between diet quality and burnout. Improved diet quality resulted in decreased burnout, while poor diet quality resulted in increased burnout. These findings suggest that improved diet quality may also be a mechanism to combat stress and burnout in AT students.

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Tables and Figures

Figure 5.1

Visual representation of hypothesized mediating relationships

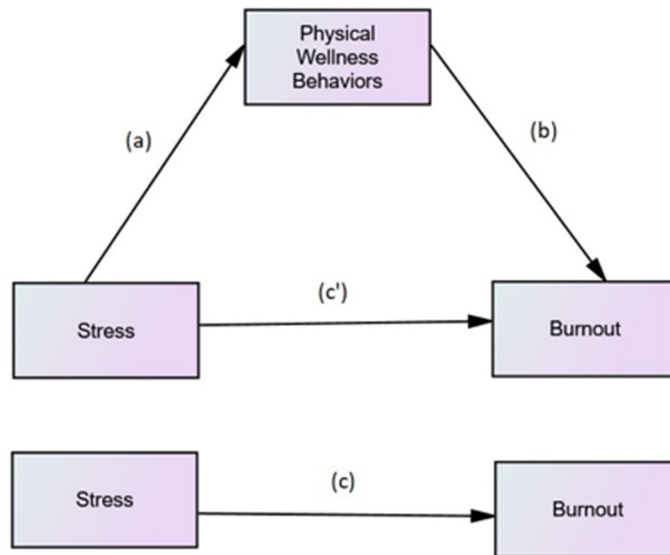
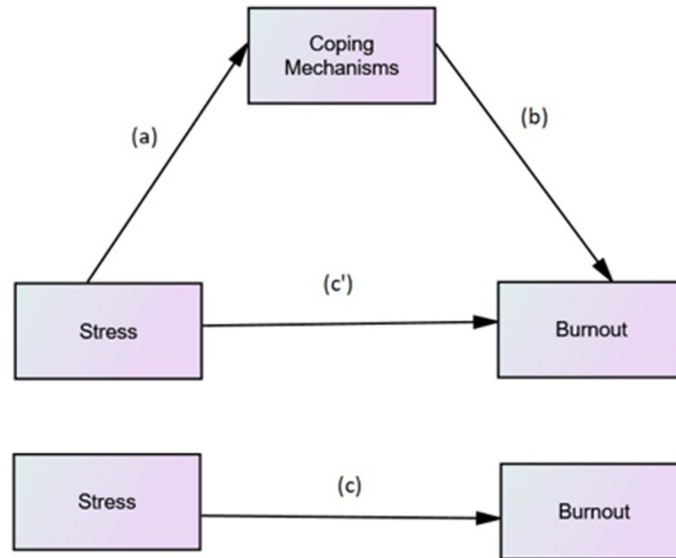


Figure 5.2

Model representing the mediating relationship of diet quality

Indirect effect = -0.037 [-0.098, -0.001]

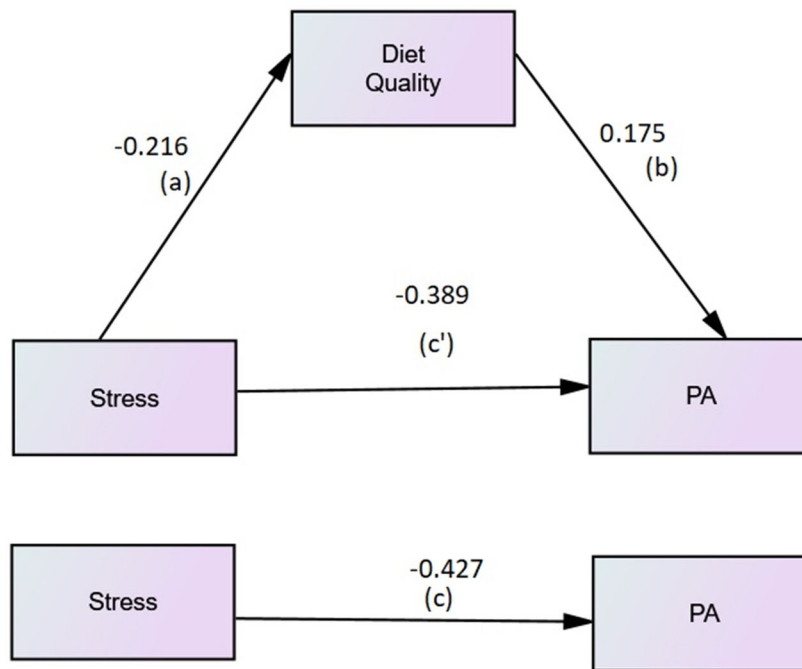


Figure 5.3

Model representing the mediating relationship of coping

Indirect effect = 0.605 [0.361, 0.855]

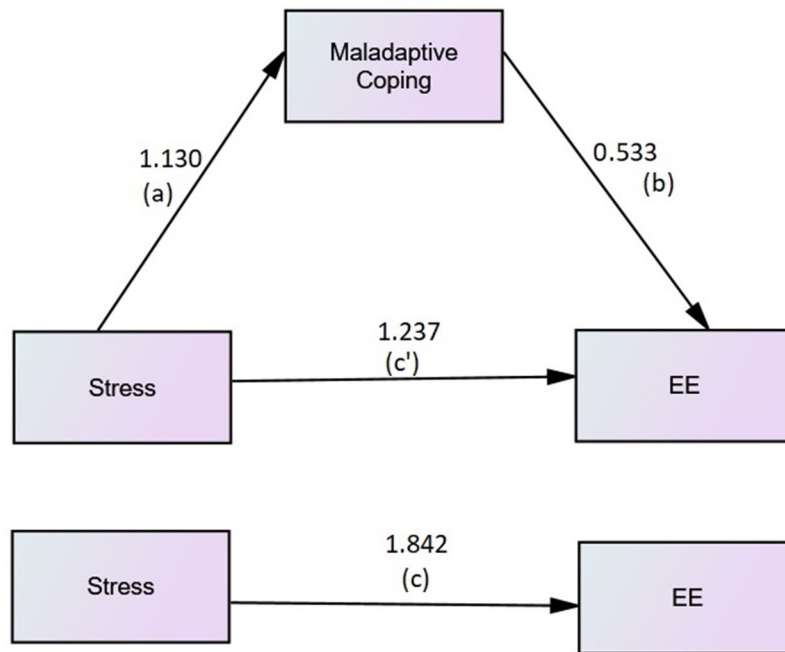


Table 5.1

Demographics and coping mechanisms utilized

Variable	<i>n</i> (%)
Sex	
Male	79 (24 %)
Female	241 (75 %)
Race	
Caucasian	249 (77 %)
Hispanic	34 (10 %)
African American	21 (6 %)
Asian/Pacific Islander	20 (6 %)
Multiracial	7 (2 %)
American Indian	6 (2 %)
Program Year	
1st-year graduate student	161 (50%)
2nd or 3rd year graduate student	134 (42 %)
Undergraduate enrolled in a combined 3+2 program	25 (8 %)
NATA District	
1 (CT, ME, MA, NH, RI, VT)	9 (2 %)
2 (DE, NJ, NY, PA)	49 (15 %)
3 (DC, MD, NC, SC, VA, WV)	38 (11 %)
4 (IL, IN, MI, MN, OH, WI)	68 (21 %)
5 (IA, KS, MO, NE, ND, OK, SD)	39 (12 %)
6 (AK, TX)	49 (15 %)
7 (AZ, CO, NM, UT, WY)	13 (4%)
8 (CA, Guam, American Samoa, HI, NV)	6 (2 %)
9 (AL, FL, GA, Puerto Rico, Virgin Islands, KY, LA, MS, TN)	25 (8 %)
10 (AK, ID, MT, OR, WA)	25 (7 %)
Coping Mechanisms Reported	
Adaptive coping	313 (98%)
Planning coping	308 (96%)
Reframing coping	307 (96%)
Acceptance coping	307 (96%)
Humor coping	267 (83%)
Religion coping	133 (41%)
Support coping	291 (91%)
Instrument coping	293 (91%)
Distraction coping	309 (96%)
Denial coping	112 (35%)
Venting coping	284 (88%)
Substance coping	110 (34%)
Behavioral disengagement	180 (56%)
Self-Blame coping	305 (95%)

Table 5.2

Burnout, coping, physical activity, and diet quality scores

Variable	Mean (SD)
MBI-HSS	
EE	24.33 (\pm 10.1)
DP	5.25 (\pm 4.4)
Brief-COPE	
Adaptive coping mechanism sum	40.54 (\pm 8.41)
Active coping	5.46 (\pm 1.50)
Planning coping	5.29 (\pm 1.56)
Reframing coping	5.46 (\pm 1.58)
Acceptance coping	5.33 (\pm 1.61)
Humor coping	4.78 (\pm 2.03)
Religion coping	3.92 (\pm 2.10)
Support coping	5.16 (\pm 1.78)
Instrument coping	5.12 (\pm 1.81)
Maladaptive coping sum	23.43 (\pm 5.48)
Distraction coping	5.39 (\pm 1.53)
Denial coping	2.64 (\pm 1.08)
Venting coping	4.23 (\pm 1.54)
Substance coping	2.64 (\pm 1.26)
Behavioral disengagement coping	3.15 (\pm 1.37)
Self-blame coping	5.20 (\pm 1.86)
IPAQ-Short Form	
Average physical activity (MET)	2683.25 (\pm 2210.64)
REAP-S	
Overall diet quality	28.65 (\pm 4.26)
PSS4	
Stress score	7.54 (\pm 3.01)

Table 5.3

Bivariate correlations between burnout, stress, coping, and wellness

Variable	1	2	3	4	5	6	7	8
1. DP								
2. EE	.523**							
3. PA	-0.109	-.129*						
4. MET	0.099	-0.016	0.101					
5. REAP-S	-0.08	-.150**	.150**	.194**				
6. Adaptive coping	0.022	-0.001	.257**	0.006	-0.016			
7. Maladaptive coping	.409**	.523**	-.117*	0.03	-.181**	.247**		
8. Stress	.245**	.552**	-.209**	-0.03	-.152**	-0.02	.619**	

Note. $N=320$ * $p < .05$, ** $p < .001$

Table 5.4

Mediating effect of coping strategies and physical wellness

Model	<i>b</i> [CI]	SE B	<i>t</i>	p
<i>Stress and PA mediated by Diet Quality</i>				
Total	-0.427 [-0.647, -0.206]	0.112	-3.81	0.0002
Direct	-0.389 [-0.610, -0.167]	0.113	-3.453	0.0006
Indirect (mediation)	-0.037 [-0.098, -0.001]	0.025		
<i>Stress and EE mediated by Maladaptive Coping</i>				
Total	1.842 [1.535, 2.147]	0.156	11.81	< 0.001
Direct	1.237 [.861, 1.61]	0.191	.647	<0.001
Indirect (mediation)	0.605 [0.357, 0.855]	0.127		

Note. *N*=320

CHAPTER SIX

Summary of Conclusions

The purpose of this dissertation was to test seven hypotheses:

H₁: Our adapted theoretical model based on findings from Atalayin et al. (2015) will identify that increased burnout scores in athletic training students will predict adverse outcomes (i.e., the onset of depressive symptoms, cheating behaviors, dishonest clinical behaviors, thoughts of dropout, decreased academic achievement).

H₂: A correlation will exist between stress and coping mechanisms in our sample of athletic training students.

H₃: A correlation will exist between coping mechanisms and burnout scores (i.e., EE, DP, PA) in our sample of athletic training students.

H₄: Coping mechanisms will mediate the relationship between stress and burnout scores (i.e., EE, DP, PA) in our sample of athletic training students.

H₅: A correlation will exist between stress and physical wellness behaviors in our sample of athletic training students.

H₆: A correlation will exist between physical wellness behaviors and burnout scores (i.e., EE, DP, PA) in our sample of athletic training students.

H₇: Physical wellness behaviors will mediate the relationship between stress and burnout scores in our sample of athletic training students.

Hypothesis One: Burnout and Negative Outcomes

Our findings indicate that burnout scores predict adverse outcomes in athletic training students. Specifically, EE scores significantly predicted depressive symptoms and increased severity of drop out thoughts. In contrast, decreased PA scores were also predictive of increased depressive symptoms in students. Additionally, increased DP scores predicted unprofessional clinical behaviors in athletic training students. The model that we adapted and tested based on findings from Atalayin et al. (2015) successfully described the predictive relationships between increased burnout scores and adverse outcomes. A visual representation of the adapted model and the relationships between adverse outcomes and burnout scores in athletic training students is provided in figure 4.1. Unprofessional behaviors included reports of falsifying patient records or lying to a preceptor that they had completed a comprehensive physical examination of a patient when in fact, they had not. These findings support our hypothesis that adverse outcomes are reported in athletic training students that have increased burnout scores. Our findings also agree with reports within samples of healthcare professional students (i.e., dental students, medical students) (Atalayin et al., 2015; Dyrbye et al., 2010a, Dyrbye et al., 2010b). Overall, our findings indicate that finding ways to mitigate and alleviate burnout in athletic training students is imperative due to the associated adverse outcomes we identified

Hypothesis Two: Correlations Between Stress and Coping Mechanisms

Our results identified that a relationship exists between stress and coping mechanisms in athletic training students. A significant positive correlation between increased stress and maladaptive coping mechanisms was identified in our sample.

Previous literature indicates that maladaptive coping mechanisms temporarily alleviate stress but do not actively eliminate the source of stress compared to adaptive coping mechanisms (Folkman et al., 2010; Folkman et al., 1986). Common maladaptive coping mechanisms reported within our sample included self-distraction, self-blame, and venting behaviors. Our results support our hypothesis that correlations between stress and coping mechanisms would be present in our sample of athletic training students. Additionally, these findings support previous reports that stress is related to coping mechanisms in other samples of students and healthcare professionals (Raedeke & Smith, 2001; Wallace et al., 2010). To our knowledge, our findings are the first to establish a relationship between stress and coping mechanisms in athletic training students.

Hypothesis Three: Correlations Between Coping Mechanisms and Burnout

Our results identified a relationship between coping mechanisms and burnout scores within athletic training students. Adaptive coping mechanisms held a significant positive relationship with PA scores. When reports of adaptive coping behaviors increased, students reported an increased sense of personal accomplishment. In contrast, maladaptive coping mechanisms were significantly correlated with increased burnout scores. Specifically, as maladaptive coping mechanism reports increased, EE and DP scores also increased. PA symptoms also reduced when maladaptive coping mechanisms were reported indicating that those reporting higher use of maladaptive coping mechanisms did not feel personally accomplished. Our findings support our hypothesis that a relationship between coping mechanisms and burnout would exist in our sample of athletic training students. These findings are similar to previous samples of student-athletes and medical students, which indicated that coping mechanisms were significantly

related to burnout scores (Palupi & Findyartini, 2019; Raedeke & Smith, 2001). Overall, coping mechanisms appear to play a role in the fluctuation in burnout scores in athletic training students. Adaptive coping mechanisms appear to be protective against increased burnout scores in athletic training students. These findings suggest that future interventions focusing on education on adaptive coping mechanisms may be beneficial in reducing burnout in athletic training students.

Hypothesis Four: Coping Mechanisms as Mediators Between Stress and Burnout

Our findings identified that maladaptive coping strategies mediated the relationship between stress and EE scores. Variables that mediate a relationship between two other variables indicate that the mediating variable explains at least a proportion of the relationship between the two variables (Fairchild & MacKinnon, 2009). Our findings indicate that maladaptive coping mechanisms explained 48.9% of the relationship between stress and burnout on the EE subscale. As stress increased, reports of maladaptive coping mechanisms increased, resulting in reduced EE scores, indicating increased burnout. These relationships are further described in figure 5.3 and table 5.4. Our findings support previous research that identifies coping mechanisms as mediators between stress and burnout (Raedeke & Smith, 2004; Wallace et al., 2010). However, due to different coping scales utilized within these previous studies, we cannot make direct comparisons. While our findings did not indicate a mediating role of adaptive coping mechanisms between stress and burnout in our sample, the significant positive correlation identified between PA and adaptive coping mechanisms suggests that the use of adaptive coping mechanisms may alleviate burnout symptoms directly instead of playing a role in explaining the stress burnout relationship.

Hypothesis Five: Correlations Between Stress and Physical Wellness Behaviors

Our results identified a relationship between stress and physical wellness behaviors in our sample of athletic training students. Habits such as maintaining an optimum level of physical activity and focusing on nutrition habits are defined as positive physical wellness behaviors (Roscoe, 2009). In our sample, a significant inverse relationship was identified between stress and diet quality. To our knowledge, our study is the first to identify a relationship between stress and diet quality in healthcare students, including athletic training students. However, no significant relationship was identified between physical activity and stress. These findings conflict with findings from other reports within healthcare students that identified a significant negative correlation between stress and exercise (Fares et al., 2016). Additionally, one qualitative report documented that athletic training students use exercise as a coping mechanism (Mazerolle et al., 2015). Due to the difference in methodologies utilized (i.e., different scales to measure activity, qualitative results) between our study and previous literature (Mazerolle et al., 2015, Fares et al., 2016)., we cannot make direct comparisons. However, our findings indicate that diet quality significantly related to stress while physical activity did not. This finding suggests that improved diet quality may be more successful in mitigating stress than does exercise in our sample of athletic training students.

Hypothesis Six: Correlations Between Physical Wellness Behaviors and Burnout

Our findings revealed relationships between physical wellness behaviors and burnout symptoms. A significant relationship between diet quality, EE, and PA symptoms was identified. Specifically, a significant negative relationship between EE

symptoms and diet quality was seen. Similarly, a significant positive correlation between PA and diet quality was identified. As diet quality scores improved, improved PA scores were seen. These findings indicate that those who report improved dietary behaviors have an increased sense of personal accomplishment. In contrast, a relationship between exercise and burnout was not identified. To our knowledge, diet quality has not been previously assessed in relation to burnout in samples of healthcare students or athletic training students. However, one study identified a significant difference in burnout scores for respondents reporting healthy eating habits during the workday in one sample of dentists (Gorter et al., 2000). No significant relationships were identified between exercise and burnout scores. These findings conflict with findings within medical students that identified that students with reduced EE scores reported increased exercise (Cecil et al., 2014). (Cecil et al., 2014). One reason for this difference may be due to differences in methodologies used between the two studies. The study by Cecil and colleagues (2014) utilized the full version of the IPAQ scale to measure physical activity, while we utilized the short-form version of this scale with respect to survey length. Additionally, Cecil et al. (2014) created a dichotomous variable indicating high and low physical activity, whereas we utilized a continuous variable in our study. However, our relationships identified between diet quality and improved burnout scores suggests that improved diet quality may be successful in mitigating burnout in our sample of athletic training students.

Hypothesis Seven: Wellness Behaviors as Mediators Between Stress and Burnout

Our findings identified that the presence of diet quality significantly mediated the relationship between stress and PA scores. The indirect effect of the mediating

relationship of diet quality and PA explained 8% of the total relationship between stress and PA scores. The mediating relationship of diet quality between stress and PA scores is further described in figure 5.2 and table 5.4. Physical activity did not have a relationship with stress or burnout in bivariate analyses and therefore did not meet the assumptions of mediation analyses. This finding explains why no significant mediation relationships between stress and burnout were identified. To our knowledge, our study is the first to test the mediating relationship of exercise and diet quality between stress and burnout. However, the physical wellness behaviors of physical activity and diet quality have been suggested as a form of coping mechanism to combat stress (Raedeke & Smith, 2004). Therefore, we hypothesized that a mediating relationship between physical activity and diet quality might exist, similar to the mediating role of general coping behaviors between stress and burnout identified in previous literature (Raedeke & Smith, 2004; Wallace et al., 2010). Our findings partially supported our hypothesis that physical wellness behaviors would mediate the relationship between stress and burnout. While we successfully identified a mediating role of diet quality between stress and burnout on one dimension, we did not identify physical activity as a mediating variable between stress and burnout. These findings further support our claim that improved diet quality may be more beneficial in response to stress and burnout than physical activity in our sample of athletic training students. Furthermore, due to the relatively small percentage that the effect of diet quality had on the overall relationship between stress and PA, it is likely that other variables affect the relationship between stress and burnout, highlighting the need for further research into the variables that explain the relationship between stress and burnout.

Conclusions

In conclusion, athletic training students suffering from burnout report adverse outcomes, including depressive symptoms, unprofessional clinical behaviors, and thoughts of drop out. Our findings suggest that adaptive coping mechanisms may be a method to alleviate or prevent burnout symptoms in athletic training students. Additionally, our findings indicate that maladaptive coping mechanisms relate to increased burnout scores. These findings indicate that maladaptive coping mechanisms are counterproductive to combating stress and burnout symptoms. While the level of exercise did not hold a significant relationship with stress and burnout, improved diet quality was identified as a potential alleviator of burnout symptoms in athletic training students. Additionally, we identified that maladaptive coping mechanisms and diet quality explain at least a proportion of the relationship between stress and burnout. These findings suggest that interventions that focus on educating athletic training students on adaptive coping mechanisms and improved diet quality may help mitigate stress in athletic training students and combat the onset of burnout. Athletic training educators should be informed of the increased risk of adverse outcomes associated with burnout in this sample of athletic training students and identify ways to help students cope with stress and burnout to avoid the deleterious consequences associated with its presence.

APPENDIX

APPENDIX A

ATS Attitudes, Behaviors, and Stress

DEMO The first few questions of this survey will ask you several demographic questions (age, gender, etc.) and ask you about your health habits. Please answer as honestly as possible and remember that all questions will remain anonymous.

Q1: D1_AGE Please type your age in the box provided below:

Q2: D2_GEN What is your gender?

- ☐ Male (0)
- ☐ Female (1)
- ☐ Other (2)
- ☐ Choose not to identify (3)

Q3: D3_ETH Which is your ethnicity? (choose all that apply)

- ☐ African American/Black (0)
 - ☐ American Indian/Alaskan Native (1)
 - ☐ Asian American/Asian (2)
 - ☐ Hispanic/Latino (3)
 - ☐ Native Hawaiian/Pacific Islander (4)
 - ☐ Multi-racial (5)
 - ☐ White (6)
 - ☐ Self Identify (7)
-

Q4: D4_EDULEVEL What year are you in your master's-level professional athletic training program?

- ☐ 1st-year graduate student (0)
 - ☐ 2nd-year graduate student (1)
 - ☐ 3rd-year or more graduate student (2)
 - ☐ An undergraduate student enrolled in a combined (3+2) program (3)
-

Q5: D5_RELAT What is your current relationship status?

- ☐ Single, never married (0)
 - ☐ Serious dating or committed relationship (1)
 - ☐ Married (2)
 - ☐ Separated (3)
 - ☐ Widowed (4)
-

Q6: D6_NATA In which National Athletic Trainer's Association district is your athletic training program located?

- ☐ District 1 (CT, ME, MA, NH, RI, VT) (0)
 - ☐ District 2 (DE, NJ, NY, PA) (1)
 - ☐ District 3 (District of Columbia, MD, NC, SC, VA, WV) (2)
 - ☐ District 4 (IL, IN, MI, MN, OH, WI) (3)
 - ☐ District 5 (IA, KS, MO, NE, ND, OK, SD) (4)
 - ☐ District 6 (TX, AR) (5)
 - ☐ District 7 (AZ, CO, NM, UT, WY) (6)
 - ☐ District 8 (CA, Guam, American Samoa, HI, NV) (7)
 - ☐ District 9 (AL, FL, GA, Puerto Rico, Virgin Islands, KY, LA, MS, TN) (8)
 - ☐ District 10 (AK, ID, MT, OR, WA) (9)
-

Q7: D7_GPA What is your approximate grade point average (GPA)?

- ☐ Lower than 2.0 (0)
 - ☐ 2.0-2.49 (1)
 - ☐ 2.5-2.99 (2)
 - ☐ 3.0-3.49 (3)
 - ☐ 3.5-3.99 (4)
 - ☐ 4.0 or higher (5)
-

Q8: D8_clinicalhours What is the average number of hours you spend at your current clinical site each week?

- ☐ 0-10 (0)
 - ☐ 10-15 (1)
 - ☐ 15-20 (2)
 - ☐ 20-25 (3)
 - ☐ 25-30 (4)
 - ☐ 30+ (5)
-

Q9: D9_studyhours What is your average number of hours spent studying during an academic semester per week?

- ☐ 0-5 (0)
 - ☐ 5-10 (1)
 - ☐ 10-15 (2)
 - ☐ 15-20 (3)
 - ☐ 20-25 (4)
 - ☐ 25+ (5)
-

Q10: AUDIT-C How often do you have a drink containing alcohol?

- ☐ Never (0)
 - ☐ Monthly or less (1)
 - ☐ 2-4 times a month (2)
 - ☐ 2-3 times a week (3)
 - ☐ 4 or more times a week (4)
-

Q11:AUDIT-C How many standard drinks containing alcohol do you have on a typical day? (see the image with typical drink sizes below)

- ☐ 1 or 2 (0)
 - ☐ 3 to 4 (1)
 - ☐ 4 to 6 (2)
 - ☐ 7 to 9 (3)
 - ☐ 10 or more (4)
 - ☐ None (0)
-

Q12: AUDIT-C How often do you have six or more drinks on one occasion?

- ☐ Daily or almost daily (4)
 - ☐ Weekly (3)
 - ☐ Monthly (2)
 - ☐ Less than monthly (1)
 - ☐ Never (0)
-

Q13: PA1 During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?

☐ 0 days (0)

☐ 1 day (1)

☐ 2 days (2)

☐ 3 days (3)

☐ 4 days (4)

☐ 5 days (5)

☐ 6 days (6)

☐ 7 days (7)

Q14: PA2 How much time did you usually spend doing vigorous physical activities on one of those days? (hours/minutes)

Q15: PA3 During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

☐ 0 days (0)

☐ 1 day (1)

☐ 2 days (2)

☐ 3 days (3)

☐ 4 days (4)

☐ 5 days (5)

☐ 6 days (6)

☐ 7 days (7)

Q16: PA4 How much time did you usually spend doing moderate physical activities on one of those days? (hours/minutes)

Q17: PA5 During the last 7 days, on how many days did you walk for at least 10 minutes at a time?

- ☐ 0 days (0)
 - ☐ 1 day (1)
 - ☐ 2 days (2)
 - ☐ 3 days (3)
 - ☐ 4 days (4)
 - ☐ 5 days (5)
 - ☐ 6 days (6)
 - ☐ 7 days (7)
-

Q19: PA6 How much time did you usually spend walking on one of those days?
(hours/minutes)

Q18: PA7 On average, during the last 7 days, how much time did you spend sitting on a weekday? (hours/minutes)

DIET The following questions will ask you about your dietary habits. For each of the questions below, indicate how often you do the following behaviors in an average week.

Q20: Diet 1 Skip breakfast?

- ☐ Usually/Often (1)
 - ☐ Sometimes (2)
 - ☐ Rarely/Never (3)
 - ☐ Does not apply to me (3)
-

Q21: Diet 2 Eat 4 or more meals from sit-down or take-out restaurants?

- ☐ Usually/Often (1)
 - ☐ Sometimes (2)
 - ☐ Rarely/Never (3)
 - ☐ Does not apply to me (3)
-

Q22: Diet 3 Eat less than 2 servings of whole-grain products or high fiber starches a day?
(Serving = 1 slice of 100% whole grain bread; 1 cup whole-grain cereal like Shredded Wheat, Wheaties, Grape Nuts, high fiber cereals, oatmeal, 3-4 whole grain crackers, 1/2 cup brown rice or whole-wheat pasta, boiled or baked potatoes, yucca, yams or plantain).

- ☐ Usually/Often (1)
 - ☐ Sometimes (2)
 - ☐ Rarely/Never (3)
 - ☐ Does not apply to me (3)
-

Q23: Diet 4 Eat less than 2 servings of fruit a day? (Serving = 1/2 cup or 1 med. fruit or 3/4 cup 100% fruit juice).

- ☐ Usually/Often (1)
 - ☐ Sometimes (2)
 - ☐ Rarely/Never (3)
 - ☐ Does not apply to me (3)
-

Q24: Diet 5 Eat less than 2 servings of vegetables a day? (Serving = 1/2 cup vegetables or 1 cup leafy raw vegetables).

- ☐ Usually/Often (1)
 - ☐ Sometimes (2)
 - ☐ Rarely/Never (3)
 - ☐ Does not apply to me (3)
-

Q25: Diet 6 Eat or drink less than 2 servings of milk, yogurt, or cheese a day? (Serving = 1 cup milk or yogurt; 1 1/2-2 ounces cheese).

- ☐ Usually/Often (1)
 - ☐ Sometimes (2)
 - ☐ Rarely/Never (3)
 - ☐ Does not apply to me (3)
-

Q26: Diet 7 Eat more than 8 ounces (see sizes below) of meat, chicken, turkey, or fish per day? (3 ounces of meat or chicken is the size of a deck of cards or one of the following: 1 regular hamburger, 1 chicken breast or leg (thigh or drumstick), or 1 pork chop).

- ☐ Usually/Often (1)
 - ☐ Sometimes (2)
 - ☐ Rarely/Never (3)
 - ☐ Rarely eat meat, chicken, turkey, or fish (3)
-

Q27: Diet 8 Use regular processed meats (like bologna, salami, corned beef, hotdogs, sausage or bacon) instead of low-fat, processed meats (like roast beef, turkey, lean ham; low-fat cold cuts/hotdogs)?

- ☐ Usually/Often (1)
- ☐ Sometimes (2)
- ☐ Rarely/Never (3)
- ☐ Rarely eat processed meats (3)

Q28: Diet 9 Eat fried foods such as fried chicken, fried fish, French fries, fried plantains, tostones, or fried yuca?

- ☐ Usually/Often (1)
 - ☐ Sometimes (2)
 - ☐ Rarely/Never (3)
 - ☐ Does not apply to me (3)
-

Q29: Diet 10 Eat regular potato chips, nacho chips, corn chips, crackers, regular popcorn, nuts instead of pretzels, low-fat chips or low-fat crackers, air-popped popcorn?

- ☐ Usually/Often (1)
 - ☐ Sometimes (2)
 - ☐ Rarely/Never (3)
 - ☐ Rarely eat these snack foods (3)
-

Q30: Diet 11 Add butter, margarine or oil to bread, potatoes, rice, or vegetables at the table?

- ☐ Usually/Often (1)
 - ☐ Sometimes (2)
 - ☐ Rarely/Never (3)
 - ☐ Does not apply to me (3)
-

Q31: Diet 12 Eat sweets like cake, cookies, pastries, donuts, muffins, chocolate, and candies more than 2 times per day?

- ☐ Usually/Often (1)
 - ☐ Sometimes (2)
 - ☐ Rarely/Never (3)
 - ☐ Does not apply to me (3)
-

Q32: Diet 13 Drink 16 ounces or more of non-diet soda, fruit drink/punch, or Kool-Aid a day?

- ☐ Usually/Often (1)
- ☐ Sometimes (2)
- ☐ Rarely/Never (3)
- ☐ Does not apply to me (3)

Outcomes The next few questions will ask you about specific behaviors or feelings you may or may not have experienced while within your athletic training program. Please answer freely as your answers will remain anonymous.

Q33-34: AcaOut_Cheat During the time you have been enrolled in your athletic training program, have you:

	Select one:	
	Yes (1)	No (0)
Permitted another student to copy from you during an examination or assignment? (1)	<input type="radio"/>	<input type="radio"/>
Ever taken credit for other's work (e.g., papers, projects, clinical work, tests) (2)	<input type="radio"/>	<input type="radio"/>

Q35-36: AcaOut_Clin During patient care, have you:

	Select one:	
	Yes (1)	No (0)

Recorded a part of a physical exam on patient documentation that you inadvertently omitted from the actual physical exam?

(1)

☐☐

Said that you had completed a comprehensive physical examination when in fact, you had not? (2)

☐☐

Q37: AcaOut_Drop Have you had any thoughts of dropping out from your athletic training education program in the last 12 months?

☐ Yes (1)

☐ No (0)

Q38: AcaOut_Drop2 If you answered yes to the first question, how serious have your thoughts of drop out been?

☐ I thought about it seriously (1)

☐ I seriously considered dropping out but never took any actions (2)

☐ I seriously considered dropping out and I met with officials at my school to discuss options (3)

☐ I seriously considered dropping out and took time off from my athletic training education program to consider my options (4)

☐ I am dropping out of my athletic training education program and am in the final stage of that process (5)

☐ Not applicable (0)

Q39-40: Depression Over the past 2 weeks, have you been bothered by any of the following problems?

	Select one:	
	Yes (1)	No (0)
Have you often been bothered by feeling down, depressed, or hopeless? (1)	<input type="radio"/>	<input type="radio"/>
Have you often been bothered by little interest or pleasure in doing things? (2)	<input type="radio"/>	<input type="radio"/>

PSS4 The following questions will ask you about your feelings and thoughts over the past month. In each case, please indicate how often you feel each description below by clicking the associated box per question.

Q41: PSS4_1 In the last month, how often have you felt that you were unable to control the important things in your life?

- ☐ Never (0)
- ☐ Almost Never (1)
- ☐ Sometimes (2)
- ☐ Fairly Often (3)
- ☐ Very Often (4)

Q42: PSS4_2 In the last month, how often have you felt confident in your ability to handle your personal problems?

- ☐ Never (4)
 - ☐ Almost Never (3)
 - ☐ Sometimes (2)
 - ☐ Fairly Often (1)
 - ☐ Very Often (0)
-

Q43: PSS4_3 In the last month, how often have you felt that things were going your way?

- ☐ Never (4)
 - ☐ Almost Never (3)
 - ☐ Sometimes (2)
 - ☐ Fairly Often (1)
 - ☐ Very Often (0)
-

Q44: PSS_4 In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

- ☐ Never (0)
 - ☐ Almost Never (1)
 - ☐ Sometimes (2)
 - ☐ Fairly Often (3)
 - ☐ Very Often (4)
-

MBI-HSS For each of the following statements, select the choice that best indicates your personal experience as an athletic training student regarding the work you perform for your classes and during patient care during clinical education.

Q45: MBI-1 I feel emotionally drained from my work.

- ☐ Never (0)
 - ☐ A few times a year or less (1)
 - ☐ Once a month or less (2)
 - ☐ A few times a month (3)
 - ☐ Once a week (4)
 - ☐ A few times a week (5)
 - ☐ Every day (6)
-

Q46: MBI-2 I feel used up at the end of a day.

- ☐ Never (0)
 - ☐ A few times a year or less (1)
 - ☐ Once a month or less (2)
 - ☐ A few times a month (3)
 - ☐ Once a week (4)
 - ☐ A few times a day (5)
 - ☐ Every day (6)
-

Q47: MBI-3 I feel fatigued when I get up in the morning and have to face another day.

- ☐ Never (0)
 - ☐ A few times a year or less (1)
 - ☐ Once a month or less (2)
 - ☐ A few times a month (3)
 - ☐ Once a week (4)
 - ☐ A few times a day (5)
 - ☐ Every day (6)
-

Q48: MBI-4 I can easily understand how my patients feel about things.

- ☐ Never (0)
 - ☐ A few times a year or less (1)
 - ☐ Once a month or less (2)
 - ☐ A few times a month (3)
 - ☐ Once a week (4)
 - ☐ A few times a week (5)
 - ☐ Every day (6)
-

Q49: MBI-5 I feel I treat some patients as if they were impersonal objects.

- ☐ Never (0)
 - ☐ A few times a year or less (1)
 - ☐ Once a month or less (2)
 - ☐ A few times a month (3)
 - ☐ Once a week (4)
 - ☐ A few times a week (5)
 - ☐ Every day (6)
-

Q50: MBI-6 Working with people all day is really a strain for me.

- ☐ Never (0)
 - ☐ A few times a year or less (1)
 - ☐ Once a month or less (2)
 - ☐ A few times a month (3)
 - ☐ Once a week (4)
 - ☐ A few times a week (5)
 - ☐ Every Day (6)
-

Q51: MBI-7 I deal very effectively with problems of my patients.

- ☐ Never (0)
 - ☐ A few times a year or less (1)
 - ☐ Once a month or less (2)
 - ☐ A few times a month (3)
 - ☐ Once a week (4)
 - ☐ A few times a week (5)
 - ☐ Everyday (6)
-

Q52: MBI-8 I feel burned out.

- ☐ Never (0)
 - ☐ A few times a year or less (1)
 - ☐ Once a month or less (2)
 - ☐ A few times a month (3)
 - ☐ Once a week (4)
 - ☐ A few times a week (5)
 - ☐ Every day (6)
-

Q53: MBI-9 I feel I'm positively influencing patient's lives through my work.

- ☐ Never (0)
 - ☐ A few times a year or less (1)
 - ☐ Once a month or less (2)
 - ☐ A few times a month (3)
 - ☐ Once a week (4)
 - ☐ A few times a week (5)
 - ☐ Every day (6)
-

Q54: MBI-10 I've become more callous towards people.

- ☐ Never (0)
 - ☐ A few times a year or less (1)
 - ☐ Once a month or less (2)
 - ☐ A few times a month (3)
 - ☐ Once a week (4)
 - ☐ A few times a week (5)
 - ☐ Every day (6)
-

Q55: MBI-11 I worry that my work is hardening me emotionally.

- ☐ Never (0)
 - ☐ A few times a year or less (1)
 - ☐ Once a month or less (2)
 - ☐ A few times a month (3)
 - ☐ Once a week (4)
 - ☐ A few times a week (5)
 - ☐ Every day (6)
-

Q56: MBI-12 I feel very energetic.

- ☐ Never (0)
 - ☐ A few times a year (1)
 - ☐ Once a month or less (2)
 - ☐ A few times a month (3)
 - ☐ Once a week (4)
 - ☐ A few times a week (5)
 - ☐ Every day (6)
-

Q57: MBI-13 I feel frustrated by my job.

- ☐ Never (0)
 - ☐ A few times a year or less (1)
 - ☐ Once a month or less (2)
 - ☐ A few times a month (3)
 - ☐ Once a week (4)
 - ☐ A few times a week (5)
 - ☐ Every day (6)
-

Q58: MBI-14 I feel that I'm working too hard.

- ☐ Never (0)
 - ☐ A few times a year or less (1)
 - ☐ Once a month or less (2)
 - ☐ A few times a month (3)
 - ☐ Once a week (4)
 - ☐ A few times a week (5)
 - ☐ Every day (6)
-

Q59: MBI-15 I don't really care what happens to some patients.

- ☐ Never (0)
 - ☐ A few times a year or less (1)
 - ☐ Once a month or less (2)
 - ☐ A few times a month (3)
 - ☐ Once a week (4)
 - ☐ A few times a week (5)
 - ☐ Every Day (6)
-

Q60: MBI-16 Working with people directly puts too much stress on me.

- ☐ Never (0)
 - ☐ A few times a year or less (1)
 - ☐ Once a month or less (2)
 - ☐ A few times a month (3)
 - ☐ Once a week (4)
 - ☐ A few times a week (5)
 - ☐ Every day (6)
-

Q61: MBI-17 I can easily create a relaxed atmosphere with my patients.

- ☐ Never (0)
 - ☐ A few times a year or less (1)
 - ☐ Once a month or less (2)
 - ☐ A few times a month (3)
 - ☐ Once a week (4)
 - ☐ A few times a week (5)
 - ☐ Every day (6)
-

Q62: MBI-18 I feel exhilarated after working closely with my patients.

- ☐ Never (0)
 - ☐ A few times a year or less (1)
 - ☐ Once a month or less (2)
 - ☐ A few times a month (3)
 - ☐ Once a week (4)
 - ☐ A few times a week (5)
 - ☐ Every day (6)
-

Q63: MBI-19 I have accomplished many worthwhile things in this job.

- ☐ Never (0)
 - ☐ A few times a year or less (1)
 - ☐ Once a month or less (2)
 - ☐ A few times a month (3)
 - ☐ Once a week (4)
 - ☐ A few times a week (5)
 - ☐ Every Day (6)
-

Q64: MBI-20 I feel like I'm at the end of the rope.

- ☐ Never (0)
 - ☐ A few times a year or less (1)
 - ☐ Once a month or less (2)
 - ☐ A few times a month (3)
 - ☐ Once a week (4)
 - ☐ A few times a week (5)
 - ☐ Every day (6)
-

Q65: MBI-21 In my work, I deal with emotional problems very calmly.

- ☐ Never (0)
 - ☐ A few times a year or less (1)
 - ☐ Once a month or less (2)
 - ☐ A few times a month (3)
 - ☐ Once a week (4)
 - ☐ A few times a week (5)
 - ☐ Every day (6)
-

Q66: MBI-22 I feel patients blame me for some of their problems.

- ☐ Never (8)
- ☐ A few times a year or less (9)
- ☐ Once a month or less (10)
- ☐ A few times a month (11)
- ☐ A few times a week (12)
- ☐ Every Day (13)

COPE The following items deal with ways you have been coping with any stress that you may have. Please respond to the following statements based on how much or how frequently you use each item to cope with school-related stress.

Q67: COPE_1 I've been turning to work or other activities to take my mind off things.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q68: COPE_2 I've been concentrating my efforts on doing something about the situation I'm in.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q69: COPE_3 I've been saying to myself "this isn't real."

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q70: COPE_4 I've been using alcohol or other drugs to make myself feel better.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q71: COPE_5 I've been getting emotional support from others.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q72: COPE_6 I've been giving up trying to deal with it.

- ☐ I haven't been doing this at all (0)
- ☐ I've been doing this a little bit (1)
- ☐ I've been doing this a medium amount (2)
- ☐ I've been doing this a lot (3)

Q73: COPE_7 I've been taking action to try to make the situation better.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q74: COPE_8 I've been refusing to believe that it has happened.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q75: COPE_9 I've been saying things to let my unpleasant feeling escape.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q76: COPE_10 I've been getting help and advice from other people.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q77: COPE_11 I've been using alcohol or other drugs to help me get through it.

- ☐ I haven't been doing this at all. (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q78: COPE_12 I've been trying to see it in a different light, to make it seem more positive.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q79: COPE_13 I've been criticizing myself.

- ☐ I haven't been doing this at all (0)
- ☐ I've been doing this a little bit (1)
- ☐ I've been doing this a medium amount (2)
- ☐ I've been doing this a lot (3)

Q80: COPE_14 I've been trying to come up with a strategy about what to do.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q81: COPE_15 I've been getting comfort and understanding from someone.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q82: COPE_16 I've been giving up the attempt to cope.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q83: COPE_17 I've been looking for something good in what is happening.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q84: COPE_18 I've been making jokes about it.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q85: COPE_19 I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q86: COPE_20 I've been accepting the reality of the fact that it has happened.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q87: COPE_21 I've been expressing my negative feelings.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q88: COPE_22 I've been trying to find comfort in my religion or spiritual beliefs.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q89: COPE_23 I've been trying to get advice or help from other people about what to do.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q90: COPE_24 I've been learning to live with it.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q91: COPE_25 I've been thinking hard about what steps to take.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q92: COPE_26 I've been blaming myself for things that happened.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q93: COPE_27 I've been praying or meditating.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q94: COPE_28 I've been making fun of the situation.

- ☐ I haven't been doing this at all (0)
 - ☐ I've been doing this a little bit (1)
 - ☐ I've been doing this a medium amount (2)
 - ☐ I've been doing this a lot (3)
-

Q95: RAFFLE Would you like to enter a raffle for a chance to win a \$10 gift card for your participation?

☐ Yes (1)

☐ No (2)

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