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## Stress, Stress Appraisal and Coping in Athletic Trainers during the COVID-19 Pandemic

Lawson Holton

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STRESS, STRESS APPRAISAL, AND COPING IN ATHLETIC TRAINERS DURING THE COVID-19 PANDEMIC

by

LAWSON HOLTON

(Under the Direction of Jody Langdon)

ABSTRACT

*Introduction:* There have been many studies conducted on the stress and mental health of frontline healthcare workers (HCWs) over the past months since the COVID-19 pandemic began. Very limited literature has examined the effect of the pandemic on athletic trainers (ATs). *Objective:* The aim of this investigation was to examine the stress, stress appraisal, and coping measures of ATs during the COVID-19 pandemic. *Methods:* Participants were recruited members from the National Athletic Trainers' Association (NATA). The Perceived Stress Scale-10 was used to measure stress, the Stress Appraisal Measure was used to measure stress appraisal, and the Brief COPE was used to measure coping strategies. *Data Analysis:* Descriptive statistics were run on all subscales of the PSS-10, SAM, and Brief COPE along with demographic variables. Where appropriate, one-way ANOVAs were run to examine differences in variables of interest between AT setting and level of education. For these analyses, an alpha level of .05 was adopted. *Results:* This sample reported an average perceived stress score of 20.31. Participants reported an almost equal score in primary and secondary stress appraisal. The most used coping strategies in this sample included self-distraction, acceptance, emotional support, positive reframing, and instrumental support, respectively. Overall, 42.9% of this sample reported that they felt underutilized during the pandemic. *Conclusion:* While this study may have had some limitations, it may have been one of the first to examine the effect of the COVID-19 pandemic on the stress, stress appraisal, and coping of ATs. Comparison of this data to other studies shows a broad agreement in similar levels of perceived stress and some similar coping methods. It is suggested that employers of ATs and other HCWs

implement stress management strategies and the use of effective coping strategies to help these populations handle their stress more effectively in the future.

INDEX WORDS: Stress, Stress appraisal, Coping, Mental health, Athletic trainer, Covid-19, Pandemic

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19 PANDEMIC

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B.S., University of Georgia, 2020

A Thesis Submitted to the Graduate Faculty of Georgia Southern University

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MASTER OF SCIENCE

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19 PANDEMIC

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## DEDICATION

I would like to dedicate this thesis to my friends and family. Thank you all for always being there for me and supporting me every step of the way these last few years. I know I would not be the person I am today without all the advice, experience, and life lessons I have learned from each and every one of you.

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## CHAPTER 1

### INTRODUCTION

In March 2020, fear shocked the United States as many state governments shut down non-essential businesses, schools, events, and gatherings to slow the spread of COVID-19. As of March 12, 2022, there have been over 79 million cases of COVID-19 in the U.S. and over 963,000 people have died as a result<sup>1</sup>. The pandemic has greatly affected many different groups of people, especially healthcare workers (HCWs) due to the overwhelming heavy burden on healthcare systems<sup>2</sup>. For this thesis, HCW was operationally defined as any person who provides medical care to patients in any setting or works in a healthcare setting (such as administrative staff). The World Health Organization has previously called for action to address the immediate need to save lives and prevent a grave impact on the physical and mental health of HCWs<sup>2</sup>. At this point, there have been numerous research studies that examined the impact of the pandemic on frontline HCWs. However, there has been little work done to examine the impact of this pandemic on athletic trainers (ATs) and the struggles they have faced so far as a profession.

It is important to note ATs role as HCWs. The profession of athletic training encompasses the prevention, examination, diagnosis, treatment, and rehabilitation of emergent, acute, or chronic injuries and medical conditions. Services provided by ATs include primary care, injury and illness prevention, wellness promotion and education, emergency care, examination and clinical diagnosis, therapeutic intervention and rehabilitation of injuries and medical conditions. Athletic training is recognized by the Department of Health and Human Services, Health Resources Services Administration, and the American Medical Association as an allied health care profession. ATs are board certified in 48 states and the District of Columbia (DC), licensed in 49 states and DC, are bound by a code of ethics, and must have graduated from an accredited baccalaureate or master's program. While ATs are usually found working with athletes participating in sports at the secondary school level, collegiate level, and professional level, they can also be found working in the clinical setting, the industrial setting, and the military<sup>3</sup>.

Far before the pandemic, there were already multiple established issues that affected ATs including stress, mental health struggles, and burnout. Some research has suggested that as many as 30% of ATs have experienced some degree of burnout<sup>4</sup>. Further, studies have shown that individuals suffering from burnout could display decreased work quality, increased substance use, and higher reporting of depressive symptoms<sup>5</sup>. Although burnout is a primary concern, it is important to examine the aspects that lead to burnout within the AT population, including stress and coping. In terms of what can impact the development of perceived stress, Hendrix and colleagues found that ATs tend to have higher levels of perceived stress if they have low social support and hardiness<sup>6</sup>. Indeed, perceived stress has been shown to predict global AT burnout along with social support and workload incongruence<sup>7</sup>. The symptoms of stress are major contributors to burnout and functional impairment among HCWs<sup>8</sup>.

In addition to these established issues, the pandemic presented new unique problems for ATs around the country. Since sports were shut down during the initial restrictions of the pandemic, employers had to find different ways to utilize their ATs or end their employment. During the pandemic, ATs moved beyond traditional hierarchies and scopes of practice to roles that fully leveraged their knowledge, skills, and abilities<sup>9</sup>. Winkelmann reported that some ATs were reworked into other jobs like temperature assessments, medical screenings, “proning” patients (rolling them onto their stomachs), and telemedicine care<sup>10</sup>. In their new jobs, some ATs believed that their skills as HCWs were being underused during the pandemic. Winkelmann also found that some clinicians (15%) were put on unpaid furlough or had been laid off during the time of survey<sup>10</sup>. Many ATs also expressed uncertainty, fears, and mental health concerns related to their job status, financial situation, and change in duties due to the pandemic<sup>10</sup>. Many local news media outlets attempted to highlight their secondary school AT as many took the job of screening athletes, disinfection, and contact tracing.

While the impact of stress itself is widely studied, stress appraisal and coping help to understand the overall process. Stress appraisal involves how an individual cognitively processes a stressor<sup>11</sup>. It is an evaluative process that focuses on the meaning or significance of a stressor and takes place continuously

throughout everyday life<sup>11</sup>. Stress appraisal is separated into primary and secondary types. Primary appraisal is an individual's evaluation of an event or situation as a potential hazard to their well-being<sup>11</sup>. Secondary appraisal is an individual's evaluation of their ability to handle the event or situation, and this depends on whether or not they think they have the resources to cope with it<sup>12</sup>. Once this appraisal process takes place, the individual is now able to move on from cognitive thinking to action and how they will respond<sup>13</sup>. Coping can simply be defined as an effort to manage psychological stress<sup>13</sup>. In other words, coping skills are the action taken after the appraisal process has been initiated. The three main types of coping are known as problem-focused, emotion-focused, and avoidant coping. Problem-focused coping involves actively or behaviorally altering the external person-environment relationship<sup>13</sup>. Emotion-focused coping involves altering the personal or internal meaning or relationship of a stressor<sup>13</sup>. Avoidant coping involves cognitive and behavioral effects that are aimed at denying, minimizing, or otherwise avoiding dealing with stressful demands<sup>14</sup>. All forms of coping have their own advantages and disadvantages.

Although it is known that the pandemic has been stressful for ATs, it is important to examine how the stress they experienced was managed. While there is little known on this topic in AT, there is far more research on stress, appraisal, and coping among HCWs. As such, it is important to review what is known thus far. Many studies have examined the prevalence of stress in HCWs during the pandemic. While the figures depended on nationality of the HCW, the lowest reported figure for stress was around 30% of frontline HCWs, with some studies reaching about 80%<sup>15,16</sup>. The mental health issues experienced by HCWs during the pandemic resulted in decreased productivity and led to a reduced quality of care<sup>17,18</sup>.

Prior research has shown that epidemics can cause severe psychological effects on individuals including development of new psychiatric symptoms, worsening of pre-existing illnesses, excessive worry/anxiety, and helplessness<sup>19</sup>. As for stress appraisal, Pearman found that HCWs scored significantly higher on both current and future stress appraisals when compared to controls in response to the pandemic<sup>20</sup>. Also, the pandemic may function as an occupational hazard for HCWs because there are

higher levels of anxiety and depressive symptoms and more severe appraisals of COVID-19 compared to controls<sup>20</sup>. As for coping with stress, HCWs adopted various strategies to deal with the pandemic. However, some strategies were better than others as multiple researchers found that emotion-focused coping strategies were associated with higher levels of mental health issues like anxiety and depression<sup>21,22</sup>.

With this information in mind, the purpose of this study is to examine the impact of the COVID-19 pandemic on the stress of ATs by examining their stress levels, stress appraisal and coping strategies. As of this time, there have been no published studies that examined the effect of the pandemic on the stress levels of ATs, their stress appraisal or the strategies they have used to cope thus far. This thesis could be one of the first studies to examine ATs stress or mental health in a pandemic. The information learned in this study could impact multiple groups of people with a connection to AT, including ATs, mental health experts, coaches, universities, clinics, hospitals, and anyone that works with or employs ATs. If ATs are undergoing new stresses and challenges from the pandemic then that could increase their risk of leaving the profession, increase negative effects on their quality of life, and increase negative effects on their quality of work. Early research on stress appraisal in HCWs in response to the COVID-19 pandemic has shown that higher primary stress appraisals were more likely to also have an increase in anxiety<sup>21</sup>. For the current study, it is hypothesized to also see this trend in ATs. Further, Pearman found that HCWs scored significantly higher on both current and future stress appraisals compared to controls in response to the pandemic<sup>20</sup>. In accordance with this, it is also expected to see this in ATs as well. As for coping, various studies have found that emotion-focused coping has led to higher levels of depression and anxiety compared to problem-focused coping in HCWs. It is expected that this trend would appear in ATs as well. Finally, while there is no current research on this topic, expected differences in stress appraisal and dependence on coping methods among the different populations of ATs is also hypothesized because of differences in job security, PPE availability, and risk of exposure to COVID-19.

## CHAPTER 2

### METHODS

#### Participants

Fifty-eight participants completed the survey between 11/9/21 and 1/27/22. Survey data was trimmed to only include those that completed the entire survey, decreasing the number of usable responses to 42. Of those who responded, all 42 participants were from the United States of America. Twenty-four states were represented with Georgia being the most popular state (23.8%). Overall, the subjects had an age range of 23-55 years ( $M = 31.33$ ,  $SD = 6.34$ ). 90.5% of participants reported not having a Spanish, Hispanic, or Latino ethnicity while 9.5% were. Most of the subjects reported female as their gender identity (78.6%) with the rest reporting male gender (21.4%). The most common highest level of education was a master's degree amongst these participants (73.8%). 23.8% had a bachelor's degree as their highest level of education while 2.4% reported having a professional degree. Most of the participants were an AT in the secondary school setting (47.6%) and college setting (33.3%) when the pandemic began. 50% of participants reported currently working in the secondary school setting while 35.7% reported working in the collegiate setting. Across participants, 31% of sampled ATs moved to a different job, with 1 moving out of AT completely. 92.9% of participants reported that athletic training was their primary source of income. The reported years of experience in athletic training varied greatly among the sample. The results have been compiled in Table 1. On average, participants reported working 40.17 hours per week ( $SD = 16.33$ ) before the pandemic and 33.36 hours per week ( $SD = 24.36$ ) after the pandemic began. In this sample, 38% of participants reported having a diagnosed mental health issue. Of the listed mental issues, 87.5% of these participants reported having either anxiety, depression, or both.

Researchers will gain access to potential participants' email addresses through the National Athletic Trainers' Association (NATA) Research Survey Service. There were almost 22,000 possible participants that were enlisted in the NATA Research Survey Service at the time of the study. Participants were recruited from the National Athletic Trainers' Association member list. The NATA provides access

to research subjects through their data collection service program. This service provides access to subjects for a study through the NATA Qualtrics platform. NATA provides the service of data collection, including contacting and reminding subjects. Upon completion of the collection period, a full, unidentified data set and summary profile is returned to the primary investigator. Any member of the NATA that met the inclusion criteria could be considered for entry. NATA sends the survey to a random sample of 1,000 people that fit the investigator's inclusion criteria. The survey will run for eight weeks with periodic reminders every two weeks. The current average response rate for the survey program is about 9%. Participants are expected to be diverse in many areas such as job setting (secondary school, collegiate, professional sports, industrial, military, clinical), gender/gender identity, race/ethnicity, and mental health challenges. To be included in this study sample, an individual must have been a full-time athletic trainer at the start of the COVID-19 pandemic in the U.S.A. from February-April 2020. Part-time ATs, graduate assistant ATs, and AT students are excluded from this study. After close of the study after eight weeks, the data will be available to the researcher for 90 days. At that point, it will be deleted by the NATA<sup>23</sup>.

#### Instrumentation

Data was collected using a web-based survey using Qualtrics®. This survey consisted of 4 individual sections: demographics, the Perceived Stress Scale, the Stress Appraisal Measure, and the Brief COPE.

#### *Demographics*

The first section of this survey contained items that pertain to the participant's personal and professional demographic information. Examples of this include age, race/ethnicity, current job setting, years of experience as an AT, country, any diagnosed mental health issues, gender/gender identity, highest level of education, average hours a week they worked before/during the pandemic, was there something outside of work and pandemic that is influencing their response, and if they are at the same job they were at when the pandemic began.

### *Perceived Stress Scale*

The first measure used in this study was the Perceived Stress Scale-10<sup>24</sup>. The PSS-10 contains 10 items to measure a person's perception of stress. The main and only construct of the PSS-10 is perceived stress. An example of a question that measures perceived stress would be asking how often the person felt nervous or stressed over the last month. The PSS was found to present adequate reliability and was correlated with life-event scores, depressive and physical symptomology, utilization of health services, and social anxiety<sup>24</sup>. The PSS has been cited in other research studies over 1,500 times since its inception. Several studies that have been conducted in the general population in a variety of countries have found Cronbach's alpha for the PSS to range from 0.75 to 0.91<sup>25</sup>. Nielson and colleagues found the PSS-10 to have an alpha of 0.71 to 0.86 which shows relatively high internal consistency<sup>25</sup>. The PSS is scored by reversing the responses to the four positively stated items and then summing across all items. Each item of the PSS is rated on a 5-point Likert scale regarding how often the individual felt a certain way. The higher the PSS score, the more the individual feels stressed and vice versa.

### *Stress Appraisal Measure*

The second measure used in this study was the Stress Appraisal Measure<sup>26</sup>. The SAM contains 28 items to measure an individual's appraisal of a specific stressful situation identified by the examiner. The SAM includes items that measure an individual's primary and secondary stress appraisal. These two main types are divided into subscales. Primary appraisal is divided into the dimensions of threat, challenge, and centrality<sup>26</sup>. Threat appraisals are those with the potential for harm/loss in the future while challenge appraisals are seen as a chance for growth/gain from the stress. Centrality refers to a person's perceived importance of an event for their own well-being. Secondary appraisal focuses on perceptions of control, and therefore is divided into the extent to which a situation is controllable-by-self, controllable-by-others, and uncontrollable-by-anyone. For example, asking someone if a situation makes them feel anxious is more of the threat subscale while asking them if the situation can have a positive impact on their life is the challenge subscale. Also, asking if a person can overcome the problems caused by a situation is more

controllable-by-self subscale while asking if a person has help available with a situation is more controllable-by-others subscale<sup>26</sup>.

The SAM is demonstrated to have good psychometric properties and measures six relatively independent dimensions including threat, challenge, centrality, controllable by self, controllable by others, uncontrollable, and overall stressfulness<sup>26</sup>. Szkody and McKinney conducted a study using the SAM on undergraduate students at a Southern United States university and found Cronbach's alpha ranging from 0.79 to 0.81<sup>27</sup>. Another study examining multiple questionnaires that measure stress appraisal estimated the SAM to have a reliability between 0.68 and 0.90<sup>28</sup>. The SAM has been cited over 700 times since it was first published. Each of the seven constructs are represented in subscales which each have four items that pertain to them. The subscale scores are calculated by summing the appropriate subscale items, and then dividing the total subscale score by 4 to create an average subscale score. The higher the average subscale score of the SAM, the higher that individual appraised their stress using that specific subscale. For example, if a person had their highest subscale mean in the challenge subscale, they appraised their stressor as more of a challenge compared to a threat (they viewed the stress as an area of growth compared to the potential for harm/loss).

### *Brief COPE*

The third measure used in this study was the Brief COPE Questionnaire which examines the strategies used for coping or regulating cognitions in response to stressors. The Brief COPE has 28 items to assess the frequency with which a person uses different coping strategies. The Brief COPE breaks down coping strategies into three categories that include problem-focused, emotion-focused, and avoidant coping. These three categories are then broken into 14 subscales: self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioral disengagement, venting, positive reframing, planning, humor, acceptance, religion, and self-blame. The Brief COPE was developed as a shorter version of the 60-item COPE which was configured based on the various models of coping. Carver initially created the full COPE scale and began the Brief COPE in 1997<sup>29</sup>. The first

sample was initially validated on a community sample who had been impacted by a hurricane. The full COPE has been cited over 15,000 times while the Brief COPE has been cited almost 7,000 times. Carver initially estimated Cronbach's alpha as it ranged from .50 to .90<sup>29</sup>. In a French study, Doron found Cronbach's alpha for the Brief COPE subscales<sup>30</sup>. Most of the scales demonstrated acceptable internal consistency except for four scales (active coping, behavioral disengagement, denial, and self-distraction<sup>30</sup>). A study performed on Malaysian medical students found a total Cronbach's alpha of 0.83 for the Brief COPE which would suggest it shows high internal consistency<sup>31</sup>. Most of the subscales also showed a measure of acceptable internal consistency as most had a CA of 0.5 or greater<sup>31</sup>. The Brief COPE is scored on a 4-point Likert scale. For scoring, the Brief COPE can be interpreted by using the three main categories or by using the 14 subscales. Each item corresponds to a certain category and subscale. To score a category or scale, simply sum the scores of the corresponding items and divide by the total number of items. A lower score in a subscale means that the individual does not use that method of coping often. Higher scores in problem-focused coping (active coping, use of instrumental support, planning, and positive reframing) means the person aims to change the stressful situation. Problem-focused coping scores are indicative of grit, psychological strength, and a practical approach to problem solving. Higher scores in emotion-focused coping (venting, use of emotional support, humor, acceptance, self-blame, and religion) indicate a person uses coping strategies that are aimed at regulating emotions associated with a stressful situation. Higher scores in avoidant coping (self-distraction, denial, substance use, and behavioral disengagement) indicate physical or cognitive efforts to disengage from the stressor.

#### Procedures

The survey was distributed via the NATA database and sent to every NATA member who volunteered to take part in research studies. Data was collected during a period from October 2021 to January 2022. Upon approval from the institutional review board at Georgia Southern University, researchers contacted the NATA and submitted a research survey request. The NATA contacted potential participants by email. The email included a brief description of the study, purpose of the study,

description of how consent would be obtained from participants, and a link to the online survey website URL. All three measures combined contain 66 items, which were combined with 10 demographic questions, bringing the total number of items to 76. On average, it took participants 18.18 minutes (1091 seconds) to complete the survey.

#### Data Analysis

The aim of this study is to examine the impact of the COVID-19 pandemic on the stress of ATs by examining their stress levels, stress appraisal, and coping strategies. To do this, descriptive statistics (mean, standard deviation, and frequencies, where appropriate) on all subscales of PSS, SAM, and Brief COPE were run along with demographic variables. Where appropriate, one-way ANOVAs were run to examine differences in variables of interest between AT setting and level of education. For these analyses, an alpha level of .05 was adopted.

Table 1

*Participant Years of Experience in Athletic Training*

Age Range	N	%
1-5	15	35.71%
6-10	11	26.19%
11-15	13	30.95%
16-20	2	4.76%
21-25	0	0%
26-30	1	2.38%

## CHAPTER 3

### RESULTS

#### Perceived Stress Levels During the COVID-19 Pandemic

Overall, the mean level of perceived stress was 20.31 ( $SD = 7.47$ ), indicating a moderate level of stress among participants. The Stress Appraisal Measure included an overall stressfulness subscale where participants, on average, reported a moderate level of stress as well (3.24,  $SD = 0.78$ ). Means, standard deviations, and alpha levels of all subscales, including overall stressfulness are presented in Table 2. Of the recorded responses, 21.4% of participants reported high levels of stress. Medium levels of stress were reported by the majority of participants with 50% of the sample while 28.6% of participants reported low levels of stress. When compared by job setting prior to the start of the pandemic, a one-way ANOVA revealed no significant differences,  $F(3, 38) = 1.03$ ,  $p = 0.391$ . On average, collegiate ATs reported a mean stress level of 23.00 ( $SD = 7.70$ ) while secondary school ATs reported a mean stress level of 18.45 ( $SD = 7.12$ ). Another one-way ANOVA looking at differences in perceived stress by highest level of education was also not significant,  $F(2, 39) = 0.98$ ,  $p = 0.383$ . On average, ATs who had a bachelor's degree reported mean stress levels of 21.80 ( $SD = 7.38$ ), while ATs who also had a master's degree had mean stress levels of 20.13 ( $SD = 7.50$ ). The one respondent in this sample who held a professional degree (such as an MD or JD) reported a very low mean level of stress ( $M = 11.00$ ).

#### Participants' Appraisal of the Stress Experienced During the Pandemic

Overall, participants scored the highest, on average, in the centrality subscale ( $M = 3.53$ ,  $SD = 0.86$ ). The next two highest scored subscales were controllable-by-self ( $M = 3.49$ ,  $SD = 0.72$ ) and controllable-by-others (3.16,  $SD = 1.09$ ). The average highest scored question in the centrality subscale asked participants how much they felt they would be affected by the pandemic. In the controllable-by-self subscale, participants scored the highest, on average, on the question that asked them if they have what it takes to do well in the pandemic. The average highest scored question in the controllable-by-others subscale asked participants if there was help available for them in dealing with the pandemic. Participants

scoring highest in the centrality subscale, on average, shows that many of them were using primary stress appraisal. However, many others scored high, on average, in secondary stress appraisal as well. This is evident by the high average scores of the controllable-by-self and controllable-by-others subscales (see Table 2).

#### Coping Strategies Used During the COVID-19 Pandemic

Based on the information in Table 2, the highest average individual coping method reported was self-distraction, followed by acceptance, emotional support, positive reframing, and instrumental support, respectively. The top coping method of self-distraction would be classified as avoidant coping while acceptance and emotional support are classified as emotion-focused coping. Positive reframing and instrumental support are classified as problem-focused coping. The large variety of strategies shows this sample was not very consistent in their choice of coping methods. Denial, behavioral disengagement, and substance use were the three methods used the least out of this sample, on average. These three methods would be classified as avoidant coping. This survey also showed scores of moderately high ( $M = 2.53$ ) in problem-focused coping, moderately high ( $M = 2.42$ ) in emotion-focused coping, and moderate ( $M = 1.88$ ) in avoidant coping.

#### AT Perspectives on Underutilization

Of the participant responses, 42.9% felt as though they were underutilized during the COVID-19 pandemic. Those that responded that they felt underutilized listed a variety of reasons for feeling that way including being laid off/furloughed and being limited to taking temperatures and other COVID screening for athletes during the height of the pandemic. One participant said that they felt that “with our extensive schooling and knowledge, there were tasks a little bit more important that we could’ve done”. Sixty-four percent of participants who felt they were underutilized were upset that their skills were not being used by their employer, they were unable to help their athletes, or they expressed that they were left out of the decision-making process. Some participants expressed frustration that they were not included on any of their school committees about health and safety during the pandemic. One respondent explained that “the

public doesn't understand athletic trainer capabilities; therefore, our capabilities were not used as they should/could have been used". However, many participants reported that they did not feel underutilized during the pandemic (57.1%) One participant said that they "felt their skills and opinions were very much valued".

Table 2

*Reliability and Descriptive Data for Survey Subscales*

Construct	Definition	M	SD	Cronbach Alpha
Perceived Stress	An individual's perception of stress	20.31	7.47	0.92
Threat	Appraisals with the potential for harm/loss in the future	3.09	0.92	0.85
Challenge	Appraisals seen as a chance for growth/gain from the stress	2.53	0.86	0.77
Centrality	Refers to a person's perceived importance of an event for their own well-being	3.53	0.86	0.87
Controllable by self	An individual feels that they have control over how they appraise their available coping resources	3.49	0.72	0.82
Controllable by others	An individual feels that other people have control over how they appraise their available coping resources	3.16	1.09	0.93
Uncontrollable	An individual feels that no one has control over how they appraise their available coping resources	2.37	0.72	0.68
Overall Stressfulness	Refers to a person's appraisal of the total stress from a situation	3.24	0.78	0.74
Primary appraisal	Primary appraisal is an individual's evaluation of an event or situation as a potential hazard to his or her well-being	3.05	0.63	0.82
Secondary appraisal	Secondary appraisal is an individual's evaluation of his or her ability to handle the event or situation, and this depends on whether or not they think they have the	3.01	0.53	0.74

	resources to cope with it			
Self distraction	The effort to selectively attend to nonemotional aspects of a situation	3.05	0.94	–
Active coping	A person directly works to control a stressor through appropriately targeted behavior	2.46	0.79	–
Denial	Refusing to accept the truth about something happening in your life	1.31	0.47	–
Substance use	The use of illegal substances or misuse of legal substances such as alcohol, nicotine, or prescription drugs in response to a stressful situation	1.77	0.94	–
Emotional support	The verbal and nonverbal processes by which one communicates care and concern for another, offering reassurance, empathy, comfort, and acceptance	2.60	0.85	–
Instrumental support	When a person is given tangible assistance or help in physical ways	2.54	0.85	–
Behavioral disengagement	When an individual gives up or withdraws effort from, the attempt to attain the goal with which a stressor is interfering.	1.48	0.56	–
Venting	When an individual has full and free expression of feeling or emotions	2.13	0.79	–
Positive reframing	Involves thinking about a negative or challenging situation in a more positive way	2.58	0.78	–
Planning	When an individual thinks about how to confront a stressor, planning one's active coping efforts.	2.52	0.78	–
Humor	The capacity to perceive or express the amusing aspects of a situation	2.39	0.97	–

Acceptance	The active embracing of subjective experience, particularly distressing experiences	3.00	0.72	–
Religion	A system of spiritual beliefs, practices, or both, typically organized around the worship of an all-powerful deity (or deities) and involving behaviors such as prayer, meditation, and participation in collective rituals	2.50	1.17	–
Self-blame	The attribution that the consequences one experiences are a direct result of one's actions or character	1.92	0.81	–
Problem-focused	The act of channeling efforts to behaviorally handle distressing situations, gathering information, decision making, conflict resolution, resources acquisition, and instrumental, situation-specific, or task-oriented actions	2.53	0.63	0.86
Emotion-focused	Involves altering the personal or internal meaning or relationship of a stressor	2.42	0.46	0.67
Avoidant Coping	Involves cognitive and behavioral efforts oriented toward denying, minimizing, or otherwise avoiding dealing directly with stressful demand.	1.88	0.45	0.75

## CHAPTER 4

### DISCUSSION

#### Overview

The purpose of this study was to examine the impact of the COVID-19 pandemic on the stress, stress appraisal, and coping mechanisms of athletic trainers. On average, the sample captured reported a moderate level of stress according to the PSS-10 and the overall stressfulness scale of the SAM. In the appraisal of stress, participants, on average, scored highest in the centrality subscale which is a form of primary stress appraisal. However, the next two highest scored subscales were controllable-by-self and controllable-by-others which both fall under secondary stress appraisal. For coping mechanisms, there was a large variety of strategies presented in this survey. The top five methods reported were self-distraction, acceptance, emotional support, positive reframing, and instrumental support, respectively.

In this survey sample, 38% of participants reported having at least one diagnosed mental health issue. According to Mental Health America, 19% of Americans were experiencing a mental illness in 2021<sup>32</sup>. This survey sample had double the reported national average of people dealing with mental health issues. As past research has shown, the strain of responding to a stressful situation, whether mentally or physically, can be cumulatively damaging and may lead to eventual disease states of the mind and body, such as mental health issues<sup>33</sup>. Additionally, the symptoms of stress are major contributors to burnout and functional impairment among HCWs<sup>8</sup>. With this sample of ATs reporting higher averages of mental health issues, more of them have factors that could lead to burnout. Some research has suggested that as many as 30% of ATs may be experiencing some degree of burnout<sup>4</sup>. These ATs suffering from burnout could display decreased work quality, increased substance use, and higher reporting of depressive symptoms<sup>5</sup>. Understanding the data from the current study and previous literature, it is critical to control the antecedents of mental health issues and burnout to lessen their severity and the size of the affected population.

Some of the participants in this study listed factors that may have been influencing their answers on their stress, appraisal, coping, and feelings of underutilization. Some ATs listed their faith as a large factor in their experience during the pandemic. Others noted more hardships they faced during an already trying time, such as pregnancy during a global pandemic, relationship issues/breakups, or having small children. Also, some named the health of family and friends as a factor into their experience in the pandemic. While everyone is different, many people faced additional struggles during the pandemic that could have added more effects on their perceived stress, appraisal, coping strategies, and feelings of underutilization.

#### Perceived Stress

According to the data, this sample represented an average PSS-10 score of 20.31 (SD = 7.47). The majority of participants (50%) reported medium levels of stress while 21.4% reported low stress levels and 28.6% reported having high levels of stress. Compared to other studies using the PSS, these levels of moderate stress are similar. On average, the ATs in this sample experienced very similar levels of perceived stress compared to other healthcare professionals during the pandemic, non-healthcare professionals during the pandemic, and a non-pandemic sample. For example, a study conducted on Greek nurses during the pandemic, found that 45.5% of their sample reported moderate stress<sup>34</sup>. Further, 82.67% of nurses in India experienced a moderate level of stress at the beginning of the pandemic<sup>35</sup>. Across 48 countries, a preliminary study examining the perceived stress at the beginning of the pandemic found an average PSS score of 17.40 (SD = 6.5) in a sample of over 1500 respondents<sup>36</sup>, also indicating a moderate level of stress. All these results are very similar in their perceived stress levels when compared to the initial PSS-10 validation study. In that study, Roberti and colleagues found perceived stress levels of 17.40 (SD = 6.1) in male college students and levels of 18.40 (SD = 6.5) in female college students<sup>37</sup>. Both values show a moderate level of stress in a non-pandemic sample.

Comparing the level of stress across respondents, the average perceived stress levels of collegiate ATs (23.00, SD = 7.70) were higher than the ATs in the secondary school setting (18.45, SD = 7.12), but

not statistically different. While there was no other literature discovered that directly compares the perceived stress levels of collegiate ATs against secondary school ATs, a study that examined the stress of collegiate ATs alone found that Division 1-A ATs had an average reported stress level of 24.20 (SD = 6.15) which is very comparable to the average collegiate AT stress in this sample<sup>6</sup>. This shows that collegiate ATs in this study were not experiencing a higher level of stress than previously reported.

### Stress Appraisal

Participants in the current study exhibited an average primary stress appraisal of 3.05 (SD = 0.63) and a secondary appraisal of 3.01 (SD = 0.53). In comparison, Rolin and colleagues found that approximately 400 various healthcare providers scored 3.0 (SD = 0.7) on primary appraisal and 3.7 (SD = 0.7) on secondary appraisal<sup>21</sup>. In addition, one German study examined the stress appraisal and coping strategies of about 1000 full-time employees in various jobs at the beginning of the pandemic<sup>38</sup>. This German study, on average, scored highest in the subscale of controllable-by-self (3.53, SD = 0.88), controllable-by-others (3.09, SD = 1.09), and challenge (2.87, SD = 0.76), respectively<sup>38</sup>. This is supported by Rolin et al.<sup>21</sup> as well. The almost equal primary and secondary stress appraisal score (3.05 and 3.01) show that this study's participants were strongly considering if the pandemic was a potential hazard to their well-being and if they had the ability to handle the pandemic with adequate coping resources. Recent research has said that efforts to improve secondary appraisal could reduce the likelihood that HCWs would have an increase in their threat perception of the pandemic which should also reduce anxiety and depression<sup>21</sup>. Increasing the use of secondary appraisal could be beneficial to anyone in a stressful situation as it is an evaluation of coping options<sup>13</sup>. While it is not actual coping, it can be seen as the cognitive underpinning of coping<sup>13</sup>. Also, research has shown that high primary stress appraisal in HCWs caused an increased likelihood of anxiety symptoms<sup>21</sup>.

### Coping Strategies

In terms of coping strategies, participants scored highest, on average, in self-distraction, acceptance, emotional support, positive reframing, and instrumental support, respectively. Denial,

behavioral disengagement, and substance use were the three methods used the least out of this sample, on average. Our survey also showed scores of moderately high (2.53) in problem-focused coping, moderately high (2.42) in emotion-focused coping, and moderate (1.88) in avoidant coping. These values represent how often a respondent is using coping methods in each subscale. The moderately high score for problem-focused coping indicates that these participants were using their coping strategies in a way to target the root of their stress from the pandemic. Also, the moderately high score in emotion-focused coping indicated that these participants were also trying to regulate their emotions associated with stress from the pandemic. Coping strategies here are compared to those of Zacher<sup>38</sup> and Sheroun<sup>35</sup>. Compared to Zacher's reported coping strategies, the current study's participants used three of the same top five coping strategies (acceptance, self-distraction, and positive reframing) while respondents in both studies also reported using substance use and denial very little as both of those strategies were in the least used<sup>38</sup>. This shows that, on average, these two samples of American ATs and German employees were using similar coping methods. Although, there was still a large variety of strategies which shows this current study's sample was not completely consistent in their choice of coping strategies. The previous study conducted by Sheroun also examined the coping strategies used by the Indian nursing students<sup>35</sup>. Sheroun's data is similar to the current study as problem-focused and emotion-focused coping were both being used more often than less effective avoidant coping strategies<sup>35</sup>. This shows that two different healthcare worker samples were using similar coping strategies in their effort to deal with the stress of the pandemic. Overall, the results of ATs' coping strategies from this study are very consistent with these two previous studies that examine coping during the COVID-19 pandemic.

#### AT Perspectives on Underutilization

The only current study that examined ATs during the pandemic was conducted by Winkelmann et al<sup>10</sup>. They found that some ATs in their sample believed their skills were underused during the pandemic and 15% of their sample were put on unpaid furlough<sup>10</sup>. While they did not specifically ask if the ATs felt underutilized, they had an open response in their survey where multiple ATs expressed feelings of being

underutilized especially if they were furloughed or laid off<sup>10</sup>. According to this current study's sample, 27.7% of the respondents that said they felt underutilized indicated that they were laid off or furloughed at the start of the pandemic. Overall, 11.9% of this sample's respondents reported being laid off or furloughed which is similar to the figure of 15% found by Winkelmann<sup>10</sup>. As listed in the results, there were a large variety of reasons that the ATs in this current sample felt that they were underutilized. Although it is unclear whether those who felt underutilized were furloughed or laid off, it is possible that those actions could have influenced their opinion on the topic. Others were upset that they were limited to menial tasks like temperature screenings or administering COVID-19 testing when ATs have a much more advanced knowledge base. These feelings of underutilization amplify the struggles that many ATs can face when dealing with a person not well-versed in the practical scope of athletic training, which was reported by a participant in this sample. Much like other situations, the pandemic seemed to further expose the lack of knowledge that employers have of an AT's skill set.

#### Limitations

The authors of this study set out to find a vast, diverse, and large sample that could have provided insight as to how the athletic training community was affected by the COVID-19 pandemic in terms of stress, appraisal, and coping strategies. The authors would have liked to capture more diverse areas of athletic training such as more professional and industrial ATs to make better comparisons amongst the various settings. Overall, the response rate on this survey was very low (4.5%) from its distribution through NATA. The very low number of respondents may have impacted the results. Some potential participants may have been turned away by the estimated time to complete the survey (participants were told it would not take more than 30 minutes), or they may have simply not checked their email around the times they received the survey and its subsequent reminders. It should also be noted that some people may have chosen to not participate in this study due to the subject matter at hand. However, it could also be said that participants may have chosen to take this study because of the subject matter which may have influenced the results (like the large prevalence of mental health issues). Finally, many participants

(23.8%) were from the state of Georgia while many other represented states only had 1 or 2 participants, so this study is not very representative of the entire United States either. The small sample size and lack of country-wide representation in this study makes it difficult to draw conclusions on the population of ATs as a whole but does provide some insight into the lives of ATs during the pandemic.

## Conclusion

In conclusion, this study may have been the first of its kind to examine the stress and coping strategies of ATs during the COVID-19 pandemic. While this study did have some limitations, this data can provide some valuable insight on ATs currently and provide direction for future studies. Comparing this data to other studies on the stress and coping of other HCWs shows a broad agreement in similar levels of perceived stress and coped with this stress in various ways.

Employers of ATs should consider the causes of these issues they are facing and find ways to mitigate them like mental health support, higher pay, more accurate workweek hours, proper personal protective equipment, etc. Preventing burnout and mental health crises in ATs could help facilitate better care for the athletes and teams they serve<sup>7</sup>. No matter where they work, ATs should be able to receive the mental health support they deserve if they need it. Providing mental-health support to HCWs is a crucial part of the overall mobilization of healthcare systems in response to COVID-19<sup>8</sup>. Since the COVID-19 pandemic has continued for over a year at this point, the stress on ATs could be accumulating. Over time, the strain of responding to stressful situations can be cumulatively detrimental and may lead to eventual disease states of the mind and body<sup>33</sup>.

This study may have been one of the first to measure the stress, stress appraisal, and coping strategies after a life-altering stressor such as a global pandemic. This study was able to provide some data on these aspects of stress and coping of ATs to allow further research or comparison in the future. The authors hope this data allows for the stress of ATs to be compared to other healthcare professionals by employers and encourages the implementation of stress management strategies and use of effective coping strategies for ATs in the future. Further, we suggest that employers take this data into

consideration and include assistance in understanding positive coping strategies into future stress management training or introduce stress management training if they are not already doing so. Employees should be educated on how to use more effective coping strategies like the problem-focused strategies to handle stress more effectively. While the COVID-19 pandemic was a life-altering event that many young professionals had never experienced before, properly appraising and coping with their stress is key to prevent future problems like mental health issues and burnout.

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## APPENDIX A

### LITERATURE REVIEW

#### Stress

Stress is a concept that dates back many years. It began as a concept of physiological strain<sup>1</sup>. Stress did not begin being studied in the psychological sense until the early twentieth century when Hans Selye began using the term to describe an orchestrated set of bodily defenses against any form of noxious stimuli (including psychological threats)<sup>1</sup>. Research and literature regarding the effects of stress grew exponentially beginning after World War II because the military was concerned with the effect of stress on soldiers functioning in combat<sup>1</sup>. From that time, stress research has expanded, as abundant evidence shows that stress is important to help improve social, physiological, and psychological health<sup>2</sup>. Today, it is a widespread issue that affects many people across many professions in different ways. Stresses from family, work, finances, or other causes are certainly no longer isolated experiences but are commonalities shared by people from various social atmospheres or backgrounds<sup>3</sup>.

#### *Definition*

Over the years, stress has had an evolving definition. According to Lazarus and Folkman<sup>1</sup>, the common definition of stress is that it is a stimulus while Matthieu<sup>3</sup> says stress has traditionally been described as a stimulus, a response, and as a transaction. Stressful stimuli are most commonly thought of as events acting on the person, but the stimuli can also arise within the person like hunger or sex which come from inherent neurological characteristics<sup>1</sup>. Hans Selye, one of the forefathers of stress research, states that stressful life events are linked to the onset of distress or disorders<sup>4</sup>. Selye defines stress as a state manifested by a specific syndrome which consists of all the non-specifically induced changes within a biological system<sup>4</sup>. Essentially, Selye thought of stress as the rate of wear and tear caused by life<sup>4</sup>.

In 1984, Lazarus and Folkman described the most common definition of stress as a stimulus<sup>1</sup>. Everly and Lating updated the definition again in 2002 and defined stress as a physiological response that serves as a mechanism of mediation linking any given stressor to its target-organ effect<sup>5</sup>. Mental stress

has been defined as a transaction when an individual's cognitive focus is on the relationship between the person and the environment<sup>1</sup>. This transactional process focuses on the awareness and thoughts that impact the overall personal stress response an individual can have in their body and mind<sup>1</sup>. Lazarus's explanations also focus on cognitions and perceptions (known as appraisals) that mediate the response to stressful events<sup>2</sup>.

### *Types of Stress*

Stress is usually divided into two main types: acute and chronic. Acute stress is provoked by the time-limited, major, or minor events that are harmful or threatening at a particular moment in a person's life or for a brief period<sup>2</sup>. For example, getting a speeding ticket or having a job interview can be common examples of acute stress<sup>6</sup>. Chronic stress arises from harmful or threatening, but stable conditions of life and from the stressful roles people normally fulfill at work or in their family<sup>2</sup>. Stressful events often create many new sources of daily or chronic stress in their aftermath, making the distinction between acute and chronic somewhat blurrier<sup>2</sup>. Chronic stress normally arises from a considerable life event like the death of a spouse or a divorce<sup>2</sup>. While the event itself is acute stress, the lingering effects from these major events such as affecting a person's morale, social functioning, and health are the effects of continuous chronic stress<sup>2</sup>.

In 1974, Selye divided stress into two types that he called distress and eustress<sup>2</sup>. Distress is the destructive type illustrated by anger and aggression and is said to damage health<sup>2</sup>. For example, Shechter and colleagues found that sustained COVID-19 related psychological distress had a negative impact on healthcare workers' (HCWs) physical health<sup>7</sup>. They found an association between clinical workplace environmental stressors and long-term cardiometabolic risk while sustained distress may disturb the body's physiological stress response system<sup>7</sup>. In contrast, eustress is the constructive type, illustrated by emotions associated with concerns for others and positive striving that would benefit the community and is said to be protective of good health<sup>2</sup>. In healthcare, Simmons and Nelson examined the effect of

eustress in hospital nurses and found that higher hope (an indicator associated with eustress) led to higher perception of health<sup>8</sup>.

### *Causes of Stress*

The stress process begins with a stressor (the stimulus) which is defined as any real or imagined event, condition, situation, or stimulus that instigates the beginning of the human stress response process within an individual<sup>5</sup>. There are two main types of stressors: psychological and biogenic<sup>3</sup>. A psychosocial stressor occurs when an individual reacts to an event, condition, or stimulus based on the attributed perception of that stressor as a threat<sup>5</sup> and is interpreted on a scale ranging from no harm to adversely affecting an individual's well-being<sup>1</sup>. Merrill and Thomas illustrate this, finding that individuals were more likely to drink alcohol to alleviate stress after being exposed to a psychosocial stressor<sup>9</sup>. Some examples of psychosocial stressors can include divorce, the death of a child, prolonged illness, unwanted change of residence, a natural catastrophe, or a highly competitive work situation<sup>10</sup>. Some of these stressors can be very minute, as illustrated in Robinette who found that a clinician simply berating a participant to count faster after asking them to count down from a large number significantly raised blood pressure in older adults compared to those who were not stressed<sup>11</sup>. Psychosocial stressors can also include environmental events. Lazarus and Cohen described three types of environmental events: cataclysmic, which affects many people, major changes affecting one or few people, and daily hassles<sup>12</sup>.

A biogenic stressor occurs when thoughts, cognitions, or an appraisal of a situation or event is not needed in order to produce the same physiological stress reaction<sup>5</sup>. Biogenic stressors can occur in the body when it reacts to substances like caffeine or environmental conditions such as extreme temperatures<sup>3</sup>. Biogenic stressors directly cause physiological arousal without the need of cognitive appraisal<sup>13,14</sup>. For example, caffeine elicits both cardiovascular and endocrine stress responses in the human body<sup>15</sup>. These stress responses produce cortisol (a bodily indicator of stress) that subsequently increases blood pressure<sup>15</sup>.

### *Consequences of Stress*

Stress can be detrimental if not dealt with properly. Over time, the strain of responding to a stressful situation, whether mentally or physically, can be cumulatively damaging and may lead to eventual disease states of the mind and body<sup>5</sup>. In HCWs specifically, the symptoms of stress can help contribute to burnout and functional impairment<sup>16</sup>. Further, individuals who are protected from certain kinds of stress are likely to be vulnerable to that stress later in life if they did not learn the proper coping skills<sup>1</sup>.

However, stress is not always detrimental. Stress and the processes that follow it, appraisal and coping, are important processes that affect adaptational outcomes<sup>1</sup>. These three main outcomes are functioning in work and social living, morale or life satisfaction, and somatic health<sup>1</sup>. Stress can cause some people to draw upon adaptive resources they never thought they had and allow them to gain strength from stress which can be used to solve future problems in the prior outcomes<sup>1</sup>.

### *Stress in Athletic Training*

While the literature on stress and stress response are vast, there is some research on the effects of stress specific to the athletic training (ATs) population. Hendrix and colleagues<sup>17</sup> performed a study that found ATs who scored lower on a hardiness (defined as a combination of adaptive personality traits including a sense of commitment, a sense of challenge and opportunity in facing difficult situations, and a feeling of control over one's circumstances<sup>18</sup>) and social support scale tended to have higher levels of perceived stress. These higher levels of perceived stress were found to be related to higher emotional exhaustion and depersonalization and lower levels of personal accomplishment. Similarly, DeFreese and colleagues found that perceived stress along with workload incongruence and social support predicted global AT burnout which suggest that stress perceptions and social support drive the dimensional AT burnout experience<sup>19</sup>. Further, some of the job requirements of ATs like balancing occupational responsibilities with parenthood can cause more stress among female ATs and can lead to burnout and fatigue<sup>20</sup>.

### *Stress in Healthcare Workers during the COVID-19 Pandemic*

Effects. Since the start of the pandemic, there has been large amounts of research conducted on the effects of the pandemic on healthcare workers. This is true for stress along with the many mental health consequences like burnout, depression, and anxiety that may come with excessive stress. Features specific to COVID-19 like mode of transmission, rapid spread, and lack of definitive treatment or vaccination were responsible for mental health problems among HCWs<sup>21</sup>. Prior research has shown that epidemics can cause severe psychological effects on people including development of new psychiatric symptoms, worsening of pre-existing illnesses, excessive worry/anxiety, and helplessness<sup>22-24</sup>. These psychological effects can lead to psychiatric illnesses that include depression, anxiety, panic attacks, somatic symptoms, PTSD, delirium, and even suicide<sup>22-24</sup>. Also, the mental health issues experienced by HCWs can decrease productivity<sup>25</sup> and can lead to a reduced quality of care<sup>26</sup>. In addition, Shechter and colleagues noted in their study that there is an association between clinical workplace environmental stressors and long-term cardiometabolic health risk while sustained psychological distress and poor sleep may disturb the body's physiological stress response system which contributes to further health risk<sup>7</sup>.

School Nurses. ATs in the secondary school setting share a similar role to that of school nurses in the fact that they may be the only HCWs physically at the school in normal circumstances. For this reason, current research concerning school nurses can give insight into what ATs might be experiencing in this setting. At the beginning of the pandemic, the majority of participants in a study of school nurses expressed a sense of concern using terms such as helplessness, uncertainty, anxiety, stress, desperation, fear, and a sense of feeling physically unwell<sup>27</sup>. Lack of information about transmission of the virus, high risk nature of special needs schools and their students, lack of PPE, and fear for family members were some of the reasons for these feelings<sup>27</sup>. Over time, the participants in this study indicated that their initial stress and fear declined over time and was replaced with a sense of psychological preparedness and support as they tried to help guide faculty, staff, and students through the pandemic<sup>27</sup>.

Prevalence. Many studies have examined the prevalence of stress and other mental health issues since the COVID-19 pandemic began. A stress study performed on Indian physicians found that the

prevalence of moderately high stress was 78.9%, high-level stress was 3.7%, depressive symptoms requiring treatment was 11.4%, and anxiety symptoms requiring further evaluation was 17.7%<sup>28</sup>. Similarly, a study conducted in Wuhan, China found that the prevalence of stress, depression, and anxiety among frontline HCWs were 29.8%, 13.5%, and 24.1% respectively, with a sample size of over 5,000<sup>29</sup>. A study performed with HCWs in Saudi Arabia and Egypt found that 69% had depression, 58.9% had anxiety, and 55.9% had stress while 37.3% reported inadequate sleep during the previous month<sup>30</sup>. A large cross-sectional study performed in the United States found that daily stress was rated high or very high by 30% of respondents, 38% had anxiety or depression, and 43% thought they were overloaded at work<sup>31</sup>. One large systematic review found that the pooled prevalence of acute stress was 56.5% in 3,000 participants, pooled prevalence of post-traumatic stress was 21.5%, and the pooled prevalence of depression and depressive symptoms was 31.1% in over 68,000 participants<sup>32</sup>. Similarly, a study conducted with New York City HCWs found that more than half of the participants screened positive for acute stress, almost half screened positive for depression, and one-third screened positive for anxiety<sup>7</sup>. Taking all of these studies into account, the reported figures on stress, depression, and anxiety in frontline HCWs varies depending on nationality. However, the lowest reported figure for stress was around 30% of frontline HCWs with some studies reaching around 80% which should still alarm medical professionals.

**Risk Factors.** Some of the studies conducted on the prevalence of stress also examined risk factors that could contribute to higher stress and other mental health issues during the pandemic. The risk factors for these issues included an age of less than/equal to 30 years, female gender, and attending emergency/night shifts<sup>30</sup>. Also, watching or reading COVID-19 related news more than two hours a day was associated with higher risk of depression, anxiety, stress, and inadequate sleeping along with a lack of perceived emotional support from family, society, and hospital. Female gender was found to be a significant factor for stress, depression, and anxiety symptoms with an approximate two times higher risk to develop these conditions<sup>28</sup>. A US study also found female gender to be more likely to describe higher prevalence of anxiety, depression, and work overload<sup>31</sup>. Pappa and colleagues also found female gender

as a risk factor for higher prevalence of depression, anxiety, and stress among HCWs along with Arafa, Wilson, and Prasad<sup>28,30,31,33</sup>. Prasad and colleagues also found that race played a role in higher stress scores as Black and Latinx HCWs reported higher stress compared to White HCWs<sup>31</sup>.

#### *Stress from other Large Traumatic Events*

The events of the September 11th terrorist attacks in 2001 could be classified as another large-scale traumatic event that affected a large population of people, similar to the COVID-19 pandemic. Life after September 11th was especially difficult for New Yorkers as there were plenty of constant reminders due to heavy media and internet coverage, elevated police and National Guard presence, and fumes that engulfed much of Manhattan the weeks after the attack<sup>34</sup>. One study found that perceived stress was moderate in a sample of graduate students after the attacks and stated that individuals who ruminate may be at higher risk of developing more stress and trauma-related symptoms following a traumatic event<sup>34</sup>. Another study found that undergraduate students were moderately high in their reporting of perceived stress in the months following the attacks<sup>35</sup>. Finally, another study examined the stress symptoms of almost 1700 staff and students at a university not in New York City<sup>36</sup>. About 76% of respondents reported one or more substantial symptoms of stress while 32% reported 3 or more<sup>36</sup>.

#### *Stress Appraisal*

##### *Definition*

Lazarus explains that appraisal of a stressor involves how an individual cognitively processes the stressor<sup>1</sup>. This cognitive appraisal process can be readily understood as categorizing an encounter, along with its various facets, with respect to its significance for well-being<sup>1</sup>. Appraisal is largely evaluative, focusing on the meaning or significance of a stressor and takes place continuously during everyday life<sup>1</sup>. Individuals may or may not perceive an event as stressful or harmful because individuals appraise their safety differently<sup>37</sup>. The theory of stress appraisal examines the process by which emotions are elicited as a result of an individual's subjective interpretation or evaluation of important events<sup>3</sup>. It can also be understood as an evaluation of events to determine one's safety in relation to their place in the

environment<sup>2</sup>. Appraisals are commonly based on different subtle cues in one's environment, what that individual has learned from previous experience, and other personality variables like goals and situational intentions<sup>2</sup>. Despite its complexity, the appraisal process occurs quickly<sup>2</sup>.

### *Primary Appraisal*

The first main type of stress appraisal is known as primary appraisal. Primary appraisal is an individual's evaluation of an event or situation as a potential hazard to his or her well-being<sup>1</sup>. An example of primary appraisal would be an individual asking if a stressor is a threat to their well-being<sup>38</sup>. According to Lazarus, there are also three subtypes of primary appraisal: irrelevant, benign positive, and stressful<sup>1,2</sup>. Irrelevant is where the individual has no vested interest in the transaction or the results of stress<sup>1,2</sup>. Benign positive primary appraisal is where the individual assumes that the situation is positive with no potential negative results to their well-being<sup>1,2</sup>. Finally, stressful primary appraisal is where the individual only perceives negative results or that the event is detrimental to their well-being<sup>1,2</sup>. Any individual can interpret the same stressor as any of the three sub-types. For example, a large thunderstorm begins, and heavy rain is present. One person may not think anything of the rain because they had no plans that day (irrelevant) while another person is happy that it has begun raining because they will not have to water their lawn or plants (benign-positive) while, yet another person begins getting anxiety due to the rain because they have an important meeting and hate driving in bad weather (stressful).

### *Secondary Appraisal*

The other main type of stress appraisal is known as secondary appraisal. Secondary appraisal is an individual's evaluation of his or her ability to handle the event or situation, and this depends on whether or not they think they have the resources to cope with it<sup>37</sup>. This appraisal also refers to a cognitive-evaluative process that is focused on what can be done about a stressful person-environment (especially when there has been an appraisal of harm, threat, or challenge)<sup>2</sup>. In order to determine the magnitude of an event using secondary appraisal, the person must focus on one of the three perceptions of harm, threat, or challenge<sup>39</sup>. Secondary appraisal is essentially an evaluation of coping options (which will

be discussed later)<sup>2</sup>. It is not actually coping but can be seen as the cognitive underpinning for coping<sup>2</sup>. An example of secondary appraisal would be an individual thinking about if they have the skills to cope with their current problem<sup>38</sup>.

### *Reappraisal*

There is also a process known as reappraisal where a previous appraisal can be changed on the basis of new information from the environment, which may resist or feed pressures from the individual, and/or information from the person's own reactions<sup>1</sup>. There is also defensive reappraisal which is an effort made to reinterpret the past more positively or to deal with harm and threats by viewing them in a less damaging manner<sup>1</sup>. Defensive reappraisal is more a form of coping which will be discussed later.

### *Goals of Appraisal*

Appraisal accomplishes several things for the stressed individual. After the stressful event has been appraised by an individual, emotions and meaning are generated<sup>1</sup>. Once both primary and secondary appraisal have been completed and emotions are made, the person is now able to move on from cognitive thinking to action and how they will respond<sup>2</sup>.

### *Appraisal in HCW or AT*

Throughout the course of the COVID-19 pandemic, there have been some early studies conducted on the pandemic's effects on HCWs in terms of stress appraisal. Rolin and colleagues found that higher levels of threat appraisal coupled with emotion-focused coping were found to be significant predictors of anxiety and depression in reaction to the pandemic<sup>40</sup>. They also discovered a moderate positive effect between anxiety and depression between measures which suggests HCWs were more likely to have an increase in anxiety symptoms if their primary stress appraisal was high (they perceived the pandemic as a higher threat to their person)<sup>40</sup>. One effort to combat this issue would be helping to improve secondary appraisal which would reduce the likelihood that HCWs would have an increase in their threat perception of the pandemic which should also reduce anxiety and depression<sup>40</sup>. Pearman found that HCWs scored significantly higher on both current and future stress appraisals when compared to controls in response to

the pandemic<sup>41</sup>. They also found that the pandemic may function as an occupational hazard for HCWs because there is evidence of higher levels of anxiety and depressive symptoms and more severe stress appraisals of COVID-19 compared to age-matched controls<sup>41</sup>.

### Coping

Like appraisal, coping is an essential part of the emotion process and how individuals deal with stress<sup>2</sup>. Coping is involved in the emotion process, starting with the appraisal of the stressor<sup>1</sup>. Along with appraisal, coping is a mediator of the emotional reaction following stress and is how people manage stressful life conditions<sup>2</sup>. To a certain extent, stress and coping can be seen as reciprocals of each other. When coping is effective, an individual's level of stress is usually low and vice versa<sup>2</sup>. Coping involves an individual using their appraisal of their stress to determine what emotion they will respond with. Emotions should reflect what a person thinks they want and how they believe they should try to attain it, and unfortunately, decisions are made poorly most of the time<sup>2</sup>.

### *Definition*

Like the word stress itself, the definition of coping has changed since the beginning through subsequent years of new theories and research. Lazarus defined coping in 1984 as an action that involves the decision of which behaviors to utilize to handle a stressful event<sup>1</sup>. It is an interaction between an individual's internal resources and external environmental demands<sup>1</sup>. It can also be seen as constantly changing cognitive and behavioral efforts to manage specific demands that are appraised as potentially taxing or exceeding a person's resources<sup>1,3</sup>. In 1999, Lazarus updated this definition to a simpler version, saying it was the effort to manage psychological stress<sup>2</sup>.

### Problem-Focused Coping

The first main type of coping is problem-focused coping. It involves actively or behaviorally altering the external person-environment relationship<sup>1</sup>. It can also be defined as channeling efforts to behaviorally handle distressing situations, gathering information, decision making, conflict resolution, resources acquisition, and instrumental, situation-specific, or task-oriented actions<sup>42</sup>. This method of

coping allows the individual to focus attention on situation specific goals and allows for some sense of mastery and control in working toward attaining their goals<sup>3</sup>. Problem-focused coping efforts are often focused at defining the problem, generating alternative solutions, weighing the alternative in terms of its cost and benefit, choosing among the solutions, and acting on them<sup>1</sup>.

#### *Emotion-Focused Coping*

One of the other main types of coping is known as emotion-focused coping. It involves altering the personal or internal meaning or relationship of a stressor<sup>2</sup>. It also uses positive reappraisal, which utilizes the process of cognitively reframing typically difficult thoughts in a positive manner. Doing this will impact deeply held values that become apparent when certain conditions occur and are needed to assist in the coping process<sup>2</sup>. Certain cognitive forms of this emotion-focused coping can lead to a change in the way a stimulus is perceived without changing the actual situation (also a form of reappraisal)<sup>1</sup>. An example of emotion-focused coping would be an individual deciding that there are more important things to worry about than their current stressor<sup>1</sup>.

#### *Avoidant Coping*

The third and final main type of coping is avoidant coping. Avoidant coping involves cognitive and behavioral effects that are aimed at denying, minimizing, or otherwise avoiding dealing with stressful demands<sup>43</sup>. It has been previously speculated that avoidance coping may play a role in stress generation<sup>44</sup>. Reliance on avoidant coping seems especially likely to generate a new, broad range of stressors<sup>44</sup>. A great example of avoidant coping is procrastination as procrastinators use this method to avoid facing feelings or thoughts that are uncomfortable<sup>45</sup>.

#### *Coping in AT or HCW*

Since the start of the COVID-19 pandemic, there has been a decent amount of preliminary literature that examines the coping strategies of HCWs and its effect on them. In New York City HCWs, Shechter found that 80% of their subjects adopted at least one type of coping behavior to manage COVID related stress with physical activity/exercise being the most commonly endorsed behavior in this

population<sup>7</sup>. In China at the beginning of the pandemic, Mi and colleagues found that Chinese HCWs who adopted various coping strategies experienced less mental health issues<sup>46</sup>. They also reported the most common method was “a positive attitude and physical exercise” and many HCWs could benefit from better coping resources<sup>46</sup>. Moreover, Subasi found that seeking social support was the most common coping method used in Turkish HCWs<sup>47</sup>. One study found that HCWs using emotion-focused coping were associated with higher levels of depression<sup>40</sup>. This article was not the only one that found an issue with emotion-focused coping. Subasi found a positive significant relationship between emotion-focused coping and anxiety scores and a negative relationship with problem-focused coping<sup>47</sup>. Canestrari and colleagues found that Italian HCWs who used humor-based coping strategies perceived the pandemic as less stressful compared to those who did not use humor and humor was positively associated with the well-being of HCWs<sup>48</sup>.

#### Current Resources for ATs/HCWs

There are some current resources aimed at assisting ATs and other HCWs in their mental health wellness. The National Athletic Trainers' Association (NATA) set out in 2014 to develop a peer-to-peer support program to assist members in the aftermath of a critical incident or catastrophic event. ATs Care formed to support ATs during crises in their lives. There are various ways to have a confidential conversation with a member of the AT Cares peer-support team. The website provides infographics on self-care following a critical incident that includes warning signs, self-help strategies, and things to avoid during an incident<sup>49</sup>. Since significant, ongoing psychological stress can have a negative impact on one's cognitive, emotional, behavioral, physical, and spiritual well-being<sup>50</sup>. There are many other general websites or spaces that ATs or HCWs can turn to for assistance with mental health crises. The Centers for Disease Control (CDC) website provides hotline numbers for suicide prevention, disaster distress, domestic violence, child abuse, and sexual assault while also providing resources for LGBTQ+, older adults, and veterans/active military. The CDC also provides websites to find a psychiatrist, psychologist, and a provider to help treat substance abuse/addiction<sup>51</sup>. The National Alliance on Mental Illness (NAMI)

aims to provide warning signs, support, and advice to HCWs. The NAMI website also gives resources where HCWS can find confidential and professional support along with peer support. This organization provides information on how to build resilience with learning new skills and tools<sup>52</sup>.

## Measures Used in the Study

### *Perceived Stress Scale*

One of the measures used in this study will be the Perceived Stress Scale-10 (PSS-10). The PSS-10 contains 10 items to measure a person's perceived stress. The PSS was developed by Cohen in 1983 and has been cited in other studies over 1,500 times since its inception<sup>53</sup>. It was found to present adequate reliability and was correlated with life-event scores, depressive and physical symptomology, utilization of health services, and social anxiety. The PSS has been used in numerous different populations since its creation.

### *Stress Appraisal Measure*

For this research, the Stress Appraisal Measure (SAM) will be used as well. The SAM was developed by Mr. Edward Peacock and Dr. Paul Wong to measure both primary and secondary appraisal along with overall perceived stressfulness in response to a certain stressful event<sup>54</sup>. After three separate initial studies, the authors found the SAM to demonstrate good psychometric properties and measures six relatively independent dimensions including threat, challenge, centrality, controllable by self, controllable by others, uncontrollable, and overall stressfulness<sup>54</sup>. The SAM has been cited over 600 times since its induction in 1990 with about 200 of those citations being since 2017. The SAM has been used in various populations including undergraduate college students, various levels and ages of athletes, spouses of stroke survivors, and stroke patients.

### *Brief COPE Questionnaire*

The last measure used in this study will be the Brief COPE. This measure examined the strategies used for coping or regulating cognitions in response to stressors. It breaks down coping strategies into three categories that include problem-focused, emotion-focused, and avoidant coping. These categories

are then broken down into 14 subscales including self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioral disengagement, venting, positive reframing, planning, humor, acceptance, religion, and self-blame. Carver initially created the full COPE and began the Brief COPE in 1997. The full COPE has been cited over 15,000 times while the Brief COPE has been cited almost 7,000 times<sup>55</sup>.

### Conclusion

In conclusion, researchers have been concerned with learning about stress and how it affects people for about the past 100 years. Stress is a fundamental aspect of everyday life as it affects everyone in different ways. Large, unexpected events, like the world-wide COVID-19 pandemic can have adverse effects on everyday stress. While some quality preliminary research has been conducted on how the pandemic has affected stress and other related factors in people, mainly HCWs, there is a void in the literature for some populations. Athletic training, as a healthcare profession, has currently been vastly underrepresented in the current literature so far. The authors are hopeful that this study can be one of the first of its kind to attempt to measure the stress, stress appraisal, and coping strategies of ATs in the pandemic.

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APPENDIX B  
SURVEY QUESTIONS

DEMOGRAPHICS

Age (as entered by participant):

Gender Identity:

- Male
- Female
- Transgender
- Gender Fluid
- Non-Binary
- Other

Race

- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or Other Pacific Islander
- White
- Two or more races

Ethnicity

- Hispanic or Latino or Spanish Origin
- Non Hispanic or Latino or Spanish Origin

Current job setting

- Secondary school
- College
- Professional Sport
- Industrial
- Military
- Other

Years of experience as AT (as entered by participant):

State (as entered by participant):

Country (as entered by participant):

Current diagnosed mental health issues (as entered by participant):

Highest level of education

- Bachelor's
- Master's
- Doctorate

Average working hours a week before pandemic (as entered by participant):

Average working hours a week during the pandemic (as entered by participant):

If your job has changed during the pandemic, what is your current job setting?

- My job setting didn't change option
- Secondary school
- College
- Professional Sport
- Industrial
- Military
- Non-AT job (list job)
- Other

Is AT your primary source of income?

Yes/No

Is there something outside of work and the pandemic that is influencing your response?

No/Yes

If yes, please explain

Based on what has happened to you in the pandemic, do you feel underutilized as an AT?

No/Yes

Please explain

## PERCEIVED STRESS SCALE

Rate responses on a 5-point Likert scale

0=Never

1=Almost Never

2=Sometimes

3=Fairly Often

4=Very Often

1. In the last month, how often have you been upset because of something that happened unexpectedly?
2. In the last month, how often have you felt that you were unable to control the important things in your life?
3. In the last month, how often have you felt nervous and “stressed”?
4. In the last month, how often have you felt confident about your ability to handle your personal problems?
5. In the last month, how often have you felt that things were going your way?
6. In the last month, how often have you found that you could not cope with all the things that you had to do?
7. In the last month, how often have you been able to control irritations in your life?
8. In the last month, how often have you felt that you were on top of things?
9. In the last month, how often have you been angered because of things that were outside of your control?
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

## STRESS APPRAISAL MEASURE

Rate responses on a 5-point Likert scale

- 1=Not at all
- 2=Slightly
- 3=Moderately
- 4=Considerably
- 5=Extremely

1. Is this a totally hopeless situation?
2. Does this situation create tension in me?
3. Is the outcome of this situation uncontrollable by anyone?
4. Is there someone or some agency I can turn to for help if I need it?
5. Does this situation make me feel anxious?
6. Does this situation have important consequences for me?
7. Is this going to have a positive impact on me?
8. How eager am I to tackle this problem?
9. How much will I be affected by the outcome of this situation?
10. To what extent can I become a stronger person because of this problem?
11. Will the outcome of this situation be negative?
12. Do I have the ability to do well in this situation?
13. Does this situation have serious implications for me?
14. Do I have what it takes to do well in this situation?
15. Is there help available to me for dealing with this problem?
16. Does this situation tax or exceed my coping resources?
17. Are there sufficient resources available to help me in dealing with this situation?
18. Is it beyond anyone's power to do anything about this situation?
19. To what extent am I excited thinking about the outcome of this situation?
20. How threatening is this situation?
21. Is the problem unresolvable by anyone?
22. Will I be able to overcome the problem?
23. Is there anyone who can help me to manage this problem?
24. To what extent do I perceive this situation as stressful?
25. Do I have the skills necessary to achieve a successful outcome to this situation?
26. To what extent does this event require coping efforts on my part?
27. Does this situation have long-term consequences for me?
28. Is this going to have a negative impact on me?

## BRIEF COPE QUESTIONNAIRE

Rate responses on a 4-point Likert scale

- 1 = I haven't been doing this at all
- 2 = I've been doing this a little bit
- 3 = I've been doing this a medium amount
- 4 = I've been doing this a lot

1. I've been turning to work or other activities to take my mind off things.
2. I've been concentrating my efforts on doing something about the situation I'm in.
3. I've been saying to myself "this isn't real."
4. I've been using alcohol or other drugs to make myself feel better.
5. I've been getting emotional support from others.
6. I've been giving up trying to deal with it.
7. I've been taking action to try to make the situation better.
8. I've been refusing to believe that it has happened.
9. I've been saying things to let my unpleasant feelings escape.
10. I've been getting help and advice from other people.
11. I've been using alcohol or other drugs to help me get through it.
12. I've been trying to see it in a different light, to make it seem more positive.
13. I've been criticizing myself.
14. I've been trying to come up with a strategy about what to do.
15. I've been getting comfort and understanding from someone.
16. I've been giving up the attempt to cope.
17. I've been looking for something good in what is happening.
18. I've been making jokes about it.
19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.
20. I've been accepting the reality of the fact that it has happened.
21. I've been expressing my negative feelings.
22. I've been trying to find comfort in my religion or spiritual beliefs.
23. I've been trying to get advice or help from other people about what to do.
24. I've been learning to live with it.
25. I've been thinking hard about what steps to take.
26. I've been blaming myself for things that happened.
27. I've been praying or meditating.
28. I've been making fun of the situation.

## APPENDIX C

## IRB APPROVAL



RESEARCH INTEGRITY

**Institutional Review Board (IRB)**

Veazey Hall 3000  
 PO Box 8005 • STATESBORO, GA 30460  
 Phone: 912-478-5465  
 Fax: 912-478-0719

[IRB@GeorgiaSouthern.edu](mailto:IRB@GeorgiaSouthern.edu)

**To:** Holton, Lawson; Langdon, Jody; Mutchler, Jessica; Patterson, Steve  
**From:** Eleanor Haynes, Director, Research Integrity  
**Approval Date:** 10/7/2021  
**Subject:** Institutional Review Board Exemption Determination - Limited Review

Your proposed research project numbered **H22111**, and titled **“Stress, Stress Appraisal, and Coping in Athletic Trainers during the COVID-19 Pandemic.”** involves activities that do not require full approval by the Institutional Review Board (IRB) according to federal guidelines.

According to the Code of Federal Regulations Title 45 Part 46, your research protocol is determined to be exempt from full review under the following exemption category(s):

Exemption 2 Research involving only the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, if: Information obtained is recorded in such a manner that human participants cannot be identified, directly or through identifiers linked to them. Please visit our FAQ's for more information on anonymous survey platforms; Any disclosure of the human participant's responses outside the research could not reasonably place the participant at risk of criminal or civil liability or be damaging to the participant's financial standing, employ-ability or reputation; Survey or interview research does not involve children; The research project does not include any form of intervention.

Any alteration in the terms or conditions of your involvement may alter this approval. *Therefore, as authorized in the Federal Policy for the Protection of Human Subjects, I am pleased to notify you that your research, as submitted, is exempt from IRB Review. No further action or IRB oversight is required, as long as the project remains the same. If you alter the project, it is your responsibility to notify the IRB and acquire a new determination of exemption. Because this project was determined to be exempt from further IRB oversight, this project does not require an expiration date.*

## APPENDIX D

## IRB AMENDMENT APPROVAL



RESEARCH INTEGRITY

**Institutional Review Board (IRB)**

Veazey Hall 3000  
 PO Box 8005 • STATESBORO, GA 30460  
 Phone: 912-478-5465  
 Fax: 912-478-0719  
[IRB@GeorgiaSouthern.edu](mailto:IRB@GeorgiaSouthern.edu)

**To:** Holton, Lawson; Langdon, Jody; Mutchler, Jessica; Patterson, Steve; Dobson, John  
**From:** Eleanor Haynes, Director, Research Integrity  
**Date:** 2/2/2022  
**Initial Approval Date:** 10/7/2021  
**Subject:** Status of Research Study Modification Request – Amendment # 1  
**Exempt Review**

After a review of your Research Study Modification Request on research project numbered H22111, and titled “Stress, Stress Appraisal, and Coping in Athletic Trainers during the COVID-19 Pandemic.” it appears that your research modification does not change the conditions of your previous exemption. The research involves activities that do not require approval by the Institutional Review Board according to federal guidelines.

**Modification Description:**

- The addition of using social media to recruit participants for this study has been approved.

*Therefore, as authorized in the Federal Policy for the Protection of Human Subjects, I am pleased to notify you that your research is exempt from IRB approval. You may proceed with the proposed research.*