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COVID-19 Distress in NCAA Division III Student-athletes

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The aim of this study was to conduct a survey-based assessment of mental health symptoms among National Collegiate Athletic Association (NCAA) Division III student-athletes at a university during the COVID-19 pandemic. We sought to identify the severity of psychological distress during the fall academic semester, including a comparison of distress among gender and sport types, at a school who resumed in-person learning and preserved competition and practice sessions. A longitudinal, repeated measures design was implemented. Results indicated a significant increase in distress as the semester progressed ($t(170) = 9.188$, $p < .001$). Moreover, there was a significant difference in distress between genders at both time points ($p < .001$, $p = .001$, respectively), but only between sport types at the first data collection ($p = .001$). A univariate analysis of variance (ANOVA) determined a significant effect of time ($p < .001$), gender ($p < .001$), and sport ($p = .008$) on COVID distress as well as the interaction of gender and sport to significantly influence symptoms ($p = .032$). The results of this study suggest COVID-19 induced psychological distress is not stagnant and women student-athletes may be more susceptible. Colleges should consider screening student-athlete mental health to understand fluctuating, acute distress as well as symptoms that endure.

Keywords: COVID-19, mental health, NCAA Division III, student-athletes

In early 2020, a novel coronavirus (COVID-19) spread throughout the world. As a result, there were unparalleled responses within communities, including restricted travel, business closures, social and physical distancing mandates, disrupted access to support systems, and shifted school structures to distance learning. Research in the general population indicated an adverse psychological response as a result of the pandemic (Taylor et al., 2020a), including a heightened level of uncertainty that contributed to loneliness, depression, binge drinking, and severe distress (Hamza et al., 2020). These symptoms intensified previous mental health illness and was evident in individuals who had not before experienced clinical levels of distress (Hamza et al., 2020). Moreover, the increased distress occurred despite most individuals not contracting the virus (Taylor et al., 2020a). Taylor et al. (2020b) indicated the psychological effect of the pandemic, especially in those not infected, is expected to be more significant than the medical impact throughout the population. This is noteworthy because without the pandemic, these individuals may not have otherwise been affected by clinical levels of distress.

Consequently, almost all (91%) of students in higher education experienced rapid changes to campus life and had altered learning formats in spring 2020 (Hamza et al., 2020). This change was considered unprecedented to the population (American College Health Association [ACHA], 2020; Hamza et al., 2020). The stressors felt were a result of the instantaneous adjustment from campus to alternative living places which, ultimately, affected daily life. In a study conducted with university students in New Jersey, a majority had difficulties focusing and struggled with the online format of classes (Kecojevic et al., 2020). These academic efforts were associated with increased levels of depression, anxiety, somatic distress, and general stress (Kecojevic et al., 2020). Moreover, as COVID-19 persists, college students have demonstrated a shift away from academic priorities to focus on the health and well-being of themselves and their families (Kecojevic et al., 2020). This is important to note as students try to balance academic challenges and a broader complexity of life trials.

College students were already identified as a population with increased vulnerabilities to mental health symptoms and illness (ACHA, 2019; Hamza et al., 2020). It is known psychological distress can have a significant effect on academic performance and social interaction (Kecojevic et al., 2020; Lederer et al., 2020). This predisposition in addition to the onset of pandemic-related distress can exacerbate symptoms in an already susceptible population. For example, in a study of university students in Texas, 71.26% indicated increased stress and anxiety during the pandemic (Wang et al., 2020). Hamza et al. (2020) noted university students in Canada with pre-existing clinical symptoms of mental health illness demonstrated similar levels throughout the onset of the pandemic, however those without pre-existing conditions experienced an increase of psychological distress. The students with pre-existing distress still had higher levels of sadness, depression, anxiety, and burdensomeness, among other symptoms, when compared to those without, however both groups then were experiencing a noticeable level of distress (Hamza et al., 2020). This is important because it indicates a broader population is affected by the pandemic and has deleterious effects on social interaction and typical behaviors.

Student-athletes, a sub-group of the entire student population, experienced significant changes to their schedules too. In spring 2020 the NCAA cancelled winter championships and spring seasons as universities and colleges closed campuses and moved to remote learning. This forced students away from direct interaction of sport supports and resources typically available,

such as coaches, teammates, or athletic trainers, while simultaneously unburdening typical team commitments required of college athletes such as strength training, practice, or travel for competition. The instant impact on emotional health was noteworthy. The NCAA developed an online survey to examine the impact of COVID-19 on student-athlete physical and mental well-being. Snowball sampling was used to reach student-athletes and over 37,000 individuals participated, of which 10,591 competed at the NCAA Division III level (NCAA Research, 2020). Results of the mental health component of the survey at the start of the pandemic (May 2020) were compared to previously collected and similar data from the ACHA. Most sample groups experienced 150 to 250% higher mental health distress when compared to baseline, pre-pandemic data (NCAA Research, 2020). Data collected in May by NCAA Research (2020) described 49% and 75% of Division III men and women student-athletes, respectively, who experienced at least occasional mental health concerns as a result of the pandemic. National data collection indicated 1 of 12 student-athletes described depression levels so high that it was difficult to function (NCAA Research, 2020). Feelings of being overwhelmed, difficulty sleeping, and exhaustion were the most frequent responses as a result of the pandemic (NCAA Research, 2020). In every emotion except anger, women student-athletes identified symptoms more frequently than men (NCAA Research, 2020). This report made clear the pandemic contributed to a heightened level of distress than ever seen in a large sample of student-athletes.

On the other hand, Graupensperger et al. (2020) identified teammate support and connectedness as important mediators of mental health and well-being during the COVID-19 pandemic. Similarly, Şenişik et al. (2020) indicated lower depression amidst the pandemic in athletes with more social relationships. Conceivably, the strong sense of social support obtainable through sport programs mediated notions of psychological distress throughout the pandemic. Most NCAA Division III student-athletes were in contact multiple times a week with teammates and coaches at the onset of the pandemic (87% and 54%, respectively; NCAA Research, 2020). Moreover, athlete identity has been found to be enhanced through the pandemic, despite limited access to training or physical interaction with athletic connections, when facilitated by teammate interactions (Graupensperger et al., 2020). Therefore, it is possible connections through sport offer some protection for general psychological distress evident during the pandemic.

For these reasons we used the Social Cognitive Theory (SCT) to apply the personal and socio-structural factors experienced by students as they relate to health (Bandura, 1998). SCT conceptualizes reciprocal causation between three determinants: interpersonal, behavioral, and environmental (Bandura, 2012). This is applicable to student-athlete mental health because individuals bring their own identity and attitudes to a team which itself has a team and sport culture that is highly influential. For instance, women college athletes had lower perceived social support and augmented internalization of feedback, performance, or stressful situations than men (Storch et al., 2005; Wolanin et al., 2015). Thus, the cognitive processes or the emotional environment may be perceived different between genders and lead to the discrepancy in risk. It is also possible performance pressure and internal attribution to success is processed differently based on the sport categorization. In fact, Proctor and Boan-Lenzo (2010) identified the more frequent use of problem-focused coping strategies in team sport athletes than individual sport athletes. Problem-based coping refers to purposeful attempts to deal with distress, including communication, planning, or seeking information compared to other forms of coping through self-blame, wishful thinking, blocking, or suppression (Proctor & Boan-Lenzo, 2010). The ability to manage problems that present through identified stressors could be different among

different genders or sport types and contribute to a difference in risk. The extent to which diverse college athlete populations have been studied prior to the pandemic remains limited (Hong, Keenan, & Putukian, 2018; Wolanin et al., 2016), therefore continued examination can help distinguish and confirm patterns through and after the pandemic.

O'Hara (2020) described the challenges of being away from campus after the shift to remote learning and, in that time away, a hopeful transition back to campus for sport competition. Yet, July 8, 2020 began a series of announcements, postponements, and cancellations for student-athletes across the country (Entertainment and Sports Programming Network [ESPN], 2020). Responses to the continued COVID-19 situation were diverse as schools started their fall semesters. Some institutions remained online, others offered hybrid options, while some returned to complete in-person campus offerings (Elias, Troop, & Wescott, 2020). These guidelines also varied based on state and local guidelines. For those in-person, campus life remained different than a typical year, with few large events, mask mandates, and physical distancing directives within campus facilities (Lederer et al., 2020). However, in-person on-campus attendance was limited with only 11% of Division III institutions offering full, in-person learning for the Fall 2020 semester (NCAA Research, 2021). The NCAA response fluctuated too. On August 5, 2020 all fall Division III championships were cancelled, though some schools and conferences opted to retain conference championship competition for individual sports like cross country, golf, and tennis, to name a few (ESPN, 2020). Moreover, teams were able to practice as state, local, and campus administration recommendations allowed. During the fall semester, 34% of all institutions completed in-season practices with no competitions (NCAA Research, 2021). Within the NCAA, only Division I level Football Bowl Series teams had the opportunity for a championship season in the fall while other sports moved championships to the spring. At the Division III level fall team sports (i.e., football, soccer, or volleyball) also moved to the spring and competed at the conference level, if at all, with no national tournament. Still, certain schools still opted out of sport competition. The dynamic of being a student-athlete on campus looked very different during the fall semester. Even those who retained some semblance of their competition season had to deal with how COVID-19 positive tests affected disruption to scheduled practice and competition. There was constant change and persistent uncertainty day-to-day during the fall 2020 season.

It has been suggested the effects of the pandemic could endure long-term (Hamza et al., 2020). Previous public health crises indicate psychopathology may extend beyond the pandemic timeline lending itself to become a chronic condition (Taylor et al., 2020a, 2020b). The indefinite timeline of the virus, and its recognized impact on multiple levels of personal influence, make this an important predicament to understand. As the mental health burden potentially increases during the time of COVID-19, there is a pressing need to understand how college student's mental health has been affected (Kecojevic et al., 2020). This is particularly true as COVID-19 spread fluctuates throughout the country and as university campuses implement guidelines to variable extents. Then, college campuses can be better equipped to provide support to students amidst the return to campus and care for student's emotional health needs. Thus, the aim of this study was to conduct a survey-based assessment of mental health symptoms among NCAA Division III student-athletes at a private university in the rural U.S. plains during the COVID-19 pandemic. We sought to identify severity of psychological distress during the fall academic semester, including a comparison of distress among gender and sport types, at a school who resumed in-person learning and preserved some competition and practice sessions. According to the literature available, we hypothesized that there would be a significant difference in mental

health symptoms related to COVID-19 across a collegiate academic season, that there would be a difference in symptoms between genders, and that there would be sport-specific differences.

Method

Study Design

A longitudinal, repeated measures design was implemented during the first semester (fall 2020) returning to in-person learning and athletic competition after COVID-19 forced campuses across the U.S. to close.

Sample

The research was approved by university Institutional Review Board (#H-31-S2019-KV). The research setting was a private, residential, and liberal arts institution of approximately 1,200 students located in the rural Plains. The data collection from student-athletes occurred in the fall semester at an NCAA Division III institution. The study sample included eligible NCAA student-athletes over the age of 18. Given representation within the school demographics, a majority of the subjects were white. Gender was self-reported by individuals who identified as either men or women and participated in those respective sport classifications. Sport type was separated into two levels: team or individual sport; the classification is based on descriptions by Miller & Hoffman (2009). Individual sport programs offered at the university included cross country, golf, tennis, track and field, and wrestling while team sport programs included baseball, basketball, football, soccer, softball, and volleyball.

Participants were recruited during initial pre-season athletic department meeting in collaboration with the sports medicine team. Student-athletes who met the recruitment criteria had to opt into the research study. A total of 572 athletes were eligible to participate. A total of 535 responded to the in-person survey and 171 responded to the follow-up survey two months later.

During the fall semester only cross country, golf, and tennis teams engaged in competition seasons with an ultimate conference championship awarded. All other fall sports were postponed to the spring but followed a phased return to practice plan based on risk of transmission through sport. After all traditional fall sports started, winter and spring sports also began their non-traditional practice plans. On campus, classes were primarily held in-person with appropriate social distancing. No adjustments were made to the academic calendar. Through the fall semester, 160 positive cases were reported among students, faculty, and staff and 617 were exposed and subsequently placed in quarantine (Central College Health Initiative, 2020). Of the reported cases, 79 positive tests were student-athletes (49.4%) and 211 placed in quarantine (34.1%) at the present institution. These reported experiences were slightly higher compared to 27% of Division III student-athletes across the country who reported having to isolate or quarantine during the fall semester (NCAA Research, 2021). Caseloads peaked surrounding the Thanksgiving holiday, thus the university administration presented students with a choice to remain at home after the holiday. Approximately 21% of students elected this option (Central College Health Initiative, 2020).

Survey Design

The NCAA developed a survey to distribute to all NCAA student-athletes at the start of the pandemic. It was similar in design to the ACHA survey distributed annually which is both valid and reliable (ACHA, 2021). Mental health constructs within the survey have reported Cronbach's alpha in the range of 0.710-0.821 and 0.902 for depression and anxiety, specifically (Rahn, 2014). The ACHA is nationally recognized for its data collection of health perceptions and behavior. A part of the developed COVID-19 survey was used in the present study. Permission was granted by NCAA Research (2020) to reproduce the survey instrument. The survey is available at the NCAA Research (2020) website. The stress scale did not provide psychometric properties in the publication (NCAA Research, 2020). Ten statements were provided, and students responded to each on a Likert scale (*never* to *constantly*).

Data Collection Procedures

Participants were asked to complete the NCAA COVID-19 Distress survey at two points, initially upon return to campus (September) and again approximately two months later, near the end of the semester (November). This was the first semester back to campus for in-person learning after the COVID-19 pandemic forced campus closure in the spring semester. The initial intake was an in-person paper survey collected at the first team meeting for each sport program; a follow-up survey was sent via campus email to those who consented to initially participate. For time (IV_1), the first data collection time is referred to as T1 and the second data collection time is referred to as T2. The ten-question survey was provided, and students responded to each statement. Demographic data was collected with the survey and included gender and sport program type. The survey responses were anonymous to the researchers. Variables include mental health symptoms related to COVID-19 (DV_1), time (IV_1), gender (IV_2), and sport type (IV_3).

Data Analysis

Descriptive data presented the frequency of mental health symptoms from the surveys at each time point. Two types of descriptive statistics were offered prior to more advanced statistical analysis: measures of central tendency and measures of variability. The measures of central tendency in this study considered the mean scores of COVID-19 distress for the total sample and by time for gender and sport type groups. Measures of variability for COVID-19 distress was represented through standard deviation. This information helped inform the distribution of scores for the measures taken T1 and T2. Additionally, further data reduction grouped student-athletes who experienced symptom levels *most every day* or *constantly* and presented the data as percentages. This breakdown was similar to the report provided by NCAA Research (2020) and offered another detailed descriptive statistic comparison of distress at the two time points and between genders and sport types.

The use of an independent *t*-test was applied to compare COVID-19 distress between the two time points. This helped evaluate the first part of the hypothesis; that is, if there was a significant difference in symptoms across a collegiate academic season. The independent *t*-test was also used on the randomized matched sample groups to evaluate trends by time as well as comparisons between gender and sport type at T1. A univariate ANOVA was applied to

determine the influence of independent variables (i.e., time, gender, and sport type) on COVID distress. An a priori alpha level of 0.05 was set for statistical significance in both tests. All statistical analyses were conducted using IBM SPSS version 27.0.

Results

The total mean score from the COVID-19 distress survey was higher in every demographic at T2 data collection than at T1. Table 1 provides mean and standard deviation for the survey split among different demographic categories.

Table 1
Survey Scores by Demographic

	T1		T2	
Demographic	Sample (n)	Mean ± SD	Sample (n)	Mean ± SD
Men	344	2.88 ± 3.328	85	6.34 ± 5.571*
Women	191	5.39 ± 4.502	86	9.14 ± 5.109*
Team Sport	353	3.33 ± 3.631	101	7.36 ± 5.456*
Individual Sport	182	4.63 ± 4.450	70	8.31 ± 5.576*
Total	535	3.77 ± 3.972	171	7.75 ± 5.509*

*$p < .001$

The T2 mean score ($M = 7.75 \pm 5.509$) was significantly higher ($t(170) = 9.188$, $p < .001$, $d = .703$, 95% CI [3.627, 5.61]) compared to the T1 mean score ($M = 3.13 \pm 3.282$) for student-athletes. For men and women, the mean scores were also highest at T2 ($M = 6.34 \pm 5.571$ and $M = 9.14 \pm 5.109$, respectively) compared to T1 ($M = 2.88 \pm 3.328$ and $M = 5.39 \pm 4.502$, respectively). Both men and women mean scores were significantly different between the two time points: $t(84) = 10.494$, $p < .001$, $d = 5.571$, 95% CI [5.14, 7.54] and $t(85) = 16.591$, $p < .001$, $d = 5.109$, 95% CI [8.04, 10.23] for men and women, respectively. There was a significant difference between genders at both T1 ($t(533) = -7.349$, $p < .001$, $d = -.663$, 95% CI [-3.244, -1.841]) and T2 (t(169) = -3.424, $p = .001$, $d = -.524$, 95% CI [-.828, -.218]) data collections. And both team and individual sport types were also highest at T2 ($M = 7.36 \pm 5.456$ and $M = 8.31 \pm 5.576$, respectively) compared to T1 ($M = 3.33 \pm 3.361$ and $M = 4.63 \pm 4.450$, respectively). Both team and individual sport mean scores were significantly different between time points: $t(100) = 13.500$, $p < .001$, $d = 5.456$, 95% CI [6.28, 8.43] and $t(69) = 12.476$, $p < .001$, $d = 5.576$, 95% CI [6.98, 9.64] for team and individual sport type, respectively. There was only a significant difference between sport types at T1 ($t(533) = -3.612$, $p < .001$, $d = -.330$, 95% CI [-1.999, -.591]) data collection, but not at T2 ($p = .597$).

Attrition Reliability Tests

The participant attrition from T1 to T2 presents a threat to internal validity. Participants were not individually linked from T1 to T2 because the research question focus was on the influence of external conditions on mental health. As a result, we could not identify and include the same participants at T1 and T2 for analyses. To address the attrition threat, we used a matched random sampling technique to create equivalent representative samples from T1. Conducting the data analyses with these matched samples allowed us to assess the reliability of overall data analyses including all responses reported above. Two matched random samples were selected from T1 based on gender and sport type representation to match the sample of participants at T2 (n = 171). Participants from the first survey response were put into an Excel file and the RAND() function was used to select the samples. Two separate random samples from T1 were used as reliability checks.

Independent *t*-test analyses using the two random samples from the T1 population of survey respondents demonstrated results consistent with those attained with the entire sample. The T2 mean score was higher compared to each random sample group at T1 and significantly different ($p < .001$). Significant differences remained between genders (random sample 1: $p = .001$; random sample 2: $p < .001$) but was no longer apparent between sport types at T1 (random sample 1: $p = .521$; random sample 2: $p = .157$). Complete descriptive statistics and results of independent *t*-test analyses are available in Appendix A. Thus, we are confident about the trends detected from T1 to T2.

Threshold of Distress

The intensity of symptoms was also analyzed to determine what proportion of student-athletes felt distress *most every day* or *constantly*, similar to groups and outcomes produced from the NCAA COVID-19 survey. This summary is similar to data collection reports published by NCAA Research (2020; 2021) which evaluated the frequency of response to each question based on the established threshold and offered an additional evaluation of distress between demographic groups. As seen in Table 2, the percentage of respondents reporting distress levels *most every day* or *constantly* were more common at the T2 time point compared to T1.

At each data collection time point and for each survey statement, women reported a higher level of distress compared to men given the frequency threshold of *most every day* or *constantly*. Feeling overwhelmed was the top concern for both genders. The biggest change in symptom prevalence between time points was feeling overwhelmed for women; there was a 26% increase in the sentiment. For men, difficulty sleeping was the biggest change between time points, wherein a 15.3% change was seen among the sample. Table 3 describes the responses by each gender at the two time points.

Once more, descriptive statistical analysis considered the frequency threshold of *most every day* or *constantly* by sport type. At the beginning of the semester (T1), individual sport athletes revealed higher rates of distress in seven of ten categories compared to team sport athletes. By the T2 data collection, individual sport athletes demonstrated higher distress than team sport athletes in five categories and, conversely, team sport athletes showed higher concerns in the other five categories. At each time point, feeling overwhelmed was the top concern for all athletes, though at T1 individual athletes also felt an equal amount of exhaustion. The biggest change in symptom prevalence between time points was feeling overwhelmed for

individual sport athletes, where there was nearly a 20% increase in the emotion. For team sport athletes, exhaustion was the biggest change between time points, in which a 24% change was seen among the sample. Table 4 describes the responses for each sport type at the two time points.

Table 2
NCAA COVID-19 Survey Responses of most every day *or* constantly *(%) by Time*

Question	T1	T2
Felt overwhelmed by all you had to do.	7.9%	29.2%
Experienced sleep difficulties	4.9%	18.1%
Felt exhausted (not from physical activity).	5.5%	24.0%
Felt very lonely.	6.0%	18.7%
Felt a sense of loss.	3.2%	16.4%
Felt sad.	3.95%	15.2%
Felt overwhelming anxiety.	6.8%	21.1%
Felt overwhelming anger.	2.8%	8.77%
Felt things were hopeless.	1.9%	8.2%
Felt so depressed that it was difficult to function.	1.1%	5.8%

Table 3
NCAA COVID-19 Survey Responses of most every day *or* constantly *(%) by Gender*

Question	T1		T2	
	Men	Women	Men	Women
Felt overwhelmed by all you had to do.	4.4%	14.7%	17.6%	40.7%
Experienced sleep difficulties	2.3%	9.4%	17.6%	18.6%
Felt exhausted (not from physical activity).	3.5%	8.9%	17.6%	30.2%
Felt very lonely.	3.8%	9.9%	16.4%	20.9%
Felt a sense of loss.	2.0%	5.2%	10.5%	22.1%
Felt sad.	2.0%	7.3%	8.2%	22.1%
Felt overwhelming anxiety.	3.5%	12.6%	14.1%	29.1%
Felt overwhelming anger.	1.7%	4.7%	8.2%	9.3%
Felt things were hopeless.	1.45%	2.6%	7.1%	9.3%
Felt so depressed that it was difficult to function.	0.6%	2.0%	4.7%	6.98%

Table 4
NCAA COVID-19 Survey Responses of most every day *or* constantly *(%) by Sport Type*

Question	T1		T2	
	Team	Individual	Team	Individual
Felt overwhelmed by all you had to do.	7.4%	8.8%	29.7%	28.6%
Experienced sleep difficulties	5.1%	4.4%	16.8%	20.0%
Felt exhausted (not from physical activity).	3.7%	8.8%	27.7%	18.6%
Felt very lonely.	5.7%	6.6%	15.8%	22.9%
Felt a sense of loss.	3.1%	3.3%	17.8%	14.3%
Felt sad.	2.8%	6.0%	15.8%	14.3%
Felt overwhelming anxiety.	6.8%	6.6%	20.8%	21.4%
Felt overwhelming anger.	2.5%	3.3%	9.9%	7.1%
Felt things were hopeless.	1.1%	3.3%	5.9%	11.4%
Felt so depressed that it was difficult to function.	1.1%	1.1%	3.96%	8.6%

A univariate ANOVA was conducted to determine differences in COVID distress between times data was collected (IV_1), genders (IV_2), and sport types (IV_3). Results revealed significant differences among the time category [$F(1, 698) = 85.851$, $p < .001$, $\eta^2 = .110$], gender category [$F(1, 698) = 41.699$, $p < .001$, $\eta^2 = .056$], sport category [$F(1, 698) = 7.149$, $p = .008$, $\eta^2 = .010$], and gender by sport [$F(1, 698) = 4.591$, $p = .032$, $\eta^2 = .007$]. Pairwise comparisons from T2 to T1 uncovered a significant mean difference of 3.522 points (pts; $p < .001$, 95% CI [2.776, 4.268]), between women and men a significant mean difference of 2.454 pts ($p < .001$, 95% CI [1.708, 3.201]), and between individual and team sport athletes a significant mean difference of 1.016 pts ($p = .008$, [.270, 1.763]). Post hoc analyses were not run as each variable only had two categories. Additionally, analysis of the interaction of gender and sport showed men individual sport athletes had a greater difference in mean ($M = 5.749 \pm .400$) than men team sport athletes ($M = 3.918 \pm .328$) when compared to women individual sport athletes ($M = 7.389 \pm .436$) and women team sport athletes ($M = 7.187 \pm .346$).

Discussion

Results from the present study indicate a significant difference in COVID-19 distress from the start to end of the academic semester upon returning to campus for in-person learning. What is more, a significant difference in psychological distress between men and women student-athletes was evident at both time points whereas sport type only yielded a significant difference at the start of the semester. This study offers attention to specific aspects of the emotional response toward the pandemic for Division III student-athletes at a private university in the rural Plains.

COVID-19 Related Mental Distress

The mean level of distress for all student-athletes significantly increased through the semester. Therefore, in the present study with respect to changes in symptoms across a collegiate academic season, the hypothesis was maintained. At both time points feeling overwhelmed was the top concern. This pattern was similar to what the larger sample of student-athletes reported (NCAA Research, 2020). At the start of the semester, anxiety was the next highest concern, followed by loneliness. This changed, where exhaustion shifted to the second highest concern in November while anxiety was third. Fatigue can be a manifestation of both physical and psychological depletion (Ye et al., 2020). The combination of being overwhelmed and exhaustion in the present sample may be a representation of the psychological depletion described by Ye et al. (2020), which increased throughout the semester. It is important for college personnel to understand the specific stressors as they fluctuate over time, especially as stressors may vary among different university environments. This knowledge contributes to development of specific coping strategies for the students served.

The changing dynamic of the virus, meaning spread through time and location, was noted as a key concept for institutions of higher education to consider (ACHA, 2020). The response to the pandemic in rural Iowa has been less restrictive than many other areas of the country, including business closure regulations and mask mandates. It was not until mid-November when a partial mask mandate was put into effect (Godfrey, 2020). Perhaps this altered the perception of the pandemic in the student body, of which a majority (approximately 70%) are in-state residents. In fact, COVID-19 case incidence and severity in the state was not prominent until after the first time point of study data collection. It is possible the change in distress increased through the semester in a similar way that the university's state and county experienced a surge in cases. Though an increase was beginning to take place at the start of the semester in the state, the rural location remained relatively unscathed. However, by early fall, Iowa had the highest positivity rate of COVID-19 in the country and cases continued to rise through December (Canipe & Shumaker, 2020; Godfrey, 2020). One journalist even indicated her visit to a public university in the state was strange, in that the pandemic had been in the country for more than half a year, but "Iowa just hasn't been acting like it" (Godfrey, 2020). Using data from the CDC Household Pulse Survey, national data shows a strong correlation ($r = 0.92$) between COVID-19 cases and increased anxiety and depression symptoms (Sebenius, 2020). The slow uptick of cases toward a peak in November could explain why students demonstrated a change in psychological distress through the fall semester.

The obligations of an academic semester fluctuate just as mental health does, along a continuum. At the time of T2 data collection mid-term exams had finished and most student-athletes, except for men's and women's basketball and wrestling, had completed their fall non-traditional seasons. In some regards, both academic and athletic pressures were at their lowest point of the semester. Yet, the present study showed higher overall distress. It is reasonable to suppose the structure and support through athletics and a routine offset stressors associated with the pandemic. This hypothesis is supported by NCAA Research (2021), which reported a negative impact on mental health due to time away from sport in Division III athletes. Specifically, 45% of men and 59% of women indicated a somewhat to strong negative effect on mental health when they were not training or competing with their teams (NCAA Research, 2021). In fact, Bullard (2020) identified a lack of a strict schedule as a stressor during the pandemic in Division III student-athletes. The results of the present study may indicate the end

of the adjusted athletic seasons amid the intensified COVID-19 prevalence in the community contributed to the increase in distress through the semester.

After COVID-19 forced cancellation of competition and physical distancing from campus, 16% of Division III student-athletes reported no psychological distress (Petrie et al., 2020). The initial COVID-19 specific distress levels were similar among college students in Texas. For example, of respondents, 19.43% revealed no psychological distress because of the pandemic (Wang et al., 2020). In the present sample, 21.8% responded with no distress through the NCAA COVID-19 survey at the start of the semester whereas only 4.7% responded the same way during the second data collection. Noticeably fewer student-athletes were protected from emotional stress as the pandemic intensified at the local and campus levels. Like the present study, Wang et al. (2020) described their student population had reported an increase to personal stress and anxiety during the pandemic. The ACHA (2020) cautioned that institutions would be affected as local conditions evolved, therefore it is important to note community trends in order to adequately support students whose distress may fluctuate through time.

Still, the present sample was at a lower intensity and frequency than national samples, even as distress was measured specific to the global health concerns. Most (69%) of the Division III sample reported at least moderate levels of distress in April and May (Petrie et al., 2020). It should be noted Petrie et al. (2020) used screenings that defined a clinical level of distress and the present study COVID-19 survey did not. Even so, at the second time point where distress was highest, only 29.2% student-athletes (n = 50) reflected feeling overwhelmed most every day or constantly. In the early appraisal of the COVID-19 effects on mental health, it has been shown those who have thrived hold a strong social network and sense of belonging (Lederer et al., 2020). Despite the stressors experienced as a result of the pandemic, perhaps the return to campus, proximity to social supports, and attempt at a stable day-to-day structure offset some of the distress seen in the broader Division III population during spring campus closures. In fact, preliminary follow-up data from NCAA research shows student-athlete primary concerns include academic worries and lack of access to sport (Bell, Coakley, & Blair, 2021). Distress in Division III student-athletes from the Northeast was associated with lack of resources or facilities to train for their sport (Bullard, 2020). The present sample had at least some level of sport in the fall which may explain why distress was lower than other student-athlete populations as this stressor was, in a way, removed. The tendency for athletes with distress to utilize their support networks is undeniably a positive coping strategy and a benefit for those who are able to resume sport participation.

Distinctions Between Genders. A significant difference of COVID-19 related distress was found between genders at both time points. This finding was similar to other reports of COVID-19 distress in student-athletes who showed women student-athletes with higher rates of distress in every mental health category (Petrie et al., 2020) apart from equal sentiments of anger (NCAA Research, 2020). At the T2 data collection, when distress was highest, women student-athletes in the present sample experienced greater intensity of symptoms for every question on the survey when compared to men. Though feeling overwhelmed was highest for both genders, 40.7% of women revealed this symptom at T2 compared to 17.6% of men. Still, this was lower than what the NCAA Research (2020) reported for being overwhelmed in a broader sample of Division III student-athletes, with 56% and 33% of women and men, respectively, reporting symptoms. The results in the present study align with what is known from previous literature, including what has been collected since the start of the pandemic (i.e., NCAA Research, 2020;

Petrie et al., 2020). The present study's hypothesis regarding symptom difference between genders was maintained.

While the effects of the pandemic were pervasive as time passed for both genders in the present study, generally, women have demonstrated higher levels of psychological distress prior to and during the pandemic (Kecojevic et al., 2020; Rice et al., 2016). Bullard (2020) also found Division III women student-athletes were more concerned than men for the future and fall academic semester at the onset of the pandemic. Some indicate this may be reflective of their willingness to respond honestly to surveys (Barnard, 2016; Ipsos MORI, 2020). In fact, women are more likely to reveal their mental health has been affected during the pandemic then men (Ipsos MORI, 2020). This study offered specific constructs of most concern at two different times during the academic semester. Beyond feeling overwhelmed, a top symptom for both genders, men also identified troubled sleep (17.6%) and exhaustion (17.6%) as concerns, whereas women revealed exhaustion (30.2%) and anxiety (29.1%) as main areas of distress. The women student-athletes level of anxiety in the present sample corresponded closest to the 30% from the national sample (NCAA Research, 2020). As an individual considers his or her specific stressors, SCT framework implies a reflection of these attitudes in the context of their environment, such as team culture and in the midst of the pandemic, can help the student-athlete understand where they need help and prompt help-seeking behaviors (Bird et al., 2020). Though most areas on the survey were lower in the present sample than the broader Division III population, this information can lead to interventions specific to each campus student population.

Student athletes' specific concerns align with the needs of their immediate context as college students and athletes, yet their pattern of results is consistent with gender-based experiences in the general population. Although people in general experience greater stress during pandemics, the degree and effects of stress are greater for women than men (Connor et al., 2020). Specifically related to COVID-19, women report worrying more than men about the negative effects of this pandemic in social, financial, physical health, and mental health domains (Fredericksen et al., 2020). As noted above, teams usually provide athletes with social support (Lederer et al., 2020), and women tend to utilize social networks as a coping strategy for stress. Thus, the differences between women and men athletes' experiences of COVID-19-related stress could stem from greater societal factors and systems that influence them. For example, Bullard (2020) found more women Division III student-athletes experienced anxiety constructs frequently during the pandemic, but also utilized self-coping strategies at a higher rate than men. As implied through SCT, individual thoughts are rooted in social contexts, like their team environment, which effect motivations and, as Bullard (2020) found, more frequent help-seeking behavior of women compared to men (Bandura, 2012). Campuses could examine approaches to providing mental health counseling in the general population to help serve their student-athletes. One advantage that colleges and universities have over the general population is greater contact with student-athletes who should help serve students, especially as we understand gender distinctions in help-seeking behavior.

Distinctions Between Sport Types. There was a significant difference in distress at the T1 data collection between sport types though no significant difference at the T2 data collection. Specifically, individual sport athletes had a higher level of distress when compared to team sport athletes. Research prior to the pandemic suggests individual sport athletes are more likely to experience anxiety and depression, though evidence is limited (Pluhar et al., 2019; Wolanin et al., 2016). The underlying principle associated with individual sport risk is the internalization of

failure and perfectionism in the pursuit to meet the stated sport demands (Pluhar et al., 2019). In an individual sport, such as tennis, cross country, or golf, the athlete has singular control of a competition result. The over-reliance on goal-oriented outcomes can increase depressive symptoms in top performers through a failure or inability to cope (Hammond et al., 2013). What is more, the individual fall sport athletes started the semester with official competition seasons. It has been noted that in-season rates of depression are higher than off-season rates (Cox et al., 2017). This could have contributed to the difference seen at the T1 data collection, when only individual sport types (i.e., cross country, golf, and tennis) were competing. Consequently, most athletes surveyed were participating in sport to a similar extent at the T2 time point and, therefore, no differences in symptoms between sport types was evident. The daily performance stressors experienced during formal competition periods is worth noting. What was perhaps surprising was the multivariate analysis revealed increased distress in men individual sport athletes which had a consequential influence between data collection times. Yet, total sport significant differences were only seen at T1 data collection not T2, so the hypothesis is partially accepted.

Again, feeling overwhelmed was the top concern for both sport type groups at both time points. At T2 data collection, 22.9% of individual sport athletes revealed high levels of loneliness, the second most common stressor for the group. It is plausible individual sport athletes feel more isolated in sport due to the nature of training or competition. While few studies have analyzed the mental health symptom difference between sport types, it is acknowledged that perceived support is related to depression (Storch et al., 2005). In the same way, at the onset of COVID-19, Şenişik et al. (2020) found lower levels of depression in professional athletes with more social relationships, but no significant difference in depression or anxiety levels between team and individual sport athletes. SCT does acknowledge there are multiple levels of influence that inform and guide attitudes, motivations, and behavior related to mental distress. It is possible the athlete interprets team support and personnel as a positive influence on mental health. No other known research has looked at the effects of sport type on psychological distress related to the pandemic. Graupensperger et al. (2020) recruited NCAA athletes from a variety of sports and identified over one-quarter of their sample with moderate to severe levels of depression but did not analyze between sport types. Ultimately more information is necessary to compare sport team types and distress levels to understand if this variable is a relevant risk factor.

Implications

Attention on data collection, prevention, and treatment options for mental health has primarily been focused on the general population. College students have historically been overlooked as a priority population for mental health psychopathology (Lederer et al., 2020). What is more, the unique presentation of mental health issues in student-athletes calls for specific research in the population to understand the matter (Hong et al., 2018). Given the effects of COVID-19 on multiple levels, including personal distress, interpersonal relationships, within academic affairs, and in community networks, it is crucial to measure distress in this population (Lederer et al., 2020). Therefore, some individuals may present symptoms to a clinical extent and others at a lower, sub-clinical level. But it is expected that individuals prior to the pandemic who were asymptomatic are now experiencing some level of distress (Hamza et al., 2020; NCAA Research, 2020). Only through screening can we understand the situation, particularly as it relates to local conditions surrounding COVID-19.

In a historical analysis of pandemic effects, the loss of usual routine has been determined as one cause of increased distress (Brooks et al., 2020). On one hand, student-athletes have adapted to many changes in their sport and training schedules, but on the other hand the pandemic has presented less commitments at any given time (Bullard, 2020; Hamza et al., 2020). This has the potential to have a disproportionate effect on an athlete population, who are generally used to full schedules throughout a typical day. In one study of Division III athletes prior to the pandemic, 66 hours a week were dedicated to academic and athletic demands (Paskus & Bell, 2016). The increased distress from isolation has led to symptoms such as exhaustion, detachment, anxiety, and poor concentration, to name a few, and rarely leads to reports of positive feelings (Brooks et al., 2020). The effects of long-term isolation or quarantine have been evident in some populations up to three years (Brooks et al., 2020). In the present study, the primary symptom was feeling overwhelmed; conceivably the altered routine of competition and training led to increased overall distress through the semester. The onset of the COVID-19 pandemic offers another emphasis to implement regular screening, peer education, and strategic planning encompassing student-athlete mental health, especially since there are similarities to periods of separation or disconnect during naturally occurring breaks in a standard academic year (Graupensperger et al., 2020).

There are some who indicate the return to normalcy is unlikely (Lederer et al., 2020). Therefore, during and after the present pandemic, college students must learn coping strategies to adequately support their own levels of distress (Ye et al., 2020). In a study of U.S. college students, 40.9% revealed they were unsure if they had the ability to cope with their increased stress whereas 43.35% indicated they had the skills to cope (Wang et al., 2020). So, a relatively equal number of students perceived they do or do not have strategies to successfully handle the amplified levels of stress. In another study of U.S. students during the pandemic, the sample preferred self-management strategies over seeking external help (Son et al., 2020). Self-management skills are particularly useful since sub-clinical distress may affect more student-athletes than clinical psychopathology (Cox et al., 2017; Wolanin et al., 2016). Regular measurement of distress offers an opportunity to understand which stressors are most prevalent in order to provide an appropriate coping mechanism to the individual or within the group being assessed. This is pertinent beyond the scope and timeline of the COVID-19 pandemic (Graupensperger et al., 2020).

Limitations

The present study has strengths, including the focus on Division III student-athletes with a longitudinal study design. However, there are at least three potential limitations concerning the results of the study. First, only 32% of the initial sample responded to the second survey distributed near the end of the semester. Using calculations provided by Wilson VanVoorhis and Morgan (2007) and a 95% confidence interval, estimated sample size needed to be at least 90 individuals. The present study established this minimum in recruitment efforts, despite the difference in absolute participation between time points. Plus, the additional attrition reliability analyses demonstrated similar trends as the initial overall sample did, excluding the sport type difference at T1. Conceivably, future research could match subjects between time points to offer exact changes among subjects between times. Moreover, it is possible those with psychological distress were more apt to respond to the follow-up survey regardless of demographic grouping.

A second potential limitation recognizes the limited generalizability to other student-athlete populations, especially those with more diverse representation because students at only one university were recruited. Additionally, while demographics such as gender and the type of sport participation were collected, the year in school was not. This analysis could have offered more insight into trends regarding distress during the pandemic. As noted by Bullard (2020), Division III first year and sophomore athletes were more likely to express intensified generalized anxiety symptoms compared to juniors and seniors, though junior men athletes expressed *several days* of symptoms compared to other academic classification years. An ideal future study could include a larger scale involving multiple institutions to collect more demographic data while still protecting the identities of student-athletes given the sensitive content involved. These methods could help understand regional distress related to the pandemic, especially as case trends fluctuate over time or as campus environments differ in health protocols.

Lastly, the survey used was beneficial to compare results to similar, previously recruited samples, but did not offer a distinction of clinical psychopathology through a scoring system. We feel future research may benefit from recruiting student-athletes using clinical diagnostic tools to best understand prevalence associated with the pandemic.

Conclusion

Student-athletes, like many other population groups, have demonstrated increased levels of psychological distress since the onset of the COVID-19 pandemic. Most, if not all, have been affected by season postponement or cancellation and had training cycles significantly altered. The present study suggests distress tendencies in Division III student-athletes tracked closely to local and state COVID-19 case trends. That is, psychological distress increased as local cases escalated over time. Additionally, women student-athletes report higher symptoms levels than men, which matches previous knowledge (NCAA Research, 2020; Petrie et al., 2020). Sport type only showed a significant difference at the start of the semester when fall individual sport athletes were the only group in a competition season. It appeared men individual sport athletes altered the T2 data trends in a substantial way. Given all teams were at a similar training commitment, and the academic semester was past mid-term week, it is reasonable to assume the pandemic was responsible for increased intensity of distress as opposed to routine stressors. Even so, it is important to identify specific risk factors in sub-populations in order to offer appropriate resources and supports to safeguard the health and safety of student-athletes.

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Appendix A

Table 5
Attrition Reliability Test: Descriptive Statistics at T1

Sample	Men (n = 85)	Women (n = 86)	Team Sport (n = 101)	Individual Sport (n = 70)	Total (n = 171)
	M ± SD	M ± SD	M ± SD	M ± SD	M ± SD
Random Matched 1	3.02 ± 3.140	4.92 ± 4.11	3.82 ± 3.99	4.20 ± 3.446	3.98 ± 3.771
Random Matched 2	2.81 ± 3.32	5.65 ± 4. 91	3.84 ± 4.13	4.81 ± 4.77	4.24 ± 4.417
Original T1 data	2.88 ± 3.328[a]	5.39 ± 4.502[b]	3.33 ± 3.631[c]	4.63 ± 4.450[d]	3.77 ± 3.972[e]

Note. Original sample sizes different. [a] n = 344. [b] n = 191. [c] n = 353. [d] n = 182. [e] n = 535

Table 6
Attrition Reliability Test: Independent t*-test Results*

Sample	IV	Significance	Mean Difference	Std. Error Difference	95% Confidence Interval	Cohen's *d*
Random Matched 1	Time	< .001	-2.347	.535	[-3.4, -1.3]	4.948
	Gender	.001	-1.895	.560	[-3.0, -.79]	3.660
	Sport Type	.521	-.378	.588	[-1.5, .78]	3.778
Random Matched 2	Time	<.001	-3.509	.540	[-4.6, -2.5]	4.993
	Gender	<.001	-2.839	.641	[-4.1, -1.6]	4.194
	Sport Type	.157	-.973	.685	[-2.3, .38]	4.404