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David Schary and Carolina Lundqvist

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**Mental Health in Times of the COVID-19 Pandemic: Exploring the Impact on Well-Being
Across the Athlete-Collegiate Career**

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David P. Schary

Department of Physical Education, Sport and Human Performance, Winthrop University, U.S.A.

Email: scharyd@winthrop.edu. ORCID: 0000-0002-6360-9599

Carolina Lundqvist

Department of Behavioral Sciences and Learning, Linköping University, Sweden.

Email: carolina.lundqvist@liu.se. ORCID: 0000-0001-6570-5480

Abstract

In reaction to the COVID-19 pandemic, restrictive policies altered student-athletes' academic and athletic life. Sparse research has investigated the pandemic's effect on student-athlete mental health in terms of both negative (e.g., depression, anxiety) and positive (e.g., well-being, quality of life) dimensions. This study explored the effect of the COVID-19 pandemic on well-being and QOL among NCAA Division I student-athletes at different stages of their collegiate career. Ninety-nine student-athletes ($M_{\text{age}} = 19.7$ years, $SD = 1.5$) completed assessments on their mental health. Regression analysis revealed experiences directly related to COVID-19 did not affect general well-being or QOL, but anxiety, depression and significant insomnia did. Social well-being was lower for student-athletes closer to graduation (e.g., juniors, seniors), independent of reported anxiety and depression levels. These findings highlight the importance of psychosocial support, particularly in times of crisis, and indicate that tailored support might be beneficial at later stages of the collegiate years.

Keywords: COVID-19, depression, positive psychology, student-athlete, well-being

Introduction

The unexpected COVID-19 pandemic significantly altered the operation of colleges and universities in the United States. To curtail the spread of the virus, state officials and college administrators implemented strict physical distancing policies and shifted to virtual instruction (Hartocollis, 2020). While necessary to limit the spread of the virus, these policies contributed to a dramatic rise in self-reported anxiety and depression among students (e.g., Hamaza et al., 2020; Husky et al., 2020; Wang et al., 2020), as well as increased use of mental health and student support services across campuses (Lederer et al., 2021).

The long-term impact on mental health from these policies is still unknown; nonetheless, the immediate impact reveals worrisome trends. For example, among student-athletes, the National Collegiate Athletic Association (NCAA) found that rates of mental health concerns were up to two times higher than pre-pandemic rates (Johnson, 2021). This trend may be especially concerning because the pre-pandemic rates already reflected a high prevalence of illness and psychological distress among student-athletes. Davoren and Hwang (2014) reported that student-athletes' self-rated symptoms of depression varied between 21% - 28% and self-rated symptoms of anxiety between 31% - 38%.

The pandemic increased mental health concerns that student-athletes have reported in studies for almost 10 years (Hainline, 2014). A predictor of mental health proposed in the literature is student-athletes' levels of perceived stress (Davoren & Hwang, 2014). As a group, student-athletes are at risk of experiencing a variety of stressors stemming from their academic and athletic responsibilities, such as role conflicts, academic and eligibility demands, physical and mental fatigue, and financial pressures (e.g., Cosh & Tully, 2015; Simiyu, 2010). During the pandemic, Johnson (2021) reported that the most common stressors for student-athletes were

51 limited access to their sport, academic pressures, COVID-19 health concerns, and financial
52 worries.

53 Despite the universal presence of these stressors among student-athletes, there is no
54 universal response to them. Instead, a variety of factors contribute and produce distinct
55 emotional and physiological responses and mental health outcomes. These factors include how
56 the stressors are perceived, individual learning history, genetic vulnerability and stress reactivity,
57 available coping resources, and access to environmental and social support (Engel, 1980;
58 Kemeny, 2003; Kimball & Freysinger, 2003; Lundqvist, 2021).

59 **Well-Being and Quality of Life**

60 The World Health Organization (WHO; 2004) defines mental health as “a state of well-
61 being in which the individual realizes his or her abilities, can cope with normal stresses of life,
62 can work productively and fruitfully, and is able to make a contribution to his or her community”
63 (p. 12). Quality of Life (QOL) is commonly regarded in the psychological literature as the
64 subjective evaluation of general well-being (e.g., Green-Shortridge & Odle-Dusseau, 2009). The
65 WHO (1999) defines QOL as “a broad ranging concept affected in a complex way by the
66 person’s physical health, psychological state, personal beliefs, social relationships and their
67 relationship to salient features of their environment” (p. 3).

68 Despite the WHO’s emphasis on well-being in their definition of mental health and
69 functionality over disorder and dysfunction, most studies on athlete mental health have so far
70 investigated various negative elements of mental health (e.g., psychological distress) with sparse
71 attention directed towards positive elements (e.g., well-being, QOL; Kuettel & Larsen, 2020;
72 Lundqvist, 2021). A one-sided focus on the negative indicators of mental health is problematic
73 considering that well-being, according to the WHO (2004) definition, is regarded as a desirable

74 mental health status. In addition, the presence of psychological distress or mental illness does not
75 automatically imply low levels of well-being or QOL (Uphill et al., 2016). For example, Van
76 Slingerland and colleagues (2018) found that student-athletes had moderate to high levels of
77 mental health functioning (i.e., higher levels of well-being) in the presence of negative mental
78 health risk factors like numerous sources of stress, injury, and conflicting roles. By not assessing
79 the positive elements of mental health, and the potentially protective nature of well-being and
80 QOL, researchers may be at risk of overlooking how various psychosocial resources may help
81 athletes stay functional and healthy, or even increase levels of resilience, despite the presence of
82 stressors and/or other obstacles (e.g., Collins & MacNamara, 2012; Lundqvist & Sandin, 2014;
83 Lundqvist, 2021; Sarkar et al., 2015).

84 Well-being as a scientific construct has a rich theoretical foundation within the broader
85 field of psychology. Two distinct perspectives of well-being are suggested in the psychological
86 literature: the hedonic and eudaimonic traditions (Lundqvist, 2011; Ryan & Deci, 2001). The
87 hedonic tradition uses the label subjective or emotional well-being and focuses on the emotional-
88 oriented component of the construct (i.e., happiness/pleasure and life-satisfaction; e.g., Diener,
89 2009; Keyes, 2005). The eudaimonic perspective has two common conceptualizations:
90 psychological and social well-being. Psychological well-being is the most widely used in the
91 literature, examining one's ability to thrive and act functionally amid life's challenges (e.g.,
92 pursuing meaningful goals, developing as a person; Ryff, 2014). Social well-being indicates an
93 individual's functioning and perceived flourishing in social life (Keyes, 1998). Although positive
94 affect may be an outcome, the primary goal from a eudaimonic view is not subjective
95 experiences of pleasure but personal growth, development, perceived meaningfulness in life

(Huta & Waterman, 2014). The three types of well-being are generally viewed as interrelated and individually contribute to a person's mental health (Keyes et al., 2002).

Within-Career Transitions

Although relatively stable, well-being can change over time, especially during major life events or transitions. For traditional-aged students, attending and graduating college represents major transitions that can affect their levels of well-being (Bowman, 2010). Bewick et al. (2010) found that undergraduates had higher psychological well-being in their second semester than their first semester of college, suggesting that a transition into a new environment can temporarily reduce well-being. A college student's well-being may also be influenced by their level of academic readiness (Punia & Malaviya, 2015), physical habits/behaviors (i.e., physical activity, tobacco use, sleep quality; Ridner et al., 2016), and the type of institution attended (Bowman, 2010).

Within sport and exercise psychology, the field of career transitions is a well-researched area, illuminating the common challenges faced by athletes transitioning out of sport and necessary support structures to make these transitions successful (e.g., Park et al., 2013; Stambulova & Wylleman, 2014). There is however less research on within-career transitions among collegiate student-athletes, and particularly during the COVID-19 pandemic. Given the range of stressors student-athletes face in both their academic and athletic roles, within-career transitions need similar attention as end-of-career transitions. Noboa (2020) identified five common challenges student-athletes face as they transition through their collegiate career: (a) conflicting academic and athletic time commitment, (b) limited choice in academic major, (c) unavailability of study abroad programs and internships, (d) health problems and injuries, and (e) mental wellness concerns (e.g., low well-being, high psychological distress). Athletic

departments have career and academic support to help address some of these concerns, and social support and mentoring programs that are beneficial (Adams et al., 2015; Kelly & Dixon, 2014). However, this support may not be sufficient to combat the broad spectrum of within-career transition concerns student-athletes may face regarding mental health, particularly during the unique challenges caused by a public health pandemic.

Stambulova's (2003) Athletic Career Transition Model states that athletes need the right resources to effectively cope with a major transition, especially under stressful circumstances. Before the COVID-19 pandemic, the transitory nature of college put students at an increased risk for psychological distress (e.g., Baik et al., 2019; Graupensperger et al., 2020). Then given the pandemic's unprecedented restrictive policies that altered academic and athletic life, many student-athletes may not have been prepared to effectively cope with them. Due to the nascent nature of the pandemic, there is little research on its impact on student-athlete well-being nor mental health protective strategies. However, preliminary results indicate that teammate social interactions (i.e., social support and connectedness) during the pandemic may have a protective effect on mental health by increasing well-being (Graupensperger et al., 2020).

Our aim was to address some of these gaps in the career transition literature regarding the role of well-being, QOL, and within-career transitions among student-athletes. Specifically, the purpose of this study was to explore the effect of the COVID-19 pandemic on well-being and QOL during the Fall 2020 semester among NCAA Division I student-athletes at different stages of the collegiate career (i.e., freshman, sophomore, junior, senior). Based on the previous research described above, we make the following two hypotheses: (a) Negative experiences of the COVID-19 pandemic (e.g., infection, quarantine), depression, anxiety or worry, and insomnia will negatively affect student-athlete well-being and QOL and (b) similar to previous

findings by Bewick et al. (2010), well-being and QOL will be lower for early-stage student-athletes (freshman, sophomores) compared to later-stage student-athletes (juniors, seniors).

Method

Participants

A total of 99 student-athletes ($M_{\text{age}} = 19.7$ years, $SD = 1.5$) from two NCAA Division I universities in the United States participated in this study. Participants were required to be at least 18 years old and current student-athletes at the time of the study. As displayed in Table 1, participants were predominantly male ($n = 65$) and Caucasian ($n = 77$), most had a full ($n = 14$) or partial athletic scholarship ($n = 56$). Academic levels were relatively evenly distributed among participants; Freshman: $n = 29$, Sophomores: $n = 21$, Juniors: $n = 24$, Seniors: $n = 18$, other academic levels: $n = 7$ (i.e., 5th year senior or graduate student). Both individual and team sports were represented in the sample, lacrosse displayed the highest number of participants ($n = 34$). Most participants had been playing their sport for eight or more years ($n = 72$). Seventeen student-athletes were not included in the study because they did not complete the assessments, but they did not significantly differ from those included in the study on sociodemographic characteristics.

COVID-19

Every participant reported experiencing at least one negative consequence associated with COVID-19. Six participants reported they had tested positive for COVID-19. Almost all participants ($n = 85$) responded they knew at least one other person, within or outside of athletics, who had been diagnosed with the infection. Moreover, 25 participants knew at least one person who had serious complications or died as a result. A total of 48 participants had also been quarantined for 14 days at least once after exposure to another COVID-19 positive person.

Measures

Mental Health Continuum - Short Form (MHC-SF)

The MHC-SF (Keyes et al., 2008) is a 14-item questionnaire assessing subjective (3 items), psychological (6 items), and social well-being (5 items) based on Ryff's (1989) and Keyes' (1998) well-being models. Respondents rate their responses on a 6-point Likert scale, ranging from 0 (*never*) to 5 (*every day*) which are summed to an overall well-being score (range: 0 – 70). In addition, subscale scores are calculated for subjective well-being (range: 0-15), psychological well-being (range: 0-30) and social well-being (range 0-25). Higher scores represent higher well-being. Previous studies have shown the MCH-SF to have acceptable internal reliability (all subscales $\alpha \geq .80$) and validity (e.g., Lamers et al., 2011). Internal reliability was acceptable for all subscales in this current study (overall well-being: $\alpha = .92$; subjective well-being: $\alpha = .95$; psychological well-being: $\alpha = .83$; social well-being: $\alpha = .84$).

Brunnsviken Brief Quality of Life Scale (BBQ)

The BBQ (Lindner et al., 2016) is a 12-item questionnaire assessing the subjective experience of QOL using a 5-point Likert scale, ranging from 0 (*do not agree at all*) to 4 (*agree completely*). The 12 items cover six life areas: leisure, view on life, creativity, learning, friends and friendship, and self-view. Each life area has two items measuring both satisfaction and the importance of each life area are measured. The BBQ total score is computed by multiplying the satisfaction and importance items for each life area and summing the six products. Total scores range from 0 to 96, higher scores indicate a more positive assessment of QOL. In previous research, the BBQ has shown good internal reliability ($\alpha = .76$) with strong concurrent and convergent validity (Lindner et al., 2016). In the current study, internal reliability was $\alpha = .83$.

Hospital Anxiety and Depression Scale (HADS)

The HADS (Zigmond & Snaith, 1983) is a 14-item questionnaire that screens for symptoms of anxiety (7 items) and depression (7 items) in the previous week. The anxiety and depression subscales use a 4-point Likert scale, ranging from 0 (*e.g., not at all*) to 3 (*e.g., Most of the time*), totals range from 0 to 21. Higher scores indicate greater psychological distress; scores between 8-10 are regarded as borderline (i.e., a score between subclinical and clinical which might indicate a clinical condition of anxiety or depression) and scores of 11 or above is regarded as an indication that the person likely displays clinically relevant depression or anxiety (Zigmond & Snaith, 1983). Borderline scores (8-10) are labeled throughout this study as *subclinical anxiety/depression* and scores of 11 or higher as *clinical anxiety/depression*. Reviewing previous research, Herrmann (1997) found strong internal reliability for both subscales (anxiety $\alpha = .90 - .93$; depression $\alpha = .81 - .90$), as well as discriminant and concurrent validity. In the current study, internal reliability was $\alpha = .76$ for depression and $\alpha = .82$ for anxiety.

Penn State Worry Questionnaire (PSWQ)

The PSWQ (Meyer et al., 1990) assesses an individual's worry or the cognitive component of anxiety. It uses 16 items that are measured on a 5-point Likert scale, ranging from 0 (*not at all like me*) to 4 (*very typical of me*). The overall score is the sum of all the items, ranging from 0 to 64, higher scores represent higher levels of worry. Previous research has shown high levels of internal reliability (*e.g., $\alpha \geq .90$*) and strong validity (Meyer et al., 1990). In the current study, internal reliability was $\alpha = .94$.

Sleep Disorders Questionnaire (SDQ)

The SDQ (Alberta Medical Association, 2015) screens for insomnia using 16 items covering 5 diagnostic subscales: insomnia (5 items), psychiatric disorders (4 items), circadian rhythm disorder (1 item), movement disorder (2 items), and parasomnias (1 item). This study only used

the insomnia subscale. Respondents rate their answer on a 5-point Likert scale, ranging from 1 (*Never*) to 5 (*Always*). The SDQ is primarily used as a clinical screening tool whereby each item represents a possible symptom of insomnia. As a result, scoring a 3, 4, or 5 on any one insomnia item infers that the individual likely suffers from insomnia. The individual likely suffers from significant insomnia that impairs daily activity if he or she scores a 3, 4, or 5 on any two insomnia items. In the current study, the internal reliability was $\alpha = .85$.

Procedures

Following standard procedures for ethical approval in the United States, the institutional review board from the first author's university approved this study. Convenience sampling was used to collect data, head coaches and team captains were contacted via email about the study, then they were asked to distribute the description of the study with a link to the questionnaire to their teams via email or text message. Before the participants completed the questionnaires, they all received information about the study and provided their informed consent. After providing their consent, the participants completed the questionnaire which consisted of demographic questions, COVID-19 experience questions, and all the measures described in the previous section. The information, informed consent, and questionnaire were distributed online using Qualtrics software (Qualtrics, Provo, UT).

Data Analysis

For descriptive statistics and study variables, means were calculated for continuous variables and proportions for categorical variables. To quantify a participant's COVID-19 negative experiences, first the number of negative experiences with a yes or no answer were summed (i.e., personal diagnosis, quarantined, teammate/coach diagnosis, family/friend diagnosis, knew someone with a serious complication). Each question answered with a "yes"

was coded 1 and “no” was coded 0. This total was then added to the number of times an individual was quarantined (range: 0 – 5) to get a final COVID-19 experience score. The average number of COVID-19 experiences for each participant was 2.83 ($SD = 1.89$).

Multiple linear regression was used to measure the effect of a participant’s mental health variables (i.e., anxiety, depression, worry, insomnia) and COVID-19 experience on well-being and QOL. For all analyses, academic standing was included as a control, it was the only demographic variable significantly related to the dependent variables. Results include R-squared values, beta coefficients, p-values, and 95% confidence intervals. Statistical significance was established at $p < 0.05$. All analyses were performed in R (version 4.0.3).

Results

Means and standard deviations for all continuous variables are shown in Table 2. On average, participants scored a 47.67 ($SD = 12.14$) of a possible 70 for total well-being and 57.97 ($SD = 19.17$) of a possible 96 for QOL. In general, all well-being (total and sub-categories) and QOL scores were lower for participants in the later stages of their college careers. There was no clear pattern for COVID-19 and worry scores, both held relatively constant across all groups.

The descriptive statistics for all categorical variables are also shown in Table 2. Most participants did not report suffering from depression symptoms ($n = 81$). However, more than half of the participants reported experiencing anxiety symptoms, classified as either subclinical ($n = 21$) or clinical ($n = 36$). Most participants showed symptoms of insomnia, with most suffering from significant insomnia. Like well-being and QOL, depression and anxiety were lower for participants in the later stages of their college careers. Insomnia held relatively constant with a small decline in sophomore year.

Hypothesis 1

As seen in Tables 3 and 4, the negative COVID-19 experience score did not significantly affect reported overall well-being or QOL but significantly affected the sub-dimension of psychological well-being ($B = -0.58$, 95% CI $[-1.03, -0.13]$). The participants' self-reported depression and anxiety scores did significantly affect total well-being: subclinical depression ($B = -8.51$, 95% CI $[-13.93, -3.18]$), subclinical anxiety ($B = -7.26$, 95% CI $[-12.24, -2.29]$), and clinical anxiety ($B = -12.36$, 95% CI $[-18.34, -6.38]$). Similar results were found for the subdimensions of subjective, psychological, and social well-being (Table 4). Subclinical ($B = -13.32$, 95% CI $[-22.5, -4.14]$), clinical anxiety ($B = -18.64$, 95% CI $[-29.65, -7.59]$) and worry ($B = 0.42$, 95% CI $[0.08, 0.75]$) significantly predicted QOL. Insomnia did not significantly impact well-being (total or sub-categories) or QOL, but the analyses showed that significant insomnia had a statistically significant negative effect on psychological well-being ($B = -2.82$, 95% CI $[-5.68, 0.04]$) and QOL ($B = -15.34$, 95% CI $[-26.29, -4.39]$) when compared to those athletes who did not report severe insomnia. Although some of the relationships between the variables were unexpected, the total variance explained for all models was significant, ranging from 45% (QOL) to 58% (total well-being).

Hypothesis 2

The later-stage student-athletes significantly differed from the reference group (freshmen) for overall well-being, social well-being, and QOL (see Tables 3 and 4). For well-being, juniors, seniors, and others (i.e., 5th year senior or graduate students) reported lower scores than freshman. For QOL, only juniors and others had significantly lower scores than freshman. Sophomores did not significantly differ from freshman in reported well-being and QOL.

Discussion

The purpose of this study was to explore the effects of the COVID-19 pandemic on well-being and QOL among student-athletes at different stages of the collegiate career. The results only partially supported our two hypotheses. Our first hypothesis predicted that the participant's experiences from the COVID-19 pandemic would negatively affect student-athlete well-being and QOL. The athletes' scores indicated that overall well-being and QOL were negatively affected; however, for our sample, it was not due to factors directly related to COVID-19 (e.g., testing positive, being quarantined, knowing someone with serious complications). Instead, the most consistent predictors of decreased well-being and QOL were self-reported symptoms of depression, anxiety, and significant insomnia.

These results support the idea of the importance of mental health awareness and the availability of psychosocial support systems also for athletes outside of the elite and professional levels, like student-athletes, in challenging periods such as pandemics (e.g., Lundqvist, 2021; Stambulova et al., 2020). As a population, student-athletes are generally in a sensitive development phase of their lives and sports careers where increased stress levels may be reported (e.g., Stambulova & Wylleman, 2015; Wylleman et al., 2013). Previous studies performed during the COVID-19 pandemic indicated that student-athletes may be particularly vulnerable to experience increased mental distress, specifically depression and anxiety, if availability to ordinary training facilities and psychosocial resources to manage stress and anxiety are insufficient (e.g., Bullard, 2020; Graupensperger et al., 2020; Pons et al., 2020). From both mental health and sports performance perspective, it may therefore be beneficial to preemptively institute psychosocial interventions tailored to collegiate student-athletes with content adaptable to mental health awareness and crisis management. This would give most student-athletes the

necessary skills to remain functional during unexpected stressful situations and provide a foundation for those that may need professional treatment.

Our second hypothesis predicted that well-being and QOL would be lower for early-stage student-athletes compared to later-stage student-athletes. The results found in this study revealed nevertheless the opposite pattern. In our sample, student-athletes in the later stages of their college years (i.e., juniors, seniors, graduate students) reported decreased levels of overall well-being and QOL compared to freshman. Particularly noteworthy was the unexpected decrease in social well-being among the older student-athletes. The unprecedented scale of the COVID-19 pandemic likely amplified struggles to many student-athletes and may have exposed the deficiencies in the student-athlete support system. The positive role of social support from athletic trainers, coaches, teammates, and other significant persons when athletes confront various obstacles is well-known in the research literature (e.g., Clement & Shannon, 2011; Rees et al., 2010).

In addition, social integration and social contribution are two components of social well-being that further may help explain our unanticipated finding. According to Keyes (1998), social integration is the extent to which people feel they belong to certain communities or social groups; whereas social contribution is the evaluation of one's social value or the belief that one is a contributing member of society (Keyes, 1998). The policies put into place to limit the spread of COVID-19 may have weakened the feelings of social integration and contribution because teams could not practice or compete, limiting how much a student-athlete could feel like an active member and contributor to the team. While all student-athletes in our sample faced the same restrictions, upperclassmen may have experienced more social distress as a result because of their proximity to graduation. For most student-athletes, graduation is a major life transition that

signifies the termination of their competitive athletic career. Typically, social support is a useful coping resource that helps student-athletes when faced with these types of major transitions (Brown et al., 2015). Our finding may therefore indicate that the perceived social security of having years left in college and/or athletic eligibility, and the feelings of social integration and contribution this provides, could potentially act as a protective effect for social well-being during the pandemic period. Although presently somewhat speculative based on available data, researchers are encouraged to investigate this hypothesis further, as well as search for feasible strategies to help student-athletes proactively protect their social well-being as graduation approaches.

A relatively large proportion of research has been conducted on career transitions between different career stages or phases of life (Stambulova & Roy, 2019). However, fewer studies have directly focused on within career transitions during college, and particularly related to challenges and potential mental health effects associated with the COVID-19 pandemic. Our results indicate that psychosocial needs may change from freshman year to later college years; thus, tailored psychosocial support may be needed to meet these changes for maximum efficiency. Future research should explore what needs of preventive support to maintain well-being and QOL that student-athletes express during different phases of their college years, specifically stressful and crisis-like situations such as pandemics. The adoption of a biopsychosocial perspective (e.g., Engel, 1980; Suls & Rothman, 2004) can be a valuable research approach because it allows for the investigation of various mediating factors that can help explain different relationships that may exist between stress exposure and mental health outcomes among student-athletes. Moreover, longitudinal research designs are necessary to evaluate acute responses (i.e., various mental health symptoms) to these types of psychological challenges. Particularly focusing on the

long-term effects on a student-athlete's mental health (e.g., clinical issues) and development (e.g., learning experiences, maturation, resilience).

Limitations & Future Directions

Although our study yielded several interesting findings, it is not without limitations. Importantly, our results are based on cross-sectional data which only captures one point in time. The adoption of longitudinal and replication designs would enable possibilities to also determine causal factors that may affect well-being and QOL across the collegiate career. Including assessments of plausible mediating biopsychosocial factors could, in addition, increase our understanding of various mechanisms behind student-athletes' different responses to the COVID-19 pandemic. For example, why some suffered negative outcomes (e.g., psychological distress) while others seemed unaffected. Various levels of resilience and/or the availability of proper social support among student-athletes could plausibly be mediating variables of value to further explore in research.

Although our study included a variety of sports, the modest sample size and convenience sampling procedure limit the generalizability of the results to a larger population of student-athletes. Most of our participants were male and Caucasian; as a result, their experiences during the pandemic may differ from minority and underrepresented groups. Similarly, participants in our study were selected from two NCAA Division I institutions in the United States. When interpreting the results, readers should consider that student-athletes at Division II or III may face alternative challenges than were found in this study. In addition, policies aimed at limiting the spread of COVID-19 varied by region, whereby the stressors faced in other parts of the United States, or other countries, could be different from those in our study. Participants may not have been negatively affected by their COVID-19 experiences, particularly being quarantined. In

addition, due to the structure of the COVID-19 assessment, we did not capture the level of severity for each experience, but it likely differed among participants. Moreover, whereas the study's quantitative approach allowed for the examination of general trends of well-being and QOL across the collegiate career, it also limited the possibility to obtain a deeper understanding of student-athletes' individual experiences and any contextual variations that may have affected their well-being and QOL during the pandemic. We, therefore, recommend that future researchers adopt qualitative methods to explore student-athletes' idiosyncratic experiences of the pandemic.

Clinical Implications

This study has several clinical implications highlighting the importance of an extended psychosocial support system around student-athletes particularly in times of crisis, such as global pandemics or severe and career-ending injuries. The results indicated that although the COVID-19 pandemic induced a disruption to academic and athletic life, well-being and QOL may be maintained via social factors. It is well-known from the clinical literature (e.g., Hammen, 2015; Martell et al., 2010) that significant and life-changing stressors confronted may pose an increased risk for the development of depression and anxiety among persons. Early preventive support with low-intensity interventions may be highly beneficial to help avoid clinical issues to develop and to support various behaviors that are related to increased well-being and QOL (cf. Lundqvist, 2020). This can also include the use of digital technology (i.e., apps, videos, online sessions) that provide athletes with the opportunity to stay connected, learn new skills, and receive appropriate levels of support, especially in times when social distance is necessary (Lundqvist et al., in press). Of equal importance is easy access to clinical and sports-adapted psychological support for those athletes who develop more serious clinical problems in need of

treatment. Early intervention, when mental health concerns first surface, is usually beneficial for the treatment prognosis (e.g., Lundqvist, 2020; Purcell et al., 2019). Athletes' help-seeking behavior should therefore be both accepted in the sports culture and encouraged by significant people in the environment (e.g., coaches, teachers), and the sports system in general.

Arguably, support systems around student-athletes should be flexible and include staff that is qualified enough to meet a great number of mental health, sports performance, and academic needs. Coaches and academic instructors who regularly are in close contact with student-athletes' can act as a general supportive resource. This can range from informal support like weekly check-ins with student-athletes to formal programming or team meetings that cover topics like stress management. All support staff should ensure that they are knowledgeable about common psychological reactions to stress, how various needs might be expressed in times of crisis and should be aware when symptoms require referral to qualified clinical support. A formalized referral process with a university's mental health services can also help expedient the referral process.

Finally, to ensure high levels of well-being and QOL among student-athletes across their collegiate career, our results suggest that tailored psychosocial support might be beneficial at later stages of the collegiate years that extend beyond career readiness. This can include evidence-based programming and/or workshops that address topics pertinent to improving well-being and QOL. For example, during the COVID-19 pandemic, successful programming for elite athletes has included topics like resilience, adaptability, personal growth/development, and developing positive relationships (Lundqvist et al., in press). Since the needs will vary and can change over time, we recommend athletic department administrator's and support personnel regularly survey their student-athletes for the most appropriate types of support.

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Tables

Table 1

Sociodemographic Characteristics of Participants

Characteristic	n	%
Gender		
Female	34	34.3
Male	65	65.7
Race		
African American	13	13.1
Caucasian	77	77.8
Other	9	9.1
Academic Standing		
Freshman	29	29.3
Sophomore	21	21.2
Junior	24	24.2
Senior	18	18.2
Other	7	7.1
Sport		
Baseball	1	1.0
Basketball	4	4.0
Golf	13	13.2
Lacrosse	34	34.3
Rowing	15	15.2
Soccer	18	18.2
Volleyball	14	14.1
Scholarship		
Full	14	14.1
Partial	56	56.6
None	29	29.3
Years Playing Sport		
0-3	16	16.2
4-7	11	11.1
8-10	31	31.3
10+	41	41.4

Note. $N = 99$. Participants average age was 19.7 years old ($SD = 1.5$).

Table 2

Descriptive Statistics for Continuous and Categorical Variables Used in Regression Analyses

<u>Variables</u>	<u>Overall (N = 99)</u>		<u>Freshman (n = 29)</u>		<u>Sophomore (n = 21)</u>		<u>Junior (n = 24)</u>		<u>Senior (n = 18)</u>		<u>Other (n = 7)</u>	
Continuous	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Well-Being												
Total	46.67	12.14	51.55	12.45	50.33	10.55	44.38	10.70	41.44	9.29	36.71	15.73
Subjective	10.93	2.80	11.90	2.65	11.67	2.54	10.29	2.39	10.44	2.31	8.14	4.38
Psychological	21.85	5.12	23.34	5.00	22.90	5.69	21.54	4.47	20.00	4.39	18.29	5.71
Social	13.89	5.68	16.31	6.08	15.76	4.13	12.54	5.55	11.00	4.43	10.29	5.99
Quality of Life	57.97	19.17	66.17	17.13	60.95	16.40	52.08	18.26	55.39	16.65	41.86	26.97
COVID-19	2.84	1.90	2.69	1.54	2.67	1.93	3.46	2.08	2.56	2.18	2.57	1.81
Worry	52.85	13.76	56.31	12.31	51.33	12.57	50.75	16.23	51.83	15.06	52.86	10.84
Categorical	<i>N</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
Depression												
Normal	81	81.81	25	25.25	18	18.18	18	18.18	15	15.15	5	5.05
Subclinical	15	15.15	4	4.04	3	3.03	5	5.05	1	1.01	2	2.02
Clinical	3	3.03	0	0.00	0	0.00	1	1.01	2	2.02	0	0.00
Anxiety												
Normal	42	42.42	11	11.11	9	9.09	13	13.13	6	13.13	3	3.03
Subclinical	21	21.21	5	5.05	7	7.07	3	3.03	4	4.04	2	2.02
Clinical	36	36.36	13	13.13	5	5.05	8	8.08	8	8.08	2	3.03
Insomnia												
No	7	7.07	3	3.03	2	2.02	0	0.00	1	1.01	1	1.01
Yes	92	92.92	26	26.26	19	19.19	21	21.21	17	17.17	6	6.06
Significant Insomnia [†]												
No	17	17.17	7	7.07	4	4.04	2	2.02	3	3.03	1	1.01
Yes	82	82.82	22	22.22	17	17.17	22	22.22	15	15.15	6	6.06

Note. [†] An individual can be classified as having insomnia and significant insomnia.

Table 3*Regression Results for Overall Well-Being and Quality of Life*

Variable	<i>Overall Well-Being</i>					<i>Quality of Life</i>				
	<i>B</i>	<i>SE</i>	<i>95% CI</i>		<i>p</i>	<i>B</i>	<i>SE</i>	<i>95% CI</i>		<i>p</i>
			<i>LL</i>	<i>UL</i>				<i>LL</i>	<i>UL</i>	
COVID-19	-0.83	0.47	-1.76	0.10	.08	-0.90	0.86	-2.62	0.82	.29
Depression										
Normal	Reference									
Subclinical	-8.51	2.67	-13.83	-3.18	.002	-8.81	4.94	-18.65	1.01	.07
Clinical	-7.58	5.54	-18.59	3.42	.17	-11.43	10.21	-31.74	8.89	.27
Anxiety										
Normal	Reference									
Subclinical	-7.26	2.50	-12.24	-2.29	.004	-13.32	4.61	-22.50	-4.14	.005
Clinical	-12.36	3.00	-18.34	-6.38	.001	-18.61	5.55	-29.65	-7.59	.001
Worry	0.13	0.09	-0.05	0.31	.16	0.42	0.17	0.08	0.75	.01
Insomnia										
No	Reference									
Yes	2.44	4.41	-6.32	11.20	.58	10.87	8.13	-5.29	27.03	.18
Significant Insomnia										
No	Reference									
Yes	-6.45	2.99	-12.38	-0.51	.03	-15.34	5.51	-26.29	-4.39	.006
Academic Standing										
Freshman	Reference									
Sophomore	-2.57	2.78	-8.12	2.95	.36	-6.90	5.14	-17.12	3.32	.18
Junior	-7.73	3.71	-15.10	-0.35	.04	-16.88	6.85	-30.50	-3.27	.02
Senior	-11.85	5.05	-21.91	-1.79	.02	-16.35	9.34	-34.91	2.21	.08
Other	-17.50	6.48	-30.39	-4.61	.008	-32.69	11.96	-56.48	-8.90	.008

Note. R-squared ($N=99$): Total Well-Being = 0.58; Quality of Life = 0.45.

Table 4

Regression Results for the Subdimensions of Subjective Well-Being, Psychological Well-Being and Social Well-Being

Variable	Subjective Well-Being					Psychological Well-Being					Social Well-Being				
	<i>B</i>	<i>SE</i>	95% CI		<i>p</i>	<i>B</i>	<i>SE</i>	95% CI		<i>p</i>	<i>B</i>	<i>SE</i>	95% CI		<i>p</i>
			<i>LL</i>	<i>UL</i>				<i>LL</i>	<i>UL</i>				<i>LL</i>	<i>UL</i>	
COVID-19	-0.12	0.12	-0.36	0.12	.32	-0.58	0.23	-1.03	-0.13	.01	-0.13	0.23	-0.59	0.33	.59
Depression															
Normal	Reference														
Subclinical	-1.99	0.69	-3.36	-0.62	.005	-3.94	1.29	-6.50	-1.37	.003	-2.58	1.33	-5.23	0.07	.05
Clinical	-2.72	1.43	-5.55	0.12	.06	-1.60	2.66	-6.91	3.69	.55	-3.26	2.76	-8.74	2.23	.24
Anxiety															
Normal	Reference														
Subclinical	-1.38	0.64	-2.65	-0.10	.04	-2.08	1.20	-4.47	0.32	.09	-3.81	1.25	-6.29	-1.33	.003
Clinical	-2.51	0.77	-4.04	-1.00	.002	-4.80	1.45	-7.17	-1.42	.004	-5.56	1.49	-8.54	-2.58	.001
Worry	0.04	0.02	-0.003	0.09	.07	0.06	0.04	-0.03	0.15	.22	0.02	0.05	-0.07	0.11	.59
Insomnia															
No	Reference														
Yes	-0.92	1.13	-3.18	1.33	.42	2.32	2.12	-1.89	6.54	.28	1.04	2.20	-3.32	5.41	.63
Significant															
Insomnia															
No	Reference														
Yes	-0.99	0.77	-3.78	1.33	.20	-2.82	1.44	-5.68	0.04	.05	-2.63	1.48	-5.59	0.33	.08
Academic															
Standing															
Freshman	Reference														
Sophomore	0.07	0.71	-1.35	1.49	.92	-0.86	1.34	-3.53	1.80	.52	-1.79	1.39	-4.55	0.97	.20
Junior	-0.46	0.95	-2.36	1.43	.63	-1.63	1.77	-5.18	1.81	.36	-5.62	1.84	-9.30	-1.95	.003
Senior	0.12	1.31	-2.45	2.71	.92	-4.06	2.44	-8.91	0.77	.10	-7.91	2.52	-12.92	-2.90	.002
Other	-2.14	1.67	-5.46	1.17	.20	-5.63	3.12	-11.84	0.57	.07	-9.72	3.23	-16.14	-3.30	.003

Note. R-squared (*N*=99): Subjective Well-Being = 0.49; Psychological Well-Being = 0.47; Social Well-Being = 0.53.