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***Mental Health Management of Male and Female Athletes in  
Sports Organizations During the COVID-19 Pandemic***

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## Abstract

*Background:* Mental disorders, symptoms of mental illness, and prevalence rates of such among athletes are equal to or exceed those of the general population, and research findings have suggested that athletes have more risk factors than the general population during the COVID-19 pandemic due to the far-reaching consequences COVID-19 restrictions have had on the world of sport. The study aimed to compare athletes' mental health at the 'end' of the pandemic with non-athletes, and whether non-athletes and athletes received mental health support during the pandemic and how it affected their mental health. *Methods:* Quantitative cross-sectional data was collected using an online questionnaire based on the four measures; DASS-21, ISSB, ARSQ, and the COVID-19 pandemic and mental health survey. Participants included 83 athletes (25 men, 58 females) and 83 non-athletes (25 men, 58 females) aged 18-65+ years. Participants were recruited through social media and recruitment flyers. *Results:* No statistically significant differences were found between the self-reported mental health status of athletes and non-athletes. The findings indicate that athletes receive support with little or no impact on their mental health. The opposite was true for the non-athlete population, whose mental health deteriorated after receiving support. The reception of emotional support slightly decreased athletes' anxiety about COVID19, while the reception of informational and tangible support increased the symptoms of non-athletes' anxiety, depression, and COVID19 anxiety. *Conclusion:* Athletes can receive support with no effect or a slight improvement in perceived mental health, whereas nonathletes experience a worsening after receiving support. The way sports organizations and coaches support athletes could suggest that crisis management in the future may benefit from taking cues from the specific methods they use.

*Keywords:* perceived mental health, perceived mental health management and support, athletes, non-athletes, gender differences

## **Introduction**

Mental health is a prerequisite for achieving well-being, which is an essential part of human life, enabling one to think, empathize, communicate, and enjoy life individually and socially (WHO, 2021). From a biopsychosocial perspective, the World Health Organization (WHO) defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (WHO, 2021, p.2). Individuals unable to achieve mental health and well-being could ultimately suffer from mental illnesses for many reasons. For example, mental illnesses refer to schizophrenia, depressive disorders, bipolar disorder, anxiety disorders, eating disorders, autism spectrum disorders, attention-deficit/hyperactivity disorder, conduct disorder, and idiopathic developmental intellectual disability. However, the list of mental illnesses is large and includes a variety of conditions not listed here and, in addition, subtypes relative to the primary classification. Nevertheless, James et al. (2018) identified that the five most common conditions people experience worldwide are major depression, anxiety disorders, schizophrenia, chronic depression (dysthymia), and bipolar disorder.

The manifestations of mental illness experienced are subjective due to multiple internal and external factors and circumstances specific to the affected individual. Factors and circumstances negatively associated with mental illness, for example, include sex, age, cognitive ability, culture, and environment (James et al., 2018; WHO, 2021). Most of the world’s population has good mental health (James et al., 2018; Vigo et al., 2016). However, according to research findings, it is likely that you or someone you know struggle or has struggled to maintain good mental health and well-being. Insights from the global burden of disease study (James et al., 2018) revealed that in 21 out of 195 countries, mental illness affects more than one in 10 individuals. However, another study by Vigo et al. (2016) estimated that the prevalence of

mental illness differs from the global burden of disease study by Feigin et al. (2016) and found underestimations of more than 10%. Although the prevalence of people with mental illness appears unclear due to inconsistencies in the study designs, considering the enormous number of individuals affected, it still represents a significant global health problem, regardless of the exact prevalence.

### **Mental Illness Among Athletes and the General Population**

As stated by WHO, mental health plays a significant and fundamental part in all human lives. Moreover, the risk of decreased mental health may even be more prominent for some populations enduring specific circumstances. For instance, in recent years, acknowledging the importance of good mental health has increased the interest in elucidating the prevalence of mental illness and related symptoms in individuals occupied in sports, especially professional athletes (Kuettel and Larsen, 2019; Perry et al., 2021). Indeed, a growing number of studies aim to gain insights into athletes' lives and enable effective interventions and recommendations for individuals and organizations to improve athletes' mental health (Kuettel and Larsen, 2019; Poucher et al., 2021; Reardon et al., 2019). Several studies show that the prevalence of mental illness and related symptoms among professional athletes, relative to specific factors and circumstances, equals or exceeds the prevalence in the general population (Reardon et al., 2019; Rice et al., 2016). For example, intense performance demands, media attention, planned/unplanned retirement, injuries, performance drops, rigorous training regimes, and deselection relative to participation in significant events comprise risk factors perceived as unique to sports environments (Perry et al., 2021; Rice et al., 2016). The impact of exposure to risk factors increases athletes' vulnerability to mental health issues compared to the general population, including anxiety, depression, and, in addition, eating disorders, substance abuse, stress, and coping (Rice et al., 2016). Annually, depending on data collection methods and biopsychosocial factors assessed, such as gender, age, personality, and available organizational

resources, between 5-35% of the athlete population report mental health disorders or symptoms (Castaldelli-Maia et al., 2019). In addition, Kuettel and Larsen (2019) reported a prevalence of diagnosable psychiatric disorders in athletes ranging from 5-68%, caused by factors such as the degree of travel activities, family problems, competitive levels, stress, and transitions in career, e.g., youth to senior athlete or retirement. In particular, the identified sport-specific risk factors impact male and female athletes differently. For example, female athletes have the highest rates of mental health problems related to anxiety, eating disorders, depression, sleep problems, and self-harming behaviors (Castaldelli-Maia et al., 2019; Poucher et al., 2021; Rice et al., 2016).

### **Athlete Mental Health Management**

The known adverse effects of mental illness and the prevalence among athletes have increased the attention to athlete mental health, consequently, mental health management is recognized as a key aspect of an athlete's career to achieve high performance (Poucher et al., 2021). Management of mental health in athletes refers to the resources, strategies, methods, and interventions available to athletes, that aim to maintain mental health, prevent, or aid in recovery from mental illness. Mental health management of athletes is often provided, accompanied, or under the responsibility of individuals in athletes' primary organizations, such as coaches, health personnel, and colleagues. Furthermore, individuals outside the organization, such as friends, husbands/wives, and other health professionals not available within the organization, can act as providers to influence the outcomes of mental health management interventions (Rice et al., 2016). For example, individuals in the organization and outside can provide social support, increasing the willpower of athletes recovering from injury (Kuettel and Larsen, 2019).

However, coaches are often responsible for the mental health management or provision of resources to help management, due to their proximity to the athletes. In addition to proximity, coaches are co-creators of the organizational culture that athletes are part of, allowing for effective mental health management (Castaldelli-Maia et al., 2019). The tasks and

responsibilities underline a coach's crucial role relative to athletes and sports organizations. For example, Castaldelli-Maia et al., 2019, found that coaches play an important role in changing perceptions of help-seeking behaviors of athletes, which are commonly associated with weakness in professional sports. In addition, Castaldelli-Maia et al. (2019) found that short anti-stigma interventions can improve the likelihood, that athletes seek mental health treatment when they feel the need. However, not all mental health management requires external assistance - athletes can gain knowledge and learn to apply coping skills related to the stressors they encounter to self-manage mental health. For example, identifying stress symptoms and using stress coping skills to minimize reactions is helpful for athletes, considering the number of stressful circumstances that occur in competitive sports (Kuettel and Larsen, 2019).

Despite the growing attention to mental health management among athletes, there are shortcomings and issues that need to be addressed in the research literature. For instance, Currie et al. (2021) highlight that interventions applied in sports heavily rely on psychiatry and clinical psychology developed to fit the general population, not athletes. In turn, there is a risk of using approaches that are not suitable for athletes. Therefore, methodological nuances are warranted to increase the applicability and effectiveness of the interventions and organizational strategies imposed on athletes. As an additional example, Wylleman (2019) argues that changes in the biopsychological perspective often used in sports contexts should change toward a more holistic perspective. In other words, a biopsychological approach does not sufficiently account for the factors affecting athletes. Thus, incorporating social, environmental, and cultural circumstances to manage mental health more effectively is warranted – organizational factors can significantly affect the athlete's mental health negatively and positively, such as the degree of emotional support available to manage symptoms of stress or anxiety (Kuettel and Larsen, 2019). In essence, the biopsychological perspective needs to be expanded in sports organizations by increasing awareness of social and organizational factors that influence mental health.

## **Female Athlete Mental Health Research**

In addition, the results of previous studies highlight differences between male and female athletes concerning mental health related to impact and reaction to risk factors (Castaldelli-Maia et al., 2019; Kuettel and Larsen, 2019; Perry et al., 2021; Poucher et al., 2021; Reardon et al., 2019; Rice et al., 2016). As stated earlier, female athletes are at an increased risk of experiencing anxiety, depression, and eating disorders compared to male athletes (Kuettel and Larsen, 2019). However, insights from research into female athletes' mental health are lacking disproportional to male athletes' mental health (Perry et al., 2021). Accordingly, developing interventions and managing the mental health of female athletes is heavily based on the knowledge related to male athletes, which is problematic considering biopsychosocial differences between the sexes (Castaldelli-Maia et al., 2019). Nevertheless, sports organizations are forced to utilize fragmented insights because of the limited gender and sport-specific data to guide and develop interventions. Consequently, mental health management's quality and effectiveness may be significantly reduced for female athletes (Perry et al., 2021).

Furthermore, the extent of the literature highlighted by Perry et al. (2021) reveals that most female athletes' mental health studies have extensively focused on eating disorders or disordered eating. Narrow population samples also characterize the available research, dominated by 'lean physique' athletes occupied with, e.g., running and gymnastics, constituting yet another shortcoming of the research literature.

The number of inadequacies in female athlete mental health research studies seems significant. In this context, Wylleman (2019) emphasizes that the social part of the biopsychosocial perspective is significantly lacking in sports organizations, Perry et al. (2021) essentially recommended the same, related to future female athlete research. Specifically, Perry et al. (2021) underline that research on female athletes' mental health should relate to social,

cultural, and environmental factors, which relate to the social dimension of the biopsychosocial perspective. Social factors could be organizational or even global events that restrict athletes from doing their work-organizational factors, such as unequal training opportunities, limited financial support, acceptance of female athletes in a male-dominated occupation, and traditional gender roles, which are suggested as factors causing differences in mental illness between female and male athletes (Castaldelli-Maia et al., 2019).

### **Effect of COVID-19 on Athletes' Mental Health and the General Population**

The COVID-19 pandemic has significantly influenced mental health due to the subsequent quarantine imposed to manage and minimize adverse effects on public health. Recent findings show that mental health and well-being have worsened, especially in several general population subgroups, including healthcare workers, disabled individuals, and individuals with pre-existing mental health problems (Olff et al., 2021; Sampogna et al., 2022). Similarly, studies focusing on athletes' mental health and well-being have shown a decline in reported mental health (Bowes et al., 2021; Reardon et al., 2020). In the general population subgroups, and among athletes, an increase in reported mental health disorders and symptoms has included PTSD, anxiety, depression, insomnia, dissociation, mental exhaustion, burnout syndrome, and sleep disorders (Bowes et al., 2021; Olff et al., 2021; Reardon et al., 2020; Sampogna et al. 2022).

Loneliness, unemployment, being female, physical disorders, previous mental disorders, duration of Internet use, social support, childhood trauma, and a history of a low degree of resilience are all linked as risk factors to a decline in mental health and well-being, and thus an increase in vulnerability to mental health disorders and symptoms (Olff et al., 2021; Sampogna et al., 2022). Athletes are exposed to the same risk factors as the general population (Bowes et al., 2021; Reardon et al., 2020), however, due to the imposed quarantine, the far-reaching consequences the world of sport has experienced compared to other occupations (Grix



et al., 2020; Smith and Skinner, 2021), athletes are exposed to new and additional stressors, e.g., tournament cancelation/paused, postponement of Olympic Games, uncertainty about employment, the closing of training facilities, and significant pay cuts.

The additional risk factors have increased athletes' vulnerability to mental health problems (Bowes et al., 2021; Reardon et al., 2020) and could therefore be classified as a vulnerable subgroup like healthcare workers, individuals with a history of mental health problems, and disabled individuals. Consequently, researchers emphasize acknowledging the challenges athletes are exposed to and bringing attention to the possible need for increased support, for instance, from their organizations (Bowes et al., 2021; Reardon et al., 2020). Notably, female athletes are most likely significantly more exposed to risk factors than male athletes (Bowes et al., 2020; Bowes et al., 2021) because of the disproportions of resources available and, further, the lack of insights concerning effective methods and strategies to manage female athletes' mental health.

In summary, research not only shows dissimilarities regarding the types of mental disorders and related symptoms between athletes and the general population but also dissimilarities and higher prevalence rates among athletes. Additionally, there are inadequacies regarding mental health management approaches and strategies for athletes, partially because interventions are designed for the normal population and not for athletes in particular. Moreover, a disproportionate trend of "favoring" male athletes seems evident, demonstrating a need for additional research into female athletes' mental health and management.

Finally, the adverse effects of the COVID-19 pandemic need to be considered, such a global event is part of the social context that athletes and the general population needs to endure. In this context, several researchers have suggested that athletes have experienced additional risk factors relative to the general population because of far-reaching consequences for actors within the world of sport. However, to the best of my knowledge, research investigating female

athletes' mental health implications of the COVID-19 restrictions and the underlying relationship with organizational mental health management is limited.

The aim of this study is, therefore, twofold:

1. To investigate the mental health of athletes at the 'end' of the pandemic in relation to non-athletes.
2. Investigate to what extent non-athletes and athletes experienced mental health management support during the pandemic and its relationship to their current mental health.

Specifically, this study aims to contribute to our knowledge by addressing the following questions:

- Are there any self-reported mental health differences between athletes and non-athletes?
- Are there any self-reported mental health differences between athletes and non-athletes regarding gender?
- Are there any gender differences in mental health management and support athletes have perceived in sports organizations during the COVID19 pandemic?
- Are there any differences in mental health management and support between athletes and a normal population, and regarding gender?
- Does being an athlete, compared to the general population, influence the relationship between perceived mental health management and support and self-reported health during the pandemic?

The present study is expected to contribute to our understanding of female and male athletes' mental health, organizational mental health management, and the implication of the distinctive circumstances and effects of the COVID-19 pandemic have imposed. In addition, this

study will benefit athletes and sports organizations by providing insights into female sports, which is currently highly warranted compared to insights into male sports.

## **Methods**

### **Study Design**

A cross-sectional quantitative design was used in the current study to compare differences between males and females in both populations (athletes and non-athletes) regarding perceived mental health and perceived mental health management and support. A population of non-athletes was used as a control; thus, the independent variables were group (athlete/non-athletes and gender (male, female)). The dependent variables were perceived mental health and perceived mental health management and support. A single online survey comprising four measures was created and used for data collection. Before administering the survey, a priori-power analysis was conducted to determine an acceptable sample size  $N$ , based on the desired alpha level, the desired power level ( $1-\beta$ ), and the effect size to be detected. G\*Power software (Faul, Lang & Buchner, 2007) was used for the analysis, specifically, a F-test (Fixed effects, main effects and interactions) where conducted, which revealed a total sample size of 128 participants as a target, to provide 80% power for the current study ( $(\alpha = 0.05)$ ,  $(1-\beta = 0.8)$ ,  $(f(V) = 0.25)$ ).

### **Participants**

The collected sample included 426 respondents; however, 151 did not complete the whole survey. The initial sample included 275 participants, comprising 192 respondents from a non-athlete population (73 males and 119 females) and 83 participants from an athlete population (25 males and 58 females). The non-athlete population was reduced to match the number of participants in the athlete group based on gender and age. This was done in order to have a similar proportion of athletes and non-athletes regarding these demographic variables (i.e., gender and age). In other words, it made both populations equivalent in two potentially

confounding variables. The matching participants from the non-athlete population in the final sample were randomly withdrawn from the 192 participants using a true random number generator (Haahr, 2022). For instance, from eleven males from the normal population aged 18-24 years, seven participants were included in the final sample to match the seven male athletes aged between 18-24 years. In the age group 18-24 years, among females in the normal population, however, there was one participant less than the female athlete group aged 18-24 years. Therefore, to match the total number of participants, the females in the non-athlete population aged 25-34 included one participant more than the matching athlete group.

The final sample comprises 166 participants, 83 from an athlete population (25 males and 58 females) and 83 from a non-athlete population (25 males and 58 females). The age characteristics of the final sample are shown in Table 1.

**Table 1**

*Age Characteristics of the Final Sample*

|                      | 18-24<br>Years | 25-34<br>Years | 35-44<br>Years | 45-54<br>Years | 55-64<br>Years | 65+<br>Years |
|----------------------|----------------|----------------|----------------|----------------|----------------|--------------|
| Final sample (N=166) | 33.1%          | 29.5%          | 21.7%          | 8.4%           | 4.2%           | 2.4%         |
| Male Athletes        | 7              | 6              | 7              | 3              | 1              | 1            |
| Female Athletes      | 21             | 18             | 11             | 4              | 3              | 1            |
| Male Non-Athletes    | 7              | 6              | 7              | 3              | 1              | 1            |
| Female Non-Athletes  | 20             | 19             | 11             | 4              | 3              | 1            |

**Measures**

The online survey consisted of 4 main measures of perceived mental health (1), athletes' perceived support (2), normal populations' perceived support (3), and anxiety of the COVID-19 pandemic (4). The normal population was also asked to provide demographic information, including gender, age, and education level. Athletes were also asked to provide demographic information, including gender, age, education level, which sport they are occupied,

whether the sport occupied within is a team or individual, the time occupied in sports, and level of performance (see appendix 2)

### ***Depression, Anxiety, and Stress Scale (DASS-21)***

The revised 21 items Depression, Anxiety, and Stress Scale (DASS-21) was used to measure participants' perceived mental health (Lovibond and Lovibond, 1995). The survey assesses three subscales concerning emotional states related to the respondent's stress, anxiety, and depression in the past seven days. Seven items comprise each subscale: stress (e.g., "I tended to over-react to situations"), anxiety (e.g., "I felt scared without any good reason"), and depression (e.g., "I felt I wasn't worth much as a person"). After considering each statement, participants are asked to rate, on a 4-point Likert scale (0 = Did not apply to me at all; 3 = Applied to me very much), to which degree it applies to them. The symptoms assessed with the stress subscale include difficulty relaxing, nervous arousal, easily upset/agitated, irritable / over-reactive, and impatient. Further, symptoms in the anxiety subscale assess autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. Included in the depression subscale are symptoms such as dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia, and inertia (Vaughan et al., 2020). Scores for depression, anxiety, and stress are calculated by summing the scores for the relevant items. The estimations of the DASS-21 using Cronbach's coefficient  $\alpha$  revealed the following coefficients; Anxiety = 0.83, Stress = 0.89, Depression = 0.92, Total = 0.90.

### ***The Athletes' Received Support Questionnaire (ARSQ)***

The athletes filled out The Athletes' Received Support Questionnaire (ARSQ) to explore the mental health management and support experienced in their sports organization. The 22-item ARSQ measures four dimensions: emotional, esteem, informational, and tangible support (Freeman et al., 2014). The items consist of statements, five emotional and esteem support items, and six informational and tangible support items. All items are followed by the

sentence “In the last week, how often did someone...” (for example, for informational support: “give you advice about performing in a competitive situation”), and the athletes are asked to rate how often they received that support using a 5-point Likert scale with the following coding; 0 (not at all), 1 (once or twice), 2 (three or four times), 3 (five or six times), 4 (seven or more times). The ARSQ had the following Cronbach’s alpha coefficients; Emotional support = 0.88, Informational support = 0.90, Tangible support = 0.89, Total support = 0.92.

### ***Inventory of Socially Supportive Behaviors (ISSB)***

The normal population’s perceived support was measured with the Inventory of Socially Supportive Behaviors (ISSB) (Krause, 1995). The inventory includes items related to six dimensions: The first dimension relates to contact with family and friends (6 items), rated on a four-point Likert scale. The items were coded; not at all (1), once or twice (2), 3 to 6 times (3), more than 6 times (4). The following four dimensions relate to received and provided tangible support, such as transportation (6 items); received and provided emotional support, for instance, having others listen and show interest (8 items); received and provided informational support, for example, sharing suggestions and information (8 items), and, negative social interactions, such as criticisms and demands from others (3 items). Tangible, emotional, and informational support, together with negative interaction was support was rated on a four-point, which was coded; never (1), once in a while (2), fairly often (3), very often (4). The last dimension of the inventory relates to satisfaction with the tangible, emotional, and informational support received (3 items), coded; not satisfied with the support (0), and satisfied with the support (1). The estimation of the ISSB revealed the following Cronbach’s alphas; Emotional support = 0.87, Informational support = 0.87, Tangible support = 0.64, Total support = 0.87

### ***COVID-19 Pandemic and Mental Health Survey***

Finally, to investigate COVID-19 implications related to mental health, all the participants were asked to respond to the COVID-19 Pandemic and Mental Health Survey (Roy

et al., 2020). The survey includes four dimensions: awareness, attitude, anxiety of COVID-19 infection, and perceived healthcare needs. The survey included six items related to awareness, constructed as multiple choice questions with the option to choose several answers. For instance, “Indicate which symptoms you think the coronavirus infection include” and “can washing your hands frequently stop the spread of coronavirus”. The attitude section included seven items rated on a 5-point Likert scale, such as, “How likely are you to quarantine/isolate yourself if you have a fever and cough”. The items were coded; very unlikely (1) to very likely (5). Anxiety related to a coronavirus infection included 18 items rated on a 5-point Likert scale, e.g., “During the past month, how often have you avoided social contact”, which was coded: (1) never, occasionally (2), sometimes (3), often (4), and always (5). Finally, to assess the perceived mental healthcare needs, the survey included 4 items rated on a 3-point Likert scale (e.g., “Do you think it would be nice to talk to someone about your worries concerning the COVID-19 pandemic”), which were coded; no (1), maybe (2), yes (3). The assessment of The COVID-19 Pandemic and Mental Health Survey showed a Cronbach coefficient of 0.92.

## **Procedure**

Participants were recruited with different methods, including snowball and convenience sampling. A recruitment flyer or informational text about the study was shared on various social media platforms (e.g., Facebook, Instagram, Twitter, LinkedIn, Reddit) starting from 19/04/2022 and ending on 19/07/2022. The recruitment flyer was also shared in physical format in sports clubs in Aalborg and Copenhagen in Denmark. Specific groups were targeted to recruit athletes, for instance, on Facebook; Health, Physical Education and Sports Sciences, Mental Health First, Women’s Support for Mental & Physical Health, etc. Individuals eligible for participation included all males and females 18 years old and older.

The study participants used a link to access the survey, which led to a welcome landing page in the data collection platform Qualtrics. Here, the background and aim of the research

were introduced to provide sufficient information on what to expect from the survey, the types of questions asked, and their rights as participants (withdrawal, GDPR, anonymity, etc.). Next, the participants needed to accept informed consent to continue. When the participants accepted the informed consent, they were divided into two subgroups: Normal population and athletes. The division was done by providing the participants with the criteria for characterizing an athlete developed from the findings and considerations of Araújo & Scharhag (2016). The following four self-selection criteria (Araújo & Scharhag 2016, p. 6) had to be fulfilled to be considered to be an athlete:

- “to be training in sports aiming to improve his/her performance/results”
- “to be actively participating in sport competitions”
- “to be formally registered in a local, regional or national sport federation”
- “to have sport training and competition as his/her major activity (way of living) or focus of personal interest, devoting several hours in all or most of the days for these activities, exceeding the time allocated to other types of professional or leisure activities”

The fourth criterion was supplemented with a time reference (above four hours per week), a proposed athlete classification by McKinney et al., (2019).

Before answering the three main components of the survey, the participants belonging to the normal population were asked to provide demographics, including gender, age, level of education, occupation, and nationality. Next, athletes were asked to provide demographics, including gender, age, level of education, nationality, type of sport, team or individual sport, time occupied in sports, and level of competition. However, only age and gender were used in the data analysis and participant descriptions. Finally, the respondents were redirected to an “end page” after completing the survey, where a short reminder concerning the project and contact information was presented. The survey included the following components according to



subgroups: *Normal population*; DASS-21, ISSB, and The COVID-19 Pandemic and Mental Health Survey. *Athletes*; DASS-21, ARSQ, The COVID-19 Pandemic and Mental Health Survey.

### **Data Analysis**

Before the main statistical analysis, the data were inspected manually to eliminate errors. Further, preliminary analyses were conducted to test the data for normality, using the Shapiro-Wilk's test and additionally visual inspection of histograms. Levene's test was used to test the homogeneity of variance.

The Shapiro-Wilk's test revealed a violation of normality, which was confirmed by inspection of histograms – the data had primarily a positive skew. Homogeneity of variances were not violated.

The primary data analysis was carried out using IBM SPSS Statistics, version 28.0.0.0 release, where all analysis was performed with a statistical significance threshold of  $p < 0.05$ . Descriptive and inferential statistics were applied to investigate differences between subgroups (normal population/athletes, female/male athletes). Several analysis of variances were conducted although the assumption of normally distributed data was violated. More specifically, analysis of variances were used to examine differences in self-reported mental health between athletes and non-athletes. In addition, analysis of variances was conducted to test if there were any differences in self-reported mental health between athletes and a normal population concerning gender. Differences between male and female athletes concerning how they perceive mental health management and support during the pandemic and self-reported mental health were also conducted by analyzing variances.

To investigate differences in perceived support between athletes and a non-athlete population and, with regard to gender, standardized scores (z-scores) were calculated, using a automated computal function in SPSS. This procedure was preformed, to normalize the raw data from the ARSQ and ISSB, in essence, to enable comparison of different survey measures. The

z-scores for emotional, informational, tangible, and total perceived support were then analyzed with an ANOVA.

Due to the violation of normality of the data, a non-parametric test was used to examine if being an athlete, compared to the non-athlete population, influences the relationship between perceived mental health management and support and self-reported health during the pandemic. Spearman's correlation coefficients were calculated, and further the computed correlation coefficients will be compared to test if any significant statistical differences exist between athletes and non-athletes. The test is performed with an online calculator designed for the specific purpose of comparing correlation coefficients (MedCalc, 2022). Furthermore, the strength of the computed correlation coefficients of anxiety, stress, depression, DASS21-total, anxiety of COVID-19, emotional, informational, tangible, and total perceived support was evaluated. The strength of the relationship between the variables was interpreted according to the cutoff points proposed in Schober et al., 2018. A correlation coefficient between 0.00–0.10 is considered a negligible correlation. If the correlation coefficient is within the interval of 0.10–0.39, the relationship between the variables is weak. Coefficients between 0.40–0.69 is considered a moderate correlation, whereas coefficients between 0.70–0.89 is interpreted as a strong correlation. A correlation coefficient within the interval of 0.90–1.00 is a very strong correlation.

The Internal consistency reliability of the measures used in the survey was estimated using Cronbach's coefficient, where alphas of .70 and .90 have been suggested for group and individual-level analyses, respectively (Nunnally & Bernstein, 1994 cited in Sinclair et al., 2011).

Lastly, G\*Power software (Faul, Lang & Buchner, 2007) was used for a post-hoc power analysis to compute the achieved power of the final sample. Similar to the priori power analysis, a two-tailed t-test (difference between two independent means (two groups)) where

conducted ( $(\alpha = 0.05)$ ,  $(1 - \beta = 0.8)$ ,  $(f(V) = 0.5)$ , Sample size group 1 = 83 / Sample size group 2 = 83)), which revealed a statistical power of 89% of the final sample.

### **Ethical statement**

The full scope of the procedures carried out in this study was in line with the law standards (2003:460) on Ethics of Research Involving Humans defined by the Swedish Ethical Review Authority (Riksdagsförvaltningen, 2014). At the start of the surveys, the participants read information about the conditions and aims of the, provided informed consent, and were assured of anonymity and the right to withdraw at any time during the study. Additionally, individuals were only considered eligible for participation if they were 18 years old and older. All the data collected was handled in accordance with GDPR, the European Council General Data Protection Regulation (European Parliament and the Council of 27 April, 2016).

## **Results**

### **Self-Reported Mental Health between Athletes and Non-Athletes**

The analysis of variance applied to investigate differences in perceived mental health between athletes and the non-athlete population did not reveal any significant differences (see Table 2).

**Table 2**

*Descriptive Statistics and a Two-Way Analysis of Variances of Perceived Mental Health Between Groups, Gender, and Groups x Gender*

|                    | Non-Athletes |           |          |           |          |           | Athletes |           |          |           |          |           | Groups x Gender   |                | Groups            |                | Gender            |                |
|--------------------|--------------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|-----------|-------------------|----------------|-------------------|----------------|-------------------|----------------|
|                    | Males        |           | Females  |           | Total    |           | Males    |           | Females  |           | Total    |           |                   |                |                   |                |                   |                |
| Variable           | <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> | <i>F</i> (1, 162) | η <sup>2</sup> | <i>F</i> (1, 162) | η <sup>2</sup> | <i>F</i> (1, 162) | η <sup>2</sup> |
| Anxiety Score      | 6.24         | 5.21      | 8.10     | 8.83      | 7.54     | 7.93      | 5.76     | 6.79      | 8.86     | 7.15      | 7.93     | 7.15      | .238              | .001           | .012              | .000           | 3.828             | .023           |
| Stress Score       | 12.16        | 6.73      | 13.62    | 11.17     | 13.18    | 10.03     | 12.72    | 9.15      | 13.69    | 9.25      | 13.40    | 9.17      | .023              | .000           | .037              | .000           | .554              | .003           |
| Depression Score   | 8.88         | 8.68      | 6.62     | 7.84      | 7.30     | 8.12      | 8.08     | 10.35     | 8.00     | 10.25     | 8.02     | 10.22     | .484              | .003           | .034              | .000           | .558              | .003           |
| DASS-21 Total      | 27.28        | 16.91     | 28.34    | 23.89     | 28.02    | 21.92     | 26.56    | 22.90     | 30.55    | 22.94     | 29.35    | 22.86     | .148              | .001           | .038              | .000           | .441              | .003           |
| Anxiety of COVID19 | 35.92        | 12.44     | 37.19    | 14.17     | 36.81    | 13.61     | 34.56    | 12.71     | 41.38    | 14.18     | 39.33    | 14.04     | 1.429             | .009           | .371              | .002           | 3.035             | .018           |

*Note: Mean = M, Standard Deviation = SD, Non-Athletes (Males; n = 25, Females; n = 58), Athletes (Males; n = 25, Females; n = 58).*

### **Gender Differences in Mental Health Between Athletes and a Non-Athletes**

An overview of the descriptive statistics and the output of the analysis of variances are shown in Table 2 regarding gender differences in mental health between athletes and the normal population. The results show no significant gender difference, however, though no significant difference was revealed in the analysis, notably, male athletes, compared with males from the normal population, have lower mean scores in total DASS21 score, Anxiety of COVID19 score, symptoms of anxiety, and symptoms of depression. On the other hand, male athletes only have a higher mean score in symptoms of stress compared to males from the normal population. Male athletes also have lower mean scores, in all but the mean score of symptoms of depression, compared to females in the normal population. Conversely, female athletes have higher mean scores in all variables compared to females from the normal population. Furthermore, except for the mean score of symptoms of depression, female athletes have higher mean scores in all variables compared to males from the normal population.

### **Athletes' Perceived Mental Health Management and Support During the COVID-19 Pandemic**

Table 3 provides output from the analysis concerning whether male and female athletes perceive differences in the mental health management and support they have experienced in sports organizations during the COVID19 pandemic. Table 3 below illustrates that female athletes have experienced less mental health management and support compared to their male counterparts. Although female athletes have lower mean scores in all the variables measured, the differences in the mean scores between male and female athletes are not statistically significant. Based on the mean scores and effect size, the results indicate that the most considerable difference in perceived mental health management and support during the COVID19 pandemic relates to the extent of informational support for male athletes relative to female athletes.

**Table 3***Descriptive Statistics and ANOVA of Athletes' Perceived Support and Subscales (ARSQ)*

| Variables               | Males    |           | Females  |           | <i>F</i> (1, 81) | $\eta^2$ |
|-------------------------|----------|-----------|----------|-----------|------------------|----------|
|                         | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> |                  |          |
| Emotional Support       | 17.84    | 6.49      | 17.09    | 4.89      | .339             | .004     |
| Informational Support   | 18.20    | 7.05      | 16.97    | 6.00      | .682             | .008     |
| Tangible Support        | 16.08    | 6.78      | 16.03    | 7.04      | .001             | .000     |
| Esteem Support          | 17.96    | 6.65      | 16.97    | 5.27      | .530             | .006     |
| Perceived Support Total | 70.08    | 22.74     | 67.05    | 18.05     | .419             | .005     |

*Note:* Males (n=25), Females (n = 58), Mean = *M*, Standard Deviation = *SD*

## **Differences Between Athletes and Non-Athletes in Perceived Mental Health and Perceived Support**

To enable a comparison of the perceived support between athletes and the non-athlete population has experienced, z-scores were computed in SPSS from the raw data, including emotional, informational, tangible, and total perceived support, which is illustrated in table 4. Further analysis revealed significant differences between groups x gender concerning three variables, including emotional support ( $F(1,162) = 12.672, p < .05$ , partial  $\eta^2 = .073$ ), informational support ( $F(1,162) = 7.645, p < .05$ , partial  $\eta^2 = .045$ ), and total perceived support ( $F(1,162) = 12.530, p < .05$ , partial  $\eta^2 = .072$ ). Pairwise comparisons revealed significant differences between males and females of the non-athlete population. Further inspection of table 4 illustrates that non-athlete males experience significantly less emotional, informational, and total support than non-athlete females. The analysis did not reveal any significant differences between athletes and the non-athlete population; interestingly, males from the non-athlete population receive the lowest level of support, whereas females from the non-athlete population receive the highest level of support. The mean z-scores also indicate that female athletes perceive less support compared to male athletes related to all four variables measured.

**Table 4**

*Descriptive Statistics of Z-Scores and Two-Way Analysis of Variances of Perceived Support Between Groups and Groups x Gender*

| Variable                | Non-Athletes |           |          |           |          |           | Athletes |           |          |           |          |           | Groups            |      | Groups x Gender   |              |
|-------------------------|--------------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|-----------|-------------------|------|-------------------|--------------|
|                         | Males        |           | Females  |           | Total    |           | Males    |           | Females  |           | Total    |           |                   |      |                   |              |
|                         | <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> | <i>F</i> (1, 162) | η2   | <i>F</i> (1, 162) | η2           |
| Emotional Support       | -.51         | .88       | .48      | .86       | .19      | .97       | .09      | 1.21      | -.05     | .91       | -.01     | 1.00      | .045              | .000 | <b>12.672*</b>    | <b>.073*</b> |
| Informational Support   | -.39         | .86       | .34      | 1.03      | .12      | 1.04      | .12      | 1.09      | -.08     | .96       | -.02     | .99       | .061              | .000 | <b>7.645*</b>     | <b>.045*</b> |
| Tangible Support        | -.21         | .78       | .32      | 1.03      | .16      | .97       | -.01     | 1.02      | -.02     | 1.01      | -.01     | 1.00      | .172              | .001 | 2.696             | .016         |
| Total Perceived Support | -.49         | .84       | .49      | .91       | .20      | 1.01      | .09      | 1.17      | -.06     | .93       | -.01     | 1.00      | .008              | .000 | <b>12.530*</b>    | <b>.072*</b> |

*Note:* Statistical Significant Differences is marked \* and bold;  $p < .05$ . Non-Athletes (Males;  $n = 25$ , Females;  $n = 58$ ), Athletes (Males;  $n = 25$ , Females;  $n = 58$ ), Mean = *M*, Standard Deviation = *SD*.



### **Differences in the Relationship Perceived Mental Health-Mental Health Management and Support between Athletes and Non-Athletes**

Spearman's correlations coefficients were calculated for all comparable variables between athletes and the non-athlete population to investigate if the correlation coefficients are significantly different between the two populations and to evaluate the strength of the relationship between the variables. Correlation coefficients for both populations are shown in table 6, which indicates statistically significant differences between several coefficients and statistically significant associations between several variables.

A closer inspection of table 6 shows statistically significant differences in the correlation coefficients related to the emotional support experienced and the level of anxiety of COVID19 the two populations perceive. Athletes perceive a weak significant decrease, whereas non-athletes perceive a very weak nonsignificant increase;  $r_s(83) = -.22, p < .05$ ,  $r_s(83) = .11, p < .05$ . A Fisher Z-test showed that the correlation between emotional support and level of anxiety of COVID19 was greater for athletes compared to that for non-athletes ( $Z = -2.11, p < .05$ ). In other words, having emotional support was associated to low levels of self-reported anxiety for COVID19 among athletes and this correlation was significantly greater than that among non-athletes.

Regarding informational support, Athletes perceived a very weak nonsignificant increase in anxiety, whereas non-athletes perceive a small significant increase;  $r_s(83) = .09, p > .05$ ,  $r_s(83) = .29, p < .05$ . A Fisher Z-test showed that the correlation between informational support and anxiety was not different between athletes and non-athletes ( $Z = -1.32, p = .09$ ). Moreover, Athletes perceived a very weak nonsignificant increase in the DASS-21 total score, whereas non-athletes perceive a weak significant increase;  $r_s(83) = .19, p > .05$ ,  $r_s(83) = .27, p < .05$ . A Fisher Z-test, however, showed that the correlation between informational support

and DASS-21 total score was not different between athletes and non-athletes ( $Z = -0.53$ ,  $p = .30$ ). The relationship between anxiety of COVID19 and informational support suggested that athletes perceive a very weak nonsignificant decrease in the level of anxiety of COVID19, while non-athletes perceive a weak significant increase;  $r_s(83) = -.08$ ,  $p < .05$ ,  $r_s(83) = .31$ ,  $p < .05$ . A Fisher Z-test showed that the correlation between informational support and level of anxiety of COVID19 was greater for non-athletes compared to that for athletes ( $Z = -2.53$ ,  $p < .01$ ). Hence, informational support was associated to higher levels of self-reported anxiety for COVID19 among non-athletes and this correlation was significantly greater than that among athletes.

Regarding tangible support, athletes experienced a very weak nonsignificant decrease in anxiety ( $r_s(83) = -.04$ ,  $p > .05$ ), a very weak nonsignificant increase in depression ( $r_s(83) = .03$ ,  $p > .05$ ), a very weak nonsignificant increase in DASS-21 total score ( $r_s(83) = .17$ ,  $p > .05$ ), and a weak nonsignificant decrease in anxiety of COVID19 ( $r_s(83) = -.14$ ,  $p > .05$ ). Non-athletes on the other hand experienced a weak significant increase in anxiety ( $r_s(83) = .38$ ,  $p < .05$ ), a weak significant increase in depression ( $r_s(83) = .32$ ,  $p < .05$ ), a weak significant increase in DASS-21 total score ( $r_s(83) = .31$ ,  $p < .05$ ), and a weak significant increase in anxiety of COVID19 ( $r_s(83) = .26$ ,  $p < .05$ ). The first Fisher Z-test, for this type of support, showed that the correlation between tangible support and anxiety was greater for non-athletes compared to that for athletes ( $Z = -2.78$ ,  $p < .01$ ). The second Fisher Z-test showed that the correlation between tangible support and depression was greater for non-athletes compared to that for athletes ( $Z = -1.91$ ,  $p < .05$ ). The third Fisher Z-test showed that the correlation between tangible support and DASS-21 total score was not different between non-athletes and athletes ( $Z = -0.94$ ,  $p > .05$ ). The last Fisher Z-test, for this type of support, showed that the correlation between tangible support and anxiety for COVID19 was greater

for non-athletes compared to that for athletes ( $Z = -2.57, p < .01$ ). Hence, tangible support was associated to higher levels of self-reported anxiety, depression, and anxiety for COVID19 among non-athletes and these correlations were significantly greater than that among athletes.

Turning to the total support score, athletes experienced a very weak nonsignificant decrease in anxiety ( $r_s(83) = -.01, p > .05$ ), a very weak nonsignificant increase in DASS-21 total score ( $r_s(83) = .17, p > .05$ ), and a weak nonsignificant decrease in anxiety of COVID19 ( $r_s(83) = -.14, p > .05$ ). Non-athletes on the other hand experienced a weak significant increase in anxiety ( $r_s(83) = .28, p < .05$ ), a weak significant increase in DASS-21 total score ( $r_s(83) = .24, p < .05$ ), and a weak significant increase in anxiety of COVID19 ( $r_s(83) = .28, p < .05$ ). The first Fisher Z-test, for this type of support, showed that the correlation between total support and anxiety was greater for non-athletes compared to that for athletes ( $Z = -1.88, p < .05$ ). The second Fisher Z-test showed that the correlation between total support and DASS-21 total score was not different between non-athletes and athletes ( $Z = -0.46, p > .05$ ). The last Fisher Z-test, for this type of support, showed that the correlation between total support and anxiety for COVID19 was greater for non-athletes compared to that for athletes ( $Z = -2.91, p < .01$ ). Hence, the total support score was associated to higher levels of self-reported anxiety and anxiety for COVID19 among non-athletes and these correlations were significantly greater than that among athletes.

**Table 6**

*Spearman Correlations for Athletes and Non-Athletes' Perceived Mental Health and Mental Health Management and Support*

|                          | 1           |              | 2            |            | 3          |              | 4   |       | 5            |              | 6     |       | 7            |             | 8            |              | 9 |    |
|--------------------------|-------------|--------------|--------------|------------|------------|--------------|-----|-------|--------------|--------------|-------|-------|--------------|-------------|--------------|--------------|---|----|
| Variable                 | A           | NA           | A            | NA         | A          | NA           | A   | NA    | A            | NA           | A     | NA    | A            | NA          | A            | NA           | A | NA |
| 1. Anxiety Score         | -           | -            |              |            |            |              |     |       |              |              |       |       |              |             |              |              |   |    |
| 2. Stress Score          | .43**       | .48**        | -            | -          |            |              |     |       |              |              |       |       |              |             |              |              |   |    |
| 3. Depression Score      | .50**       | .54**        | <u>.59**</u> | <u>.21</u> | -          | -            |     |       |              |              |       |       |              |             |              |              |   |    |
| 4. DASS-21 Total         | .68**       | .76**        | .76**        | .69**      | .75**      | .66**        | -   | -     |              |              |       |       |              |             |              |              |   |    |
| 5. Anxiety of COVID19    | .32**       | .34**        | .04          | .25*       | .14        | .34**        | .20 | .44** | -            | -            |       |       |              |             |              |              |   |    |
| 6. Emotional Support     | -.05        | .11          | .12          | .17        | .01        | -.06         | .11 | .09   | <u>-.22*</u> | <u>.11</u>   | -     | -     |              |             |              |              |   |    |
| 7. Informational Support | <u>.09</u>  | <u>.29**</u> | .16          | .16        | .04        | -.01         | .19 | .27*  | <u>-.08</u>  | <u>.31**</u> | .52** | .68** | -            | -           |              |              |   |    |
| 8. Tangible Support      | <u>-.04</u> | <u>.38**</u> | .14          | .10        | <u>.03</u> | <u>.32**</u> | .17 | .31** | <u>-.14</u>  | <u>.26*</u>  | .33** | .18   | <u>.56**</u> | <u>.26*</u> | -            | -            |   |    |
| 9. Total support         | <u>-.01</u> | <u>.28*</u>  | .18          | .18        | .01        | .01          | .17 | .24*  | <u>-.17</u>  | <u>.28*</u>  | .78** | .86** | .83**        | .90**       | <u>.74**</u> | <u>.36**</u> | - | -  |

*Note:* A = Athletes (n = 83), Non-Athletes = NA (n = 83). Coefficients tested for statistical differences between groups are bold typed and underlined  $p < 0.05$ . Associations between variables; \*\* Correlation is significant at the 0.01 level (2-tailed). \* Correlation is significant at the 0.05 level (2-tailed).

## **Discussion**

The current study aimed to investigate the mental health of athletes at the ‘end’ of the COVID19 pandemic in relation to non-athletes, and furthermore, to what extent non-athletes and athletes experienced mental health management and support during the COVID19 pandemic and its relationship with their current mental health. Five underpinning questions related to the overall objectives were investigated, revealing several interesting results. First, no statistically significant differences were found in self-reported mental health between athletes and non-athletes, which also was the case with regard to gender differences in self-reported mental health between the two populations. Second, gender differences in perceived mental health management and support were not significantly different within the athlete population. Third, statistically significant gender differences were found with respect to the extent of social support athletes and non-athletes experienced, however, only within the non-athlete population. Finally, the results indicated significant differences between athletes and non-athletes concerning the relationship between perceived mental health and mental health management and support.

### **Mental Health Differences Between Athletes and Non-Athletes**

Athletes had higher scores on all the mental health variables investigated than non-athletes in the study, which differs from the findings of Puš and Kajtna (2022). For example, in a sample of 146 female football players, the percentage of players reporting normal to mild symptoms of anxiety and depression was larger than the percentage of non-athletes reporting normal to mild symptoms of anxiety and depression. However, the findings in the current study and those of Puš and Kajtna (2022) did not show statistically significant differences between the two populations investigated. Hence, indicating similar mental health status among athletes and non-athletes.

The study by Crawford & Henry (2003) shows normative data of the DASS-21 and the underlying subscales. A comparison of the mean scores illustrates relatively large numerical differences, where the scores are higher in all measures in the current study. To illustrate, the mean anxiety score for non-athletes (Table 2) was 7.54, whereas the normative data show a mean anxiety score of 3.56. The total DASS-21 score in the current study is 28.02 relative to a mean score of 18.38 in the normative data. It is tempting to speculate that the exposure to the COVID19 pandemic influences the evident differences. For example, the WHO states that the COVID-19 pandemic triggers a 25% increase in the prevalence of anxiety worldwide. However, different exposures and circumstances than COVID19 could also explain the differences in mean scores illustrated, such as development over time. Notably, the normative data regarding DASS-21 was collected almost twenty years ago – it is commonly known in the literature that anxiety is and has been on the rise for many years (Goodwin et al., 2020).

### **Mental Health Differences Between Athletes and Non-Athletes Regarding Gender**

Despite the lack of a significant gender difference between athletes and non-athletes, male athletes have lower mean scores on the total DASS21 score, the anxiety of COVID19 score, symptoms of anxiety, and symptoms of depression when compared to males from the general population. These results are in line with the results found in the study conducted by (Şenışık et al., 2020). Furthermore, except for the mean score for symptoms of depression, male athletes have lower mean scores than women in the general population, which also falls in line with the findings of Şenışık et al., (2020). However, the tendency that athletes have better mental health compared to non-athletes is inconsistent, which the findings from the study conducted by Knowles et al., (2021) illustrate. In addition, the findings from the current

research related to female athletes are consistent with the findings of Knowles et al., (2021), which indicate that athletes experience higher anxiety levels than non-athletes.

In contrast to male athletes in the current study, female athletes have higher mean scores for all factors compared with non-athlete females. In addition, except for the mean score for depressive symptoms, female athletes have higher mean scores for all variables compared to athletes and non-athlete males. As stated in the article by Şenışık et al., (2020), athletes, in general, have better health than non-athletes, however, as discussed, findings also indicate the opposite. One possible explanation as to why female athletes experience a lower mental health status could relate to the decrease in activity athletes have experienced during the COVID19 lockdown. In addition to the decline in activity, the subsequent isolation could also influence the female athletes' mental health in a negative manner, which some findings have indicated (NCAA.org, 2021).

### **Gender Differences in Athletes' Perceived Mental Health Management and Support**

Consistent with previous findings (Hagiwara et al., 2017), the analysis of gender differences in athletes' perceived mental health management and support in the current study did not reveal significant differences. However, compared to their male counterparts, female athletes perceived less mental health management and support - female athletes have smaller mean scores across all measured variables. Conversely, other findings indicate that gender differences in athletes' perceived mental health management and support exist. For example, Katagami and Hironobu (2017) found that male athletes received significantly more esteem and emotional support than female athletes. As previously discussed, a possible explanation of the inconsistent findings could be influenced by several factors. Again, the relationship and dynamics between the receiver and provider of the support can significantly affect the tendency to seek support. Furthermore, the availability of supportive individuals or a help-seeking culture

within the sports organization may also influence the extent to which the athletes perceive and seek support.

### **Mental Health Management and Support Differences between Gender, Athletes, and Non-Athletes**

The findings related to differences in perceived mental health management and support indicated that males and females in the non-athlete sample experienced statistically significant differences in the level of social support they experienced. Specifically, females experienced emotional, informational, and total support to a greater extent compared to males. These results are partly consistent with that of Stokes and Wilson (1984), who found that females report receiving more emotional support compared to males. Stokes and Wilson (1984) did not find differences between males and females related to the informational and total support experienced, which was the case in the current study. However, the statistical difference in informational support found between non-athlete females and males in the present research is reflected in the findings from the study conducted by Olson and Shultz (1994). Olsen and Shultz (1994) revealed that women perceive significantly higher informational support levels than males. Moreover, like the findings from the current study and findings from the study by Stokes and Wilson (1984), Olson and Shultz (1994) also found that females experienced a significantly higher degree of emotional support compared to men.

One possible explanation as to why females experience more support takes root in comparisons of personality, which indicate that females have higher levels of agreeableness compared to males. The trait of agreeableness is associated with the tendency to give and seek social support to a greater extent. The findings supporting the existence of differences between males and females in supportive behaviors are ascribed to social and biological characteristics (Tifferet, 2020). For instance, related to social differences between gender,



Olsen, and Shultz (1994) describes how the male socialization process regularly deemphasizes emotional expressiveness in favor of autonomy, self-reliance, and independence. Consequently, the male socialization process may limit the development of social support networks. Female socialization encourages verbal expressiveness that prioritizes warmth and the search for intimacy. Females are more inclined to identify their need for aid and assistance, consequently developing more socially supportive connections (Olsen and Shultz, 1994). From a biological perspective, the differences in social support experienced between males and females could relate to differences in cognitive coping strategies. Females tend to find social support to aid them in finding solutions to the problems they encounter, whereas males regularly use leadership behaviors and assertive attitudes as a coping strategy (Defares, Brandjes, Nass, and van der Ploeg, 1984, cited in Olsen and Shultz, 1994). The female coping strategy is common in all ages of life and, therefore, possibly reinforced, consequently a fundamental behavior for females (Eagly and Wood, 1991, cited in Olsen and Shultz, 1994).

### **Relationship Between Perceived Mental Health Management and Support and Self-Reported Health**

The current findings indicate that being an athlete significantly influences the relationship between perceived mental health management and support and self-reported health during the pandemic compared to non-athletes. In addition, the results suggest that non-athletes might have experienced adverse effects on mental health from receiving support, contrary to athletes, who have experienced mainly no effects at all or positive effects, and that these correlations are stronger among non-athletes than athletes. In short, (1) emotional support was associated to lower levels of self-reported anxiety for COVID19 among athletes, and this correlation was significantly greater than that among non-athletes; (2) informational support was associated

to higher levels of self-reported anxiety, and anxiety for COVID19 among non-athletes and both correlations were significantly greater than that among athletes; (3) tangible support was associated to higher levels of self-reported anxiety, depression, and anxiety for COVID19 among non-athletes and these correlations were significantly greater than that among athletes; and (4) the total support score was associated to higher levels of self-reported anxiety and anxiety for COVID19 among non-athletes, and these correlations were significantly greater than that among athletes.

With respect to the findings among the athletes, similar results have been obtained in the study by Sullivan et al., (2020), more specifically, the findings revealed that higher levels of social support correlate with less depressive symptoms among college student athletes. Additionally, Sullivan et al., (2020) found that tangible support from personal sources was predictive of depressive symptoms, which is slightly similar to the findings in the current study. The effects of social support the athletes experience are generally consistent with the literature, which indicate that positive levels of emotional, informative, and tangible support positively impact athletes (Fernanda Porto Maciel et al., 2021).

Contrary, for the non-athletes, the results showed that social support has significant associations that can be interpreted as increases in anxiety symptoms, depression symptoms, and anxiety of COVID19, which seems counterintuitive at first glance. However, the results are consistent with previous findings among medical students, which show that mental health can be negatively affected when receiving low and medium levels of social support (Yin et al., 2021). Suggestively, the negative effect non-athletes experience on their mental health may be explained by the level of social support they have received, illustrated in table 4 - high levels of social is simply needed to experience a positive effect on mental health. It could also be speculated that the quality and provider of the support non-athletes

received was poor relative to the quality of the support the athletes experienced. One important aspect of the quality of support relates to who provides the support – findings indicate that the relationship between provider and receiver can be significantly affected negatively and positively (Stokes and Wilson, 1984).

Nevertheless, except for the negative relationship between emotional support and anxiety for COVID19, all correlations among athletes were nonsignificant. Hence, a plausible conclusion is that athletes were not negatively or positively affected by any type of support, while the non-athlete population was negatively affected. Furthermore, since this was a crosssectional study, another plausible conclusion is that individuals who were more worried about COVID19 and had higher levels of mental illness, to begin with, were the ones seeking more support during the pandemic.

### **Limitations**

The findings of this study must be seen in the light of some limitations; therefore, the results should be interpreted with caution. First, using a cross-sectional design poses a limitation of the study because it only allowed the inference of associations between variables and did not provide the potential for inferring causality. Secondly, the data obtained relied on self-report, which may be subject to common biases, such as social desirability bias, recall bias (several items asked the respondents to recall details from the past month), and nonresponse bias. For example, athletes may be reluctant to talk about their mental health because they fear the negative associations and prejudices often associated with mental health problems (Rice et al., 2016). Third, the ability to generalize the results is questionable due to the size of the final sample, which could be considered relatively small, although a satisfying statistical power was obtained.

Furthermore, unexpectedly at the ‘end’ of the COVID19 pandemic, there was potentially a significant confounder variable: the war in Ukraine. In essence, symptoms of anxiety, stress, or depression could be influenced by this global social event. In other words, mental health was evaluated retroactively (7 days), consequently, due to the length of the period data was collected, those who answered at the beginning of the data collection and those at the end could have different contexts as reference points. Moreover, a confounding variable that may have had a role in influencing the results refers to the fact that the two groups of participants answered slightly different surveys regarding the social support received. In general, the disadvantages discussed may affect the validity and reliability of the results.

### **Future Research**

Several adjustments can be implemented to increase the quality of the current study. For example, conducting a longitudinal study to capture the development of mental health over time should be considered to reveal if the participants’ mental health status is improving or worsening. Additionally, in the current study, a relatively large proportion of respondents did not complete the survey, which could be seen as an indicator of shortening the duration of the survey. In turn, adjusting the survey length could increase the response rate, consequently obtaining a larger sample, which further would help improve the sample’s representativeness.

### **Conclusion**

The present study contributes to our understanding of how male and female athletes perceived mental health and perceived mental health management and support in sports organizations at the ‘end’ of the COVID19 pandemic. Additionally, the present study illustrates how non-athletes have experienced mental health and mental health management and support compared

to athletes. The findings suggest that athletes are able to receive support, consequently without effect or with a slight positive effect on their mental health status. The contrary was evident among the non-athlete population, which experienced worsening mental health from receiving support. Furthermore, athletes experienced less anxiety about COVID19 from receiving emotional support. On the other hand, non-athletes experienced increased symptoms of anxiety, depression, and anxiety of COVID19 from receiving informational and tangible support. If future studies can pinpoint that the cause of this effect is the way athletes receive support, it is plausible to suggest that future crises might need to deliver and organize support in similar ways that sports organizations and coaches do.

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## Appendix

### Appendix 1

#### Survey Flow

Standard: Informed consent (1 Question)

Participants Allocation (4 Questions)

##### ATHLETES

Block: Demographics Athletes (8 Questions)

Block: Perceived Mental Health (4 Questions)

Block: COVID-19 Pandemic and Mental Health Survey (13 Questions)

Block: Athlete Received Support (5 Questions)

##### NON-ATHLETES

Block: Demographics general population (5 Questions)

Block: Perceived Mental Health (4 Questions)

Block: COVID-19 Pandemic and Mental Health Survey (13 Questions)

Block: Received Social Support (11 Questions)

Page Break

Start of Block: Informed consent

Q1.1

**Welcome** - Thank you very much for taking the time to participate in the current study. The current research aims to improve our understanding of the mental health management of female athletes in sports organizations in comparison to male athletes and the general population at the end of the COVID-19 pandemic.

*It takes approximately 10-15 minutes to complete the survey.*

**Please read the following text thoroughly before taking any further action.**

*Please be assured that your responses will be kept anonymous, and that participation is entirely voluntary. By clicking the button "I consent", you acknowledge that your participation in the study is voluntary, that you are 18 years of age, and that you are aware that you can terminate your participation in the study at any time and for any reason without prejudice. The survey includes questions about demographics, mental health in general, perceived social support received, and mental health related to the COVID-19 pandemic. According to the Personal Data Regulation (GDPR), the data collected will be handled and deleted after the analysis is completed or no more than three months after the survey is submitted.*

- ☐ **I consent** (1)
- ☐ **I do not consent** (2)

*Skip To: End of Block If Informed consent not given*

Q2.1 The survey has been **terminated** - you are free to leave. However, I still want to thank you for getting this far, for being generous with your time - thanks a lot.

Feel free to share the survey link below if possible - I would appreciate it tremendously.  
Have a nice day

**Link:** [https://lundpsychology.eu.qualtrics.com/jfe/form/SV\\_3rRhzd2Uw7WlJKS](https://lundpsychology.eu.qualtrics.com/jfe/form/SV_3rRhzd2Uw7WlJKS)

End of Block: Terminated the survey

---

Start of Block: Participant allocation

Q3.1

**Note:** *It is essential to us that you finalize the survey by answering all the questions. Answer the questions truthfully and to the best of your ability. If you have doubts about how to answer a particular question, we recommend you choose the most neutral answer from your perspective.*

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Page Break

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## Q3.2

**Consider the following four statements, whether they apply to you?**

|   | Yes (1)               | No (0)                |
|---|-----------------------|-----------------------|
| I am training in sports aiming to improve my performance/results. (1)   | <input type="radio"/> | <input type="radio"/> |
| I am actively participating in sports competitions. (2)   | <input type="radio"/> | <input type="radio"/> |
| I am formally registered in a local, regional, or national sports federation. (3)   | <input type="radio"/> | <input type="radio"/> |
| I work in sports full or part-time or spend a lot of time training and competing in my free time ( <i>minimum 4 hours a week</i> ). (4) | <input type="radio"/> | <input type="radio"/> |

End of Block: Participant allocation

Start of Block: Demographics Athletes

## Q4.1

**How old are you?**

▼ 18-24 years old (2) ... 65+ years old (8)

## Q4.2

**What is your gender identity?**

- ☐ Male (1)
- ☐ Female (2)
- ☐ Non binary / transgender / third gender (3)
- ☐ Other (4)

---

**Q4.3 In which country do you currently reside?**

▼ Afghanistan (1) ... Zimbabwe (195)

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**Q4.4 What is the highest level of school you have completed or the highest degree you have received?**

▼ Less than high school degree (1) ... Professional degree (JD, MD) (8)

---

**Q4.5**

**Specify the type of sport in which you compete, e.g., soccer, basketball, running, golf**

*(Preferably, specify in English)*

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**Q4.6**

**Do you compete in an individual- or a team sport?**

☐ Individual (10)

☐ Team (11)

---



#### Q4.7 Indicate the level you are training and competing

- ☐ **Olympic athlete** - Individuals that competed in the 2021 Olympic Games. The volume of training and competition hours/week  $\geq 10$ .
- ☐ **World elite athlete** - Individuals listed in the ranking of the top-100 best the past year/past season. The volume of training and competition hours/week  $\geq 10$ .
- ☐ **National elite athlete** - Individuals that regularly compete in the upper National division or league. The volume of training and competition hours/week  $\geq 10$ .
- ☐ **Competitive athlete** - Individuals emphasize improvements in performance and competing in official competitions. The volume of training and competition hours/week  $\geq 6$ .
- ☐ **Recreational athlete** - Individuals with an emphasis on competition, pleasure, and fitness - registered in a recreational league or open events. The volume of training and competition hours/week  $\geq 4$ .
- 

#### Q4.8 Please specify if you are occupied in sports full-time, part-time or if sports is a leisure-time activity

- ☐ Full-time (1)
- ☐ Part-time (2)
- ☐ Leisure-time (4)

End of Block: Demographics Athletes

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Start of Block: Perceived Mental Health

#### Q5.1

*In the following block, you will evaluate your perceived mental health by considering statements related to symptoms of anxiety, stress and depression. **Note:** This is **NOT** a diagnostic assessment.*

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Page Break

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#### Q5.2

**Evaluate if the following symptoms have applied to you during the past week**

|  | <b>Did not apply to<br/>me at all (0)</b> | <b>Applied to me to<br/>some degree, or<br/>some of the time<br/>(1)</b> | <b>Applied to me to a<br/>considerable de-<br/>gree or a good part<br/>of time (2)</b> | <b>Applied to me very<br/>much or most of<br/>the time (3)</b> |
|--|---|--|--|--|
| I was aware of dry-<br>ness of my mouth<br>(2)   | <input type="radio"/>                     | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |
| I experienced<br>breathing difficulty<br>(e.g. excessively<br>rapid breathing,<br>breathlessness in the<br>absence of physical<br>exertion) (4)            | <input type="radio"/>                     | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |
| I experienced trem-<br>bling (e.g. in the<br>hands) (7)  | <input type="radio"/>                     | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |
| I was worried about<br>situations in which I<br>might panic and<br>make a fool of my-<br>self (9)  | <input type="radio"/>                     | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |
| I felt I was close to<br>panic (15)  | <input type="radio"/>                     | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |
| I was aware of the<br>action of my heart<br>in the absence of<br>physical exertion<br>(e.g. sense of heart<br>rate increase, heart<br>missing a beat) (19) | <input type="radio"/>                     | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |
| I felt scared without<br>any good reason<br>(20)   | <input type="radio"/>                     | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |

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Page Break

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Q5.3

**Evaluate if the following symptoms have applied to you during the past week**

|  | <b>Did not apply to<br/>me at all (0)</b> | <b>Applied to me to<br/>some degree, or<br/>some of the time<br/>(1)</b> | <b>Applied to me to<br/>a considerable<br/>degree or a good<br/>part of time (2)</b> | <b>Applied to me<br/>very much or<br/>most of the time<br/>(3)</b> |
|--|---|--|--|--|
| I found it hard to<br>wind down (2)  | <input type="radio"/>                     | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |
| I tended to over-<br>react to situations<br>(4)  | <input type="radio"/>                     | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |
| I felt that I was<br>using a lot of<br>nervous energy<br>(7)                                     | <input type="radio"/>                     | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |
| I found myself<br>getting agitated<br>(9)  | <input type="radio"/>                     | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |
| I found it difficult<br>to relax (15)  | <input type="radio"/>                     | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |
| I was intolerant of<br>anything that kept<br>me from getting<br>on with what I<br>was doing (19) | <input type="radio"/>                     | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |
| I felt that I was<br>rather touchy (20)  | <input type="radio"/>                     | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |



Q5.4

**Evaluate if the following symptoms have applied to you during the past week**

|   | <b>Did not apply to<br/>me at all (0)</b> | <b>Applied to me to<br/>some degree, or<br/>some of the time<br/>(1)</b> | <b>Applied to me to<br/>a considerable<br/>degree or a good<br/>part of time (2)</b> | <b>Applied to me<br/>very much or<br/>most of the time<br/>(3)</b> |
|---|---|--|--|--|
| I couldn't seem to experience any positive feeling at all (2)   | <input type="radio"/>                     | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |
| I found it difficult to work up the initiative to do things (4) | <input type="radio"/>                     | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |
| I felt that I had nothing to look forward to (7)                | <input type="radio"/>                     | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |
| I felt downhearted and blue (9)                                 | <input type="radio"/>                     | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |
| I was unable to become enthusiastic about anything (15)         | <input type="radio"/>                     | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |
| I felt I wasn't worth much as a person (19)                     | <input type="radio"/>                     | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |
| I felt that life was meaningless (20)                           | <input type="radio"/>                     | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/>  |

**End of Block: Perceived Mental Health**

**Start of Block: COVID-19 Pandemic and Mental Health Survey**

Q6.1

In the following block, you will consider your personal awareness and attitude towards the coronavirus. Further, you will consider your mental health related to the COVID-19 pandemic.

**Note:** This is **NOT** a diagnostic assessment.

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Page Break

Q6.2

**Indicate if you think coronavirus can spread through**

- ☐ Touching (1)
  - ☐ Sneezing (2)
  - ☐ Kissing (3)
  - ☐ Food (4)
  - ☐ None of the above (6)
- 

Q6.3

**Indicate which symptoms you think the coronavirus infection include**

- ☐ Fever (1)
  - ☐ Headache (2)
  - ☐ Cough (3)
  - ☐ Sore throat (4)
  - ☐ Fatigue (5)
  - ☐ Breathing difficulty (6)
  - ☐ Chest pain (7)
  - ☐ None of the above (8)
-

Q6.4

**Which of the following statement regarding coronavirus infection is true?**

- ☐ Coronavirus is highly contagious (1)
  - ☐ Coronavirus is highly fatal (2)
  - ☐ There is no treatment as of now for coronavirus infection (3)
  - ☐ We can not prevent the transmission of coronavirus infection (4)
  - ☐ There is no evidence that self-quarantine can prevent spread of novel coronavirus (5)
- 

Q6.5

**Can isolating a person with symptoms stop the spread of the coronavirus?**

- ☐ Yes (1)
  - ☐ No (2)
  - ☐ I don't know (3)
- 

Q6.6

**Can washing your hands frequently stop the spread of coronavirus?**

- ☐ Yes (1)
- ☐ No (2)
- ☐ I don't know (3)



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Q6.7

**Can pets at home transmit coronavirus?**

- ☐ Yes (1)
  - ☐ No (2)
  - ☐ I don't know (3)
- 

Page Break

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Q6.8

**To which extent do you think**

|  | Very unlikely<br>(1)  | Somewhat un-<br>likely (2) | Neither likely<br>nor unlikely<br>(3) | Somewhat<br>likely (4) | Very likely<br>(5)    |
|--|-----------------------|----------------------------|---------------------------------------|------------------------|-----------------------|
| Washing<br>hands fre-<br>quently can<br>lower the risk<br>of coronavirus<br>infection? (1) | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>                 | <input type="radio"/>  | <input type="radio"/> |
| Traveling<br>across/within<br>the country is<br>safe during<br>these times?<br>(10)        | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>                 | <input type="radio"/>  | <input type="radio"/> |

Q6.9

**To which extent do you agree that**

|   | Strongly disa-<br>gree (6) | Somewhat<br>disagree (7) | Neither agree<br>nor disagree<br>(8) | Somewhat<br>agree (9) | Strongly agree<br>(10) |
|---|----------------------------|--------------------------|--------------------------------------|-----------------------|------------------------|
| Social distanc-<br>ing is essential<br>to stop the<br>coronavirus<br>spreading? (1)   | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/>  |
| Patients with<br>coronavirus<br>infection, who<br>are declared<br>cured, should<br>not be allowed<br>to stay within<br>the commu-<br>nity at this<br>time? (11) | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/>  |

Q6.10

**How likely are you**

|   | Very unlikely<br>(1)  | Somewhat un-<br>likely (2) | Neither likely<br>nor unlikely<br>(3) | Somewhat<br>likely (4) | Very likely<br>(5)    |
|---|-----------------------|----------------------------|---------------------------------------|------------------------|-----------------------|
| To quaran-<br>tine/isolate<br>yourself if you<br>have a fever<br>and cough? (1) | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>                 | <input type="radio"/>  | <input type="radio"/> |

Page Break

Q6.11

**During the past month, how often**



|   | Never (1)             | Occasionally<br>(2)   | Sometimes (3)         | Often (4)             | Always (5)            |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Have you thought about the COVID-19 pandemic? (1)                                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Have you felt paranoid about being exposed to the coronavirus? (6)                | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Have you avoided going to parties? (7)  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Have you avoided social contact? (8)  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Have you avoided large meetings and gatherings? (9)                               | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Have you avoided ordering food online? (10)                                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Have you talked to your friends about the pandemic? (11)                          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Have you had difficulties sleeping from worrying about the coronavirus? (12)      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Have you felt affected by posts on social media about coronavirus infection? (13) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Have you felt  
affected by  
talks about  
coronavirus  
infection in  
newspapers  
and news on  
television?  
(14)

☐☐☐☐☐

Have you felt  
a need to buy  
and stock es-  
sentials at  
home? (15)

☐☐☐☐☐

Have you got-  
ten afraid of  
reports of indi-  
viduals being  
sick in your  
social circle?  
(16)

☐☐☐☐☐

Have you felt  
the need to use  
sanitizer or  
gloves? (17)

☐☐☐☐☐

Have you felt  
the need to  
wash your  
hands con-  
stantly? (18)

☐☐☐☐☐

Have you felt  
worried about  
yourself and  
close social  
contacts re-  
garding the  
spread of the  
coronavirus?  
(19)

☐☐☐☐☐

Have you used  
a facemask  
without any  
apparent signs  
and symptoms  
of the corona-  
virus? (20)

☐☐☐☐☐

Have the idea  
of coronavirus  
infection  
freaked you  
out leading to  
inappropriate  
behaviors with  
anyone? (21)

☐☐☐☐☐

Have the idea  
of coronavirus  
infection  
freaked you  
out from posts  
on social me-  
dia? (22)

☐☐☐☐☐

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Page Break

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Q6.12

**Do you think it**

|  | No (1)                | Maybe (2)             | Yes (3)               |
|--|-----------------------|-----------------------|-----------------------|
| Would be nice to talk to someone about your worries concerning the COVID-19 pandemic? (1)                          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Is necessary to get mental health support if one panics and tells lies about the pandemic situation? (2)           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Would be beneficial if mental health professionals help people in dealing with the current COVID-19 situation? (3) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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Q6.13

**Would you suggest**

|  | No (1)                | Maybe (2)             | Yes (3)               |
|--|-----------------------|-----------------------|-----------------------|
| Mental health support when individuals are highly affected by the COVID-19 pandemic? (1) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

End of Block: COVID-19 Pandemic and Mental Health Survey

Start of Block: Athlete Received Support

Q7.1 In the following block, you will evaluate the extent of support you have received during the last month in the context of sport.

**Note:** We acknowledge that remembering the precise extent of support received in the past is difficult - keep in mind that approximating the “correct” answer is sufficient.

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Page Break

Q7.2

**During the past month, how often did someone**

|  | Not at all (1)        | Once or twice<br>(2)  | Three or four<br>times (3) | Five or six<br>times (4) | Seven or more<br>times (5) |
|--|-----------------------|-----------------------|----------------------------|--------------------------|----------------------------|
| Cheer you up?<br>(1)   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |
| Listen to you?<br>(2)  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |
| Show concern<br>for you? (3)   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |
| Make you feel<br>that they<br>would always<br>be there for<br>you? (4) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |
| Comfort you?<br>(5)  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |

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Q7.3

**During the past month, how often did someone**

|                                     | Not at all (1)        | Once or twice<br>(2)  | Three or four<br>times (3) | Five or six<br>times (4) | Seven or more<br>times (5) |
|-------------------------------------|-----------------------|-----------------------|----------------------------|--------------------------|----------------------------|
| Encourage<br>you? (2)               | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |
| Emphasize<br>your abilities?<br>(3) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |
| Tell you, you<br>can do it? (4)     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |
| Reinforce the<br>positives? (5)     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |
| Boost your<br>confidence?<br>(6)    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |

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Q7.4

**During the past month, how often did someone**

|   | Not at all (1)        | Once or twice<br>(2)  | Three or four<br>times (3) | Five or six<br>times (4) | Seven or more<br>times (5) |
|---|-----------------------|-----------------------|----------------------------|--------------------------|----------------------------|
| Give you advice about performing in competitive situations? (1) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |
| Give you tactical advice? (2)                                   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |
| Offer you ideas and suggest actions? (3)                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |
| Help you put things in perspective? (4)                         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |
| Help you decide what to do? (5)                                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |
| Give you advice about what to do? (6)                           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |

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Q7.5

**During the past month, how often did someone**

|  | Not at all (1)        | Once or twice<br>(2)  | Three or four<br>times (3) | Five or six<br>times (4) | Seven or more<br>times (5) |
|--|-----------------------|-----------------------|----------------------------|--------------------------|----------------------------|
| Help plan your training? (1)                                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |
| Help with transport to training and competition/matches? (2) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |
| Do things for you at training and competitions/matches? (3)  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |
| Help set sessions in training? (4)                           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |
| Help you with tasks? (5)                                     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |
| Help manage your training sessions? (6)                      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/>    | <input type="radio"/>      |

End of Block: Athlete Received Support

Start of Block: Demographics general population

Q8.1

**How old are you?**

▼ 18-24 years old (2) ... 65+ years old (7)

Q8.2

**What is your gender identity?**

- ☐ Male (1)
  - ☐ Female (2)
  - ☐ Non binary / transgender / third gender (3)
  - ☐ Other (4)
- 

Q8.3

**In which country do you currently reside?**

▼ Afghanistan (1) ... Zimbabwe (195)

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Q8.4

**What is the highest level of school you have completed or the highest degree you have received?**

▼ Less than high school degree (1) ... Professional degree (JD, MD) (8)

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Q8.5

**What is your occupation?**

- ☐ Management, professional, and related (1)
- ☐ Service (2)
- ☐ Sales and office (4)
- ☐ Farming, fishing, and forestry (5)
- ☐ Construction, extraction, and maintenance (6)
- ☐ Production, transportation, and material moving (7)
- ☐ Government (8)
- ☐ Retired (9)
- ☐ Other (10)

End of Block: Demographics general population

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Start of Block: Received Social Support

#### Q9.1

In the following block, you will evaluate the extent of social support you have received and provided during the past month.

**Note:** We acknowledge that remembering the precise extent of support received and provided is difficult - keep in mind that approximating the “correct” answer is sufficient.

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**Q9.2 During the past month, how often have you**  
(Contact with family)

|   | Not at all (1)        | Once or twice (2)     | 3 to 6 times (3)      | More than 6 times<br>(4) |
|---|-----------------------|-----------------------|-----------------------|--------------------------|
| Gone out to visit<br>family? (1)                      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>    |
| Had family visit<br>you? (2)                          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>    |
| Had contact by<br>phone or letter<br>with family? (3) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>    |

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Q9.3

**During the past month, how often have you**  
(Contact with friends)

|  | Not at all (1)        | Once or twice (2)     | 3 to 6 times (3)      | More than 6 times<br>(4) |
|--|-----------------------|-----------------------|-----------------------|--------------------------|
| Gone out to visit<br>friends? (1)                      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>    |
| Had friends visit<br>you? (2)                          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>    |
| Had contact by<br>phone or letter<br>with friends? (3) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>    |

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Q9.4  
**During the past month, how often has someone**  
(Tangible support received)

|  | Never (1)             | Once in a while<br>(2) | Fairly often (3)      | Very often (4)        |
|--|-----------------------|------------------------|-----------------------|-----------------------|
| Provided you with transportation? (1)  | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |
| Pitched in to help you do something that needed to get done, like household chores or yard work? (2) | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |
| Helped you with shopping? (3)  | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |

Q9.5

**During the past month, how often has someone**  
(Emotional support received)

|   | Never (1)             | Once in a while<br>(2) | Fairly often (3)      | Very often (4)        |
|---|-----------------------|------------------------|-----------------------|-----------------------|
| Listened to you<br>talk about your<br>private feelings?<br>(1)                    | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |
| Been right there<br>with you (physi-<br>cally) in a stress-<br>ful situation? (2) | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |
| Comforted you by<br>showing you<br>physical affec-<br>tion? (3)                   | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |
| Expressed interest<br>and concern in<br>your well-being?<br>(4)                   | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |

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 Page Break

Q9.6

**During the past month, how often has someone**  
(Informational support received)

|  | Never (1)             | Once in a while<br>(2) | Fairly often (3)      | Very often (4)        |
|--|-----------------------|------------------------|-----------------------|-----------------------|
| Suggested some action you should take in order to deal with a problem you were having? (1)         | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |
| Given you information that made a difficult situation easier to understand? (2)                    | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |
| Helped you understand why you didn't do something well? (3)  | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |
| Told you what they did in a stressful situation that was similar to one you were experiencing? (4) | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |

Q9.7  
**During the past month, how often have you**  
(Tangible support provided)

|  | Never (1)             | Once in a while<br>(2) | Fairly often (3)      | Very often (4)        |
|--|-----------------------|------------------------|-----------------------|-----------------------|
| Provided some-<br>one with transpor-<br>tation? (1)  | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |
| Pitched in to help<br>someone do<br>something that<br>needed to get<br>done, like house-<br>hold chores or<br>yard work? (2) | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |
| Helped someone<br>with their shop-<br>ping? (3)  | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |

Q9.8

**During the past month, how often have you**  
(Emotional support provided)

|  | Never (1)             | Once in a while<br>(2) | Fairly often (3)      | Very often (4)        |
|--|-----------------------|------------------------|-----------------------|-----------------------|
| Been right there with someone (physically) who was experiencing a stressful situation? (Q8.21) | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |
| Comforted someone by showing them physical affection? (Q8.22)                                  | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |
| Listened to someone talk about their private feelings? (Q8.23)                                 | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |
| Expressed interest and concern in someone's well-being? (Q8.24)                                | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |

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 Page Break
 

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Q9.9

**During the past month, how often have you**  
(Informational support provided)

|  | Never (1)             | Once in a while<br>(2) | Fairly often (3)      | Very often (4)        |
|--|-----------------------|------------------------|-----------------------|-----------------------|
| Suggested some action that someone should take in order to deal with a problem they were having? (1)   | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |
| Given someone some information that made a difficult situation easier to understand? (2)               | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |
| Told someone what you did in a stressful situation that was similar to one they were experiencing? (3) | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |
| Helped someone understand why they didn't do something well? (4)                                       | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |

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**Q9.10 During the past month, how often have you felt** (Negative interaction)

|   | Never (1)             | Once in a while<br>(2) | Fairly often (3)      | Very often (4)        |
|---|-----------------------|------------------------|-----------------------|-----------------------|
| That others have made too many demands on you?<br>(5)         | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |
| Others were critical of you and things you did?<br>(2)        | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |
| Those around you tried to pry into your personal affairs? (3) | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |
| Others took advantage of you?<br>(4)                          | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |

Page Break

Q9.11

**During the past month, indicate if you have been**  
(Satisfaction with support received)

|   | Satisfied (1)         | Not satisfied (2)     |
|---|-----------------------|-----------------------|
| Satisfied with the tangible support you received (1)      | <input type="radio"/> | <input type="radio"/> |
| Satisfied with the emotional support you received (2)     | <input type="radio"/> | <input type="radio"/> |
| Satisfied with the informational support you received (3) | <input type="radio"/> | <input type="radio"/> |

End of Block: Received Social Support

## Appendix 2

**Table 7**

*Type of Sport Athlete Participants are Occupied*

|       |                           | Frequency | Percent | Cumulative Percent |
|-------|---------------------------|-----------|---------|--------------------|
| Valid | American Football         | 2         | 2,4     | 2,4                |
|       | Athletics                 | 8         | 9,6     | 12,0               |
|       | Australian Football (AFL) | 1         | 1,2     | 13,3               |
|       | Badminton                 | 4         | 4,8     | 18,1               |
|       | Basketball                | 4         | 4,8     | 22,9               |
|       | Brazilian Jiu Jitsu       | 1         | 1,2     | 24,1               |
|       | Canoe                     | 1         | 1,2     | 25,3               |
|       | Climbing                  | 1         | 1,2     | 26,5               |

|                           |    |       |       |
|---------------------------|----|-------|-------|
| Crossfit                  | 1  | 1,2   | 27,7  |
| Curling                   | 1  | 1,2   | 28,9  |
| Cycling                   | 3  | 3,6   | 32,5  |
| Fencing                   | 1  | 1,2   | 33,7  |
| Figure skating            | 1  | 1,2   | 34,9  |
| Football                  | 10 | 12,0  | 47,0  |
| Handball                  | 9  | 10,8  | 57,8  |
| Hockey                    | 3  | 3,6   | 61,4  |
| Judo                      | 1  | 1,2   | 62,7  |
| Kayak                     | 1  | 1,2   | 63,9  |
| Mixed Martial Arts        | 2  | 2,4   | 66,3  |
| Olympic weightlifting     | 1  | 1,2   | 67,5  |
| Powerlifting              | 2  | 2,4   | 69,9  |
| Ringball                  | 1  | 1,2   | 71,1  |
| Road biking               | 1  | 1,2   | 72,3  |
| Rugby                     | 1  | 1,2   | 73,5  |
| Running                   | 7  | 8,4   | 81,9  |
| Shooting                  | 1  | 1,2   | 83,1  |
| Showjumping               | 1  | 1,2   | 84,3  |
| Squash                    | 1  | 1,2   | 85,5  |
| Swimming                  | 1  | 1,2   | 86,7  |
| Tennis                    | 3  | 3,6   | 90,4  |
| Triathlon                 | 3  | 3,6   | 94,0  |
| Weightlifting             | 4  | 4,8   | 98,8  |
| Wheelchair track and road | 1  | 1,2   | 100,0 |
| Total                     | 83 | 100,0 |       |

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**Table 8***Athlete Performance Level*

|                        | N  | %     |
|------------------------|----|-------|
| World elite athlete    | 4  | 4,8%  |
| National elite athlete | 33 | 39,8% |
| Competitive athlete    | 30 | 36,1% |
| Recreational athlete   | 16 | 19,3% |

**Table 9***Athletes Occupied in Individual or Team Sport*

|            | N  | %     |
|------------|----|-------|
| Individual | 48 | 57,8% |
| Team       | 35 | 42,2% |

**Table 10***Time Athletes are Occupied in Sport*

|              | N  | %     |
|--------------|----|-------|
| Full-time    | 7  | 8,4%  |
| Part-time    | 32 | 38,6% |
| Leisure-time | 44 | 53,0% |

**Table 11***Level of School Participants Completed*

|              |  | N  | %     |
|--------------|--|----|-------|
| Non-athletes | 1 Less than high school degree   | 2  | 2,4%  |
|              | 2 High school graduate (high school diploma or equivalent including GED) | 11 | 13,3% |
|              | 3 Some college but no degree   | 6  | 7,2%  |
|              | 4 Associate degree in college (2-year)                                   | 8  | 9,6%  |
|              | 5 Bachelor's degree in college (4-year)                                  | 31 | 37,3% |
|              | 6 Master's degree  | 23 | 27,7% |
|              | 7 Doctoral degree  | 1  | 1,2%  |
|              | 8 Professional degree (JD, MD)   | 1  | 1,2%  |
| Athletes     | 2 High school graduate (high school diploma or equivalent including GED) | 17 | 20,5% |
|              | 3 Some college but no degree   | 10 | 12,0% |
|              | 4 Associate degree in college (2-year)                                   | 7  | 8,4%  |
|              | 5 Bachelor's degree in college (4-year)                                  | 23 | 27,7% |
|              | 6 Master's degree  | 20 | 24,1% |
|              | 7 Doctoral degree  | 6  | 7,2%  |