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Eating habits and mental health among rugby players of the Peruvian pre-selection during the second quarantine due to the COVID-19 pandemic

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Abstract

Objectives: Social isolation during the COVID-19 pandemic impacts the mental health and diet of populations.
Aim: The aim of the study was to evaluate whether the eating habits and mental health status of the rugby players of the Peruvian pre-selection were affected by the second quarantine of the COVID-19 pandemic.
Methods: A cross-sectional study was carried out through a pre-structured online survey in 74 players, 42 men (56.8%) and 32 women (43.2%). The mean age was 20.5 ± 4.4 years. Participants completed a validated food frequency questionnaire and depression, anxiety, and stress scale-21 (DASS-21).
Results: 58.1% of the respondents reported that their dietary intake remained the same or increased. 58.3% of the players experienced anxiety, among which 26.4% reported moderate and severe symptoms. A greater proportion of participants <20 years old reported depression compared to those ⩾20 years (68.6% vs 31.4%, $p = 0.010$). Those who reported inadequate food intake were more likely to report depressive symptoms ($p = 0.006$).
Conclusion: These findings reaffirm the need to implement programs of psychological support and nutritional counseling among athletes to reduce negative symptoms and better face mental health and dietary challenges in these times of crisis.

Keywords

COVID-19, eating habits, mental health, pandemic, Peru, rugby

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Introduction

The first case of COVID-19 appeared in the city of Wuhan, China, at the end of 2019, and spread throughout the world, which is why it was reported by the World Health Organization (WHO) as a global health emergency of international importance.[1] To control the spread of the disease, authorities in various countries, including Peru, were forced to take measures such as social distancing and mandatory quarantine.[2] Although the measures may be beneficial in terms of preventing the transmission of the disease, since study findings have shown that the strict measures that were implemented promptly by the government benefited the mental health of the population;[3] however, evidence is emerging of the impact of social distancing, confinement, and mask use on mental health.[4] In addition, there are links between the COVID-19 pandemic and observed negative changes in food intake in populations.[5] The global impact of COVID-19 on mental health is an obvious fact according to various studies.[2,5,6] For example, rates of symptoms of anxiety, depression, and stress have been evidenced in a proportion between 6.33% and 50.9%, 14.6% and 48.3%, and 8.1% and 81.9%, respectively, in the population of various countries such as China, Spain, Italy, Iran, the United States, Turkey, Nepal, and Denmark.[7] In athletes, depression,

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anxiety, and traumatic stress are among the main health problems during the COVID-19 pandemic.[8]

Moreover, the pandemic control measures caused a generalized interruption in sports activities, including the training of athletes.[8] To safeguard the health of athletes, as well as those involved in sport, all sporting events and competitions at the international, national, and regional levels have been postponed or eliminated,[9] which causes a decrease in the level of physical activity of athletes.[10] For athletes, this interruption in training could represent psychological pressure, due to fear of the sudden interruption of their athletic career and, eventually, a loss of financial income or sponsorship.[11] Furthermore, it can lead to an increase in unpleasant emotions during social isolation.[12] In addition, there is a risk that when athletes return to training, they will experience a progressive loss of physical fitness, leading to an increased risk of injury[13] and mood disturbances due to lack of commitment.[14]

However, government restrictions to slow the spread of COVID-19 can significantly influence dietary intake. In athletes, they not only affect training, but they also involve changes in lifestyle including inappropriate eating habits.[15] For example, the results of a study conducted on 32 master cyclists during the COVID-19 pandemic reported inadequate nutrient intake in participants.[16] A study evaluating changes in nutritional habits in rugby players indicated that food intake during social isolation remained the same or increased.[17] It is possible that these dietary changes negatively impact the composition of athletes; therefore, they should decrease the total energy intake proportionally, considering the reduction of physical activity. Other findings from an international online survey showed that participants changed their eating habits toward an unhealthy dietary pattern.[18] Likewise, the results of an online cross-sectional study in Polish adults have reported that almost half reported having eaten more food during the pandemic.[19] It is important to follow healthy eating habits during confinement, because the sudden return to training and play after the lifting of restrictions can lead to an increased risk of injury and a healthy diet can reduce the impact.[20]

Reduced contact with club nutrition professionals, traumatic stress, depression, and anxiety caused by the COVID-19 pandemic may lead to unfavorable food choices.[21] For example, 42% of study participants who reported changes in eating behaviors during confinement attributed this change to a higher prevalence of psychological disorders such as depression and anxiety.[6] Inadequate dietary habits often coexist with psychological disorders such as depression and anxiety.[22]

Various studies were carried out in different populations and countries to identify the influence of social isolation due to the COVID-19 pandemic on food and mental health.[2,5,6] Staying home for a long time due to social isolation is also likely to negatively affect the mental health status and dietary intake of athletes. However, there are a few studies that report data in this population. More research is needed in developing countries such as Peru, to address the knowledge gap on the subject of study. Therefore, the purpose of this study was to explore the effects of the COVID-19 restrictions on food and mental health among the players of the Peruvian rugby pre-selection during the second quarantine.

Materials and methods

Participants and study design

An online cross-sectional study was carried out applying a pre-structured survey during the second quarantine in February 2021. A total of 74 athletes selected through non-probability convenience sampling participated in the study. All were members of the Peruvian Rugby Federation. Initially, the Federation's management personnel were contacted to obtain the data of the players, and they were explained what the study consisted of. The survey was administered through a Google Form. [The survey questionnaire is available as supplemental material online]. The data were collected through email and WhatsApp. Written informed consent was obtained from the participants by clicking "I wish to participate" after reading the approved informed consent that appears on the first page of the survey. Participants were not offered any incentive to answer the survey. Their participation was voluntary. In addition, they were informed that they could leave the study at any time if they wanted to. All players of the Peruvian rugby team aged 19–32 years were included in the study, and all those who did not give their written informed consent were excluded. Ethical approval to carry out the study was obtained from the Research Ethics Committee of the Universidad Peruana Unión and the number 044-2021/UPeU/FCS was registered. Finally, the survey was applied according to the protocol of the Helsinki Agreement.

Food frequency questionnaire

A food frequency questionnaire (FFQ) was used to evaluate the dietary intake of the players, adapted and validated in a previous study for use in the Peruvian population. To determine the reliability of the instrument, Cronbach's alpha was used, which resulted in a reliability index of 79.4%, being very acceptable for this type of study.[23] The questionnaire contained a variety of foods and allowed players to report how often they consume those foods. Forty-five items were considered, grouped into 16 food groups, such as meat (minced meat, red meat, chicken, and turkey), eggs, fish, dairy products, cereals, fruits, vegetables, sugary drinks, among other food groups. Each item of the questionnaire is made up of five alternative responses about the frequency in which they eat food. The answer alternatives were classified as follows: every day = 5 points, two to four times/week = 3 points, one time/week = 1 point, one to three times/month = 0.5, and never = 0 points. A score $\geqslant 5$ and <5 was considered adequate and inadequate intake, respectively. The questionnaire also asked

Table 1. Cutoff points for DASS-21 scale.

Subscales	Normal	Mild	Moderate	Severe	Extremely severe
Depression	0–4	5–6	7–10	11–13	14+
Anxiety	0–3	4–5	6–7	8–9	10+
Stress	0–7	8–9	10–12	13–16	17+

players to report which foods and beverages their consumption increased during the COVID-19 pandemic and finally asked whether their overall food intake increased, remained, or decreased during the COVID-19 pandemic.

Depression, anxiety, and stress scale

The impact of mental health was evaluated using the depression, anxiety, and stress scale-21 (DASS-21). The scale has been validated for use in Spanish, with a Cronbach's alpha of 0.91.[24] It contains 21 multiple choice questions. The responses were classified on a 4-point Likert-type scale, the scale used was 0 = never; 1 = sometimes; 2 = often, 3 = almost always, and 4 = always. It consists of three subscales that measure depression, anxiety, and stress. The DASS-21 scale has proven to be a valid measure to assess mental health during the COVID-19 pandemic in both the general population[25] and athletes.[26] Table 1 shows the classification of the subscales.

Moreover, sociodemographic data were collected such as age, sex, level of education, category of the game to which it belongs, position in the game, and adherence to the sport of rugby. In addition, dietary patterns (vegetarian and non-vegetarian) were collected.

Statistical analysis

Data were extracted, reviewed, and coded for subsequent analysis using the IBM SPSS version 26 statistical software package (SPSS, Inc., Chicago, IL, USA). Descriptive analyses were carried out based on tables of absolute frequencies and percentage distribution for all study variables, including sociodemographic data of the participants, eating habits, and mental health. To calculate the scores on the depression, anxiety, and stress subscales, discrete scores for all items were added. The total score for each subscale was categorized according to the cut-off points described in the methodology section. Chi-square test was used. Finally, to evaluate the distribution of the levels of depression, anxiety, and stress of the players according to the general data and eating habits of the players, cross-tabulation was used. Variables with a probability value (p-value) less than 0.05 were considered statistically significant.

Results

In February 2021, a total of 74 players from the Peruvian rugby pre-selection team voluntarily answered an online survey, of which 56.8% (n = 42) were men and 43.2% (n = 32) were women. The mean age was 20.5 ± 4.4 years (range = 18–32 years). 55.4% identified themselves as defenders or Backs. The largest proportion of the participants was non-vegetarian (90.5%). Finally, 51.4% were students of a technical career and 48.6 studied a university career.

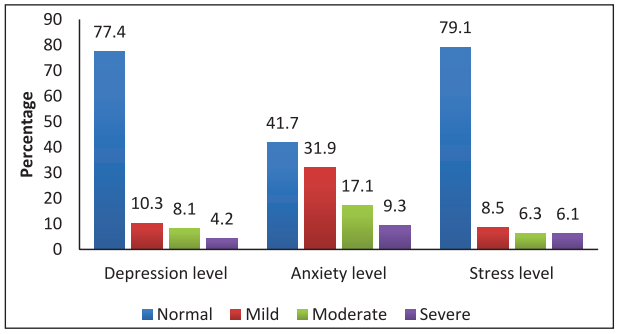

Figure 1. Distribution of the parameters of mental health disorders among rugby athletes during the second quarantine due to the COVID-19 pandemic.

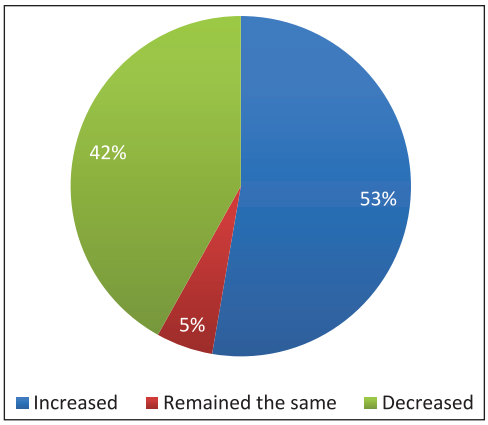

Figure 2. Responses for total food intake during the second quarantine due to the COVID-19 pandemic.

Figure 1 illustrates that 22.6% of the players reported having experienced some type of depression, whereas 10.3% reported mild symptoms, while 8.1% and 4.2% reported moderate and severe symptoms, respectively. More than half (58.3%) of the players experienced anxiety, among which 26.4% reported moderate and severe symptoms. More than 20% of the respondents in the sample reported experiencing stress and the majority 12.4% reported moderate and severe stress.

More than half of the players reported that their total food intake remained the same or increased during the pandemic (Figure 2).

Figure 3 reports on foods that increased during the COVID-19 pandemic among rugby players. More than half (59.1%) of the participants reported that they have increased the consumption of healthy food during the pandemic, considering 24% reporting consumption of fruits and vegetables, followed by 7.9%, 7.4%, 6.8%, 6.6%, and 6.4%, reporting consumption of beans, whole grains, fish, nuts and dairy products, and eggs, respectively.

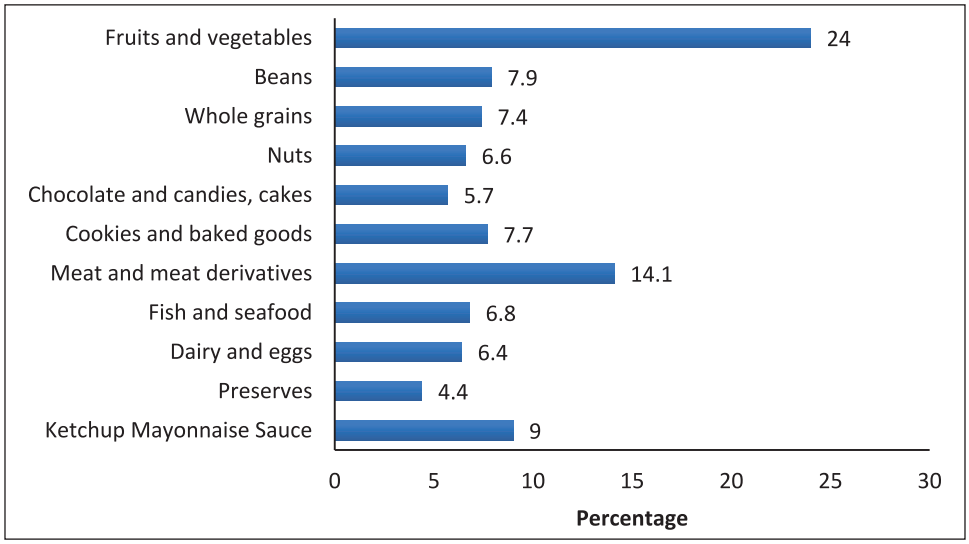

Figure 3. Foods that increased during the second quarantine due to the COVID-19 pandemic among rugby athletes.

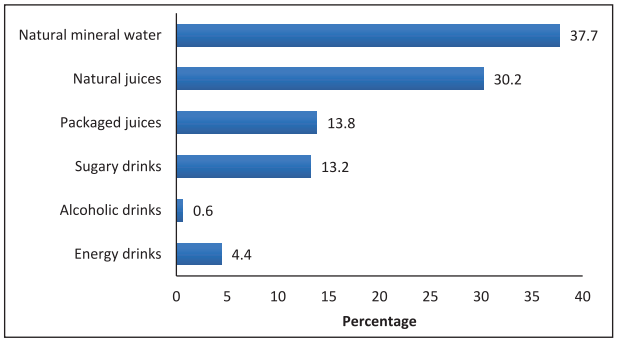

Figure 4. Beverages that increased among rugby athletes during the COVID-19 pandemic.

Figure 4 shows that more than 67% of the respondents in the sample reported that they have increased consumption of healthy beverages, with 37.7% reporting an increase in the consumption of natural water and 30.2% reporting an increase in the consumption of natural juices. There was a smaller proportion that reported increases in the consumption of alcoholic beverages (0.6%).

Table 2 shows the distribution of the psychological health characteristics of the players according to their sociodemographic, sports and dietary characteristics. More than 68% of players under 20 years of age reported depression compared to those ⩾20 years (68.6% vs 31.4%, $p = 0.010$). Furthermore, 54.3% of the players who reported inadequate food intake reported depressive symptoms, compared to 45.7% with an adequate intake ($p = 0.006$).

Discussion

Social isolation due to the COVID-19 pandemic has been adopted as a mandatory measure to reduce the risk of contagion among populations; however, these measures involve other health risks, such as depression, anxiety, stress, and alterations in lifestyle, including inappropriate eating habits.[5,18,19] The ongoing and widespread effects of the pandemic are not only seen particularly in athletes, but also in the entire general population.

In this study, more than half of the respondents reported that their dietary intake remained the same or increased during the pandemic. These findings could be due, albeit partially, to the high levels of anxiety reported by participants who reported anxiety symptoms. Our results are consistent with findings from other studies conducted in the general population during the COVID-19 pandemic, which found that high levels of anxiety were associated with overeating.[27,28] It seems that these results are also a response to boredom and loneliness.[29] In a pandemic context, characterized by widespread confinement and being at home for long periods of time, players may be exposed to more palatable foods around them, which, consequently, can lead to repeated episodes of ingesting large amounts of food. While this study did not assess the effects of COVID-19 restrictions on changes in body composition, athletes should nevertheless reduce their total energy intake in response to reduced physical activity,[30] because changes in exercise routines can result in a decrease in daily energy expenditure.[17]

In this study, when players were asked which foods increased during the pandemic, the largest proportion reported that the consumption of healthy foods such as fruits, vegetables, nuts, and fish, among others, increased. In addition, the consumption of healthy beverages such as natural water and fruit juices increased. This is consistent with a study conducted on rugby players during the restrictions imposed by the COVID-19 pandemic, showing that the majority of the study sample reported that the intake of fruits and vegetables increased, while the intake of packaged foods

Table 2. Distribution of the psychological health aspects of the players according to their sociodemographic, sports, and dietary data during the second quarantine due to the COVID-19 pandemic.

	Depression		Anxiety		Stress	
	Yes	No	Yes	No	Yes	No
Sex	*n*/%	*n*/%	*n*/%	*n*/%	*n*/%	*n*/%
Female	16 (45.7)	16 (41.0)	27 (46.6)	5 (31.3)	2 (50.0)	30 (42.9)
Male	19 (54.3)	23 (59.0)	31 (53.4)	11 (68.8)	2 (50.0)	40 (57.1)
p-value	0.684		0.274		0.779	
Age (years)						
<20	24 (68.6)	15 (38.5)	31 (53.4)	8 (50.0)	2 (50.0)	37 (52.9)
$\geqslant 20$	11 (31.4)	24 (61.5)	27 (46.6)	8 (50.0)	2 (50.0)	33 (47.1)
p-value	0.010*		0.807		0.911	
Level of instruction						
Technical	16 (45.7)	22 (56.4)	28 (48.3)	10 (62.5)	3 (75.0)	35 (50.0)
University	19 (54.3)	17 (43.6)	30 (51.7)	6 (37.5)	1 (25.0)	35 (50.0)
p-value	0.358		0.314		0.331	
Playing position						
Forward	14 (40.0)	19 (48.7)	27 (46.6)	6 (37.5)	2 (50.0)	31 (44.3)
Backs	21 (60.0)	20 (51.3)	31 (53.4)	10 (62.5)	2 (50.0)	39 (55.7)
p-value	0.451		0.519		0.823	
Adherence to sport						
<3 years	16 (45.7)	14 (35.9)	26 (44.8)	4 (25.0)	3 (75.0)	27 (38.6)
$\geqslant 3$ years	19 (54.3)	25 (64.1)	32 (55.2)	12 (75.0)	1 (25.0)	43 (61.4)
p-value	0.390		0.153		0.149	
Eating habits						
Adequate	16 (45.7)	30 (76.9)	34 (58.6)	12 (75.0)	2 (50.0)	44 (62.9)
Inadequate	19 (54.3)	9 (23.1)	24 (41.4)	4 (25.0)	2 (50.0)	26 (37.1)
p-value	0.006*		0.232		0.606	

p: chi-square test.
*$p < 0.05$ (significant).

and of convenience was less during social isolation.[17] According to this study,[17] it appears that the closure of food establishments and food delivery services, temporary restrictions on social gatherings, group get-togethers at junk food restaurants, cafes, and bars may have resulted in better healthy food options for the players. Moreover, these results are similar to the findings of an online survey applied to the Italian population in which a reduction in the intake of salty snacks, processed meats, carbonated, and sugary drinks has been reported.[31] Similarly, other studies have reported that around a quarter of participants improved their dietary intake, reporting increased consumption of healthy foods, and nearly a third decreased their consumption of sugary beverages.[32] However, these results contrast with a survey conducted in the Polish population during the period of social isolation by COVID-19 that showed that a third of the participants do not consume fresh fruits or vegetables daily.[19] Healthy eating habits play an important role and can be very beneficial for both the general population and athletes in these times of health crisis.

In addition, in this study, the drink that most decreased its consumption among players during the pandemic was alcohol. Similarly, a decrease in binge drinking and a shift toward healthy eating have been reported among a sample of participants of similar age (18–35 years) in the general population.[18] It is speculated that this trend could be explained by the fact that they are not surrounded by other friends and/or fellow drinkers.[18] In contrast, the results of two studies conducted during the pandemic on 32 master cyclists[16] and in 24 paracyclists and 1 paratriathletes,[33] respectively, they have reported an increase in alcohol intake. This is in line with other studies conducted in the general population during the COVID-19 pandemic.[34] In athletes, this could have adverse long-term effects on overall physical health, which could result in decreased performance levels.

In this study, those players who reported inadequate food intake reported depressive symptoms in a higher proportion. Diet can be an important factor in the onset and treatment of mental illness. These results are consistent with findings from recent systematic literature studies conducted before the pandemic in which it has been found that a diet dominated by adequate consumption of fruits, vegetables, and fish was associated with a lower risk of depression, instead, a diet rich in calorie-dense foods such as sugars, saturated fats, sugary drinks, and junk food was associated with a lower prevalence of depression.[35–37] It is possible that unhealthy

foods negatively affect the level of inflammation in the body and may be related to an increase in the symptoms of depression, while healthy foods characterized by being anti-inflammatory can reduce the risk and protect against mental illnesses, by reducing inflammation of the brain.[38] In addition, diets rich in antioxidants can reduce oxidative stress in a specific area of the brain, thus helping to alleviate the symptoms of depression.[35] Although the practices of sports activities are generally associated with health benefits, however, in athletes the consumption of a healthy diet recommended by experts should be encouraged, since greater adherence to a healthy diet is associated with protective effects for mental health.[39]

Some studies report mixed findings on the age with respect to the mental health of the population in relation to the health crisis of COVID-19.[40,41] However, in this study, we found that athletes under 20 years of age were more likely to present symptoms of depression compared to those of older age. These findings are similar to the results of an online survey applied to the general population during the COVID-19 pandemic, where young age is associated with an increased risk of psychological disorders such as depression, anxiety, and stress.[5] The reason for this trend could be due to the little life experience of the younger participants, the lack of previous exposure to disasters, or similar crises. Some literature has suggested that constant exposure to screens and easy access to information through social networks could explain the greater depression and stress among the youngest.[42] In addition, it is speculated that in addition to financial concerns, the need for both parents to telecommute while educating their children could be another stressor impacting younger age groups on mental health.[5] Another important factor to consider is the student-athlete condition of the sample in this study (51.4% were students of a technical career and 48.6% studied a university career). Findings from a recent study provide insight into the potentially adverse effects of the COVID-19 pandemic on the mental health of student-athletes.[43] The impact of the COVID-19 pandemic is not only evident on the psychological well-being, but also on the physical and social well-being of student-athletes. Faced with this situation, some timely recommendations have been made to address the impact of COVID-19 on the mental health of student-athletes, emphasizing the role of sports organizations and academic institutions in managing and monitoring the mental health of students-athletes. This population is a vulnerable group that may require additional mental health support with a personalized care approach that is tailored to their academic and athletic lifestyles.[44]

Participation in sports activities is generally associated with mental health benefits.[45] The results of this study show that participants were less likely to report depression and stress. A study that explored changes in the mental health of professional athletes during the COVID-19 pandemic has shown that the mental health status of athletes was better compared to non-athletes.[8] On one hand, this could be explained by the fact that rugby is a team sport. Team athletes appear to be less affected by disturbing psychological disorders.[9] Having the support of other team members could be beneficial in resisting in the face of the adversities and emotional challenges of the pandemic.[46] In fact, social interaction, even with distancing between team athletes and feelings of belonging, could reduce the levels of symptoms of mental disorders, being an effective "buffer" against psychological distress.[8,47] On the other hand, carrying out activities can reduce the symptoms of mental disorders by promoting positive thoughts in people and can serve as a coping tool in the face of negative events.[48] In addition, the results of some studies highlight the use of cognitive-behavioral therapy as one of the effective strategies to reduce feelings of depression and stress during the COVID-19 pandemic.[49]

However, constantly thinking about negative events can increase the risk of anxiety symptoms.[50] Moreover, when negative thoughts are persistent over time, there is a possibility that the beneficial effects of physical exercise are not enough to control or reject them.[8] This could justify the results of this study, where more than half of the participants had different degrees of anxiety symptoms. It is possible that intense negative thoughts about the risks of contagion with COVID-19 and restrictions can reduce the positive effects of physical exercise on the mental health of players, increasing symptoms of anxiety. In addition, during social isolation due to COVID-19, players trained infrequently and for shorter periods of time, which can lead to an increased risk of anxiety symptoms. The results of a study in which 565 elite and sub-elite athletes were surveyed found that the period of social isolation due to COVID-19 was associated with an increase in symptoms of depression, anxiety, and stress.[10] It is possible that stress related to uncertainty regarding dates of return to sports activities and prolonged social isolation can lead to an unfavorable state of mental health for athletes. Studies carried out in the general population have shown that the pandemic period leads to an increase in symptoms of depression, anxiety, and post-traumatic stress.[5,6,8] It is speculated that changes in people's lifestyles, separation from loved ones, fear of infection, and negative thoughts about the health of those they love could explain these changes in mental health.[51] These results highlight the urgent need to consider the impact of the restrictions imposed by the COVID-19 pandemic and accelerate the implementation of preventive measures to improve the mental health of the general population and, particularly, athletes.

Limitations

This study has some limitations that must be considered. For example, it was not possible to carry out pre- and post-analysis because there was no line on mental health before the pandemic, so it was not possible to carry out pre-post analysis of mental health symptoms; consequently, we are not sure that increased anxiety is related to COVID-19. In

addition, considering the anonymous nature and subjectivity of online survey responses, it is possible that players do not respond honestly and that the responses may not reflect the sentiment of the participants. This study used self-reported but validated questionnaires to measure symptoms of depression, anxiety and stress; however, clinical diagnoses of psychological symptoms made by a physician based on health care data were not used. The gold standard for establishing psychiatric diagnosis requires a structured interview and functional neuroimaging.[49,52,53] Moreover, response bias constitutes a weak point in this study, considering that athletes who were initially more anxious, stressed, and with depressive symptoms due to the pandemic may have been less likely to participate in the study. This could result in an underestimation of the true burden of the parameters reported in the study. Regarding dietary intake, it is difficult to obtain precise answers when participants are asked if there have been changes in their food or drink intake as a result of the restrictions imposed by the pandemic, considering that we have not requested information on macronutrient intake and essential micronutrients. Another limitation is that the survey only provided cross-sectional data on the mental health status and eating habits of the athletes; therefore, the longitudinal studies are required to consider causal and temporal inferences. It is important to mention that the sample size/power analysis was not performed; in addition, the sample was selected by non-probability sampling instead of considering a random selection, these factors may limit the generalizability of the results and conclusions of the study. Furthermore, this study lacks adequate statistical analyzes (logistic regression) due to the size of the sample ($n = 74$); however, we believe that these limitations do not invalidate the results of this study because it provides evidence that may be important to implement nutritional education and mental health promotion programs in athletes.

Conclusion

In conclusion, the risks of depression are evident among Peruvian rugby players who reported inadequate food intake. Food is an essential component of psychological well-being, yet it is often overlooked, especially in times of crisis. Moreover, current research provided insight into changes in dietary intake during the COVID-19 pandemic. Likewise, anxiety is prevalent among Peruvian rugby players. Although physical exercise is beneficial in preventing mental health symptoms, it is possible that intense negative thoughts about the risks of contagion to COVID-19 and restrictions can reduce the positive effects of physical exercise on the mental health of players, increasing anxiety symptoms. However, participants were less likely to report depression and stress. Feelings of belonging to the team and having social support, such as your teammates and coaches, can be beneficial in resisting in the face of the adversities and psychological challenges of the pandemic. The findings of this study suggest that as the health crisis due to COVID-19 continues to evolve, it is important to monitor the emotional well-being and dietary intake of athletes. Finally, implementing a program of psychological support for players and nutritional counseling can help reduce negative symptoms and better face mental health and dietary challenges in these times of crisis. Furthermore, future interventions based on athletes could analyze the perception and willingness of athletes to receive the COVID-19 vaccine as part of the measures to face the pandemic.

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Author contributions

D.M.D.-T. conceptualized this study, and G.E.V.-S. designed the study, wrote the protocol, and collected the data. D.M.D.-T., G.E.V.-S., M.R.-V., Y.E.C.-M., and J.S. conducted the literature searches and provided abstracts of previous research studies. D.M.D.-T and J.-S. performed the statistical analysis and interpretation of the data. D.M.D.-T., G.E.V.-S., M.R.-V., and Y.E.C.-M. wrote the first draft of the manuscript. They all read and approved the final manuscript.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval

The study was carried out considering the criteria established in the Declaration of Helsinki and received the approval of the Research Ethics Committee of the Universidad Peruana Unión and registered under the reference no. 044-2021/UPeU/FCS.

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Informed consent

Written informed consent was obtained from all subjects before the study.

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Supplemental material

Supplemental material for this article is available online.

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