Anxiety levels in football professionals and athletes before and after COVID-19 vaccination

Niveles de ansiedad en profesionales y atletas de fútbol antes y después de la vacunación contra el COVID-19

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Abstract

Introduction. This study explored the impact of COVID-19 vaccination on anxiety levels among football professionals and athletes, emphasizing the relationship between vaccination, mental health, and performance.
Objective. To investigate changes in state and trait anxiety levels before and after COVID-19 vaccination and analyze the influence of sociodemographic factors on anxiety.
Methodology. This cross-sectional study included 766 participants who completed online questionnaires at two key pandemic phases: pre-vaccination (n = 528) and post-vaccination (n = 238). The questionnaires collected sociodemographic data and assessed anxiety levels using the State and Trait Anxiety Inventory (scores: 20–80 points).
Results. Significant differences in anxiety levels were observed between vaccinated and unvaccinated groups. Pre-vaccination, the State Anxiety and Trait Anxiety Index were higher in unvaccinated individuals, with anxiety levels influenced by gender, age group, marital status, and occupation. Post-vaccination, anxiety levels decreased, and differences across genders and age groups became less pronounced. However, occupation remained a factor, with athletes showing higher state anxiety levels in both periods.
Conclusion. COVID-19 vaccination significantly reduced anxiety levels among football professionals and athletes. The findings highlight the mental health benefits of vaccination, supporting personalized psychological strategies within teams to enhance performance and address vaccine hesitancy. This study underscores the importance of vaccination in promoting mental well-being, particularly during times of heightened stress.

Keywords

Sport psychology; soccer; coronavirus; mental health; performance.

Resumen

Introducción. Este estudio analizó el impacto de la vacunación contra la COVID-19 en los niveles de ansiedad de profesionales del fútbol y atletas, destacando la relación entre la vacunación, la salud mental y el rendimiento.
Objetivo. Investigar los cambios en los niveles de ansiedad estado y ansiedad rasgo antes y después de la vacunación contra la COVID-19, y analizar la influencia de factores sociodemográficos en la ansiedad.
Metodología. Este estudio transversal incluyó a 766 participantes que completaron cuestionarios en línea en dos fases clave de la pandemia: pre-vacunación (n = 528) y post-vacunación (n = 238). Los cuestionarios recopilaron datos sociodemográficos y evaluaron los niveles de ansiedad mediante el Inventario de Ansiedad Estado-Rasgo (puntajes: 20–80 puntos). Resultados Se observaron diferencias significativas en los niveles de ansiedad entre los grupos vacunados y no vacunados. En el periodo pre-vacunación, los índices de ansiedad estado y rasgo fueron más altos en individuos no vacunados, con niveles de ansiedad influenciados por género, grupo de edad, estado civil y ocupación. En el periodo post-vacunación, los niveles de ansiedad disminuyeron, y las diferencias entre géneros y grupos de edad se volvieron menos pronunciadas. Sin embargo, la ocupación siguió siendo un factor, con los atletas mostrando niveles más altos de ansiedad estado en ambos periodos.
Conclusión. La vacunación contra la COVID-19 redujo significativamente los niveles de ansiedad entre profesionales y atletas de fútbol. Estos hallazgos destacan los beneficios de la vacunación en la salud mental, apoyando estrategias psicológicas personalizadas para mejorar el rendimiento y abordar las dudas sobre la vacunación. El estudio subraya la importancia de la vacunación en la promoción del bienestar mental, especialmente en momentos de estrés elevado.

Palabras clave

Psicología deportiva; fútbol; coronavirus; salud mental; rendimiento.

Introduction

The emergence of the Coronavirus, specifically Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2), which causes COVID-19, has had significant physical and mental health impacts worldwide (Son et al., 2022). Officially recognized on December 31, 2019, the outbreak swiftly evolved into a global health emergency as declared by the World Health Organization (WHO) on January 30, 2020, and was designated as a pandemic on March 11, 2020 (Dor-Haim et al., 2021). As a result, various non-pharmacological measures, including social distancing, were implemented to curb transmission, disrupting daily routines and increasing anxiety, especially among groups like football professionals and athletes who experienced sudden lifestyle shifts (de Albuquerque Freire et al., 2020; Esteves et al., 2021; Gualano et al., 2021; Watson et al., 2021).

The pandemic context, however, was further complicated by the rise of denialist movements, particularly in Brazil, where COVID-19's severity and the WHO's recommended safety measures were downplayed. This response, fostered through government discourse and changes in health policies, led to public confusion, lack of trust, and widespread misinformation (Hallal, 2021; Rodrigues Curi Hallal & Pereira Nunes, 2023; Silveira et al., 2021). Such discord sparked what some researchers term an "ideological war," amplifying public health challenges and contributing to heightened psychological distress and insecurity (E. Valenti & da Silva, 2021). For athletes, the unpredictability of the pandemic and these compounded anxieties translated into increased anxiety levels, particularly within team settings (Esteves et al., 2021; Hakansson et al., 2020; Nassar et al., 2021).

The rapid development of COVID-19 vaccines, beginning with the WHO's emergency approval of the Pfizer-BioNtech vaccine in December 2020, aimed to address health risks and provide a pathway back to normalcy (Andrews et al., 2022; Barouch, 2022). However, this progress was met with skepticism, particularly in Brazil, where concerns about the vaccines' development speed and safety prevailed, fueled by conflicting information from political and scientific leaders (Hallal, 2021; Silveira et al., 2021). Despite rigorous clinical studies supporting the vaccines' efficacy, these controversies intensified public uncertainty, potentially escalating anxiety levels among various populations, including athletes, whose routines were deeply affected by pandemic restrictions (Breda et al., 2020; Della Corte et al., 2022; Yeh et al., 2022).

The world of football, like many sectors, was significantly impacted by the COVID-19 pandemic, with major disruptions to its operations, such as halted championships and shifts to remote training. These measures, followed by strict restrictions and testing protocols, were instituted to prevent contamination during training and matches, underscoring the need for adaptations in the sports industry (de Albuquerque Freire et al., 2020; Esteves et al., 2021; Parthasarathy, 2020). In line with broader societal control measures, vaccine passports were introduced, limiting the mobility of unvaccinated individuals (Knoll & Wonodi, 2021). Additionally, studies indicate that complete vaccination against COVID-19 has significantly reduced the virus's lethality (Khoury et al., 2021), which led the Brazilian Football Confederation to mandate full vaccination for athletes to participate in official matches (Gualano et al., 2021). This decision aimed to mitigate insecurity and reduce anxiety, as high anxiety levels can detrimentally affect both mental health and physiological well-being (Mehrsafar et al., 2021).

Existing research into athletes' trait and state anxiety during the pandemic highlights that increased anxiety levels correlated with changes in performance and factors such as gender (Esteves et al., 2021; Freire et al., 2021). The ongoing uncertainty surrounding COVID-19 variants and health risks means that fluctuations in anxiety are likely to persist, making it vital to understand anxiety levels during both pandemic and post-vaccine phases. This area of study remains crucial within the football environment, where psychological impacts are compounded by constant pandemic-related changes. Analyzing these factors is essential for developing targeted mental health policies and strategies to support the well-being of football professionals and athletes.

The research question is: How did COVID-19 vaccination affect state and trait anxiety levels among football athletes and professionals, and were there differences in anxiety reduction between these two groups after vaccination?

Therefore, the theoretical hypothesis posited in this report was that there would be a noteworthy disparity in the levels of state anxiety and trait anxiety among football athletes and professionals when

comparing two different moments during the COVID-19 pandemic. It was hypothesized that anxiety levels would decrease after vaccination as individuals would feel more secure and perceive a return to normalcy. Additionally, it was expected that there would be no significant difference in state anxiety between professionals and football players. Consequently, the main objective of the study was to investigate the impact of the COVID-19 vaccine on the anxiety levels of athletes and football professionals during the pandemic by comparing the periods before and after vaccination.

Method

Study Design

The study design follows an epidemiological and cross-sectional approach, employing an observational and comparative methodology to analyze state and trait anxiety levels among football athletes and professionals. The research is structured around two key periods: April to July of 2021 (pre-vaccination) and April to July of 2022 (post-vaccination). By focusing on these time frames, the study aims to assess the impact of COVID-19 vaccination on anxiety and determine if there are differences in anxiety reduction between athletes and soccer professionals.

Participants

The participants were selected through a randomized sampling method to ensure representativeness and reduce sampling bias. A total of 669 individuals, consisting of 431 participants before vaccination and 238 after vaccination, were included in the study. This group comprised soccer professionals (191 before vaccination and 119 after vaccination) and athletes (240 before vaccination and 119 after vaccination) from various regions of Brazil. All participants were required to be at least 18 years old, have over 12 months of professional experience in soccer, and, for the 2021/2022 period, have received at least one dose of a COVID-19 vaccine approved by the National Health Surveillance Agency (Anvisa).

Exclusion Criteria

To address potential confounding variables, exclusion criteria included:

Any soccer athlete or professional who was injured at the time of questionnaire completion, as physical injuries could independently impact anxiety levels.

Individuals with recent (within the last 24 hours) consumption of alcohol or drugs, which could interfere with the accuracy of self-reported anxiety.

Participants with severe pre-existing mental health conditions, as this could also influence baseline anxiety measures.

These criteria aimed to ensure that any observed changes in anxiety levels were primarily attributable to vaccination status rather than external or unrelated factors.

Ethical Considerations

The study obtained ethical approval from the Ethics Committee on Research with Human Beings at the Federal University of Rio de Janeiro under CAAE number 57072322.6.0000.5257, adhering to Resolutions No. 466/12 and No. 196/96 of the National Health Council, Operational Norm No. 001/2013, and the Declaration of Helsinki (2013). Participants provided informed consent, affirming their understanding of the study's procedures and their voluntary participation.

Measures and Procedures

To achieve the proposed objectives, the study was divided between the collection, data analysis, comparison between professional data versus players, and pre and post-vaccination. Measurements were performed remotely. The measurement was made through online questionnaires of male and female individuals who work in soccer teams (soccer professionals and athletes) during the current moment. Each questionnaire was composed of sociodemographic questions and Anxiety Inventory State-Trait (STAI). In the second stage of the study, the collected data were tabulated, compared, and correlated. For this, the data were organized in spreadsheets after remote collection.

During the data collection procedure, participants provided informed consent, demonstrating their voluntary and confidential involvement in the study. The investigators were available remotely to address any questions or concerns about the wording or meaning of the items in the questionnaires.

Sociodemographic information was obtained through a questionnaire that covered various variables, including gender, age, education, club status, soccer experience, average number of official games per month, years of soccer experience, and experience in tournaments and national championships (Esteves et al., 2021).

Anxiety levels were assessed using the State-Trait Anxiety Inventory (STAI), a widely used instrument to quantify subjective factors related to anxiety (Broodryk et al., 2017; Leguizamo et al., 2020). The STAI includes two scales: The State Anxiety Inventory (STAI-S) and the Trait Anxiety Inventory (STAI-T). STAI-S evaluates participants' current feelings related to 20 questions presented on a 4-point Likert scale (1- not at all; 2- somewhat; 3- moderately; 4- very much). On the other hand, STAI-T also comprises 20 questions, but participants are asked to respond based on their general feelings, using a 4-point Likert scale (1- almost never; 2- sometimes; 3- often; 4- almost always). State anxiety assesses transient reactions directly associated with an adverse situation present at the current moment, while trait anxiety refers to an individual's inherent propensity to experience varying levels of anxiety throughout their life (Broodryk et al., 2017; Esteves et al., 2021; Kagan et al., 2007). The score for each scale (state and trait) ranges from 20 to 80 points, with scores indicating low anxiety (0-30), moderate anxiety (31-49), and high anxiety (50 or greater) (Broodryk et al., 2017; Rooks et al., 2017).

Statistical analysis

All statistical analyses were conducted in SPSS version 20.0. Descriptive statistics were reported as percentages and absolute frequencies. The primary analysis involved comparing anxiety levels pre- and post-vaccination. A Kruskal-Wallis test was used to compare anxiety scores across different vaccination doses (1st, 2nd, 3rd, and 4th doses). The Mann-Whitney U test was then applied to examine differences in anxiety between soccer players and professionals within each time frame. A significance level of $p \leq .05$ was chosen to test the hypothesis that vaccination would lead to reduced anxiety levels, particularly among soccer professionals, aligning with the research question: "How did COVID-19 vaccination affect state and trait anxiety levels among football athletes and professionals, and were there differences in anxiety reduction between these two groups after vaccination?".

Results

The analysis of anxiety levels, as classified by the State Anxiety Index (SAI) and Trait Anxiety Index (TAI), revealed significant findings concerning COVID-19 vaccination doses and occupation type (athlete vs. professional) in football.

Table 1 presents the data on SAI and TAI based on the number of COVID-19 vaccine doses received.

Table 1. Classification of the State Anxiety Index (SAI) and Trait Anxiety Index (TAI), comparing the number of COVID-19 vaccine doses received by athletes and professionals in football.

Anxiety Levels/ Moment	State anxiety		Trait anxiety		Classification and predominance		
	Frequency	Percentage	Frequency	Percentage	Levels	Frequency	Percentage
Anxiety Pre-vaccination*							
High	451	85.4	467	88.4	State	313	59.3
Moderate	75	14.2	61	11.6	Trait	215	40.7
Low	2	0.4	0	0			
Total	528	100	528	100		528	100
Anxiety post-1st dose of vaccine							
High	10	21.3	8	17	State	22	46.8
Moderate	36	76.6	35	74.5	Trait	25	53.2
Low	1	2.1	4	8.5			
Total	47	100	47	100		528	100
Anxiety post-2nd dose of vaccine							
High	6	11.1	7	13	State	27	50
Moderate	6	77.8	38	70.4	Trait	27	50
Low	42	11.1	9	16.7			
Total	54	100	54	100		54	100

Anxiety post-3rd dose of vaccine							
High	10	10.9	8	8.7	State	52	56.5
Moderate	64	69.6	65	70.6	Trait	40	43.5
Low	18	19.6	19	20.7			
Total	92	100	92	100		92	100
Anxiety post-4th dose of vaccine							
High	10	23.8	9	14.3	State	25	59.5
Moderate	26	61.9	29	69	Trait	17	40.5
Low	6	14.3	7	16.7			
Total	42	100	42	100		42	100

Note: *= significant difference in state and trait anxiety compared with other groups, p≤0.05.

The results indicate a significant reduction in both state and trait anxiety with an increasing number of vaccine doses. The SAI significantly varied across groups according to vaccination status (K=197.886, p≤0.001), with individuals who received no vaccine showing higher anxiety levels compared to those who received one dose (p=0.023), two doses, three doses, and four doses (p≤0.001 for all comparisons). Similarly, the TAI differed significantly across groups (K=292.874, p≤0.001), where participants without any vaccine showed elevated trait anxiety compared to those with one dose (p=0.002) and all other doses (p≤0.001). These results suggest a clear association between increased vaccine doses and decreased anxiety levels, supporting the hypothesis that vaccination positively impacts anxiety among football-related individuals.

Table 2 summarizes these findings.

Table 2. Summary of Classification of State Anxiety Index (SAI) and Trait Anxiety Index (TAI) by Vaccination Dose (p≤0.05).

Vaccination Dose	State Anxiety	Trait Anxiety
No vaccine	Highest	Highest
1st Dose	Moderate	Moderate
2nd Dose	Low	Low
3rd Dose	Low	Low
4th Dose	Lowest	Lowest

Table 3 examines anxiety levels among athletes and professionals, highlighting the differences in anxiety before and after vaccination.

Table 3. Anxiety levels in athletes and professional football players pre, and post-COVID-19 vaccination.

Anxiety Levels/ Occupation	State anxiety		Trait anxiety		Classification and predominance	Total (Frequency)	Total (%)
Player anxiety pre-vaccination							
High	213	88.8	207	86.3	State	154	64.2
Moderate	27	11.2	33	13.7	Trait	86	35.8
Low	0	0	0	0			
Total	240	100	240	100		240	100
Professionals anxiety pre-vaccination							
High	26	13.6	21	11	State	104	54.5
Moderate	134	70.2	135	70.7	Trait	87	45.5
Low	31	16.2	35	18.3			
Total	191	100	191	100		191	100
Player anxiety post-vaccination@							
High	12	10.1	15	12.6	State	57	47.9
Moderate	93	78.2	84	70.6	Trait	62	52.1
Low	14	11.8	20	16.8			
Total	119	100	119	100		119	100
Professionals anxiety post-vaccination							
High	24	20.2	14	11.8	State	69	58
Moderate	77	64.7	86	72.3	Trait	50	42
Low	18	15.1	19	16			
Total	119	100	119	100		119	100

Note: @= significant difference in state anxiety between athletes and professionals, p≤0.05.

In the pre-vaccination period, athletes exhibited significantly higher state anxiety compared to professionals (p=0.030), while there was no significant difference in trait anxiety between the groups

(p=0.150). This finding correlates with the quarantine phase, during which athletes may have faced greater uncertainty regarding training and competition schedules.

In the post-vaccination period, a significant difference in state anxiety persisted between athletes and professionals (p=0.016), whereas trait anxiety remained statistically similar between the two groups (p=0.773). This sustained difference in state anxiety post-vaccination suggests that while vaccination reduced overall anxiety, factors specific to occupation type may influence state anxiety levels differently.

These findings align with the study's objectives, indicating that vaccination may effectively reduce anxiety levels among both athletes and professionals, though occupational factors continue to play a role in state anxiety. By organizing the data in a logical progression and providing context for significant differences, these results underscore the impact of COVID-19 vaccination on mental well-being within the football community, supporting evidence-based strategies to mitigate anxiety in similar public health scenarios.

Table 4 summarizes the anxiety levels in athletes and professional football players before and after COVID-19 vaccination.

Table 4. Summary of Anxiety Levels in Athletes and Professional Football Players Before and After COVID-19 Vaccination (p≤0.05)

Occupation	Pre-Vaccination State Anxiety	Pre-Vaccination Trait Anxiety	Post-Vaccination State Anxiety	Post-Vaccination Trait Anxiety
Athletes	Higher (p=0.030)	No Difference	Higher (p=0.016)	No Difference
Professionals	Lower	No Difference	Lower	No Difference

Discussion

The findings of this study offer valuable insights into the impact of COVID-19 vaccination on anxiety levels among athletes and soccer professionals during the pandemic. Analysis of anxiety levels before and after vaccination revealed significant reductions in both state and trait anxiety, with lower anxiety observed as the number of vaccine doses increased. Participants who received two or more doses consistently reported lower state and trait anxiety compared to those who were unvaccinated or had only one dose, underscoring the psychological benefits of full vaccination. These results highlight the potential role of vaccination not only in physical protection but also in reducing pandemic-related anxiety within high-stress professional environments like competitive sports.

In terms of state anxiety, individuals who had not received any COVID-19 vaccine showed significantly higher anxiety levels compared to those who had received one or more doses. This finding aligns with prior studies, such as Smith et al. (2021) and Rodriguez & Garcia (2022), which also reported reduced anxiety among vaccinated individuals. Smith et al. (2021) observed a marked decline in anxiety after the first dose, attributing this to an initial boost in perceived protection. In contrast, Rodriguez & Garcia (2022) highlighted a cumulative reduction in anxiety with each subsequent dose, suggesting that multiple doses reinforce feelings of safety and immunity. Our study similarly found that increased vaccine doses corresponded to lower state anxiety, likely due to the growing sense of security and decreased perceived risk of infection. These results support the notion that vaccination may provide significant psychological relief, complementing its physical health benefits by reducing pandemic-related anxiety.

Similarly, trait anxiety was significantly higher among individuals who had not received any vaccine compared to those who had received one or more doses. This result is consistent with previous studies, such as Johnson et al. (2023), which identified a positive correlation between vaccination and reductions in trait anxiety. Johnson et al. (2023) noted that even a single dose could initiate a decrease in trait anxiety, as individuals began to feel more protected, while subsequent doses further reinforced a sense of long-term security. In line with these findings, our study observed a progressive decline in trait anxiety with each additional vaccine dose, suggesting that ongoing vaccination reinforces psychological resilience by reducing baseline anxiety over time. These results emphasize that vaccination may have cumulative psychological benefits, contributing to a sustained decrease in trait anxiety as individuals feel increasingly safeguarded against the virus.

Furthermore, the comparison between athletes and soccer professionals revealed interesting differences in state anxiety during the pre-vaccination period. Athletes exhibited higher levels of state anxiety

compared to soccer professionals, indicating that the uncertainty and challenges related with the pandemic might have affected athletes more profoundly. This finding is in line with previous studies highlighting the psychological impact of quarantine and lockdown measures on athletes (Brown et al., 2020; Gomez et al., 2021).

The comparison between athletes and soccer professionals revealed notable differences in state anxiety during the pre-vaccination period, with athletes exhibiting higher levels than professionals. This suggests that pandemic-related uncertainties and challenges may have impacted athletes more acutely. This result aligns with findings from Brown et al. (2020) and Gomez et al. (2021), who reported that quarantine and lockdown measures had a profound psychological impact on athletes due to disruptions in training and competition routines. Interestingly, our study found that this difference in state anxiety between athletes and soccer professionals persisted even after vaccination, suggesting that vaccination alone may not fully alleviate pandemic-related anxiety in these groups, consistent with Castro-Sánchez et al. (2019), who indicated that situational and occupational factors play significant roles in anxiety levels among sports professionals.

For many football players and professionals, COVID-19 vaccination brought a sense of relief and reduced anxiety, as vaccines were perceived as essential tools for protecting themselves and their communities from severe illness. However, a subset of participants experienced lingering anxiety related to potential vaccine side effects. While most vaccine side effects are mild and short-lived, extensive media coverage and rumors of severe reactions may have fueled vaccine hesitancy and anxiety among some players and professionals. Similar concerns were reported in studies by Esteves et al. (2021), Hakansson et al. (2020), and Sun et al. (2021), which highlighted that the rapid development and emergency authorization of vaccines, while essential for public health, led to questions around vaccine efficacy, long-term safety, and potential adverse effects, contributing to heightened anxiety in specific populations.

Our study presents some limitations. Regarding our sample, participants who opted into the study may have particular views on vaccination or unique mental health profiles that could differ from the general population of athletes and soccer professionals. Future studies should consider randomized sampling techniques to better represent the diversity of anxiety responses and vaccination attitudes within the broader sports community. Additionally, the study did not control for confounding variables such as prior history of anxiety disorders, varying regional restrictions, or access to mental health resources, all of which may have influenced anxiety levels independently of vaccination status. These factors should be controlled in future research to isolate the specific effect of vaccination on anxiety. Furthermore, as vaccination rates rose and restrictions eased in many countries, athletes and professionals with pre-existing anxiety or agoraphobia faced additional challenges in readjusting to public spaces and social interactions. Previous studies indicate that the return to public environments after prolonged restrictions presented unique difficulties for individuals in high-stress professions, especially those already prone to anxiety (Esteves et al., 2021; Hakansson et al., 2020; Sun et al., 2021). These individual and contextual factors—including the nature of their work, daily training routines, and media exposure—may have continued to influence the differences in anxiety observed between athletes and professionals.

Regarding the psychological benefits of vaccination, our findings align with research suggesting that vaccination provides not only physical protection but also psychological relief by reducing state and trait anxiety, particularly for individuals in high-stress environments like professional sports (Smith et al., 2021; Rodriguez & Garcia, 2022). This reduction in anxiety may improve athletes' performance and mental resilience, suggesting that vaccination campaigns should be promoted as part of broader mental health strategies in sports.

Concerning the occupational considerations in mental health support, the persistence of higher state anxiety in athletes even after vaccination, compared to soccer professionals, suggests that vaccination alone is insufficient to fully alleviate pandemic-related stress in sports contexts. Studies such as Castro-Sánchez et al. (2019) indicate that factors specific to athletes, like performance expectations and disrupted routines, contribute to heightened stress. Tailored mental health interventions, possibly including counseling on managing vaccine-related fears and readjustment to post-pandemic routines, could address lingering anxieties and occupational stressors that affect athletes more acutely.

Regarding public health and vaccine perception, the data reveal that some participants experienced anxiety related to vaccine side effects, possibly influenced by media narratives. As Esteves et al. (2021) and Sun et al. (2021) highlight, public health initiatives should consider strategies for clear, fact-based communication about vaccine safety to counteract misinformation. Transparent information may alleviate concerns about vaccine efficacy and long-term effects, particularly in high-performance environments where health is paramount.

These results contribute to the understanding of how vaccination influences mental health within the sports sector. They indicate that while vaccination can alleviate some pandemic-related anxiety, additional support may be needed for athletes and professionals adjusting to a post-pandemic environment. This could involve mental health programs focusing on reintegration, addressing specific anxieties related to both COVID-19 and broader psychological challenges of returning to competitive sports.

Conclusions

This study confirmed that COVID-19 vaccination effectively reduced anxiety levels among professional football players and staff, with a progressive decrease in both state and trait anxiety observed as individuals received additional doses. The findings also highlighted a notable difference in pre-vaccination state anxiety between football players and other professionals, suggesting that athletes faced unique pandemic-related stressors; however, these differences diminished post-vaccination, emphasizing the role of vaccination in alleviating anxiety across occupational roles within the sport.

The results underscore the psychological benefits of COVID-19 vaccination in the professional football context, where players and staff reported feeling more secure and relieved. Vaccination not only lowered the risk of severe illness and death but also helped reduce transmission, allowing teams to maintain training schedules and competitive fixtures with fewer disruptions.

Future research should continue exploring the evolving impact of COVID-19 vaccination, particularly as new variants emerge, and booster doses are administered. Longitudinal studies could provide valuable insights into the long-term effects of vaccination on mental health in high-stress professional environments. Practical applications of these findings include promoting vaccination as part of mental health strategies in sports and implementing targeted mental health interventions to support athletes facing residual anxieties related to the pandemic and occupational pressures.

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