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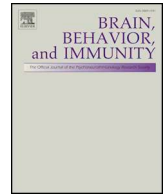
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Contents lists available at ScienceDirect

Brain, Behavior, and Immunity

journal homepage: www.elsevier.com/locate/ybrbi

Addressing potential impact of COVID-19 pandemic on physical and mental health of elite athletes



Dear Editor,

Coronavirus disease 2019 (COVID-19) is now a highly contagious and fatal respiratory pandemic that is having a large negative impact on many different aspects of society, one in particular, sports. Heeding health authorities' recommendations, several national and international athletic events, including the 2020 Olympics, have been postponed or canceled in an attempt to limit the virus spread by attending crowds. These cancellations and wide-spread mandates for social distancing are negatively affecting athletes who are unable to continue regular training (World Health Organization, 2020a). Numerous positive COVID-19 tests in competitive athletes at the global level and in premier leagues have demonstrated that no one is safe (Corsini, Bisciotti, Eirale, & Volpi, 2020). The applied quarantine regulations and subsequent isolation have affected many elite athletes' ability to practice. Videos from many well-known athletes show that overcoming the challenges, continuing with alternative training, and adaptation during the pandemic have been possible. However, a number of potential issues remain to be addressed for elite athletes, one of which being a widespread concern about mental health issues (World Health Organization, 2020b). While some athletes will be able to build on existing coping resources, other athletes may experience a negative response over a period of weeks to months. While a certain level of anxiety over the coronavirus is completely normal, high levels of anxiety or stress can have a devastating effect on daily life. In this regard, sport psychologists report a higher demand for online psychological counseling and diagnosis of psychological disorders among these athletes during the pandemic, including fear of being infected, anxiety of physical recovery if infected, lack of access to fitness centers, disturbed sleep, eating disorders, obsessive-compulsive disorder, and family conflicts. Inability to manage stress and lack of proper coping may lead some to experience short or long term depression (Frank, Fatke, Frank, Förstl, & Hölzle, 2020).

The COVID-19 infection has recently been found to seriously suppress the neuroendocrine-immune system (Cao, 2020), which is closely involved in stress and stress resilience as well as coping strategies. The pathological influence of COVID-19 on these interactions and responses suggests stress vulnerability that might be detectable by immune and stress bio markers (Simpson & Katsanis, 2020). Periods of inactivity, isolation from athletic teams, distance from the athletic community, less qualified interactions with athletic coaches, and lack of social support (e.g., fans, sports organizations, media, etc.) have also been shown to cause emotional distress and psychological disorders in athletes (Reardon et al., 2019). Due to the multi-dimensional impact of pandemic-related consequences for elite athletes, as a unique population, analytical studies to identify circulating bio markers, time-course of effect and negative impact, and response to coping strategies or treatment interventions (e.g., Psychological First Aid intervention) (Yang et al., 2020) might be useful, and in line with the bio-psycho-

social approach.

Management strategies, therefore, need to include physical and mental treatment for infected athletes and optimize athletic environments, which are influenced by geographical locations, governments, and time-resources, for training and recreation. Some attempts to standardize and give recommendations are on the way (Schinke et al., 2020). Artificial intelligence and digital-based platforms can potentially provide immediate help, and consequently, recommendations or psychological interventions can be provided.

In planning for the post-COVID-19 pandemic, sport related organizations must consider a regular built-in infection control measure of risk-benefit evaluation and the available resources needed to administer it in a team training environment. Essential travel after re-opening should be evaluated and decided on a case-by-case basis, balancing benefits, risks, and risk mitigation options, which might be affected by the damaged post-pandemic economy.

World-class athletes might not face financial problems, but the cancellation of leagues and competitions that are a source of income will greatly affect many teams around the globe (Toresdahl & Asif, 2020). While teams and coaches might try to find ways to save elite athletes first, lower-level athletes are prone to more challenges under these conditions. Therefore, governments must consider financial support for affected athletes and teams, not only under the current situation, but also considering prevention strategies for the future. Learning from the past economic crises caused by previous pandemics, planning for the current situation, and eventual future prevention strategies would seem to require the establishment of a specific task force.

In summary, in critical situations, health authorities and sport communities must identify their priorities and make plans to maintain athletes' health and athletic activities. Several aspects play an important role in prioritization and strategic planning, e.g., physical and mental health, distribution of resources, and short to long-term environmental considerations.

Funding

The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests

None declared.

Contributors

ALL the authors discussed the idea and contributed to writing the paper.

<https://doi.org/10.1016/j.bbi.2020.05.011>

Received 2 May 2020; Received in revised form 4 May 2020; Accepted 4 May 2020

Available online 06 May 2020

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.bbi.2020.05.011>.

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