

## REVIEW

# Sport and exercise participation in time of Covid-19—A narrative review of medical and health perspective

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## Abstract

Coronavirus outbreak during 2020 brought enormous challenges for the world of sport and exercise. Much debated lockdown finished with the first wave in most countries and the “new normal” was the new beginning for professional and recreational sport activities. The aim of this narrative review is to acknowledge the most important medical and health aspects of sport and exercise participation until COVID-19 pandemic is resolved. Management of existing crisis creates numerous opportunities for medical advances. Remote testing, tele-health, field laboratories, continuous follow-up of professional athletes, technological advances and artificial intelligence in new sporting environment using multidisciplinary, and systematic approach can be now thoroughly evaluated and defined for the best SEM practices. Sports and exercise medicine expertise in prevention can have a decisive role in dealing with ongoing and future pandemics.

## KEYWORDS

exercise, health, physical activity

## 1 | INTRODUCTION

Coronavirus outbreak during 2020 brought enormous challenges for the world of sport and exercise.<sup>1–3</sup> Much debated lockdown<sup>4</sup> finished with the first wave in most countries and the “new normal” was the new beginning for professional and recreational sport activities.<sup>5</sup> Economic aspect of sport cessation during lockdown is out of the scope of this paper but we must acknowledge the determinative role of financial resources for COVID-19 related sport regulations. The aim of this narrative review is to acknowledge the most important medical and health aspects of sport and exercise participation until COVID-19 crisis is resolved.

Post-COVID-19 pre-participation health evaluation of athletes and general population requires evidence-based approach adapted to healthcare resources and in compliance with ongoing epidemiological situation.<sup>6</sup> There are several scientific statements and expert opinions available to sports and exercise medicine (SEM) professionals for

post-COVID return to play<sup>7–12</sup> and rehabilitation guidance.<sup>13</sup> Scientific literature is expanding exponentially<sup>11,14</sup> and regular updates to existing guidelines are necessary for ethically sound medical decisions.<sup>5</sup> It is now well known that we are dealing with multi-organ disease that can in some (around 10% of patients who have tested positive for SARS-CoV-2 virus) cases result in chronic symptoms also known as long-COVID.<sup>15–17</sup> For physically active individuals, any cardiorespiratory sequelae can be life threatening and comprehensive clinical examination complemented with additional clinical tests when necessary must be warranted.<sup>18–20</sup> The new JAMA study on CMR findings in competitive athletes that recovered from COVID-19 highlights the importance of CMR risk-stratification assessment for myocardial inflammation.<sup>21</sup> Similar CMR study, published earlier in the same journal, detected ongoing myocardial inflammation in 60% of patient recently recovered from COVID-19 which indicates the necessity of a regular follow-up of long-term cardiovascular consequences of

COVID-19.<sup>22</sup> Recent review on cardiorespiratory considerations for return-to-play in elite athletes after COVID-19 infection includes symptom-guided decision-making model and proposed protocol protects against over-medicalization and false-positive findings.<sup>23</sup> The correct balance of the necessary diagnostic tests in pre-participation health evaluation is crucial for protecting the health of physically active individuals in times when the healthcare system is under pandemic burden which also seriously affected the amount of regular exercising.<sup>8,24</sup> Additional strain on athlete's already vulnerable mental health must be avoided.<sup>25</sup> The newly published International Olympic Committee Sport Mental Health Assessment Tool 1 should be a good addition to existing pre-participation health evaluation protocols.<sup>26</sup>

Medical care of professional and recreational athletes requires now more than ever the multidisciplinary, well-structured, and individualized approach.<sup>27</sup> SEM professionals are responsible for athletes' health and they must adapt their practices to evolving coronavirus pandemic.<sup>8,28</sup> The new regular follow-up of physically active individuals and especially professional athletes (daily monitoring),<sup>3</sup> beyond lasting challenges, brings also an opportunity for additional research and development of new and innovating medical procedures. Doping control made the first steps in developing the new technologies inspired by COVID-19 crisis. Remote assessment of professional athletes, the use of "omics" technologies, and artificial intelligence help cost-benefit, frequency, and overall trust in anti-doping testing.<sup>29</sup> Athletes' remote assessment narrative review that was published in British Journal of Sports Medicine gives new and comprehensive definition of teleSEM and eSEM and provides structured guidance for future studies on remote health care of physically active individuals (patient and athletes).<sup>30</sup>

SEM professionals should advice gradual return to play and gradual return to pre-quarantine performance level.<sup>9</sup> Long-term performance consequences of COVID-19 are currently unknown and future studies should provide more data that will definitely put SEM professionals on athletes' performance map.<sup>2</sup> Cardiopulmonary exercise testing and other functional capacity assessment modalities as aerosol-generating procedures require special concern in new pandemic conditions.<sup>31,32</sup> Difficulties in providing essential preventive measures during their implementation we might overcome with remote assessment and field testing. SEM field laboratories can be of great help in this "new normal" circumstances. In addition to functional testing, manual therapy and other diagnostic and therapeutic procedures that require direct contact with patient should respect epidemiological preventive measures and excising expert recommendations.<sup>33</sup> For mass endurance participation sporting events, it is now available the Infectious Diseases Outbreak Management Tool that can

facilitate the risk assessment, mitigate the strain on public health, and reduce the common risk factors.<sup>34</sup>

As stated earlier in this review, COVID-19 crisis is continuing and our best attempts to adapt include the general knowledge of SEM prevention. Last several years, scientific literature was very fruitful in exposing the data on injury and infectious diseases prevention in athletes.<sup>35,36</sup> The same principles of regular monitoring, evaluation, revision, and ongoing education should be applied in efforts to stop or minimize COVID-19 transmission. SEM professionals bear the greatest responsibility for implementation and quality control of preventive measures in sporting settings.<sup>28</sup>

The significance of SEM and its protagonists in contemporary times is also reflected in epidemiological data on hospitalized and ICU COVID-19 patients. Chronic non-communicable diseases as major risk factor for sever COVID-19 clinical presentation all can be successfully prevented and controlled with regular and structured physical activity programs. SEM community should take a decisive role in preparing the world's population for future inevitable infectious diseases outbreaks—lessons to be learned from COVID-19 experience.<sup>37</sup> Additionally, lockdown has inspired many, previously sedentary, individuals to commence structured exercise with sport patterns like walking, running, biking etc—making the role of a SEM expertise even more relevant nowadays.<sup>38</sup>

This narrative review in its concise manner presented the most important studies on COVID-19 sport participation medical and health features. The main conclusion relates to numerous opportunities created in managing the existing crisis. Remote testing, tele-health, field laboratories, continuous follow-up of professional athletes, technological advances, and artificial intelligence in new sporting environment using multidisciplinary and systematic approach can be now thoroughly evaluated and defined for the best SEM practices. Sports and exercise medicine expertise in prevention can have a decisive role in dealing with ongoing and future pandemics.

## CONFLICT OF INTEREST

We declare no conflict of interest.

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