

COVID-19: Rehabilitation Needs, Therapeutic Development, and Impact on the Health System

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1. Introduction

The COVID-19 pandemic has impacted the health of millions of people worldwide, with many survivors experiencing persistent symptoms and long-term disabilities. Rehabilitation and therapeutic interventions have become essential for managing the physical, cognitive, and emotional consequences of the disease [1–3]. The development of effective rehabilitation strategies and therapeutic interventions requires collaboration and knowledge sharing among health professionals, researchers, and policymakers [1–3].

Furthermore, a new condition has been started to characterized subjects previously affected by COVID-19: long COVID. Indeed, several clinical sequelae might persist after acute COVID-19, albeit their etiology, clinical characteristics, and rehabilitative needs are still poorly characterized [4,5].

To address these needs, the Special Issue “COVID-19: Rehabilitation Needs, Therapeutic Development, and Impact on the Health System” aims to gather recent advances in rehabilitation and therapeutic interventions for COVID-19, as well as their impact on the health system.

It covers a wide range of topics related to COVID-19 rehabilitation and therapeutic development, including but not limited to: the physiological mechanisms and pathophysiology of COVID-19 and their impact on rehabilitation, the development of rehabilitation programs and interventions for COVID-19 survivors, the use of tele-rehabilitation and virtual reality in COVID-19 rehabilitation, the role of multidisciplinary approaches in COVID-19 rehabilitation, and the impact of COVID-19 on the health system, including its implications for specific rehabilitation strategies to improve long-term outcomes.

2. New Perspectives for COVID-19 Rehabilitation

Eleven papers [6–17] were published between December 2021 [13] and January 2023 [6] in the Special Issue “COVID-19: Rehabilitation Needs, Therapeutic Development, and Impact on the Health System”. Concerning the study design, there was 1 systematic review and meta-analysis [16], 9 original papers [6–14], one 1 case series [17].

More in detail, Capecci et al. [6] presented a study on the clinical and functional evolution in patients with Parkinson’s disease during the pandemic. They reported that patients with Parkinson’s disease experienced a decline in functional abilities and increased motor and non-motor symptoms during the pandemic, which highlights the importance of monitoring and providing adequate rehabilitation services to Parkinson’s disease patients during times of crisis. Yamada and Shoi Shi [7] used time series data on COVID-19 infections in Japan to estimate infection-related human mobility networks. Their findings suggested that the networks of people’s movements became more localized, and that travel between different regions was significantly reduced during the pandemic. This study provided valuable insights into the impact of COVID-19 on human mobility and the transmission of the virus. Brêda Mascarenhas et al. [8] presented a new device in order to prevent early intubation in hypoxemic patients. They found that the use of the



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device resulted in a significant reduction in the number of patients requiring intubation, providing evidences for the potential utility of this device in the treatment of COVID-19 patients. Onu et al. [9] presented an observational study on the impact of physiotherapy on patients suffering from COVID-19. They reported that physiotherapy significantly improved the physical function and quality of life of patients, highlighting the importance of rehabilitation services in the treatment of COVID-19. Paolucci et al. [10] investigated the utility of high flow nasal cannula during pulmonary rehabilitation in COVID-19 patients in acute respiratory failure. They reported that the use of high flow nasal cannula was associated with significant improvements in respiratory function and oxygenation. This study provides valuable in-sights into the potential benefits of high flow nasal cannula in the treatment of COVID-19. Moreover, Scaturro et al. [11] presented a case–control study on the role of acetyl-carnitine and rehabilitation in the management of patients with post-COVID syndrome. They report that the combination of acetyl-carnitine and rehabilitation resulted in significant improvements in fatigue, sleep quality, and cognitive function. This study provided evidence for the potential benefits of this approach in the treatment of post-COVID syndrome.

Furthermore, de Sire et al. [12] investigated the neuromuscular impairment of knee stabilizer muscles in a COVID-19 cluster of female volleyball players, and the role of rehabilitation in the post-COVID-19 return-to-play. They report that the rehabilitation program resulted in significant improvements in knee stability and functional outcomes, demonstrating the potential benefits of rehabilitation in the treatment of COVID-19-related neuromuscular impairments.

Furthermore, an observational study [13] reported the impact of the second wave of COVID-19 on outcomes in hip fracture patients. It should be noted that a transdisciplinary management of patients with hip fragility fractures is mandatory [14], and the paper performed by Morri et al. [13] highlighting the benefits, feasibility and limitations of this approach. More in detail the authors showed that patients who underwent surgery during the second wave of the pandemic had worse outcomes than those who underwent surgery during the first wave, highlighting the impact of the pandemic on non-COVID-19-related health issues [13].

Andritoi et al. [15] investigated the use of modern technologies in post-COVID-19 cardiopulmonary rehabilitation. They reported that the use of virtual rehabilitation programs can be effective in improving physical function and reducing symptoms of post-COVID-19 syndrome.

The paper “Impact of Rehabilitation on Fatigue in Post-COVID-19 Patients: A Systematic Review and Meta-Analysis” aimed to evaluate the effectiveness of rehabilitation interventions on reducing fatigue in patients who have recovered from COVID-19. The study used a systematic review and meta-analysis approach to analyze the existing research on the topic, demonstrating that post-COVID-19 patients may experience persistent chest CT abnormalities, decreased lung function, persistent fatigue, respiratory symptoms, decreased functional capacity, and decreased quality of life up to 6 months after symptom onset or hospital discharge. On average, 8 out of 10 patients had returned to work or reported no work impairment at around 3 months of follow-up [16].

The paper “Whole-Body Cryostimulation: A Rehabilitation Booster in Post-COVID Patients? A Case Series” is a case series study that explored the potential of whole-body cryostimulation as a rehabilitation intervention for post-COVID-19 patients. The study described the experiences of six patients who underwent whole-body cryostimulation, involving the exposure to extreme cold temperatures for short periods of time, evaluating the effects on their physical and mental health, and demonstrating that long COVID patients reported clinically significant improvements related to health and functioning [17].

Lastly, it should be noted that the COVID-19 pandemic also provided a new model of rehabilitation starting from the need for telemedicine: the “telerehabilitation” [18]. Several studies [18–20] showed how this novel approach might have effects not only during a such difficult period but also in the next future also helping the health system.

3. Conclusions

In conclusion, the COVID-19 pandemic has brought significant challenges to the global health system and has increased the need for effective rehabilitation approaches. The articles in this Special Issue provided a comprehensive understanding of the rehabilitation needs of COVID-19 patients, the development of novel therapies, and the impact of the pandemic on the healthcare system. The contributions from researchers and clinicians across the world highlight the importance of a collaborative effort to overcome the current crisis and improve the health and well-being of those affected by COVID-19. We hope that this Special Issue will serve as a valuable resource for researchers, clinicians, and policymakers, and that the knowledge and insights shared in this collection will lead to continued advancements in the field of COVID-19 rehabilitation.

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