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The Impact of the COVID-19 Pandemic on Outdoor Physical Activities for People with Disabilities, including the Risks for Psychophysical Well-Being

Giacomo Farì [1,2,*], Pietro Fiore [3,4], Vincenzo Ricci [5], Alessandra Zonno [1], Marko Joksimovic [6], Domenico Petruzzella [1], Giulia Gioia [1], Denise Giarrizzo [1], Savino Mastrorillo [1], Brunella Coretti [1], Francesco Paolo Bianchi [7], Francesco Agostini [8], Antonella Muscella [2], Maurizio Ranieri [1] and Marisa Megna [1]

1 Department of Basic Medical Sciences, Aldo Moro University, Piazza Umberto I, 70121 Bari, Italy
2 Department of Biological and Environmental Science and Technologies (Di.S.Te.B.A.), University of Salento, 73100 Lecce, Italy
3 Neurorehabilitation Unit, Istituti Clinici Scientifici Maugeri, IRCCS Bari, 70124 Bari, Italy
4 Italian Society of Physical and Rehabilitation Medicine (SIMFER), 00198 Rome, Italy
5 Physical and Rehabilitation Medicine Unit, Luigi Sacco University Hospital, ASST Fatebenefratelli-Sacco, 20157 Milan, Italy
6 Faculty of Sport and Physical Education, University of Montenegro, 81000 Podgorica, Montenegro
7 Department of Biomedical Science and Human Oncology, Aldo Moro University, Piazza Umberto I, 70121 Bari, Italy
8 Department of Anatomical and Histological Sciences, Legal Medicine and Orthopedics, Sapienza University, 00185 Rome, Italy
* Correspondence: dr.giacomofari@gmail.com; Tel.: +39-080-559-5416

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Abstract: The restrictions and social distancing measures due to the COVID-19 pandemic have created many obstacles in the practice of outdoor physical activity (OPA) throughout the world, particularly for the most vulnerable people, such as those with disabilities. The aim of this study was to explore the impact of pandemic-related limitations on the OPA of an Italian cohort of people with disabilities practicing sports. A retrospective observational study was conducted using an online survey. The questionnaire was distributed to 121 disabled athletes who practiced different outdoor physical activities. A total of 96 completed the survey, which collected demographic data, information about daily outdoor physical activity and sports habits, and about physical and psychological health before and during the pandemic. The frequency of daily OPA per week, along with the hours of physical activity, significantly decreased during the pandemic compared to those of the year before ($p < 0.0001$). A statistically significant deterioration was also found in the physical and mental well-being of disabled athletes during the pandemic ($p < 0.0001$) when compared to those from the year before the advent of COVID-19. This research demonstrated the negative impact of COVID-19 restrictions on OPA levels and on the physical and mental well-being of athletes with disabilities. It also highlighted a new challenge regarding the sustainability and integration of the national health system, demonstrating the necessity of improving the consistent accessibility of people with disabilities to OPA, both under normal conditions and emergency situations, in order to guarantee their psychophysical well-being.

Keywords: COVID-19; outdoor physical activity; disability; accessibility

1. Introduction

The benefits of physical activity for people with disabilities are well known. The beneficial effects are both physical and psychological, including maintaining a healthy physical condition, preventing diseases, improving body image perception, increasing self-esteem, and growing social relationships [1]. "Adapted" physical activity, which has

its origins in a relatively recent period, provides valid support to promote independent living and social inclusion. In this sense, for people with disabilities, sports represent a form of adapted physical activity that improves general health, when carried out at a recreational level, and which also allows for self-evaluation in real competitions, when the sport is carried out at a competitive level [2]. However, people with disabilities lead a more inactive lifestyle than the rest of the population, as they participate less in sports and physical activity in general [3,4]. The cause of this limited participation should be sought by identifying a series of barriers, represented by the availability of suitable mobility aids, accessibility to facilities, transport limitations, lack of motivation, as well as the availability and competence of support personnel [5–7]. The COVID-19 pandemic complicated this situation, since it revolutionized many aspects of everyday life for every individual around the world. COVID-19 massively attacked human health, causing sudden lifestyle changes, through social distancing and home isolation, with great social, psychological, and economic consequences [8–10]. The highly contagious nature and pathogenicity of the SARS-CoV-2 made it necessary to introduce a series of restrictions to reduce the transmission of the disease, which in turn, had a huge impact on sports activity all over the world. The restrictive measures introduced during the first lockdown to limit the spread of COVID-19 had repercussions both for basic sports practices and for elite competitive sports, which is why many sporting events were postponed globally, including the Tokyo 2020 Olympic and Paralympics Games [11]. It follows that the restrictions affected all people who practiced physical activity, including those with disabilities, whether they were professional or amateur athletes. Although professional athletes with disabilities usually have greater needs and opportunities than do amateur athletes with disabilities, both have faced similar challenges and obstacles during the pandemic [12].

Long periods of inactivity, inaccessibility to properly equipped sports facilities, the cancelation of sports competitions, as well as all the limits imposed on the practice of competitive and non-competitive sports, could be responsible for a negative impact on the general health and athletic performance of disables athletes [13,14].

From an individual perspective, geographic restrictions on sports activities and the need to stay home also led to a reduction in outdoor physical activity (OPA) and outdoor sports, increasing sedentary behaviors [15–17]. The OPA-related health benefits are well demonstrated, and potentially, everyone can benefit from becoming more physically active [18–23]. Outdoor sports can also play an important role in the prevention or the management of mild to moderate mental illnesses, such as depression and anxiety [24]. Moreover, regular participation in recreational outdoor sports and OPA, which often coincide for people with disabilities who have fewer opportunities to independently participate in any outdoor activity, has a positive association with improved life quality, life satisfaction, community reintegration, and employment [25,26].

With regard to people without disabilities, many studies in the literature showed the effects of the forced suspension of indoor and outdoor physical activity due to the pandemic [17,27–30], but the same results cannot be extrapolated to people with disabilities [31].

Thus, the aim of this retrospective observational study was to understand how people with disabilities have been impacted by COVID-19, specifically in relation to their opportunity to practice OPA and outdoor sports during the first year of restrictions related to the ongoing pandemic and to investigate which possible factors influenced participation in these outdoor activities by analyzing a cohort of disabled Southern Italian athletes.

2. Materials and Methods

2.1. Study Design and Participants

The model is that of a retrospective observational study.

People with disabilities who were enrolled in Southern Italian sports associations were included in the study. The following criteria were mandatory: the presence of sensorial and/or motor disability, membership in professional sports associations for people with

disabilities, regular OPA in the two years preceding the pandemic, and the ability to understand and express informed consent. A total of 121 disabled athletes were contacted for the study. A total of 25 did not join the survey, and 96 athletes were recruited. The disabled athletes practiced the following sports: soccer, tennis, running, outdoor athletics, handbiking, horse riding, and skating. Using google modules, an online survey was developed to investigate the impact of the COVID-19 pandemic on OPA for people with disabilities. Informed consent was obtained from all participants involved in this study; in the case of underage athletes, a consent form was completed by a parent or guardian of the minor. The survey was distributed via email on 11 March 2021, with the request that it be completed and submitted by 11 May 2021. All the procedures were in accordance with the principles outlined in the Declaration of Helsinki.

2.2. Procedures

The survey was modeled after other online surveys adopted for epidemiological studies regarding sports activities [32–34]. It was created on the basis of the opinions of ten university researchers expert in sport science and rehabilitation medicine who shared in the structuring of the items and in the determination of the length of the questionnaire. It underwent a pilot validation test before being sent to the recruited subjects. The survey consisted of descriptive open-ended and multiple-choice questions divided into four different sections. The first section provided information regarding the study and contained the informed consent. The second section collected demographic data: gender, age, type of disability, and type of sport practiced. The third section gathered relevant information on the athletes' daily outdoor training habits and their physical and psychological health status approximately 12 months before the pandemic (11 March 2019–11 March 2020). The fourth section collected relevant information concerning the athletes' daily outdoor training habits and an evaluation of their physical and psychological health during the first 12 months of pandemic (11 March 2020–11 March 2021). After completing this section, the athletes were asked if COVID-19 had negatively affected their OPA and their participation in outdoor sports, along with the reasons for this effect, proposing the following options:

1. restrictions related to lockdown (forced suspension of activities);
2. risk of contagion during the practice of OPA;
3. economic difficulties that limited the organization of the sports associations;
4. other/unknown (to be specified by the compiler).

The date of 11 March 2020 was taken as a turning point, because it coincided with the first lockdown imposed by the Italian government to combat the COVID-19 pandemic. In addition to the survey described above, the 12-Item Short Form Survey (SF-12) [35] was included in the third and fourth sections. SF-12 is a self-reported outcome scale that verifies the health impact on the everyday life of an individual. It investigates the following domains: limitations in physical activities due to health problems; limitations in social activities due to physical or emotional problems; limitations in usual activities caused by physical health problems, pain, and general mental health; limitations in usual activities due to emotional problems, vitality, and general health perceptions [36,37].

The survey was sent to the all the athletes, and they were asked complete it regarding the sport practiced. Data were collected anonymously and referred to the 12 months before the pandemic and to the first 12 months of the pandemic.

2.3. Statistical Analysis

Data analysis was performed using Stata MP17 software (version 17-StataCorp LLC-4905 Lakeway Drive College Station, Texas 77845-4512, USA).

The continuous variables were expressed as mean ± standard deviation and range, or the median and interquartile (IQR) range and range; the categorical variables were expressed as frequencies. The skewedness and kurtosis tests were performed to assess the normal distribution of the continuous variables; all were normally distributed or normalizable. To compare continuous variables between time periods, the Wilcoxon's sign

rank test was performed, and a categorical variable comparison between time periods was performed using McNamar's test. For all tests, a two-sided p-value < 0.05 was considered as statistically significant.

3. Results

A total of 96 athletes comprised the sample; Table 1 describes the sample characteristics.

Table 1. Characteristics of the sample. "Competitive" athletes were those who practiced sports activities at a competitive level, and "amateur" athletes were those who practiced outdoor physical activities that did not include competitive aspects.

Variable	Value
Females; n (%)	57 (59.4)
Age (years); mean ± SD (range)	37.4 ± 13.2 (15–71)
Type of disability; n (%)	
Paraplegia	43 (44.8)
Tetraparesis	31 (32.3)
Upper limb amputation	11 (11.5)
Hemiparesis	4 (4.2)
Monoparesis	2 (2.1)
Sensorineural disabilities	5 (5.2)
Type of activity; n (%)	
amateur	45 (46.9)
competitive	51 (53.1)

The athletes OPA habits, referring to the year before the pandemic and the first year of pandemic, are described in Table 2.

Table 2. Outdoor sports practice before and during the pandemic.

Variable	Before Pandemic	During Pandemic	*p*-Value
Daily training/week; n (%)			
0–1	8 (8.3)	50 (52.1)	McNemar's test $p < 0.0001$
2	33 (34.4)	22 (22.9)	
3	30 (31.3)	10 (10.4)	
4	13 (13.5)	8 (8.3)	
>4	12 (12.5)	6 (6.3)	
Hours training/week; n (%)			
<1	3 (3.0)	41 (42.7)	McNemar's test $p < 0.0001$
1–2	23 (24.0)	20 (20.8)	
3–4	26 (27.1)	17 (17.7)	
5–6	21 (21.9)	7 (7.3)	
>6	23 (24.0)	11 (11.5)	
Competitions (YES/NO); n (%)	35 (36.5)	23 (24.0)	McNemar's test $p < 0.0001$
number of competitions; mean ± SD (range)	3.1 ± 5.8 (0–30)	1.1 ± 2.4 (0–10)	Wilcoxon's sign rank test $p = 0.001$

A statistically significant difference was found when comparing the scores of disabled athletes for the SF-12 physical dimension survey before and during the pandemic (before: 45.2 ± 9.6; 24.0–60.3 vs. during: 39.9 ± 9.7; 14.5–63.5; Wilcoxon's sign rank test $p < 0.0001$) and when comparing the scores for the SF-12 mental dimension survey before and during the pandemic (before: 49.1 ± 8.8; 28.7.0–65.1 vs. during: 38.9 ± 11.3; 10.9–68.5; Wilcoxon's sign rank test $p < 0.0001$).

A total of 84 (87.5%) athletes reported that the COVID pandemic negatively affected the possibility of practicing outdoor sports and OPA; the main reason cited was the lockdown

restriction (n = 55; 65.4%), followed by the fear of contagion (n = 21; 25.0%), logistic and economic problems (n = 4; 4.8%) and others (n = 2; 2.4%); the reasons were unknown for 2 subjects (2.4%).

4. Discussion

The COVID-19 pandemic caused enormous lifestyle changes for billions of individuals around the world. Outdoor sports practice was also negatively affected at both the amateur and professional levels. This study aimed to describe the inevitable social consequences of this health emergency. Despite the fact that this research is purely descriptive, it represents an opportunity to highlight a health and social challenge which existed even before the beginning of the pandemic, i.e., the accessibility of people with disabilities in Southern Italy to OPA and outdoor sports, regardless of the pandemic restrictions. In fact, it is important to point out the lack of available services necessary to guarantee a healthy lifestyle for people with disabilities, under both emergency and ordinary conditions. This issue exhibits even greater resonance if we consider other fragile categories of the population which encountered difficulties in carrying out outdoor activities, including OPA. This concerned, for example, the elderly population and rural–urban migrants in China, who were not able to carry out outdoor physical activities as usual, as they were further discriminated against and marginalized during the pandemic [38,39].

Currently, there is growing interest in the use of outdoor natural environments to promote health and well-being and in the concept of "green exercise". This recent trend responds to the need to reduce the cost of health care, which increases as regular physical activity decreases. In fact, physical exercise benefits both mental and physical health, and outdoor exercise appears to be more effective than indoor physical activity [40]. The restrictions imposed to limit the transmission of Sars-CoV2 seem to have more negatively affected the outdoor sports practice of athletes with disabilities compared to that of able-bodied athletes [41].

Although our findings are purely descriptive, the frequency of outdoor daily training per week and the number of training hours per week significantly decreased globally during the pandemic compared to results from the year before the pandemic. For those who participated in official sports competitions, the number of these competitions held during the pandemic also significantly declined compared to that noted during the pre-pandemic period. Moreover, 84 (87.5%) athletes reported that the COVID-19 pandemic negatively affected the possibility of practicing OPA and outdoor sports. Thus, these survey results offer us a starting point for a more general reflection, which we consider necessary.

Notably, before the pandemic, people with disabilities acknowledged the lack of sufficient opportunities to practice OPA as they would have liked, and declared that they experienced a lower state of well-being, highlighting a global double risk of suffering from both loneliness and a decreased desire to practice sports at a competitive level compared to people without disabilities. Despite the motivation to be physically and mentally active, they viewed their own impairment as a difficult barrier to overcome [36,42]. It would instead be preferable to encourage outdoor sports programs, showing the positive effects of inclusion or reintegration of special groups, including people with physical and mental disabilities, young people with autism, and disengaged youths or youths at risk [43]. Hence, the limitation to regular OPA practice necessitates the investigation of various aspects, i.e., personality traits, such as the lack of motivation or interest, and the relationship to available social resources. Numerous environmental barriers are known to limit access to sporting services. These include the scarce availability of adequate mobility aids and sports facilities, as well as the lack of competent sports staff and the high costs of specific exercise programs [44–47]. The lockdowns imposed during the pandemic may have exacerbated these obstacles for disabled athletes. Particularly in Italy, these repeated lockdowns resulted in unprecedented restrictions, limiting the participation in daily activities, including OPA, which not only caused the strengthening of the pre-existing barriers, but also the development of new barriers represented by the closure of indoor and

outdoor sports/play facilities, reduced access to health professionals (e.g., physiotherapists and sports trainers), and imposed social distancing [48–50].

Some athletes expressed the fear of contagion as the main reason for their suspension of OPA and outdoor sports, and similar data were also collected in other studies [32,47]. COVID-19 produced a greater apprehension in undertaking OPA and sports, due to the risk of becoming infected with SARS-CoV-2 and developing severe symptoms related to the disease [50].

Among the reasons that led to reduced OPA, there were also logistical and economic problems. Financial resources destined for full integration for people with disabilities are often limited. As a consequence, there is also a reduced opportunity for OPA practice [51]. In fact, many people with disabilities can lead a normal daily life, including participation in sports, thanks to public financial support, without considering that their participation is subject to adapted facilities and equipment, as well as the availability of adequate personal support. From this point of view, OPA is a great opportunity, since it not only benefits practitioners in multiple ways, but it also requires public investments, which are considered very cost-effective [52]. Moreover, OPA is a sustainable choice; in fact, it is practiced in sports facilities, such as parks, woods, and other green areas, which are easy to access, low-cost, and available to everyone, without physical or economic limitations [53,54]. It is intuitive that during the COVID-19 pandemic, the economic difficulties, both for public administrations and for private citizens, further reduced the accessibility to indoor and outdoor sports for people with disabilities, that instead would have required even greater resources in an emergency phase [55]. Some attempts to address these specific and contingent difficulties were made during the last two years of pandemic. Rimmer et al. considered a group of patients with a history of stroke; they verified that the obstacles to sports practice included the cost of gym enrollment and the possibility of being able to travel to the gym location using public transport. To overcome these difficulties, they recommended that an exercise program be carried out at home, which did not require any expensive equipment, but which was also more difficult to perform without the guidance of qualified personnel [54,55].

Observing the pre-pandemic situation, people with disabilities usually lead a less active lifestyle when compared to the general population, with evidence of reduced participation in sports and physical activities [56,57]. According to World Health Organization (WHO), people with disabilities should perform 150 min of moderate-to-intense physical activity per week, where possible, or perform some type of regular physical activity, depending on their abilities, avoiding inactivity [58]. Our survey shows a reduction in the global time dedicated to OPA during the pandemic for disabled athletes. It is known that keeping physically active is beneficial to mental health, improving skills, self-confidence, self-esteem, and providing social support to people with disabilities [59]; therefore, the OPA reduction induced by the pandemic clearly negatively impacted the general health of people with disabilities. According to our survey, particularly regarding the SF-12 results, it seems that the impact of the ongoing pandemic, causing the reduction in the opportunity to play outdoor sports, had a negative effect, both mentally and physically, on athletes with disabilities. Although restrictive measures during the pandemic were adopted to safeguard the physical health of the population, they also produced many negative effects on mental health, with an increase in anxiety, anger, and symptoms attributable to post traumatic stress disorder [47].

The isolation of individuals, in combination with the fear of contagion, caused a state of chronic stress, capable of inducing structural and functional alterations in the brain, altered social behaviors, and the limitation of an individual's ability to cope with stressful factors during the pandemic. Forced confinement also limited access to the practice of all types of sports, especially if carried out indoors and in groups.

On the contrary, OPA is easy to practice and grants many benefits, especially psychological ones, due to the natural environments in which it takes place [30]. Consistent OPA

counteracts anxiety and depression; on the other hand, chronic stress reduces the possibility and the desire to practice it, giving rise to a vicious circle that is difficult to stop [60–62].

A study by Theis et al. highlights the negative impact of the COVID-19 lockdown on the physical activity levels and mental health of children and young adults with disabilities: 61% of participants reported a reduction in physical activity levels and over 90% of them reported a negative impact on mental health (including worse behaviors, moods, and fitness levels, as well as social and learning regression). Many of the interviewed subjects reported a lack of access to specialized facilities, therapies, and equipment as reasons for this, reporting the long-term effects of this lack of access on their children's mental health and physical activity levels [46].

On the other hand, there is also some initial evidence of sports participation resilience regarding athletes with disabilities during the period of restrictions [58,59]. Shaw et al. conducted a study on paracyclist athletes: in some cases, these athletes seem to have been more resilient than the general population, probably due to the outdoor nature of their sport and the resilience developed because of the experience of dealing with an impairment [63].

This observation offers a useful strategy for facing the difficulties of continuing OPA, despite the extraordinary period of limitations, i.e., the implementation of outdoor activity, with adaptations, where possible, for sports usually played indoors. This method could guarantee the continuity and effectiveness of sports practice, even in situations of health emergency and forced social distancing. The need to be monitored by qualified personnel can be guaranteed by the use of new technological tools that allow trainers to remotely manage athletes. It is so desirable that new research contribute to determine the best training programs and the most reliable monitoring systems for OPA carried out remotely by people with disabilities. In fact, for people with disabilities, sports represent an occasion for rehabilitation, understood as an opportunity to preserve or implement one's residual autonomies [64–67].

In this regard, OPA and outdoor sports favor a greater lasting adherence to physical activity, up to a lifelong in duration. This appears to be the case, since people have experienced more enjoyment and gained more satisfaction from physical activity outdoors, so much so that they want to repeat the experience indefinitely [40,52].

It is clear that, in order to preserve the opportunity for everyone to play sports, especially for athletes with disabilities, new economic investments, as extraordinary as is the current health emergency, are needed to reduce inequalities and promote the health of all people.

Limitations

This study is not free from limitations.

First, the sample is small; however, this is a convenience sample, whose homogeneity is guaranteed by the fact that all the enrolled subjects were members of sports associations dedicated to sports for people with disabilities; consequently, they regularly practiced sports before the pandemic.

Another limitation is the self-reported nature of the survey responses: data were collected in the absence of clinical supervision, but this was necessary to overcome the limitations regarding inter-individual meetings imposed by the pandemic and to reach a higher number of athletes using an online survey.

Furthermore, all data was referred to retrospectively, with reference to the year before the pandemic and the first year of pandemic: it is understandable that this remains the only way to make this type of comparison at the moment, since the pandemic was rapid and unforeseen, and it has caused serious changes that must be investigated in all possible ways.

Last, the choice to use SF-12, which is a general scale regarding quality of life, derived from the fact that there are currently no other specific assessment scales to evaluate the impact of SA on the quality of life in people with disabilities practicing different sports.

Furthermore, despite its descriptive nature, we consider the attempt to shed light on an uncomfortable problem a strong point of this study, as well as the fact that it investigates

the accessibility to sports for people with disabilities in an era of pandemic emergency, which is a topic still too little investigated in the world, particularly in Europe, despite the state of emergency activated from the first weeks of 2020 until today.

5. Conclusions

The COVID-19 related restrictions significantly limited the practice of OPA for people with disabilities, who experienced a worsening of physical and mental well-being. Although this study is descriptive in nature, we believe it offers general insights that are useful for protecting the health of fragile people, such as people with disabilities. Institutions should provide more support to facilitate regular sporting practice for this population and to encourage health-promoting behaviors, even during very difficult situations such as a pandemic. It would be desirable to smooth out the disparities that limit access to sports already habitual under normal circumstances, and which are even more apparent during a pandemic. Therefore, further studies are needed to investigate all the conditions that could create new sustainable opportunities for health and social integration for people with disabilities.

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