Sports participation during a lockdown. How COVID-19 changed the sports frequency and motivation of participants in club, event, and online sports

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The determining factors of (dis)continued sports participation during COVID-19 restrictions:

Towards a typology of sports participants in times of a pandemic

Abstract

The COVID-19 crisis and its related measures had and still have an enormous impact on how people practice and experience leisure. The current study focuses on how different sports participation segments reacted to the first lockdown in Flanders that started in March 2020. The logistic regression results indicate that participants with online sports experience were shown to have a (more) positive effect on their sports participation behavior, while less having to adapt and less missing their previous behavior. The exact opposite is found for sports club membership in the pre-COVID-19 period, while former sports event participation has a positive effect on sports frequency, but a negative effect on missing previous sports behavior. A canonical correlation analysis groups that group sociodemographic and sports-specific variables graphically around four clusters of COVID-19-sports participants, i.e. people who experience restrictions in (i) time and sports infrastructure, (ii) canceled sports club and event activities, (iii) time and fear/sickness, and (iv) nothing. The results of both analyses offer a detailed insight into which sports participation settings are affected most by COVID-19, and thus which segments policy should focus on in minimizing the effect of the measures on physical activity and on sports participation.

Keywords: COVID-19, sports participation, logistic regression, canonical correlation analysis

1. Introduction

Stating that COVID-19 had an enormous impact on citizens' behavior is knocking on an open door. To prevent the virus from spreading among the population, which may result in an overloaded healthcare system, numerous countries (were forced to) impose social restrictions and stay-at-home measures (e.g. lockdown). Lockdowns forced prohibited people from going to restaurants, pubs, leisure centers, gyms, theaters, museums and other kinds of out of home activities (Lashua et al., 2020). These restrictions and measures seriously impacted the ways citizens were able to practice their leisure activities, accelerated shifts in leisure behavior and forced people to rethink their leisure patterns (Mackenzie & Goodnow, 2020). A prime example in this matter is sports participation, an activity that is often practiced away from home and with fellow sports companions (Constandt et al., 2020). The main research focus in the current paper is on how different types of sports participants changed their behavior due to COVID-19 and the measures associated with it.

There is scientific consensus that practicing sports is beneficial for physical, psychological, and social health (Eime et al., 2013; Son et al., 2020; Xie et al., 2020). Carter et al. (2020) argued that physical activity (which is an inherent part of sports) should not be marginalized during a pandemic, given the overall health risks that are associated with obesity and the specific figures that indicate that obesity increases mortality rates due to COVID-19. Some preliminary results indeed indicate that the lockdown measures had, and still have, adverse collateral effects in the field of sports participation that go beyond the risks associated with direct viral infection (Pietrobelli et al., 2020), such as cardiac diseases (Hall et al., 2020) obesity (Carter et al., 2020), social isolation (Hall et al., 2020) or rheumatic diseases (Pinto et al., 2020). Other researchers focused on the effects on youth's physical (in)activity and even mention a potential 'generation lost' to sports as a consequence of the coronavirus disease (Drummond et al., 2020).

Given the associated risks of insufficient physical activity, the current study contributes to the discussion on the influence of specific COVID-19 measures on sports participation. While some countries such as the Italian Government prohibited most physical (outdoor) activities during the outbreak of COVID-19 in Europe (see Mattioli et al., 2020), other regions opted for a partial lockdown. In Flanders (i.e. the Northern, Dutch speaking part of Belgium and the research context of the current study), for example, sports participation was basically the only outdoor activity that was allowed during the COVID-19 lockdown (i.e., individual, with household members or with maximum 1 'sports buddy'), resulting in increased sports participation among adults (Constandt et al., 2020). The above results indicate that studies in different regions (with different lockdown measures) give insight in how different social restrictions result in different effects on sports participation. Therefore, more research on the relationship between is needed to contribute to the ongoing debate about how the direct risks of COVID-19 infection can be balanced with the direct and indirect psychological, health, and other costs of the specific lockdown measures. Given this background, the current study investigates how the COVID-19 measures (i) prevented people from taking part in sports, (ii) whether they (had to) adapt(ed) their sports participation, and (iii) whether they missed their usual way of sports participation behavior.

The above questions will be answered for prime segments of sports participants. In existing COVID-19 studies, sports participation has often been considered as an umbrella concept for all kinds of sports participants. Nevertheless, scientific consensus is present about the fact that sports participants can and should be divided into a number of segments. Examples are sports club members versus participants that prefer light (i.e., less formalized) sports settings, or people who prefer to take part in structured mass participation sports events (Borgers et al., 2018; Xie et al., 2020). This distinction is important, because a number of the aforementioned sports activities and settings are perfectly adapted to (and could potentially

even benefit from) the COVID-19 related social distance measures (e.g., running alone in a forest). On the contrary, sports activities and settings with high-spread risks (e.g., indoor contact sports) are not appropriate during a pandemic (Halabchi et al., 2020). Moreover, people will also face difficulties in engaging in sports club activities, mass sports participation events, and group sports in the (near) future (Evans et al., 2020). Hence, the current study focuses on different segments of sports participants, and on how they changed their sports participation behavior due to the COVID-19 measures. More precisely, the first research goal is to study which sports segments (i.e., sports club members, sports event participants, and those engaged in online sports) sport less/more, had to change their sports habits/behavior, missed how they practiced sports before the COVID-19 measures, and had to overcome barriers to take part in sports.

Moreover, the second research goal is to visually map whether different types of COVID-19 sports participants can be deduced by means of the collected research data. Based on these typologies, governments and other sports policy makers could gain insights with regard to (i) different types of sports participants during a pandemic, (ii) how they changed their sports participation habits, (iii) and how they were feeling about these changes. This kind of information could help policy makers to better understand how lockdown restrictions affected specific groups of sports participants in terms of their sports participation. In addition, such knowledge also provides interesting information about how future measures could help citizens to stay sufficiently physically active. After all, many countries are still implementing restrictions when it comes to social contacts (e.g., sports). Furthermore, the World Health Organization has stated that countries might need to go back under full lockdown in the near future due to new outbreaks of COVID-19 (McNamara, 2020).

2. Literature review

Leisure appears to be one of the most strongly affected industries due to COVID-19 (Lachance, 2020; Lashua et al., 2020). The popularity of many leisure activities is based on the ability to socially interact with others (Xie et al., 2020). As these activities are often unable to adapt themselves to new rules of social distancing, they are currently suspended in many countries until the new coronavirus is under control. In this light, sports presents itself as an interesting case to enhance our knowledge about the tension between leisure's benefits and risks during an international health crisis. During the COVID-19 lockdown, many public authorities encouraged physical activity through sports to strengthen one's immune system against viral infections. However, many types of sports participation – those that entail close physical interaction with others – were temporarily forbidden due to the risk of mass dispersion of the new coronavirus.

2.1. Sports participation in times of COVID-19-related restrictive measures

Worldwide, different measures have been taken to prevent COVID-19 from spreading among the population. Overall, governments are currently facing the challenging task to find a balance between the trade-off of keeping the mortality rate as low as possible, and the effects of the mitigation measures on economic welfare and other health indicators such as (in)sufficient physical activity (Anderson et al., 2020). Numerous countries have implemented a restrictive quarantine (i.e., a national lockdown) to prevent COVID-19 from (further) infecting the population as much as possible. Nevertheless, restrictions differed from country to country, and given the fact that Flanders is the research context of the current study, it is therefore interesting to define the restrictive quarantine measures that were in place in this particular region during the data-gathering period.

In contrast to the very strict lockdown in countries such as China, France, Italy and Spain, the Belgian government opted for a so-called 'lockdown light'. While schools were closed and people had to work from home, citizens nevertheless were allowed to practice

certain specific sports activities such as walking, cycling, and non-motorized activities on wheels (e.g. skateboarding, inline skating) (Constandt et al., 2020). Other restrictions imposed on sports participation were that the sports activities had to be practiced alone, with other household members, or with maximum one friend outside the family. People were allowed to go as far as they would/could, although people had to start the activity form their home as it was forbidden to use a car (or other motorized transport vehicles). Finally, citizens were not allowed to take a rest during their sports activities, and/or to visit people at their home. Consequently, other sport forms such as sports club activities and mass leisure and thus also sports events were not allowed (Lachance, 2020), whereas fitness centers (and other kinds of sports infrastructure) had to close their doors.

In summary, sports were one of the few leisure activities that were allowed and even encouraged by the government during the COVID-19 lockdown. However, these activities were strictly limited to solo-sports and to non-organized sports. Therefore, the current study investigates how the lockdown measures affected different segments of sports participants and the manner in which they were used to practice sports. On the one hand, it can be expected that the behavior and perception of sports club members, event sports participants, and people who (normally) need team-mates and/or opponents for their sports activities, are affected more strongly by the COVID-19 lockdown compared to so-called individual, 'light-organized' sports participants. On the other hand, we test whether the opposite conclusion applies for people who – at some extent –practiced sports online/virtually pre-COVID-19. In line with Lachance (2020) who sees opportunities for virtual/online volunteering, this of course also goes for virtual/online sports participation. The COVID-19-measures of social distance and cancelations of events created momentum for a switch towards online/virtual leisure activities (Lachance, 2020). Therefore, people who are already familiar with

online/virtual sports participation can be expected to be better positioned to (partially or fully) switch to online forms of sports participation.

2.2. Sports participation during COVID-19

The current study investigates how sports participation (and perceptions) have changed since the COVID-19 measures in Flanders. This study thereby aims to gain insight in how differences between different segments of sports participation might be present. For example, as claimed by Potts and McKenna (2020), it is possible that people are more aware of the importance of physical activity than ever, which could eventually lead to more sports participation in the population. Nevertheless, given that COVID-19 is a recent phenomenon, evidence-based figures to underpin this claim are scarce. Some preliminary findings suggest that children's time spent on sports activities decreased during the COVID-19 lockdown (Pietrobelli et al., 2020; Xiang et al., 2020), but there are also indications that changes in adults depend on the specific restrictive measures in countries. In Flanders, where solitary outdoor activities such as running and cycling were still allowed during the lockdown, on average a rise in sports participation has been noticed (Constandt et al., 2020). In Tyrol (Austria) a 'very early and very harsh lockdown' was implemented, as all outdoor activities (including jogging and hiking) were forbidden (Schnitzer et al., 2020; Miner & Wright, 2020). Figures indicate that people engaged less in sports during the stay-at-home order (Schnitzer et al., 2020).

2.3. Sports-specific segments

In the past, numerous studies attributed benefits to sports club membership. Membership of a sports club has been demonstrated to increase the frequency of, and time spent on sports (Borgers et al., 2016; Downward et al., 2014; Lera-López et al., 2015), life satisfaction (Eime et al., 2009), learning and leadership skills (Tsigilis et al., 2009), mental well-being and

social-connectedness (Eime et al., 2010). Pietrobelli and colleagues (2020) argued that the COVID-19 lockdown measures can be compared with (an extra-long) summer recess. They further expect that people who practiced sports in organized settings will experience a negative effect on their sports participation behavior (Pietrobelli et al., 2020). The current study will investigate whether the organizational setting has an impact on how sports participants are affected by the lockdown measures (RQ1a). A similar argumentation goes for mass participant sports events. Funk and colleagues (2011) demonstrated that these events can serve as important correlates of future physical activity and sports participation. The annulation of mass participation sports events could thus have a negative effect on sports participants who were preparing for such an event (RQ1b). A final context under study relates to the usage of online sports platforms, which can serve as an important driver towards a healthier and more sports active lifestyle (Glynn et al., 2014). Moreover, during a lockdown, these platforms can serve as one of the sole options that still allow for social contact and competition while taking care of the obliged distance. People who already used online social platforms to practice sports can be expected to have been influenced less in regard to their sports behavior (RQ1c).

There is a large number of different kinds of sports activities. These activities can be divided into categories that are relevant with the COVID-19 measures in mind (see also above). More precisely, a distinction can be made between activities that are practiced alone versus activities that require other people. Schnitzer and colleagues (2020) found that people engaged more in outdoor sports during the COVID-19 lockdown in Austria. This type of sports activities are typically practiced alone and outside specific sports infrastructures. Consequently, people who were already taking part in solitary sports activities pre-COVID-19 can be expected to be able to continue their sports behavior, while people who engaged in

those sports that need (at least) one opponent pre COVID-19 will have to switch to other activities if they want to remain sports active (RQ2).

In addition to the above two research questions, a third research aim is to investigate the effect of the sociodemographic variables sex, age, education, and having children on sports participation during the time of COVID-19 restrictions (RQ 3). As individuals and households faced challenging times, the abovementioned sociodemographic variables are expected to significantly impact how people were (un)able to continue their sports participation during the COVID-19 lockdown. Most studies on sports participation pre COVID-19 report that men spend more time in sports than women (e.g., Downward et al., 2014). Combined with the findings of Collins et al. (2020) that COVID-19 leads to a significantly larger decrease of working hours and to an increase in childcare among women compared to men, it can thus be expected that women's sports participation behavior is impacted most since the lockdown (RQ3a). A similar negative relationship with sports participation can be forecasted for families with school-aged children, as schools were shut down (RQ3b). As such, parents had to take care for their children (e.g., childcare and/or assisting pre-teaching) without much external support. For age, mixed results have been reported previously. Although the majority of existing studies found decreasing sports activity with increasing age (e.g., Borgers et al., 2016), others might argue that retired people – in case they are still in good health – could dedicate more of their time to physical activity and/or sports. However, elderly people are more vulnerable to be severely ill (or to pass away) due to COVID-19 (Carter et al., 2020). As a consequence, previous studies have suggested that people over 55 years old might be more restricted and/or hesitant to engage in sports during a pandemic (Constandt et al., 2020; Son et al., 2020). Therefore, a negative relationship between age and changes in sports participation behavior during the COVID-19 lockdown is hypothesized (RQ3c).

3. Method

A self-developed, online questionnaire has been distributed through email, newspapers, and social media in the third week after the COVID-19 measures entered in Flanders, namely from the 30th of March until the 5th of April. The data were weighted for gender, age, and education, resulting in a representative sample of 13,515 respondents from aged 18 till 75 years old. The current study only includes those people who took part in sports before the COVID-19 measures were included because (i) the research questions focus on sports participation habits (i.e., setting, kind of sports activities) and thus on people who have been sports active, (ii) almost all sports-specific variables are 'blank' for the non-participants, and (iii) there is an overrepresentation of people who were sports active.

Logistic regressions are used to investigate the determining factors of the three dependent variables, namely respondents (i) that maintained or increased their sports participation frequency versus respondents that reduced the frequency of their engagement in sports, (ii) that adapted the nature of their sports participation versus those who had not, and (iii) that missed their usual sports participation versus those who did not miss it (Table 1). The latter (Missing_sports) is only asked to the respondents that answered 'yes' to (Adapted_sports). The descriptive results in Tabel 1 demonstrate that overall, approximately 3 out of 4 adults in Flanders were able to be equally or more active when compared to the period before the COVID-19 social restrictions. Nevertheless, 4 out of 5 indicated they had to adapt their sports behavior, and said they missed aspects of their former sports participation.

[insert Table 1 near here]

The first group of independent variables indicate how people practiced sports before the COVID-19 measures. The respondents were asked whether they practiced sports online, in an organized sports context (sports club), and/or whether they were preparing themselves to

take part in a mass sport event. Next, it was asked in which sports activities they took part. In line with De Haan and Breedveld (2000), these activities were divided into three categories, namely (i) sports activities performed solely for recreational purposes such as running and fitness (solo), (ii) sports activities for which at least one opponent is needed according to the formal rules of the game, such as racquet sports and martial arts (duo), and (iii) team sports that typically involve two teams of at least two players, such as basketball and soccer.

In a second part we focus on sociodemographic variables, that also can be seen as control variables. Having children or not, the level of education, age, and sex were included.

Finally, a non-linear categorical canonical correlation analysis with optimal scaling (OVERALS) is used, with a large number of variables. This method provides a graphical solution to describe the relationship between variables, and is therefore useful for segmentation purposes in the field of leisure and sports (e.g., Alén et al., 2017; Scheerder et al., 2005). This OVERALS-method suits the data well, as it is designed to cope with ordinal and nominal data (Alén et al., 2017; Van der Burg et al., 1994). In the analysis all variables of the regression are included, except for 'Missing_Sports'. After all, this question was only asked to the people who answered 'Adapted_sports' positively, and would therefore result into dropping a large number of the observations. Also, when compared to the regression analyses, experienced obstacles to practice sports were added to the canonical correlation analysis. The experienced obstacle variables are closed sports infrastructure ('obst_infr'; 40.2%), no sports club activities ('obst_club'; 31.2%), no friends to sport with ('obst_friend'; 24.5%), canceled sports events ('obst_event'; 25.8%), no adequate environment to practice sports ('obst_env'; 14.6%), fear for COVID-19 ('obst_fear'; 9.3%), lack of time ('obst_time'; 3.2%), no interest (anymore) ('obst_intr'; 2.2%), sickness ('obst_sick'; 1.9%), people who experience no obstacles ('obst_no'; 28,9%).

4. Results

When looking at Table 2, a first glimpse of the change in sports participation and perception for the sports-specific groups can be detected. Although the bivariate statistics do not control for other variables, the results seem to suggest that sports club members were affected most by the lockdown restrictions. The same conclusion applies for sports participants that were used to take part in sports activities for which at least one opponent is needed (duo and team).

[insert Table 2 near here]

In Table 3 the logistic regressions results are given, with ‘More_sports’, ‘Missing_sports’, and ‘Adapted_sports’ as the dependent variables.

[Insert Table 3 near here]

Figure 1 gives an overview of the canonical correlation results. Variables that are close to the origin of the coordinate system do have little discriminatory power, while the opposite goes for variables are at the top/down or the far left/right. Also, variables close to each other are related.

[insert Figure 1 near here]

5. Discussion

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6. Conclusion

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Table 1. Descriptive statistics of the dependent and independent variables (in %)

Dependent variables	Moreless_sports (N=11,646)		Adapted_sports (N=11,763)		Missing_sports (N=8,802)	
	Equal or increased (1)	76.8	Yes (1)	79.6	Yes (1)	79.4
	Reduced (0)	23.2	No (0)	20.4	No (0)	20.6
Independent variables						
Online_SP	Yes	11.2				
	No	88.8				
Club_SP	Yes	42.3				
	No	57.7				
Event_SP	Yes	34.0				
	No	66.0				
Solo_sport	Yes	94.7				
	No	5.3				
Duo_sport	Yes	8.2				
	No	91.8				
Team_sport	Yes	8.6				
	No	91.4				
Children	Yes	38.7				
	No	61.3				
Age	Age 18-34	25.5				
	Age 35-54 (ref.)	38.8				
	Age 55-74	35.7				
Education	Educ_student	5.2				
	Educ_lower (ref.)	59.3				
	Educ_higher	35.5				
Sex	Male	52.6				
	Female (ref.)	47.4				

Table 2. Overview of the bivariate statistics for the dependent variables by the sports-specific independent variables (in %)

	Overall	Sportclub	Event	Online	Solo	Duo	Team
Moreless_sports	76.8	71.6	80.5	86.1	77.9	51.9	66.5
Adapted sports	79.6	90.7	81.9	79.3	78.1	95.9	93.9
Missing_sports	79.4	88.1	81.2	75.7	77.1	80.6	85.8

Table 3. Logistic regression results for the determining factors of maintaining, adapting and missing sports participation behavior pre- versus post-COVID-19 restrictions

	Maintained or increased sports participation	Adapted their sports participation behavior	Miss their sports participation behavior
Online_SP	0.572***	-0.231**	-0.225*
Club_SP	-0.407***	1.191***	1.111***
Event_SP	0.24***	0.081	0.174**
Sport_solo	0.107	0.060	-0.302*
Sport_duo	-0.960***	1.596****	0.479***
Sport_team	-0.418***	0.620***	0.122
Children	0.104	-0.084	0.125
Age 18-34	0.074	0.169*	-0.003
Age 35-54 (ref.)			
Age 55-74	0.014	-0.387***	0.271***
Educ_student	0.028	0.075	0.060
Educ_lower (ref.)			
Educ_higher	0.018	0.256***	-0.046
Male	0.195***	-0.162***	-0.096
Constant	0.949***	-0.267	-0.204

*p<.005
**p<.01
***p<.001

Figure 1. Component loadings of the canonical correlation analysis for COVID-19 sports participants (N=11,927)