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ORIGINAL ARTICLE

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Effect of the COVID-19 pandemic on an international sample of golfers with disabilities

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Abstract

Introduction: Participation in adaptive sports can mitigate the risk for obesity and social isolation/loneliness in individuals with disabilities (IWDs). The coronavirus disease 2019 (COVID-19) pandemic and related changes in physical activity exacerbated existing barriers to participation in adaptive sports. There is limited literature assessing the potentially disproportionate effect of pandemic-related changes to physical activity in IWDs.

Objective: To determine how golf benefits IWDs and understand the effect of changes to golfing habits during the pandemic.

Design: A survey was distributed to all registered players ($n = 1759$) of the European Disabled Golf Association (April 2021). It assessed participants' demographic information (age, sex, race/ethnicity, nationality, impairment, golf handicap), golf habits before/after the pandemic, and perceived impact of golf and COVID-19-related golf restrictions to physical/mental health and quality of life (QoL).

Setting: European Disabled Golf Association (EDGA) worldwide database.

Patients: Responses were received from 171 IWDs representing 24 countries. Age 18 years or older and registration with EDGA were required for inclusion.

Interventions: Survey.

Outcomes: Self-reported golfing habits, mental/physical health, and QoL.

Results: Mean participant age was 51.4 ± 12.9 years. Most respondents were amputees (41.5%) or had neurological diagnoses (33.9%). Pre-pandemic, 95% of respondents indicated that golf provided an opportunity to socialize, and most participants reported that golf positively affected physical/mental health and QoL. During the pandemic, more than 20% of participants reported golfing with fewer partners and 24.6% of participants reported playing fewer rounds per month ($p < .001$ for both); these findings were consistent across geographical region, ethnicity, and type of disability. Most participants (68.4%) perceived that their ability to golf had been impacted by COVID-19 and that these changes negatively affected their mental/physical health and QoL.

Conclusions: Golf benefits the physical/mental health and QoL of IWDs internationally. Changes to golfing habits throughout the COVID-19 pandemic negatively affected these individuals. This highlights the need to create opportunities for physical activity engagement and socialization among adaptive athletes during a global pandemic.

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INTRODUCTION

Individuals with disabilities (IWDs), comprising 15% of the global population, face higher risks of obesity, cardiometabolic disease, and social isolation than their able-bodied counterparts.[1,2] Regular physical activity (PA) has been shown to improve the mental and physical health and quality of life (QoL) of individuals across the spectrum of demographics.[3,4]

A recent review by Murray et al.[4] found that the sport of golf, which is played by millions of individuals worldwide, provides similar health and wellness benefits to regular PA.[4–6] It improves balance and aids in chronic disease prevention/treatment, cardiometabolic factors, and body composition.[4,7,8] Prior studies have also suggested that in golfers with disabilities (GWDs), the sport provides an opportunity to attain daily PA metrics and leads to the development of a peer network, thereby improving social connection.[2,3,9]

Strategies intended to limit coronavirus disease 2019 (COVID-19) transmission, including social distancing and facility closures, limited participation in adaptive sports and exacerbated the risk for loneliness and chronic disease associated with physical inactivity.[2,10] The effect of these changes to regularly active IWDs has not been studied. Determining the influence of this change in an adaptive sport, such as golf, can inform strategies to maintain PA and sports engagement among IWDs throughout future potential pandemics.

The purpose of this study was to assess the benefits of regular golf participation in a global cohort of GWDs and investigate the effect of pandemic-related changes to golf participation and the perceived benefits of the sport. We hypothesized that golf would positively affect the physical and mental health and QoL of IWDs and that pandemic-associated changes would negatively affect these metrics. COVID-19 pandemic mitigation strategies also differed by geographic location, and so a secondary objective of this study was to describe these differences.[11]

METHODS

This study was approved by our institutional review board.

Participants

Data were collected in April 2021, via an anonymous survey distributed to all registered European Disabled Golf Association (EDGA) players ($n = 1759$), which incorporates all official disability golf players globally. Participants provided electronic consent; those age <18 years or not registered with EDGA were excluded.

Survey design

The survey had three components:

1. Demographics
   Age, gender identity, race/ethnicity, nationality, type of disability, golf handicap, and employment status were collected.
2. Pre-pandemic and current golfing habits
   Participants described golfing habits before (March 2020) and during the pandemic (March 2020 to April 2021 when the survey was administered), specifically. They specified the number of golf playing partners (alone, 1, >1 partner), days per month spent golfing (<4 or ≥4), participation in non-golf exercise, and perception of golf as socialization (yes, no, not sure).
3. Impact of pandemic-related changes in golf engagement on participants
   Participants rated the effect of golf on their physical health, mental health, and QoL before and after the pandemic using a 5-point Likert scale, where 1 = Strongly Disagree and 5 = Strongly Agree.

Statistical analyses

Golf habits were compared using Fisher's exact tests. Multivariate analyses were conducted using a multiple logistic regression model to analyze the effect of location, race/ethnicity, disability, employment status, and golf handicap. Wilcoxon signed-rank and Mann–Whitney *U* tests were used to analyze responses to Likert-scale questions between subgroups.

RESULTS

Demographics

The survey received 171 responses from 1759 registered players (9.7%). Most respondents were male (88.9%) and Caucasian (70.2%). The mean age was 51.4 ± 12.9 years. Responses were received from players in 24 different countries across 5 continents, with the highest numbers coming from the United States (19.3%) and the United Kingdom (18.1%). Amputation was the primary reported reason for disability (41.5%), followed by neurological diagnosis (33.9%). Golf handicap index ranged from less than or equal to 10 strokes (29.8%) to 11–20 strokes (35.6%) and >20 strokes (34.5%).

The two subgroups defined by location were North America ($n = 46$) and Europe ($n = 102$). The three subgroups defined by nature of disability were amputee,

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TABLE 1 Demographic information ($n = 171$)

Demographic	Variable	N	%
Age (y)	Mean	51.4 ± 12.9 (Mean ± SD)	
Gender	Male	152	88.9
	Female	19	11.1
Ethnicity	Caucasian	120	70.2
	Asian/Indian	3	1.8
	Hispanic/Latino	4	2.3
	Native American	2	1.2
	Pacific Islander	1	0.6
	Other	36	21.1
	Prefer not to answer	5	2.9
Nationality	United States	33	19.3
	United Kingdom	31	18.1
	France	15	8.8
	Canada	13	7.6
	Australia	12	7.0
	Belgium	9	5.3
	Sweden	8	4.7
	South Africa	7	4.1
	The Netherlands	6	3.5
	Italy	5	2.9
	Spain	5	2.9
	Czech Republic	4	2.3
	Denmark	4	2.3
	Slovakia	3	1.8
	Norway	3	1.8
	Germany	3	1.8
	Finland	2	1.2
	Ireland	2	1.2
	Israel	1	0.6
	South Korea	1	0.6
	Vietnam	1	0.6
	New Zealand	1	0.6
	Portugal	1	0.6
	Austria	1	0.6
Impairment	Amputee (lower limb)	40	23.4
	Amputee (upper limb)	31	18.1
	Other	31	18.1
	Intellectual/neurological	16	9.4
	Spinal cord injury	16	9.4
	Visual	11	6.4
	Cerebral palsy	8	4. 7
	Multiple sclerosis	7	4.1
	Stroke	7	4.1
	Traumatic brain injury	4	2.3

neurological diagnosis (cerebral palsy [CP], traumatic brain injury [TBI], spinal cord injury [SCI], multiple sclerosis [MS], stroke), and other (Table 1). The two subgroups used to analyze the impact of ethnicity were "Caucasian" and "All other races."

Golfing habits before and during the COVID-19 pandemic

More than 95% of respondents indicated that golf allowed them to socialize before the COVID-19 pandemic, and 70% of participants reported that their ability to golf from March 2020 onwards (to April 2021) had been affected by the pandemic. This latter result was significantly different ($p < .011$) between geographic subgroups with the European sub-cohort reporting more of an impact

As outlined in Table 2, during the pandemic, the number of participants who golfed 4 or more times per month dropped by 20.5% ($p < .001$). This was consistent across type of disability ($p < .001$, $p < .004$) and ethnicity ($p < .001$, $p < .003$). This change in rounds per month was larger in the European subgroup ($p < .001$) than the North American subgroup ($p < .01$), but both groups saw a statistically significant decrease. Participants also reported a 12.3% decrease in participation in non-golf exercise after March 2020.

There was a 24.6% decrease in respondents who reported playing with >1 partner per round from 76.0% to 51.4% ($p < .001$) after March 2020 (Table 2). This decrease was consistent when compared between ethnicity groups, ($p = .03$ for both), location ($p < .006$, $p < .019$), and disability ($p < .001$, $p < .024$). Of note, the majority of participants (81.9%) reported wearing a facemask while golfing after March of 2020.

Effect of pandemic-related changes in golf engagement on participants

As outlined in Figure 1, respondents agreed/strongly agreed that playing golf regularly positively affected their physical health (87.7%), mental health (91.8%), and QoL (92.4%) before the COVID-19 pandemic. There was no significant difference in this result when comparing geographical subgroups or types of disability ($p > .05$ for both).

As outlined in Figure 2, the majority of respondents also agreed or strongly agreed that COVID-19-related changes to their golfing habits led to a negative effect on their physical health (68.4%), mental health (53.3%), and QoL (69.2%), leading to increased feelings of isolation (65.8%). There was no statistically significant difference in these responses between geographic regions ($p > .05$).

DISCUSSION

This study aimed to assess the effect of regular golf participation on GWDs and examine the effects of the

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TABLE 2 Pre-pandemic and during-pandemic self-reported number of golf days per month and number of golf partners per round compared for the total cohort (TOTAL), and further analyzed for each of the geographic subgroups (European Subgroup and North American Subgroup).

	Golf Days per Month			Golf Partners per round				
Golfer Location	**<4**	**≥4**	***p* value**	**Alone**	**1**	**>1**	**N/A**	***p* value**
European sub-cohort pre-pandemic (%)	22.9	76.5	.001**	5.9	21.6	72.6	0	.006*
European sub-cohort during pandemic (%)	34.3	52.0		9.8	34.3	43.1	12.8	
North American sub-cohort pre-pandemic (%)	28.3	71.7	.01*	4.4	15.2	80.4	0	.019*
North American sub-cohort during pandemic (%)	32.6	54.4		8.7	26.1	60.9	4.4	
TOTAL cohort pre-pandemic (%)	25.7	74.3	.001**	5.3	18.7	76.0	0	.001**
TOTAL cohort during pandemic (%)	46.2	53.8		8.2	30.44	51.4	9.9	

*Denotes statistical significance $p < .05$.
**Denotes statistical significance $p < .001$.

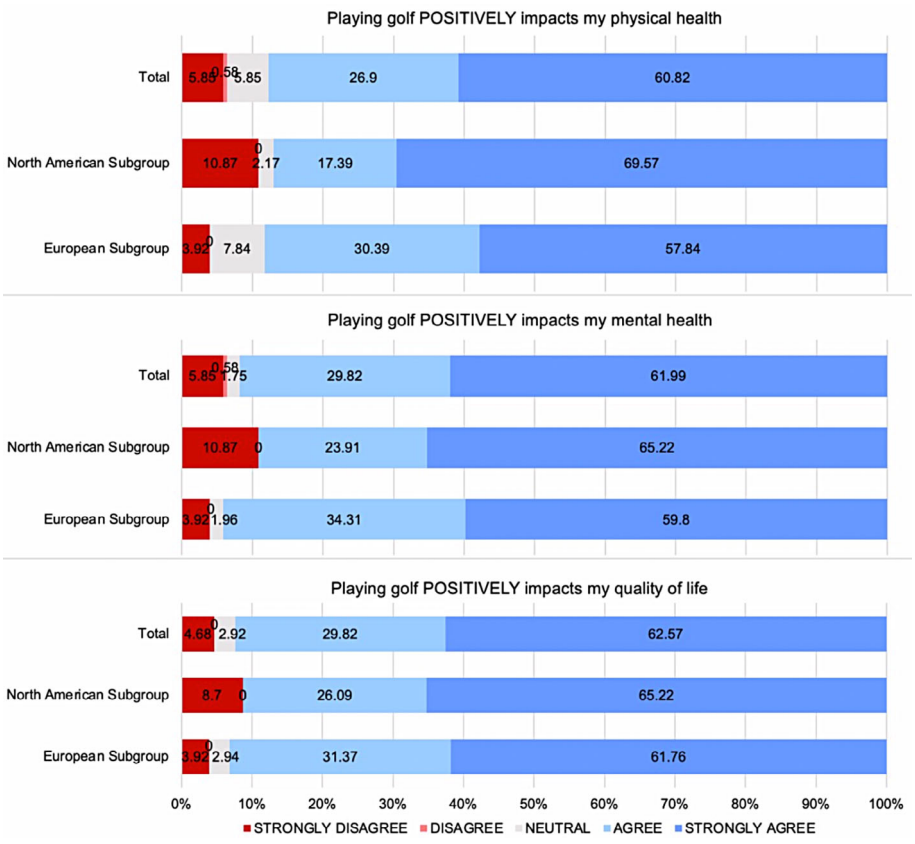


FIGURE 1 Participants' responses when asked to indicate the degree to which they agree with statements about how pre-pandemic participation in golf affected their physical health, mental health, and quality of life. Responses were recorded on a Likert scale (1–5, where 1 = Strongly Disagree and 5 = Strongly Agree). Shown for the total cohort and geographic subgroups.

COVID-19 pandemic on this population. The hypothesis was that golf would positively affect the physical and mental health and QoL of GWDs, but COVID-19-related changes to golfing habits would have a negative effect. The results support this hypothesis, with a clear majority of participants reporting that golf positively affected their physical health, mental health, and QoL.

Most participants reported reduced golfing frequency and partners due to COVID-19, which was associated with negative changes to their physical and mental health and QoL, and with increased social isolation. These results align with the existing literature that emphasizes the importance of frequent PA and strong peer networks for individuals with and without disabilities.[3] A study by McGuine et al.[12] highlighted the negative effects of decreased socialization in team sports, underscoring the importance of socialization in sport.[12] The study suggests that the necessary policies implemented to limit COVID-19 transmission interrupted the socialization that golf offered IWDs, potentially explaining the negative effect that was observed.

Another study examining the effect of the pandemic on IWDs, specifically Parkinson disease, found significantly worse stress, depression, anxiety, and QoL

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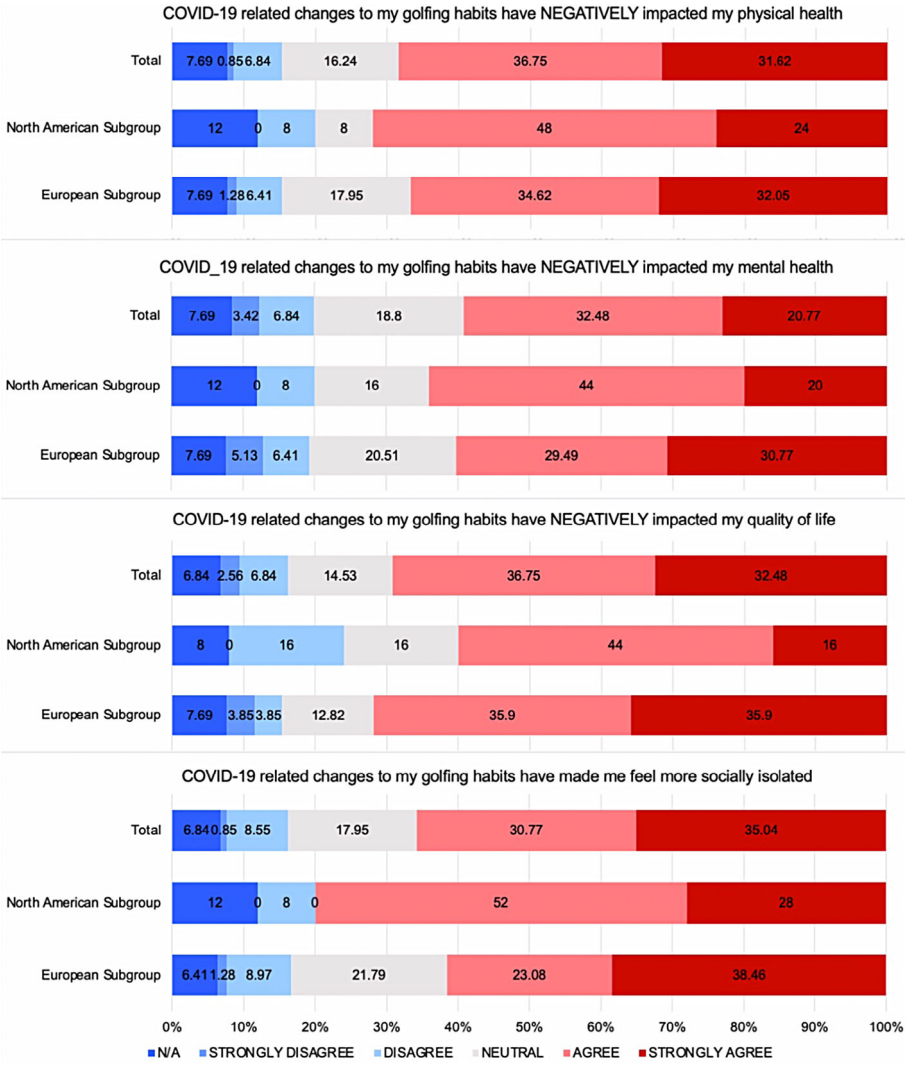


FIGURE 2 Participants' responses when asked to indicate the degree to which they agree with statements about how pandemic-related changes to golf habits affected their physical health, mental health, quality of life, and feelings of isolation. Responses were recorded on a Likert scale (1–5, where 1 = Strongly Disagree and 5 = Strongly Agree). Shown for the total cohort and geographic subgroups.

throughout the pandemic when compared with controls.[13] Although these results, along with those of the present study, are descriptive, they highlight the need for increased consideration of IWDs when implementing public policies.

Limitations

Limitations include self-reported responses, potentially biased by participants who were more negatively affected by pandemic-related changes to golf access. This study focused on GWDs registered with EDGA (largest organization representing disability golfers worldwide) and does not represent all GWDs. Comparison to non-golfing group of IWDs could not be undertaken in this study but may have been useful to minimize bias from confounding variables. Our study did not differentiate between self-imposed and governmental playing restrictions.

CONCLUSION

This study assessed the effect of COVID-19 restrictions on the PA of IWDs in the context of a specific sport. Golf provides an avenue for regular PA and socialization, benefitting IWDs. The COVID-19 pandemic significantly hindered the ability of GWDs to engage in sport, potentially affecting their health and QoL. This study suggests that golf benefits IWDs and emphasizes their need to maintain PA to prevent long-term health consequences resulting from sedentary behavior.

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DISCLOSURES

All authors declare that they have nothing to disclose.

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