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Physiotherapist and participant perspectives from a randomized-controlled trial of physiotherapist-supported online vs. paper-based exercise programs for people with moderate to severe multiple sclerosis

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ABSTRACT

Purpose: There is a gap in research on how best to support exercise in moderate to severe MS. The objective of this study is to share perspectives of people living with MS and physiotherapists on their experiences in a randomized clinical trial of online physiotherapy vs. an active comparator.

Methods: Semi-structured exit interviews were conducted with volunteer participants from the online and comparator arms of the trial, and focus groups were held with study physiotherapists. Transcripts were analyzed using reflexive thematic analysis.

Results: Perspectives from participants with MS yielded three themes: *usability* of their program, *utility* of their program, and *motivation to participate*. Visual and dexterity impairments limited the usability of the online program. Having an opportunity “to be pushed” was valued by participants in both trial arms. Motivation to exercise was variable, and participants desired periodic face-to-face contact with their physiotherapists. Perspectives from trial physiotherapists yielded similar and complementary findings concerning usability and utility.

Conclusions: Participants with MS and physiotherapists found the online physiotherapy platform useful for supporting exercise, yet they identified some limitations. As the appeal of online platforms has increased since the pandemic, it will be important to consider the needs of people with moderate to severe MS.

Trial registration number: NCT03039400.

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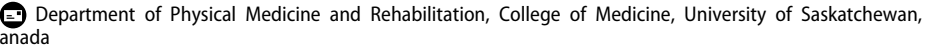
► IMPLICATIONS FOR REHABILITATION

- People with moderate-to-severe MS and physiotherapists involved in a clinical trial found online physiotherapy useful for supporting exercise. Physiotherapists and participants using the online program desired improved platform accommodations for people living with MS with visual and dexterity impairments.
- Physiotherapists and people living with MS from both the online exercise program and comparator groups perceived a need for more face-to-face contact and opportunities to build therapeutic alliance.
- Perspectives from prescribing physiotherapists and people living with MS about supporting exercise online may have practice implications during and post-pandemic.

Introduction

Exercise and lifestyle physical activity is recommended for people with multiple sclerosis (PwMS) throughout the disease course [1]. How best to support exercise adherence to maximize the benefits of exercise remains a priority area of research [2,3]. The COVID-19 pandemic has created barriers to in-person support for exercise and increased interest in online platforms. A survey study from Israel reported that almost one-third of PwMS self-reported decreased fitness levels during the pandemic [4]. The benefits of exercise in PwMS are many, including maintained or improved function [5], and possible disease-modifying effects [6]. A meta-analysis of online physical activity interventions conducted pre-

pandemic reported a moderate effect size for increasing physical activity levels for PwMS with mild disability [7]. Studies involving online platforms to support exercise in PwMS have largely only included people with mild to moderate disability, and few trials have reported qualitative user perspectives [8–12]. Positive experiences were reported by ambulatory PwMS in a trial of online exercise (Web-Based Physio), especially in terms of ease of access and flexibility of the online program [12]. However, the authors identified that the exercise program did not consistently meet the hopes and expectations of participants. They recommended that future studies should also seek the perspectives from participants in comparator groups to provide context and understanding about motivation and expectations for exercise [12].

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We conducted a 26-week randomized controlled trial of an online intervention delivered with Web-Based Physio (now www.giraffehealth.com) including people with moderate-to-severe disability [13]. The trial was conducted pre-pandemic and registered with clinicaltrials.gov (Trial registration number: NCT03039400). All participants received an initial in-person assessment by a physiotherapist with experience in MS care. Participants were randomized 2:1 to follow the online exercise program with pre-recorded exercise videos or to the active comparator group involving a paper-based exercise prescription. Exercise prescriptions placed emphasis on repetitive small and large movements for maintaining function over time (i.e., exercises for trunk control for independent sitting and transfers, upper-limb function for self-care, etc.). Programs were individualized in terms of exercises, level of difficulty, and the number of sets and repetitions. A minimum of two exercise sessions per week for six months was prescribed for all participants [13].

The online program tracked exercise adherence in real-time and provided an asynchronous chat message feature for communication with physiotherapists. There was no significant between-group difference in exercise frequency, however, nearly 50% of participants in both groups increased their frequency of exercise. Both groups participated in exercise sessions two or more times a week for most of the 26-week trial [13]. The experiences of physiotherapists and the participants from both groups in the trial may provide further context to the quantitative trial results and inform future research and practice in exercise adherence in moderate to severe MS. The objective of this study is to share the perspectives of PwMS and physiotherapists on their experiences with involvement in a randomized clinical trial of online physiotherapy vs. an active comparator.

Methods

To examine the perspectives of study participants living with MS in the trial, one author (SJD) conducted telephone exit interviews with volunteer participants within four weeks of the participant completing the study [13]. Inclusion criteria for enrollment in the original study were diagnosis of MS, internet access, residing within 300 km of the study centre (unless willing to travel to the centre for all assessments), and exercising less than twice weekly. Exclusion criteria included severe cognitive impairment. No formal cognitive assessment tool was utilized to determine eligibility; participants had to demonstrate the ability to provide informed consent by the judgement of the research study physiotherapists. We recruited for the study through the Saskatchewan MS Clinic and the MS Society of Canada. Participants who completed their final research assessment were invited to participate in the exit interviews.

The study exit interview guide was modified from a previous guide developed to report the experiences of ambulatory participants with MS participating in another study of Web-Based Physio [12]. The template interview guide from the Dennett et al. [12] study was developed with open-ended questions and prompts aimed to capture an understanding of the individual experiences of participants randomized to the online group. The current interview guide was modified to address participants in either the comparator group or online group and the guide was piloted with a person living with advanced MS. Questions explored motives, experiences during the study, processes for following exercise prescription, and challenges.

The perspectives of study physiotherapists were sought at focus groups with investigators (SJD, KK, DN). Two focus groups occurred with the seven physiotherapists involved with the study, each lasting 90 min. The first focus group occurred near the study

mid-point when ~50% of participants were halfway through the 26-week protocol and the second focus group was held at the end of the study. Study physiotherapists and PwMS provided explicit consent to participate.

Interviews with study participants and the focus groups with physiotherapists were recorded and transcribed. We took a qualitative descriptive approach, in that the aim was to describe the expressed experiences and perceptions of the participants and physiotherapists [14]. Transcripts were analyzed using reflexive thematic analysis [15,16]. Authors (DN, SJD, KK) individually read the transcripts to gain familiarity with the data, noting codes and initial themes. Authors then met to discuss and come to an agreement on main themes, followed by further reflective analysis and meeting to refine and define the themes and write the report [16]. Ethical approval was granted by the University of Saskatchewan Biomedical Research Ethics Board.

Results

Participant demographics

Thirty-five participants who completed the quantitative study were invited to provide interviews. Eighteen participated, providing a response rate of 51% (18/35). Thirteen participants from the online group and five participants from the comparator group provided exit interviews (11 females, seven males). Participant demographics are detailed in Table 1. The median age was 57.5 years (range 26–76), disease duration from the first onset of MS symptoms was 19 years (range 2–40 years), and Patient-Determined Disease Steps (PDDS) score was 4 (range 2.0–6.0). A score of 2 on the PDDS indicates a visibly abnormal gait without requiring ambulation aids; a score of 4 indicates dependence upon unilateral support for walking even 25 feet; and a score of 6 indicates essential confinement to a wheelchair or scooter for mobility [17].

All seven study physiotherapists (seven females) participated in the focus groups, each with at least 5 years' experience working with persons with MS. Most of the physiotherapists had more than a decade of neuro-rehabilitation clinical experience.

Perspectives from participants living with MS yielded three distinct yet overlapping themes: *usability of the exercise program*, *utility of the exercise program*, and *motivation to participate*. *Usability of the exercise program* refers to the ease of use of the program—whether this is related to the usability of the online program or the comparator paper-based program. *Utility of the exercise program* refers to the perceived value and benefit of the program. The theme *utility of the exercise program* included perceived limitations and advantages about the online or paper-based program which informed the PwMS perspectives about what was most helpful to them. Physiotherapists also shared perspectives about the usability and utility of the online exercise program in comparison to the paper-based exercise program.

Usability of the exercise program: PwMS perspectives

Most PwMS using the online platform reported that it was easy to use with no trouble accessing and navigating the site. For example, one participant, who described herself as “probably not” a computer user, reported that using the online platform was “easy enough” (Sophia; online group). The platform was designed for participants to log in each session to follow the exercise prescription by video from a computer or iPad. However, some participants reported doing the exercises without logging into the

Table 1. Demographics.

Participant pseudonym	Gender	Trial group	Age range	PDDS ^a	# of weeks completing ≥ 2 exercise sessions/week ^b	Disease course	Place of residence
Sophia	F	Online	65–69	2	22	RRMS	City
Riley	F	Online	30–34	3	4	RRMS	City
Amelia	F	Online	55–59	6	21	SPMS	City
Susan	F	Online	65–69	4	23	RRMS	City
Olivia	F	Comparator	55–59	4	4	PPMS	Rural
Elijah	M	Online	55–59	5	1	PPMS	Town
Amanda	F	Online	65–69	3	23	PPMS	City
Jacob	M	Online	25–29	2	3	RRMS	City
Jennifer	F	Comparator	50–54	3	26	RRMS	Town
Liam	M	Online	40–44	7	22	SPMS	City
Benjamin	M	Online	50–54	6	1	PPMS	City
Jack	M	Online	50–54	4	3	RRMS	City
Anthony	M	Comparator	70–74	4	25	SPMS	City
Emma	F	Online	75–79	3	23	SPMS	City
Noah	M	Online	50–54	2	25	RRMS	Rural
Charlotte	F	Comparator	75–79	6	17	PPMS	Rural
Isabella	F	Comparator	25–29	3	2	RRMS	City
Hannah	F	Online	55–59	2	20	SPMS	Town

^aPatient determined disease steps.

^bDuration of randomized controlled trial was 26 weeks. A trial physiotherapist prescribed individualized exercises to be completed as tolerated at least 2×/week for participants in both the online and active comparator groups.

platform as they found it cumbersome to login or restrictive to have to be located near their computer.

I logged in every two weeks.... And then I probably did them twice a week. An app on a phone would be nicer. (Riley; online group)

Some reported taking the time to login only to use the videos to refresh their memory on how to perform the exercises, especially after a period of non-adherence.

... Well, I didn't need to watch the videos every time I did it. I needed to do it to refresh my memory. Like after I was away for two weeks, I had to play them all sort of thing, remember what I had to do. (Amelia; online group)

Other participants reported challenges or inconveniences with the usability of the online platform. The main challenges related to the buttons and tabs being hard to see and/or click in the case of visual limitations or upper-extremity tremor.

With the software the start and stop button for the timing is very close, so those of us without the best dexterity or a tremor – I would sometimes go to stop it and end up resetting it. (Susan; online group)

Some people randomized to the comparator group were pleased not to have to contend with the online technology to follow the exercises, and others randomized to the online group also still preferred paper exercise instructions.

It worked for me because I have the (paper) handout and I put it beside my phone so when my phone goes it reminds me to do something. Yeah, otherwise I forget. Also... I like my newspaper. I don't like the computer anymore. (Olivia; comparator group)

I got the web-based, but I printed out my program and I used the paper mostly. I did log in for a bit, but just found it too cumbersome or I'd forget to start. It was my worst thing; I'd forget to start it and then I would go through the exercise... So, I just continued with the paper. (Elijah; online group)

Olivia in the comparator group utilized technology to get started with exercise through an alarm set on her mobile phone, which she self-initiated. No participants were instructed to set reminder alarms as part of this study. Elijah in the online program group mentioned that the platform did not serve as a useful reminder to start exercising, yet a paper printout was of value.

Usability of the exercise program: physiotherapist perspectives

The main usability challenge with the online exercise program from the perspective of physiotherapists related to challenges with efficient exercise prescription. Finding the desired exercise on the platform took time.

The exercises were quite hard to sift through on the website itself... you just had to scroll. And then to get an explanation of it you had to click on it, wait for it to load, read the explanation. (PT1)

And you couldn't search, you had to try and find that list. (PT2)

Physiotherapists could not quickly preview videos from their login side of the program. Physiotherapists shared that they do not use a universal nomenclature for describing exercises, and therefore finding a named exercise from a list was difficult. Study physiotherapists compared the efficiency of the novel online prescription to their clinical practices outside of the research study. These practices involved access to online picture diagrams with explanations for print from a local source. Using a familiar system seemed faster than navigating the online video prescription platform.

A unique feature of Web-Based Physio was the ability to monitor exercise participation. Monitoring participation and responding to questions within the program was a quick process for most of the physiotherapists.

And some of them it's just a quick check in five or ten minutes. It's all good. (PT5)

Yeah, and their [patients'] questions are very pointed. Because they have to be concise. (PT1)

Physiotherapists found it easy to monitor program engagement and participants' diaries through the website. However, with the lack of a universal nomenclature for exercises, physiotherapists were not always clear on which exercise the participant was referring to in their diary.

I liked the online diary because you could see if your patient logged in or not, but what I found difficult is if they filled their diary and they referred to their exercise, you didn't have their program right there in their diary... So [it] was like, 'Oh, which one was that? So, more ability to see their program and their diary at the same time. (PT3)

Utility of the exercise program: PwMS perspectives

PwMS in both the online and comparator groups reported that access to a study MS-specialist physiotherapist provided valued advice and expertise about exercise. Before taking part in the study, some participants expressed they had never accessed or were not aware of MS-specialist physiotherapist services. Receiving a prescription for a feasible, personal home exercise program designed in consultation with the study physiotherapist was valued.

... get something that was relevant. Something specifically for me that I could do at home. That would be good for me particularly. You know I have limited energy of course, so if I'm going to invest [in] it, I want to invest in something that is most useful for me. (Susan; online group)

Participants randomized to the online program felt that remote exercise monitoring or asynchronous contact with the physiotherapist by email or messaging was not as helpful as in-person exercise with the physiotherapist with immediate real-time feedback.

I just found that having somebody check up on me and know that they're watching. It's not quite as good as having somebody to do it with, but it's the next best thing. (Amanda; online group)

So, if there was a way, I know in-person is best, but if there was a way to get feedback on how I'm performing the exercises would be best. Some real-time feedback. (Susan; online group)

Participants in both groups reported that they found their programs useful for improving or maintaining function. The online platform was useful for participants with less motivation at the outset or for those experiencing declining function. The theme utility overlapped with the theme *motivation* in that a useful aspect of the online program was that it seemed to help participants shift towards a more positive mindset.

I noticed I'm slowly getting stronger. (Jennifer; comparator group)

Each year I'm physically able to do less of it... When each year you can do less, well then eventually, you're thinking you can't do anything. This study helped change that and remind me of things I can do. (Liam; online group)

I realized I could do so much more than I thought I could. You know, it's really, really easy to fall into that mindset of 'oh no, I'm a cripple now. I'm useless. I can't do anything.' (Jacob; online group)

However, many also reported that more direct and frequent supervision was desired.

... there could've been a little bit more supervision. Like in terms of encouragement... I think that was the biggest hole for me. I thrive on people that want to encourage me. (Benjamin; online group)

I didn't really feel that I had a coach. (Elijah; online group)

Well, I'm seventy years old and for some reason I still need to focus on somebody telling me what to do. (Sophia; online group)

Supervision appeared associated with the theme *motivation to participate*. For one participant, supervision was viewed as critical for getting started.

I didn't follow it because I actually need a person to motivate me until I start going, and then once I start seeing results, I'm okay. (Jack; online group)

Utility of the exercise program: physiotherapist perspectives

Physiotherapists generally perceived that one of the main benefits of Web-Based Physio was being able to reach underserved areas and reduce the need for travel.

... especially for the people that are from far away, right, it makes it easier, so nobody has to travel. Or more importantly, they don't have to travel. (PT4).

However, similar to the participants with MS, physiotherapists found in-person appointments to be more beneficial, particularly when things changed for participants.

You don't... physically see them again doing the exercises that you've changed. So that was always my problem with adapting exercises. I know I'm telling you how I want you to do this, I know that you're saying that you understand how to do this. But I actually don't know if you're doing it how I want you to. So, are you targeting the things that I think we need to target, or we need to target for your goals, or are you just doing what you think you're supposed to do? (PT1)

Physiotherapists acknowledged a need for establishing therapeutic connections with participants. They reported that the online physiotherapy platform provided the opportunity for a therapeutic alliance with "back and forth" communication. However, the platform alone was not appropriate for everyone, all the time.

... because of the back and forth of the web-based, I felt fairly connected to most of them. I felt there were times when a patient really had something happen, and I had a couple of those where something really, really happened to them, and I would've wanted them to come back in so that I could re-assess them. And not just try to carry on with - because I don't know where they are anymore. (PT5)

Motivation to participate: PwMS perspectives

Motivation to participate includes the desire and reasons identified by PwMS to participate in the study and to continue participating in exercise for the duration of the trial. Motivation to participate overlapped with the usability and utility themes in terms of whether the assigned program was seen as useful by PwMS for motivating participation.

Some PwMS reported their random group assignment to the online group was a good fit for them because knowing exercises were being monitored online motivated participation.

It was easier than doing a paper thing. Because it meant that somebody was kinda watching me and that I had to get up and do it. (Amelia; online group)

However, other factors besides exercise monitoring and supervision also contributed to motivation. The majority of participants reported that the primary reason to participate in the study was the hope to fulfill, even partially, an identified need to exercise.

Because it was something at least. (Olivia; comparator group)

I just felt like that this body needs exercise, so this would force me to do it. (Jack; online group)

Fueling the hope for motivation to exercise included an expectation that the study would provide an accountability structure.

I was welcoming a chance to be pushed a bit more. (Anthony; comparator group)

... I want to accomplish something so when I signed up, I knew it would help me do it. I made a commitment, so I really did my best to do it. I don't like feeling like I've failed or that I have failed other people. (Susan; online group)

Other less frequently cited motives for participation included wanting to advance MS research and MS care.

I was pretty desperate for something to be a part of when it comes to MS research or MS services. (Anthony; comparator group)

Discussion

The objective of this study was to share the perspectives of PwMS and physiotherapists on their involvement in a randomized clinical trial of online physiotherapy vs. an active comparator. The

primary aim of the pilot randomized clinical trial was to improve exercise adherence through specialist physiotherapy support using online Web-Based Physio for people with moderate-to-severe MS. Perspectives from this trial evaluation support that many PwMS with moderate to severe disability volunteering to participate in the trial experienced increased motivation to change their exercise behaviour.

PwMS with moderate to a severe disability may face increased challenges with travel to access in-person support for exercise. In our trial, inclusive of people with more advanced disabilities, some participants experienced technical challenges with using the online support program, and the program did not replace a perceived need for intermittent face-to-face contact. Other trials conducting qualitative trial exit evaluations of PwMS with mild to moderate disability participating in the Web-Based Physio intervention found the online program to be motivating, and also easy to use and accessible [11,12]. However, Web-Based Physio did not consistently meet the “hopes and expectations” of all the participants providing exit interviews. Dennett and colleagues suggested that online exercise programs may be best suited for the “technology literate, those who prefer to exercise independently in an environment of their choice and have confidence and skills to self-manage without face to face contact” [12; p. 3013]. Our trial evaluation, which also includes perspectives from the trial physiotherapists and PwMS with higher levels of disability, similarly supports these recommendations. Dlugonski and colleagues also conducted a randomized controlled trial including ambulatory PwMS where the intervention was a different online video platform designed to support exercise behaviour. They reported in their trial process evaluation that some of the participants desired more interaction with their peers online [8]. Perspectives from people with moderate to severe MS in our study did not include a desire to connect specifically with peers online. However, face-to-face contact with a physiotherapist for support with exercise was perceived as especially valuable and useful for some.

The perspectives from this study and from the above-mentioned trial evaluations were all collected before the COVID-19 pandemic. These pre-pandemic perspectives should now be interpreted in a new context where face-to-face care may be limited, and online approaches may be more widely incorporated into practice and policy. Physiotherapists involved with the present study and participants randomized to the online intervention both reported on the benefits of Web-Based Physio with recommendations for further improvements. The utility of the platform included remote asynchronous monitoring capabilities by a physiotherapist specialist prescribing the exercises. However, more opportunities for specialist face-to-face interaction featured prominently for some.

Home-based remote exercise programs have taken precedence during the pandemic. Perspectives about online platforms may look different now, and different again in the future. During the pandemic, PwMS were found to be significantly less active during a stay-at-home order, according to step counts using wrist-worn activity monitors [18]. The World Health Organization has promoted home exercise during the pandemic [19] and access to remote applications for exercise has had a positive influence on exercise behaviour [20]. While participation in exercise may have increased for some, survey data support that PwMS were less active during the pandemic [4]. PwMS experience significant barriers to exercise and the consequences of further reduced physical activity could adversely affect disease outcomes. Pre-pandemic experiences and perspectives from PwMS and physiotherapists

concerning the use of online platforms may be relevant to understanding and increasing exercise adherence.

A primary motive to participate in the study for PwMS was a strong initial desire “to do something.” In non-research settings, people often have a choice in what they do to support exercise behaviour. Perceived peer or professional support for the person’s choice on how they aim to improve their exercise behaviour may be an important predictor of exercise behaviour [21]. A randomized trial design removes choice by assigning participants to a group. While participants said they were initially motivated to participate in the study and do something to help change exercise behaviour, some participants suggested that their group assignment was not a good fit for them. They affirmed a preference for using paper vs. technology or vice versa to support the exercise. In clinical practice, circumstances may also limit the scope of available support.

Some PwMS found the online program especially useful for increasing their motivation to exercise. It remains unclear which aspects of the online program or the study most influenced motivation for exercise. A few participants reported that improvement or stabilization of their physical function was motivational. Some participants reported that remote support and monitoring by the specialist physiotherapist supporting the use of the online platform motivated exercise behaviour change. The Web-Based Physio platform was not designed specifically as a cognitive behavioural intervention for changing exercise behaviour. A review of remotely delivered interventions in MS found that cognitive behavioural telemedicine interventions improve mood and possibly function [22]. Both the comparator group and the online physiotherapy group in our study had access to a one-time individualized, in-person exercise prescription by a physiotherapist. Physiotherapists were not specifically trained in cognitive behavioural approaches for improving exercise behaviour. Possibly, motivation for exercise could be enhanced further by the deliberate integration of cognitive behavioural approaches provided online and in person. Our results suggest even limited physiotherapist contact may influence motivation for exercise.

PwMS in both the online and comparator group expressed a desire for a chance “to be pushed,” welcoming supervision and encouragement with their exercise. With MS being a highly variable and fluctuating condition, individual needs for motivation or supervision may similarly change. Coaching may be a way to provide this motivation since coaching takes an individualized approach, creates a sense of accountability, and may increase adherence and motivation [23]. Coaching is recommended as an approach to health care in many chronic diseases to develop and support patients’ self-management skills [24] and has been employed in physical activity research in MS [1]. Coaching requires health care providers to take a facilitator role to actively engage patients as shared decision-makers and actively apply behavioural techniques [25]. One’s level of readiness to change (e.g., non-intender, intender, actor) may influence which behavioural techniques best support action [26]. Physiotherapists may engage in coaching behaviours even if not explicitly trained in behaviour change theories and techniques. Web-Based Physio was not designed specifically to support a coaching intervention. Future research needs to look at methods for preparing health care providers’ knowledge, skills, and desire to fill a coaching role [27]. Online platforms could include enhanced infrastructure and training needed for greater coaching and supervision opportunities.

Both physiotherapists and PwMS in the intervention group found the online platform useful for monitoring exercise. The

monitoring feature provided motivation for some PwMS to be activated to exercise, but for others, remote support was still not sufficient. These differing perspectives align well with the observation that "... in the context of an MS service, it is worth considering how the MS population can be segmented on the basis of disease burden and levels of activation" [28, p. 1396]. Health care involves finite budgets, and frequent coaching or face-to-face interaction with MS experts are not feasible or perhaps needed for all PwMS. Real-time video interaction between PwMS and prescribing physiotherapists using teleconsultation platforms has recently become commonplace. This practice may further increase participant activation and the utility and usability of the platform used in our study. However, some prescribers and PwMS still find a preference and need for in-person contact and paper-based exercise prescriptions. Exercise and physical activity guidelines recommend referral to a specialist for segments of the MS population with increasing disability and facilitated exercise by a trained assistant if mobility is very limited [1]. The best methods for delivering sustainable and limited-resourced specialist support need to be elicited.

Compared to participants with MS, physiotherapists shared some similar as well as different perspectives on the themes of usability and utility, perhaps owing to differing needs. Perspectives of persons with MS and physiotherapists in this study identified recommendations for improved usability and implementation of online technology including versatility for use on a mobile device through an app. Technology for persons with moderate-to-severe MS also needs to include accommodations for visual and dexterity challenges. Logging in and navigation within the platform needs to be simple and fast. Prescribers require the platform to support efficient and personalized prescription practices. The designers of Web-Based Physio have now modified their program (www.giraffehealth.com) to include easier search and video viewing features and are piloting interfacing with real-time video conferencing options. However, physiotherapists may not have the time to learn a new prescribing platform, particularly if there is an option to continue with current established practices.

Similar recommendations for increasing online technology usability have been identified by others. Pramuka and van Roosmalen suggested a Universal Design approach to usefulness, including attention to equitable use, flexibility, simplicity, tolerance for error, and minimal effort [29]. Thirumalai and colleagues reworked the aesthetics and content of a mobile health app for PwMS to improve navigation, function, and interaction [30]. Remy and colleagues found that persons with moderate or severe MS were less interested in receiving telerehabilitation [31], however, our experiences with online physiotherapy pre-pandemic indicate individual preferences. Our results underscore that PwMS with a moderate-to-severe disability can use online technology to support exercise adherence and ease of usability and patient choice are important. Remote health care practices may become more standard care post-pandemic, however patient choice in the preferred method of care delivery is likely to remain critical for patient-centred care.

This qualitative study is not without limitations. We did not obtain exit interviews from those who left the study prematurely and we had fewer volunteers from the comparator group completing exit interviews. Despite our efforts to clarify that participants did not need to meet any exercise adherence standard to continue to participate in the original trial or the exit interviews, it is possible that motivational factors influenced their decision to continue in the trial. We did not assess self-efficacy for physical activity, known to be a predictor for exercise behaviour change

[32]. Physical activity self-efficacy could have influenced study participant perspectives and recruitment. Recruitment in our study was limited to PwMS who were exercising less than twice a week at baseline.

Participants with severe cognitive impairment were also excluded from participating if they were unable to provide consent. Further research on online programs inclusive of people with more severe cognitive challenges is warranted. We also could not detect any associations or trends between the main themes and disability as measured by the PDDS, age, or place of residence. We did not collect data on race, socio-economic status, or exercise self-efficacy. Larger sample sizes may be required to determine how these factors, and other factors including cognition and mood, may be associated with the perceived utility of online programs supporting exercise. Many of the physiotherapists completed their professional training before the widespread use of technology in clinical practice. The pandemic may have fuelled different attitudes about technology-supported exercise behaviour than reported here. However, the pre-pandemic perspective that PwMS desire easy-to-use technology which allows supervision and coach-participant relationships may be increasingly relevant as the widespread implementation of online health care support continues.

Conclusion

This study conducted pre-pandemic identified that PwMS desire more support from expert specialist physiotherapists than was provided by the original Web-Based Physio platform. Modifications to the online platform (now www.giraffehealth.com) together with the use of other videoconferencing platforms may improve usability and support for exercise, yet the results from this study support that technology is unlikely to replace the need for periodic face-to-face contact in PwMS with moderate-to-severe disability. Providing choice and building a therapeutic alliance between the professional and people living with MS may hold the greatest promise for improving exercise adherence.

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Disclosure statement

Lorna Paul is co-inventor of Web-Based Physio and now a director of the social enterprise Giraffe Healthcare. However, she was not involved with data collection. The other authors declare no conflicts of interest.

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