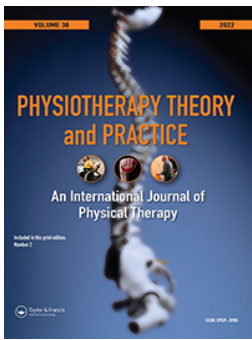


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## Experiences of people with multiple sclerosis participating in a social cognitive behavior change physical activity intervention

Item Type	Article
Authors	Russell, Niall;Gallagher, Stephen;Msetfi, Rachel;Hayes, Sara;Motl, Robert W.;Coote, Susan
Citation	Physiotherapy Theory and Practice;
Publisher	Taylor & Francis - Routledge
Download date	2026-05-15 10:54:16
Item License	<a href="https://creativecommons.org/licenses/by-nc-sa/1.0/">https://creativecommons.org/licenses/by-nc-sa/1.0/</a>
Link to Item	<a href="https://hdl.handle.net/10344/11006">https://hdl.handle.net/10344/11006</a>



# Physiotherapy Theory and Practice

## An International Journal of Physical Therapy

ISSN: (Print) (Online) Journal homepage: <https://www.tandfonline.com/loi/iptp20>

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To cite this article: Niall Russell, Stephen Gallagher, Rachel M. Msetfi, Sara Hayes, Robert W. Motl & Susan Coote (2022): Experiences of people with multiple sclerosis participating in a social cognitive behavior change physical activity intervention, Physiotherapy Theory and Practice, DOI: [10.1080/09593985.2022.2030828](https://doi.org/10.1080/09593985.2022.2030828)

To link to this article: <https://doi.org/10.1080/09593985.2022.2030828>



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# Experiences of people with multiple sclerosis participating in a social cognitive behavior change physical activity intervention

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## ABSTRACT

**Background:** Understanding the experiences of people with MS taking part in physical activity interventions is critical to inform future interventions.

**Aim:** The aim was to gain insight into the experiences of people with MS taking part in a behavior change group physical activity intervention with a novel social cognitive theory component.

**Methods:** A qualitative semi-structured interview format was utilized. Questions focussed on expectations, views and beliefs at being involved in the study, beliefs on physical activity, and subjective evaluation of the trial content and delivery. Seventeen people were interviewed and data were analyzed using thematic analysis.

**Results:** Three themes were generated: psychological and social factors, intervention processes, and MS identity. The acceptance of MS as an identity acted as an initial barrier to exercise, with a more positive, exercise-enabling identity post-intervention. Psychological factors such as self-efficacy and anxiety, as well as social factors such as social support, were found to play an important role in how participants experienced the program. Similarly, intervention processes included support for group-based activities and structure of exercise classes, and were also inter-linked to the other themes.

**Conclusion:** It appears that group-based exercise interventions are acceptable and feasible for people with MS. The qualitative findings support previously reported quantitative findings that the Step it Up intervention is effective at promoting physical activity and improving psychological outcomes.

## ARTICLE HISTORY

Received 30 June 2020

Revised 17 September 2021

Accepted 22 December 2021

## KEYWORDS



Behavior change; intervention; multiple sclerosis; physical activity; qualitative

## Introduction

Multiple Sclerosis (MS) is a chronic, progressive condition of the central nervous system, which has detrimental effects on mobility, vision, sensory functioning and balance (Kamm, Uitdehaag, and Polman, 2014). Disease progression results in significant effects on a person's quality of life, as well as costs in relation to ability to work and medical provision (Adelman, Rane, and Villa, 2013; National Institute for Clinical Effectiveness, 2014). Current evidence promotes the positive effects of exercise for symptom management including fatigue and to preserve mobility (Rietberg, Brooks, Uitdehaag, and Kwakkel, 2005; Sa, 2014). Participation in exercise and physical activity is associated with improvements in quality of life and reduced relapse rates (Afkar, Ashouri, Rahmani, and Emami Sigaroudi, 2017). However, there are significant barriers to people with

MS engaging in exercise and exercise interventions as a symptom management strategy (Learmonth and Motl, 2016).

Despite well-established benefits of physical activity, people with MS are significantly less physically active than the general population and those with other health conditions (Pilutti et al., 2014). This may be in part because people with MS perceive negative effects of physical exertion, including increased fatigue as a result of exercise (Motl, McAuley, and Snook, 2005; Smith et al., 2011), and fearful emotional responses to previous experiences of exercise (Stroud and Minahan, 2009). In a content analysis of 19 qualitative studies, Learmonth and Motl (2016) found that the most commonly identified perceived barriers of physical activity in people with MS were environmental barriers such as inadequate facilities and/or advice from healthcare

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professionals; and personal barriers such as fatigue, fear and apprehension. Addressing these barriers will help to increase the success of exercise interventions in this population.

Moreover, although successful in the short-term, exercise interventions for people with MS fail to maintain physical activity levels over time (Sangelaji et al., 2016). Of particular relevance is that the decision to exercise (or not) is constantly renegotiated and reassessed in light of current experience (Stroud and Minahan, 2009). Therefore, in order to be successful over the longer term, physical activity interventions require that psychological barriers are addressed (Kim, Mehta, Lai, and Motl, 2020; Stroud and Minahan, 2009).

Recent positive results have been found in group-based interventions. Group exercise seems to provide an opportunity for social support which helps participants address some of the psychological barriers to exercise (Aubrey and Demain, 2012; Learmonth et al., 2013). Specifically, exercising with people who have similar levels of disability seems to empower people with MS to take action and improves self-efficacy in relation to symptom self-management (Learmonth et al., 2013). It is evident that group exercise can offer social benefits, and can also help people with MS to address some of the self-limiting beliefs they have about the disease. However, it is not clear they address the barriers participants face in their everyday lives (i.e. the fear of exercising around healthy people) (Learmonth et al., 2013) or the lack of opportunity to take part in similar group classes after the intervention (Aubrey and Demain, 2012).

One way of addressing these barriers is to deliver an exercise intervention in parallel with education based on social cognitive theory (SCT) (Bandura, 1986). SCT is one of the most widely-adopted theoretical frameworks for understanding and optimizing physical activity (Casey et al., 2017; Kim, Mehta, Lai, and Motl, 2020) while also including educational aspects on the positive and non-damaging effects of physical activity. Along these lines, the “Step it Up” program is a physical activity-based exercise feasibility study trial designed for people with MS and it uses SCT as its theoretical basis (Coote et al., 2014; Hayes et al., 2017). In brief, it aimed to harness: personal (e.g. targets self-efficacy); behavioral (e.g. targets learning); and environmental (e.g. provides appropriate supports) components of SCT (Sangelaji et al., 2016) to facilitate behavior change. This consisted of a ten-week group program of exercise sessions and workshops that focused on the provision of information relative to physical activity participation based on the principles of SCT; namely outcome expectations, self-efficacy, impediments and goal setting (Hayes et al.,

2017; Kim, Mehta, Lai, and Motl, 2020). The exercise component of the intervention consisted of group-based aerobic and strengthening elements which were delivered by a physiotherapist, with the aim of progressively increasing intensity to enable participants to reach the MS exercise guidelines (Coote et al., 2014; Latimer-Cheung et al., 2013). The SCT components were delivered directly following each exercise session in the form of group discussions, physiotherapist led educational sessions, written assignments, and videos of people with MS discussing how they maintain a physically active lifestyle. Further, throughout the intervention participants kept diaries with exercise logs and wrote individual reflection exercises on their performance. A week-by-week breakdown of the intervention content can be found in the study protocol (Coote et al., 2014). The quantitative results of the feasibility trial, which were positive, are reported elsewhere (Coote et al., 2017; Hayes et al., 2017). The objective of the present study was to gain insight into the experiences of people with MS taking part in the physical activity with SCT intervention component of the feasibility trial. The addition of an in person SCT component to an exercise class is novel to group MS exercise studies and how it is experienced is not yet known.

## Methods

### Participants

A convenience sample of 26 participants in the experimental group were contacted via telephone and invited to participate. Of those, 17 agreed (14 women and 3 men) and completed the interviews; those who did not take part cited time pressures. The interviews took place immediately after the intervention. The average age was 42.9 years (SD = 9.35) and all were able to walk without any aid. See Table 1 for further demographic information. Further details on the inclusion and exclusion criteria of trial participants can be found in the study protocol (Coote et al., 2014). In brief, the inclusion criteria listed in the protocol (Coote et al., 2014) includes a sedentary lifestyle (< 30 minutes of moderate to strenuous exercise one day or more per week over the last six

**Table 1.** Participant demographic information.

Gender	Female n = 14 Mean	Male n = 3 SD
Age	42.88	9.35
PDSS score*	1.41	1
EDSS score*	3.26	0.59
Duration of symptoms (years)	7.38	4.33

\*PDSS = Patient Determined Disease Steps; EDSS = Expanded Disability Status Scale.

months). The aim of the intervention was to target those who were newly diagnosed with minimal disability to establish health promoting physical activity behaviors. Each gave written informed consent and the study was approved by the Faculty research ethics committee at the researchers' university. The COREQ (Consolidated Criteria for Reporting Qualitative Research) Guidelines (Tong, Sainsbury, and Craig, 2007) for reporting of qualitative studies were adhered to and used to improve the conduct and reporting of the study (Booth et al., 2014).

### Design

Individual semi-structured interviews, either conducted by phone (n = 14) or in the clinic (n = 3), were used to explore participants' experiences of taking part in the intervention and the trial (average duration 19 mins, range 15 to 30 minutes). NR, a trained qualitative methods psychology research assistant, conducted the interviews. The interview schedule focussed on expectations, views and beliefs at being involved in the study itself, thoughts and beliefs on physical activity, and subjective evaluation of the trial content and delivery. The schedule was piloted with two people with MS, who did not participate in the intervention, and revised where relevant. Interviews were audio recorded and transcribed verbatim for analysis.

### Data analysis

Interview transcripts were analyzed using inductive thematic analysis (Braun and Clarke, 2006). Although our interview schedule was semi-structured, which may be construed as deductive, probing was used throughout interview to explore in more detail the salient experiences of the participants. The authors favor a subjectivist perspective on qualitative data; as such, the interview schedule contained mostly open-ended questions and provided participants the opportunity to elaborate on their experiences. This method ensures that the results are descriptive and remain close to the dataset, allowing for analysis that is shaped by the participants' experiences rather than a pre-determined theory (Sandelowski, 2000). Initially, the interview data (transcripts) were read and re-read, before being open-coded line by line by NR, SG and RM. This coding produced 58 codes, which stayed very close to the original wording in the transcripts, and which represented all meaning identified in the data. These codes were reduced to nine higher order codes which

represented recurring ideas, and were categorized into recurring themes and subthemes until a final list of themes was generated. Each transcript was then revisited to trace any pertinent ideas or data. In order to provide a check on the rigor and validity of the analysis and interpretation of participants' accounts, authors NR, SG and RM analyzed segments of the data independently and also subjected all the data set to further scrutiny by re-reading the transcripts and reassessing the themes. It is also worth noting that NR is a psychology graduate while SG and RM are both psychologists who specialize in disability and health with expertise in mixed methodology and this perspective may have influenced our interpretation of the findings. Finally, the perspective of the other coauthors SC, SH, RM alongside service users were also sought at many junctures during the initial coding and presentation of findings at our research team meetings to assist with validity and interpretation.

### Results

Analysis of the transcripts generated three main themes: psychosocial factors, intervention processes, and MS identity. These themes are not mutually exclusive; rather they are overlapping and identify the factors which helped to promote or discourage exercise before, during and after participating in the Step it Up program. For example, as participants engaged with the program, some became more accepting of their MS and its impact on them; this, in turn, helped them overcome some of their initial fears and reservations on their physical ability while at the same time, the processes and design of the intervention itself enhanced these experiences. Quotes are referenced by participant pseudonyms.

#### Psychological and social factors

These factors were both prohibitive, mainly prior to the intervention, and facilitative, mainly during and after the intervention, of exercise participation. When asked about concerns with taking part, some discussed psychological issues as barriers. Some participants talked about *feeling anxious or distressed because of their MS symptoms* (Olivia) and being in *different places emotionally* (Barbara) which prevented them from exercising in the past. These are seen as being part and parcel of having MS with *'vague expectations'* (Barbara) with limitations set:

You see with MS that bar will be met only a handful times in the month, if you know what I mean.

In addition to this, for others when asked about how they felt before taking part, psychological aspects of having *low self-esteem* (Veronica), and feeling *self-conscious* (Aisling) were cited as barriers to exercise activities in the past.

Further, once engaged with the program the negative psychological barriers were less evident from participants' talk. However, now the psychological reactions were of feeling guilty at missing classes:

I felt really guilty about missing the two classes" and "feel like you're letting people down if you don't kind of go (Margaret).

While for others a new attitude was evident (Declan); "*I feel better and I suppose mentally as well, yeah, definitely*" (Nina); "*I'm very, very happy*" (Olivia). As well as the physical benefits, when asked how they felt afterward participants spoke about improved mood "*You just feel ten times better. Mood swings have definitely decreased.*" (Aoife). Thus, it seems that initial fears and anxieties can be overcome and replaced by a positive mental attitude while feelings of guilt about participation can be reduced once personal expectations are being met. Moreover, the role of the physiotherapist to facilitate these changes was also discussed:

she's made me more motivated that now, do you know what, don't worry about missing a few classes, just keep going and get into it (Deirdre).

Aisling said she finds exercise "*less . . . ahm, as daunting now*" and that the program has given her "*more confidence.*" While it appears that a diagnosis of MS is mentally and physically draining, taking part in the program counteracts this and helps to build confidence and stronger belief in their abilities.

I am so happy to think that I can do a 30 minute walk again because, going back again to what I said earlier, your self-confidence gets hammered when you are told you have a diagnosis like MS or any other diagnosis (Olivia).

Thus, it seems that for some, taking part in the exercise intervention itself is perhaps a tool to address some of these psychological barriers.

While encouragement from family and friends was discussed as a facilitator, lack of encouragement at home, which was present while at the group, emerged as a barrier:

At home it's harder to do because you don't have anyone pushing you. (Edwina).

After they got involved with the program levels of familial support increased and they became more involved or encouraging as demonstrated by this quote:

if they didn't see me doing exercises they'd be going, 'Mum, have you done your exercises for this week?' (Olivia).

Similarly, social support was also discussed by others in relation to exercise maintenance:

the support from the physiotherapist I think . . . we're going to miss that. I certainly am in the next few weeks . . . (Aisling).

Overall, it appears that as one engages with the exercise program, along with the physical gains, there are positive shifts in psychological well-being among participants. While social support from the group and the physiotherapist are important factors in the program, familial support can act as either a facilitator or a barrier, something which is not addressed in this program.

### **Intervention processes**

Here participants talked about elements of the intervention set-up and workshop sessions that served as motivational influences. For example, participants cited the general structure of the weekly planned session itself, "*Slow start, build up*" (Olivia), "*getting into a routine*" (Aoife), as one of the main motivators for attending. Participants also emphasized the importance of the class environment: "*I wouldn't have done them at home if I hadn't had the enjoyment of the group I'd say.*" (Siobhán), as well as support from the group-based intervention which provided an opportunity for a direct comparison with others with MS. For example, this quote from Edwina illustrates this very well:

It was the motivation and seeing other people doing it and saying well they can do it, so can I and that was the encouragement to me then to stay doing it . . .

The group-based approach also seemed to instill a sense of support that went beyond the class:

It was also a social event for us in so far as after our class, we went for coffee and relaxed and chilled and we were still home before lunchtime (Olivia).

It seems that the therapeutic and peer relationships and group norms that are formed during the course of the program are as important to the participants as the planned exercise activities.

In contrast, some participants felt there was a "*one size fits all*" (Barbara) approach at the initial session. This hindered people's levels of enthusiasm as Barbara noted that each participant was in a different place that

varied with time since diagnosis emotionally and physically. She, for example, did not want the supportive aspect of the sessions because she had been diagnosed 10 years and had already come to terms with it. While some participants enjoyed giving advice to those diagnosed more recently (Margaret; Declan); this was not always welcome as some of these happened to be more self-conscious about talking openly about their MS (Deirdre). Because the structure (e.g. weekly sessions) was identified as an important facilitator, participants expressed concern about continuing exercise without that structure:

I will find it harder without the class environment to be disciplined. (Olivia).

In future trials, these experiences and needs may need to be addressed. The SCT-based components of the intervention were mentioned by several participants. Barbara outlined the benefits of goal setting:

What I liked about it was actually seeing the different, I suppose setting goals. So actually forcing me to sit down and say I'm going to look at what I want to be able to achieve and when I want to be able to do that and I suppose measuring the success of setting those goals.

Several participants described having set long term goals since completing the intervention, such as weight loss (Barbara, Deirdre), pilates and swimming (Edwina), 5 km run (Jessica), and a canoe trip (Margaret). Deirdre said that she marks *"whatever week I think 3 months will be and plan towards that."* This suggests that the goal-setting element of the program was successful in facilitating future goal-setting behavior in relation to exercise.

Several participants mentioned their ability to overcome barriers to exercise following the program, including overcoming pain and discomfort (Margaret), lack of will-power (Barbara), and poor exercise environment (Jessica). Margaret talked about planning ahead for bad weather:

my Mum was saying ... she'd this lovely jacket and I said I'm going to take that jacket because like it was rain gear, do you know, so when the weather gets bad I still won't have an excuse because I'll have the clothes.

The ability of participants to identify barriers and discuss strategies to overcome them suggests that this SCT component was successful. Similarly, the ability to manage expectations was discussed by several participants. Of playing golf, Declan said:

I play three times a week. I'm playing with low handicappers who are way better than me. It's not that I'm trying to be as good as them, it's just that if I could be half as good as them it would be great ... I'm being positive and hitting the ball, do you know, not kind of

saying oh come on you weak fuck, do you know, just get behind the ball and hit it, do you know what I mean, and not hitting it too far. But now I'm able to concentrate and say right the ball's going there and if I can get in around that, perfect, do you know what I mean.

Declan's ability to engage in exercise with people who he perceives as more capable without putting pressure on himself to reach their level is a good sign that he is managing his expectations around physical activity.

### **MS identity**

For some participants, having a diagnosis of MS was a stigmatized identity with the label being more debilitating than having the illness itself. For example, one participant said *"I don't like it being a sticker on my forehead"* (Noreen) while for another they pushed the identity to one side (Barbara): *"what I was doing was completely ignoring that I had MS entirely."* Thus, for some accepting the MS identity and can be difficult as some are keen to be seen as people beyond MS, not wanting *"to be treated differently"* (Nina). The quote below from Aoife illustrates this very well:

you let them you know wrap you up in cotton wool basically and they say it's a bad idea and this, that and the other when it's actually not ...

The need to be treated equally by others and not just be seen as people with MS is very strong here and this exercise program seems to be a good medium for adopting a new identity beyond their MS identity; when asked about how they felt after taking part one participant said *"now I would prefer to be the mammy who walks than the mammy with MS"* (Noreen), indicating that their MS identity is not one that defines who they are any more and this may have changed as they transitioned through the program.

Moreover, Noreen spoke about the program having a positive effect on their perception of MS:

I think when you see other people ... on the program and people say what they've done and what they haven't done and like a lot of my friends knowing I have MS would have held me back whereas now I just get on with life.

In fact, for some it was the first time they had had the courage to discuss their MS openly with others (Aoife)

### ***I'm probably ready to tell my sons now probably after this***

Implying that they have become more confident in themselves, accepting of having MS, perhaps their limitations, but also their abilities and new identities.

## Discussion

The key aim of this qualitative study was to explore how people with multiple sclerosis experienced a physical activity feasibility pilot trial. The themes generated here highlight emotional, psychological, social, intervention processes and illness-related that were important in facilitating or inhibiting engagement or experienced as a consequence of participating in the physical activity intervention. Consistent with existing research on the barriers to exercise among people with MS, issues of self-efficacy, self-esteem and psychological distress were confirmed in our sample. Importantly, however, while these were only evident prior to participation; following participation improvements on most of these factors were evident. This suggests that initial fears and anxieties that people with MS have around exercise participation can be overcome.

Intervention design processes were important for the participants. Here, participants spoke about trial design and delivery elements that assisted engagement. For example, they discussed how the weekly sessions helped to get them into a routine, and the benefits of group sessions for facilitating engagement and making the exercise fun, and having a peer group to directly compare themselves to. The power of exercise routine or habit cannot be under-estimated as research shows health behaviors become effortless and automatic when they repeated over time (Gardner, Lally, and Wardle, 2012). Similarly, others have found that social bonds and group coherence developed during exercise participation are likely to facilitate long-term maintenance (Devereux-Fitzgerald, Powell, Dewhurst, and French, 2016). In fact, the lack of support from family and friends was highlighted by some participants as a barrier. However, the participants in this study gained support from the group which is consistent with this research showing that social support derived from the peer group has multiple benefits and could be a good substitute if support is not available elsewhere (Devereux-Fitzgerald, Powell, Dewhurst, and French, 2016). Indeed, the need for support from the group beyond cessation of the trial was highlighted as a concern going forward which may have implications for maintenance. Moreover, not only were bonds developed with other people with MS; participants also felt supported by their therapists, a supportive relationship that has been found to be an important motivator for adherence in patients with MS (Rieckmann et al., 2015). Further, given that this was a group-based intervention social comparison was also very evident (Festinger, 1954). Those living with chronic conditions often make upward or downward comparisons with each

other, which can have effects on their psychological and physical well-being (Arigo, Suls, and Smyth, 2014). Here, participants evaluated their own performance beliefs against their peers who seemed to be more disabled than they were and this downward social comparison clearly served as a motivator. However, it is worth noting that both upward and downward comparisons have benefits and drawbacks for confidence and self-esteem (Arigo, Suls, and Smyth, 2014; Festinger, 1954; Gibbons and Gerrard, 1989); although more recent research has highlighted the potentially damaging aspect of upward comparisons in the social media age (Cramer, Song, and Drent, 2016; Tiggemann and Polivy, 2010). Indeed, previous qualitative research on group exercise in people with MS found that exercising in an environment with healthy people can be a barrier as they may feel self-conscious that their symptoms will be observed (Learmonth et al., 2013). This is something that health professionals delivering interventions may need to manage carefully especially in group setting as the negative effects of this were clearly evident during the initial sessions where MS identity varied across the group and had consequences for illness identity, and acceptance of material and knowledge being presented.

In addition, participants own sense of MS identity was an important factor in their participation experiences. In people with disabilities, higher symptom severity and social stigma are associated with higher levels of disability identification (Bogart, Rottenstein, Lund, and Bouchard, 2017). Disability identification is associated with psychosocial well-being and self-advocacy (Bogart, Rottenstein, Lund, and Bouchard, 2017) and lower psychological distress (Bogart, 2015). However, individuals with milder symptoms may shun the stigmatized identity in favor of one which does not impair them in relation to healthy people. This allows them to pay less attention to their disability which may result in them engaging in fewer disease self-management behaviors such as exercise. Indeed, several participants in the present study reported having avoided identifying with their disability out of fear of stigma or being treated differently. However, there is currently no evidence that this identity avoidance leads to reduced exercise behavior. Considering the importance of integrating an MS identity into one's personal identity for the self-management of symptoms, and the potentially hindering effect of a highly stigmatized identity containing self-limiting beliefs, it is worth examining how interventions can instill a more positive conception of MS identity so that self-limiting beliefs about the disability are reduced.

Indeed, simply engaging in physical activity can dismantle some of the self-limiting beliefs people with MS have about their ability to perform exercise. In this

sense, exercise can be used as a way of transforming or maintaining an identity as non-disabled, or reinterpreting the definition of disability to include physical activity (Adamson, Adamson, Littlefield, and Motl, 2018). This is a form of social creativity whereby individuals with a stigmatized identity re-categorize aspects of that identity to more favorably compare to other groups (Jackson, Sullivan, Harnish, and Hodge, 1996). This has been shown to be an important process for people with disabilities in developing a healthy identity; for example, the social creativity strategy of valuing disability for its own sake is associated with higher self-esteem in a disabled sample (Nario-Redmond, Noel, and Fern, 2013).

Similarly, the participants of the Step it Up program reported having reassessed their thoughts and beliefs surrounding MS and what a person with MS can do. While MS identity was stigmatizing and disabling before the intervention, with participants expressing inhibition toward physical activity because of their self-limiting beliefs surrounding the disease, the experience of the intervention allowed them to reassess their image of MS as wholly debilitating. It is clear from these findings that it is possible to facilitate the re-categorization of a stigmatized identity through an SCT-based intervention, and that this is an important process in improving self-efficacy around physical activity.

The introduction of various SCT topics by participants suggests that these aspects of the program had an impact. As previous research has linked low levels of exercise behavior with a lack of knowledge regarding the risks and benefits of exercise, low self-efficacy, variable outcome expectations, and ambiguous exercise goals (Fifolt, Edwards, Barstow, and Motl, 2020), it is promising that participants in the present study demonstrated understanding on the benefits of exercise, improved self-efficacy compared to before the intervention, the ability to manage expectations, and the ability to set long-term goals.

While it is outside the scope of the present study to compare the SCT-based intervention and the control intervention, quantitative findings show that only the SCT group improved at 3 and 6 month follow up in physical impact of MS, anxiety, depression, and cognition (Coote et al., 2017), suggesting that the SCT component offers additional psychological and physical benefits compared to traditional group-based interventions. Future qualitative research integrating SCT components into exercise interventions should present more targeted questioning on the SCT components to determine which are most effective in increasing exercise behavior and improving psychological outcomes.

As this was a pilot feasibility trial of the exercise plus SCT our main focus was to examine their experiences in order to inform a future trial using this theory-driven exercise intervention. It is clear that group environments are effective at promoting physical activity in people with multiple sclerosis. This social aspect should be a core component of future interventions, as should regular support from a physiotherapist. The integration of SCT elements into participants' everyday lives is an encouraging sign that educational sessions based on SCT can be a valuable adjunct to physical activity interventions in people with MS.

A strength of this study is that it has explicated some of the complexity of the experience of people with MS taking part in an exercise intervention. These factors are important for further developments of the intervention itself but are also critical to running an effective definitive trial later. The sample size is admittedly small, although similar to other qualitative studies. The interviews were also relatively short. Face-to-face interviews in qualitative research are typically 30-minutes or more but we found the telephone interviews much shorter to conduct, which has been observed as a trend in qualitative research (Irvine, 2011). Phone interview participants tend to provide relatively less detail, perhaps due to limited rapport-building opportunities, which is a limitation of the study. However, data saturation was reached with no new ideas arising from the latter interviews.

Another key limitation is that we did not interview the control participants who were offered exercise education as an alternative and their experiences may have been different. A further limitation is the lack of interview questions specifically targeting the SCT components of the intervention. However, as this was an exploratory study with a bottom-up analytical strategy, it was more important to allow participants the space to discuss the aspects of the program which were salient to them. Finally, the analysis and theme generation was primarily done by psychologists and this influence should be noted as it may have played a part in the findings. While a subjectivist approach was employed to allow for inductive analysis, the authors were all aware of the SCT underpinnings of the intervention, which may have influenced higher order coding.

In sum, the findings help to understand the complexity of intervention trials, and how they are applied and experienced (Nielsen, Fredslund, Christensen, and Albertsen, 2006). Participants reported having avoided physical activity due to low self-esteem, self-efficacy, and/or anxiety. However, it seems as though participating in the intervention improved some of these outcomes. Inactivity in MS is a complex issue, and

encouraging people to take part in exercise trials when they perceive themselves as not having the skills or physical abilities may require careful attention during recruitment campaigns. Participants were clearly aware that these psychological factors contributed to their inactivity pre-intervention. Therefore, it may be prudent to highlight the psychological benefits when promoting such programs, as people with MS may be more inclined to participate if the sole focus is not on physical activity, which many potential participants believe themselves to be incapable of. Moreover, the findings also indicate that the group-based design and therapeutic relationships may be powerful drivers of motivation and should also be considered critical elements in a definitive trial.

## Acknowledgments

We would like to thank the people with MS who volunteered for the study.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Funding

This work is supported by the Irish Health Research Board, Health Research Award, grant number: HRA\_PHR/2013-264.

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