

Conclusions: Physical activity was reduced in PwMS from before to during the pandemic. Concerns of contracting COVID-19 and a loss of support were highly associated with reduced physical activity. There is a need to support PwMS aiming to increase physical activity. Physical activity programmes which address walking (the most frequent), disability and the use of wearable technology may be preferable.

Disclosure

Authors have nothing to disclose.

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Changes in sedentary behaviour and physical activity in response to an exercise intervention in persons with multiple sclerosis

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Introduction: A substantial body of evidence supports the beneficial effects of exercise for persons with Multiple Sclerosis (PwMS). However, recent systematic reviews indicate that current exercise interventions only increase self-reported exercise participation, but fail to increase objective measures of total physical activity (PA). This could indicate that PwMS compensate for exercise training (i.e. by decreasing their non-exercise PA or increasing sedentary behaviour [SB]), which might blunt exercise effects.

Objective: To assess physical activity changes of PwMS during a structured exercise intervention, in order to optimise exercise prescription guidelines and exercise benefits.

Aim: In this non-randomised pilot study, the effects of a running exercise intervention on whole-week PA, non-exercise PA and SB are compared between PwMS and healthy controls (HC).

Methods: Twenty-nine mildly-disabled PwMS (EDSS 0–4) and 26 HC completed 10 months of home-based, periodized exercise in which high-intensity interval training and moderate-intensity continuous training sessions were alternated. PA (stand time, low-intensity PA [LIPA] and moderate-to-vigorous PA [MVPA]) and SB (total SB and time in sedentary bouts of ≥ 60 min) were measured by accelerometry (activPAL3) for 7 consecutive days at baseline, and after 5 and 10 months of exercise. PA and SB were calculated as percentages of waking time/day for the whole week and for exercise (EX) and non-exercise (NONEX) days separately. Secondary outcomes included changes in fatigue, cardiorespiratory fitness, blood pressure, resting heart rate and fat percentage.

Results: There were no differences in baseline PA and SB between groups. During the intervention, both groups trained at a similar mean exercise intensity (mean \pm SEM: $79 \pm 1\%$ of their maximal

heart rate) for a total exercise duration of 62.2 ± 1.5 h. Interestingly, whole-week MVPA only increased in HC (MS: $+0.2 \pm 0.4\%$ vs.HC: $+1.9 \pm 0.5\%$, $p=0.035$). Moreover, on NONEX days at both 5 and 10 months, PwMS significantly increased their total SB (MS: $+2.8 \pm 1.2\%$ vs.HC: $-0.4 \pm 1.3\%$, $p=0.029$) and time in sedentary bouts of ≥ 60 min (MS: $+0.7 \pm 0.2$ h vs.HC: $+0.1 \pm 0.2$ h, $p=0.003$), while HC did not. Fatigue, cardiorespiratory fitness, resting heart rate and fat percentage improved similarly in both groups.

Conclusion: In contrast to HC, PwMS did not show a net increase in MVPA during a structured exercise training intervention due to increases in sedentary behaviour on non-exercise days.

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Can a seated 6-minutes knee antiphase movement test help understand walking fatigability in moderately disabled people with MS through a movement control perspective? Preliminary results

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Introduction: People with multiple sclerosis (pwMS) present often abnormal walking fatigability (prevalence among moderately disabled patients $\sim 50\%$). Recent findings indicated that a seated 6-minute knee flexion/extension antiphase movement test (6AMT), which minimizes muscle and balance effort compared to the 6-minute walking test (6MWT), is a promising test to “isolate” and investigate central driven mechanisms. However, the feasibility and performance of moderate pwMS presenting walking fatigability on the 6AMT is not known.

Objectives: To investigate the performance in the 6AMT in moderate pwMS with and without walking fatigability and healthy people.

Methods: Twenty-four pwMS were divided into walking fatigability (MSWF: 55 ± 7 years, EDSS 4.9 ± 1 , $n=17$) and non-walking fatigability (MSNWF: 58 ± 11 years, EDSS 5.3 ± 0.9 , $n=7$) groups, using the distance walking index (DWI₆₋₁, cut-off of 10% of decline in distance), derived from the 6MWT, for allocation. Seventeen healthy people (HC- 51 ± 6 years, $n=17$) composed the healthy control group. The participants performed the 6MWT at their maximum self-selected speed, recording the distance walked minute-by-minute and the total distance. After resting for 30 minutes, two trials (30 minutes apart) of a seated 6AMT were performed. Participants were asked to perform the 6AMT as fast as possible, simulating a walking pattern. Movement variability,

amplitude, and frequency were calculated. Group comparisons (one-way ANOVA) were applied for the 6MWT and 6AMT outcomes.

Results: MSWF ($DWI_{6-1} = -15 \pm 4\%$) presented a significantly larger DWI_{6-1} ($p < 0.001$) compared to MSNWF ($DWI_{6-1} = -2 \pm 5\%$) and CG ($DWI_{6-1} = 1 \pm 7\%$), with no difference between MSNWF and HC. Both MSWF ($316 \pm 129m$) and MSNWF ($291 \pm 110m$) walked shorter distances in the 6MWT than HC ($572 \pm 63m$) ($p < 0.001$), with no difference between MSWF and MSNWF. During the 6AMT, the MSWF presented higher movement variability and lower amplitude ($p < 0.01$) than HC. Both pwMS were similar in terms of 6AMT performance. Movement frequency was similar among groups.

Conclusion: The higher variability and lower amplitude during the 6AMT in the MSWF group may indicate impairments in programming and executing the antiphase movement compared with HC. The findings during the 6AMT may relate to the 6MWT, underlying walking fatigability. We propose the next steps to relate the 6AMT outcomes with gait biomechanics (e.g., stride length) to identify the possible causes of walking fatigability in pwMS.

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COVID-19 and multiple sclerosis: a thematic analysis of the unique experiences of people with multiple sclerosis during the COVID-19 pandemic

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Introduction: The impact of the COVID-19 pandemic on people living with multiple sclerosis (MS) is expected to be significant. Whilst quantitative research in this area has been undertaken, there is a paucity of qualitative research; this study will therefore provide valuable insights into individual experiences and perceptions of people with MS (PwMS) in the United Kingdom (UK) during this unique period.

Objective: The ongoing global health crisis leaves us all in a state of uncertainty that requires constant adaptation to the new 'normal' we are living in, and it is important that the challenges faced by the MS community are recognised and addressed as part of this learning process. We explore self-reported data gathered during the pandemic to reach conclusions regarding the impact of the crisis on PwMS.

Aim: To enhance understanding of the experiences of PwMS during the COVID-19 pandemic and identifying potential areas where further support could be beneficial.

Method: Between March 3 and October 29, 2020, 1,685 free-text comments regarding the unique experiences of PwMS were collected online by the UK MS Register (UKMSR).

Thematic analysis of 1,000 randomly selected responses made by 682 individuals was used to investigate the perceived impact of COVID-19 on the participants, following a constructivist approach.

Results: Five main themes were identified in the data: connectedness, attitudes towards change, mental health, stigma, and information and advice. Results of the thematic analysis were varied, with significant numbers reporting positive experiences of the pandemic.

Conclusions: Individual levels of connectedness and attitude towards change significantly influence how PwMS experience life during the COVID-19 outbreak. The data showed the impact of COVID-19 on mental health to be mixed among PwMS. The pandemic has highlighted that some PwMS remain fearful of being stigmatised in the workplace because of their condition.

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Short- and long-term perceived improvement in self-efficacy of people with multiple sclerosis participating in an individualised physiotherapy outdoor-group and digital intervention, emphasising trunk control and high intensity physical activity

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Introduction: Trunk control and physical activity are reduced in people with MS (PwMS) even when disability is mild and moderate (Expanded disability status scale (EDSS) 0-3.5). Trunk control is essential for optimal physical function and individualised, group-based physiotherapy and digital support may be beneficial.

Aim: To explore the user perspectives of a new intervention (CoreDISTparticipation) which combine these components.

Objective: What are the short- and long-term experiences of PwMS (mild-moderate) participating in a 4-week individualised, group-based physiotherapy and digital intervention emphasising trunk control and outdoor high intensity physical activity (CoreDISTparticipation)?

Methods: This interview study was nested within a randomized controlled trial. A total of 30 in-depth interviews of all participants in the intervention group ($n=15$; 12 woman; age 38-66 years old; EDSS 0-3.5) were conducted (week 6 and 24). Systematic Text Condensation analysis is performed, informed by a Dynamic Systems Theory and Enactive theoretical framework.