FOCUSED QUESTION

What is the effectiveness of a group exercise–based intervention program for people moderately affected with multiple sclerosis?


CLINICAL BOTTOM LINE:

This pretest–posttest study showed that an exercise-based intervention for people moderately affected by multiple sclerosis is effective in increasing physical activity and confidence in balance. The study has a high level of evidence and a low chance for biases; however, it would be difficult to replicate because not all exercises were used at each session. Also, during the evaluation portion, three versions of assessment protocols were used to prevent fatigue, but these protocols were not recorded. The intervention group in this article showed minimal statistically significant changes; however, there were notable changes in their physical activity and confidence in their balance, which demonstrates that the exercise regimen was effective. Occupational therapy practitioners would benefit from the results found in this article because there was a noticeable difference in the participants’ level of physical activity and confidence in balance. An exercise-based intervention approach is beneficial for persons affected with multiple sclerosis to work on physical activity levels and confidence in their balance.

RESEARCH OBJECTIVE(S)

List study objectives.

The study aimed to evaluate the effectiveness of a group, community leisure center–based combined exercise intervention for people moderately affected with multiple sclerosis.

DESIGN TYPE AND LEVEL OF EVIDENCE:

- Randomized control trial (RCT)
- Level I
- Pretest–posttest
Limitations (appropriateness of study design):
Was the study design type appropriate for the knowledge level about this topic? Circle yes or no, and if no, explain.

YES/NO

Multiple sclerosis and its symptoms are a known topic. Length of time for an exercise regime has not been stated in the literature.

SAMPLE SELECTION
How were subjects selected to participate? Please describe.

Purposive sampling: Recruited from National Health Service (NHS) Ayrshire and Arran register of all patients known to have had multiple sclerosis services.

Inclusion Criteria
Participants were included if they had a confirmed diagnosis of multiple sclerosis, an Extended Disability Status Scale score of 5 to 6.5, stable rehabilitation and drug therapy for 30 days prior to entry of the study, cognitive scores of over 24 on the Mini-Mental State Examination, and access to the intervention sites using their own or public transportation.

Exclusion Criteria
Participants were excluded if they had experienced exacerbation of their multiple sclerosis symptoms within 3 months prior to the study, or had any medical condition that may prevent them from taking part in the exercise intervention.

SAMPLE CHARACTERISTICS

N = 32

<table>
<thead>
<tr>
<th>% Dropouts</th>
<th>Total: 22%</th>
<th>Intervention group: 16%</th>
<th>Control group: 6%</th>
</tr>
</thead>
</table>

| #/ (%) Male | 9 (28%) | #/ (%) Female | 23 (79%) |

Ethnicity: NR

Disease/disability diagnosis: Multiple sclerosis

Check appropriate group:

| < 20/study group | Yes | 20–50/study group | 51–100/study group | 101–149/study group | 150–200/study group |

INTERVENTION(S) AND CONTROL GROUPS

Add groups if necessary

Group: Intervention Group 1

Brief Description: Participated in a group exercise class. Aerobic, stretching, resistance, balance, and aerobic endurance exercises were incorporated into the class.

Setting: Community center, 2 separate sites
<table>
<thead>
<tr>
<th>Who Delivered?</th>
<th>Physical therapist and fitness instructor (physical therapist was same for both intervention groups, fitness instructor was not)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency?</td>
<td>2 times per week</td>
</tr>
<tr>
<td>Duration?</td>
<td>12 weeks, 24 total treatments</td>
</tr>
</tbody>
</table>

**Group 2: Control Group**

<table>
<thead>
<tr>
<th>Brief Description</th>
<th>Participants were advised to continue on their usual routine, seeking health care as needed, and to not start a new exercise routine for the 12 weeks of the study.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting</td>
<td>N/A</td>
</tr>
<tr>
<td>Who Delivered?</td>
<td>N/A</td>
</tr>
<tr>
<td>Frequency?</td>
<td>N/A</td>
</tr>
<tr>
<td>Duration?</td>
<td>12 weeks</td>
</tr>
</tbody>
</table>

**Intervention Biases: Circle yes or no and explain, if needed.**

- **Contamination**
  - YES/NO: There is a possibility for contamination if the participants increased their level of activity solely by participating in routine care.

- **Co-intervention**
  - YES/NO: NR. It was not stated whether the intervention group could use analgesic medications.

- **Timing**
  - YES/NO: Twelve weeks and 24 treatment sessions is an appropriate amount of time to begin to see change.

- **Site**
  - YES/NO: The intervention took place at a community center.

- **Use of different therapists to provide intervention**
  - YES/NO: The intervention was given by the same physical therapist, but by different fitness instructors.

**MEASURES AND OUTCOMES**

Complete for each relevant measure when answering the evidence-based question:

- **Timed 25-Foot Walk Test** measures walking speed over a short distance. Had good reliability and validity in this population as reported in the article. Measure was used three times: before intervention, at 8 weeks, and at 12 weeks.
Body mass index measures weight/height. Validity and reliability NR. Measure was used three times: before intervention, at 8 weeks, and at 12 weeks.

The 6-minute walk test measures endurance. Validity and reliability NR. Measure was used three times: before intervention, at 8 weeks, and at 12 weeks.

Berg Balance Scale measures dynamic balance. Validity and reliability NR. Measure was used three times: before intervention, at 8 weeks, and at 12 weeks.

Timed Up and Go Test measures a person’s amount of mobility and dynamic balance. Validity and reliability NR. Measure was used three times: before intervention, at 8 weeks, and at 12 weeks.

Break Test measures quadriceps strength of the weaker leg (established at baseline by measuring both legs). Validity and reliability NR. Measure was used three times: before intervention, at 8 weeks, and at 12 weeks.

PhoneFITT questionnaire measures activity levels and time spent on those in a typical month. Validity and reliability NR. Measure was used three times: before intervention, at 8 weeks, and at 12 weeks.

Activities Balance Confidence questionnaire measures self-perceived balance confidence. Validity and reliability NR. Measure was used three times: before intervention, at 8 weeks, and at 12 weeks.

Fatigue Severity Scale measures self-reported fatigue. Validity and reliability NR. Measure was used three times: before intervention, at 8 weeks, and at 12 weeks.

Hospital Anxiety and Depression Scale measures anxiety and depression. Validity and reliability NR. Measure was used three times: before intervention, at 8 weeks, and at 12 weeks.

Leeds Multiple Sclerosis Quality of Life Scale measures quality of life. Validity and reliability NR. Measure was used three times: before intervention, at 8 weeks, and at 12 weeks.

Goal Attainment Scale measures the individual participants’ goals. Validity and reliability NR. Measure was used three times: before intervention, at 8 weeks, and at 12 weeks.
Measurement Biases
Were the evaluators blind to treatment status? *Circle yes or no, and if no, explain.*

**YES/NO**  
Assessor was blinded to group allocation.

Recall or memory bias. *Circle yes or no, and if yes, explain.*

**YES/NO**  
The next time the participants were shown the evaluations was 8 weeks later.

**RESULTS**
List results of outcomes relevant to answering the focused question
Include statistical significance where appropriate (*p* < 0.05)
Include effect size if reported

<table>
<thead>
<tr>
<th>Participation in the intervention group showed statistical significant improvement in physical activity levels and balance confidence.</th>
</tr>
</thead>
</table>
| PhoneFIT questionnaire: *p*-value: 0.009  
  - 47% intervention group/0.2% control group |
| Activities Balance Confidence: *p*-value: 0.001  
  - 42% intervention group/8% control group |
| Timed 25-Foot Walk Test’s overall findings were that there was improvement in all outcome measures for the participants who took part in the intervention group. |
| Positive effects also were found for dynamic balance and leg strength. |

Was this study adequately powered (large enough to show a difference)? *Circle yes or no, and if no, explain.*

**YES/NO**  
Sample size is 32, which is considered small.

Were appropriate analytic methods used? *Circle yes or no, and if no, explain.*

**YES/NO**  
An ANOVA was used to compare repeated measures, T-tests were used to determine differences in demographic variables, and a Mann–Whitney U-test was used for non-parametric outcomes.

Were statistics appropriately reported (in written or table format)? *Circle yes or no, and if no, explain.*

**YES/NO**  
Statistics were written in a clear table format, with representative measurements at each time of evaluation.
CONCLUSIONS
State the authors’ conclusions that are applicable to answering the evidence-based question.

In this study, there were only two evaluations that showed statistical significance in the measured outcomes of the participants in the intervention group. However, the results suggest that a leisure-based community exercise group does provide benefits for those who are moderately affected by multiple sclerosis. Participants in this group may increase physical activity, decrease uncertainty of balance, and improve their leg strength. The results indicate a need for further research on exercise-based group sessions for those affected with multiple sclerosis focusing on long-term gains and progress.

This work is based on the evidence-based literature review completed by Laura Feldhaus, OTS, and Rebecca von der Heyde, PhD, OTR/L, CHT, Faculty Advisor, Maryville University


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