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Effectiveness of Nontraditional or Home-Based Programming on ADL Performance of Individuals Living with Multiple Sclerosis: A Systematic Review

Kimberlyn Belveal, OTS, Stephanie Gunkel, OTS, Amanda Hajare, OTS, Alex Lambropoulos, OTS, Claudia Hilton, PhD, MBA, OTR, FAOTA, Amber Armstead, DrPH, OTR, BCPR **Department of Occupational Therapy**

The University of Texas Medical Branch, Galveston, Texas

Abstract

Importance: Multiple Sclerosis (MS) affects individuals' abilities to participate in activities of daily living (ADLs).

Objective: To examine the efficacy of evidence-based nontraditional and home-based interventions for use in PLMS to improve ADL performance.

Data Sources: Five databases — PubMed, CINAHL, Cochrane Library, OT Seeker, and Ovid Medline produced 924 research articles. Thirty-two articles were selected for full-text review, and 15 were included in this systematic review.

Study Selection and Data Collection: Inclusion criteria: level 2B or higher evidence, minimum of 25 participants with MS, addressed ADLs or body functions supporting ADL performance, and published since 2010. Exclusion criteria: Not written in English, not peer-reviewed, and published prior to 2010.

Findings: Strong evidence supports nontraditional and homebased interventions to improve ADL performance in PLMS.

Conclusion and Relevance: High levels of evidence support nontraditional and/or home-based interventions to improve ADL performance in PLMS. Innovation and technology continue to expand the occupational therapists' toolbox of interventions.

What This Article Adds: This review supports the emerging clinical use of nontraditional and home-based treatments in addressing ADL performance for PLMS.

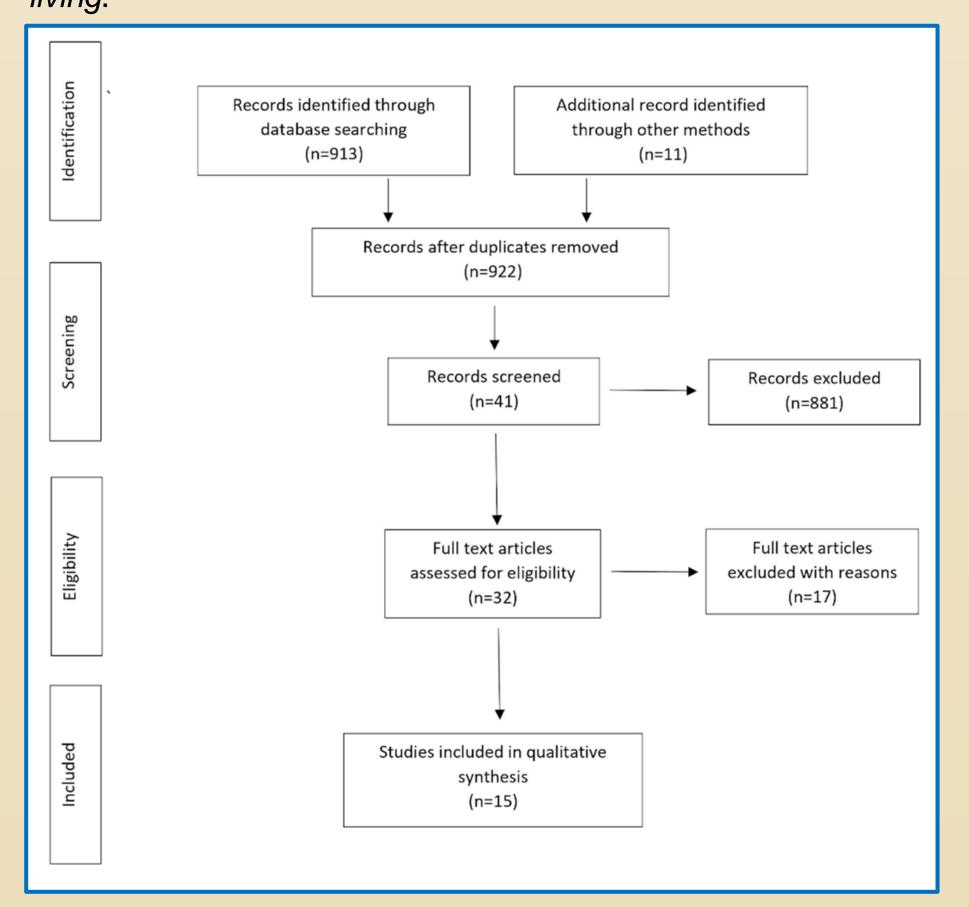
Methodology

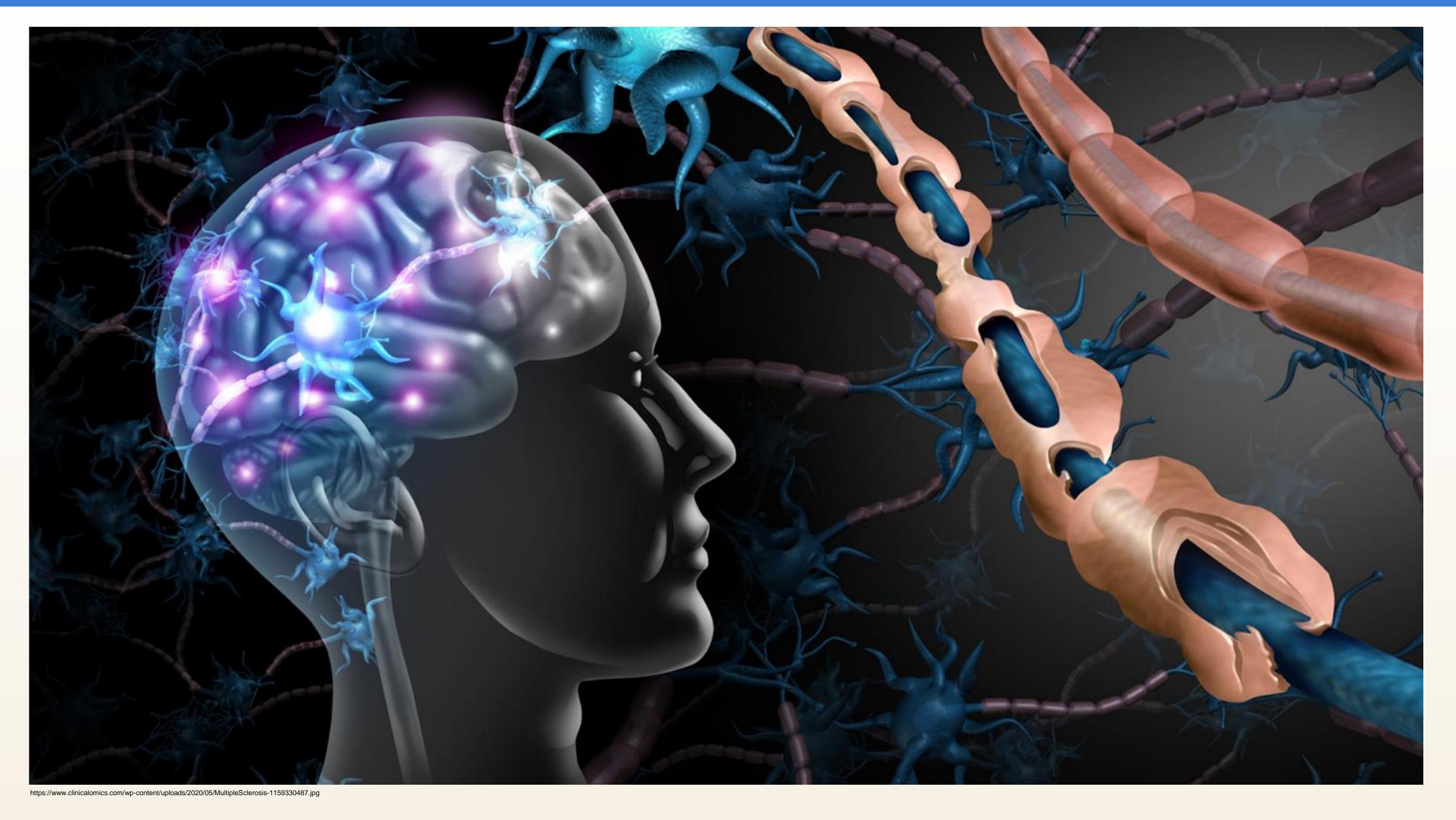
The databases searched included PubMed, CINAHL, Cochrane Library, OT Seeker, and Ovid Medline.

Inclusion criteria: (1) Publication date within the last ten years, (2) At least 25 participants, with the exception of one study (N=19), (3) Evidence level of 2B or higher (OCEBM Levels of Evidence Working Group, 2011), (4) List MS as a condition being studied, and (5) Directly address either performance of ADLs or body functions to support ADLs.

Exclusion criteria: (1) Did not meet the predetermined definition for nontraditional or home programming, (2) Had less than 19 participants, (3) Were level three evidence or lower, (4) A systematic review, (5) Not written in English, (6) Not peerreviewed, (7) Published prior to 2010, or (8) MS was not a condition studied (AOTA, 2020a).

Search terms: The search terms researchers used included multiple sclerosis, occupational therapy, multiple sclerosis rehabilitation, fatigue, activities, alternative, alternative medicine, home-based, homecare, self-rehabilitation, and activities of daily living.





Results

In-Person Nontraditional

- Yoga interventions resulted in significant improvements in quality of life and pain in women living with MS (Doulatabad et al., 2012).
- Nontraditional balance interventions utilizing whole body vibration training (WBVT) and vestibular rehabilitation resulted in statistically significant improvements in balance, functional mobility, and Barthel Index scores (Claerbout et al., 2012; Tramontano et al.,
- Nontraditional self-management interventions had significant effects on quality of life, functional status, and ADL satisfaction (Goverover et al., 2018; Kos et al., 2016).
- Intervention using a musical keyboard leads to significantly significant improvement in hand function, resulting in increased ADL function (Gatti et al., 2014).

Home-Based

Virtual Interventions • Two, online cognitive behavioral therapy programs resulted in significant, positive effects on ADL function, physical activity, fatigue and thinking (Dlugonski et al.,2012; Pöttgen et al.,2018).

Physical Interventions

- A home-based, online dexterity program resulted in significant improvements in ADL performance in PLMS (Kamm et al., 2015).
- An online, home-based strengthening program maintained ADL performance over time in PLMS (Miller et al., 2011).
- A virtual, home-based vestibular rehabilitation program led to significant improvements in quality of life, functional mobility, balance, and depression (Ozgen et al., 2016).
- A cooling suit intervention resulted in significant improvements in fatigue and ADL independence (Özkan et al., 2017).
- A virtual physical activity intervention utilizing customized pamphlets did not lead to any significant improvements (Plow et al., 2014).
- A home-based exercise program led to significant improvements in fall risk scores, walking speed, confidence, balance, and postural sway (Sosnoff et al., 2014).
- A 12-week square stepping exercise program did not lead to any significant improvements in functional mobility or function (Sebastião et al., 2018).

Implications for OT Practice

- Occupational therapists should consider the use of nontraditional programs for improving ADL performance as evidence-based interventions for patients with a diagnosis of MS.
- Occupational therapists should consider using home-based programs for improving ADL performance as evidence-based interventions for patients with a diagnosis of MS.
- Future research requires repetition of outcomes, larger sample sizes, and longer follow up periods to increase reliability and validity for the use of nontraditional and home-based programs for PLMS.

Conclusions

- MS is a debilitating condition that affects individuals worldwide that may impair individuals' engagement and performance in their ADLs and their quality of life.
- This review identified 15 research studies with various interventions and outcome measures related to ADL performance that contribute to the literature.
- Interventions such as vestibular rehabilitation, yoga, music production, self-management interventions, ELEVIDA (online cognitive-based intervention), cooling suits, home-based manual dexterity program, physical activity and self-management pamphlets were all found to be effective, evidence-based interventions to improve ADL performance in PLMS.
- The results of this review indicate that rehabilitative therapy to improve ADL performance in PLMS can incorporate nontraditional methods and is effective in multiple environments.
- Nontraditional approaches for MS rehabilitation deliver more accessible, intriguing, and motivational interventions for PLMS.
- Future research should analyze the effects of nontraditional and home-based programming using larger sample populations and longer intervention follow up periods.
- Future research should differentiate between types of MS and their effects on ADL performance outcomes using nontraditional and home-based programs.

Limitations

- This review includes a variation in the definition nontraditional interventions.
- Not all ADL domains were evaluated through these interventions.
- Studies included moderate sample sizes (only one had over 100 participants) that may affect the ability for population generalization.
- No two interventions were the same, affecting the reliability of outcomes.
- Many of the studies included in this systematic review the need for more long-term follow-ups.
- A lack of reported heterogeneity among study participants' diagnosis of MS.
- Few articles in this review distinguished participants based upon the variation of MS diagnosis, which could significantly affect the outcomes of interventions.

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