

Outdoor Adventure Programs for Persons with Multiple Sclerosis

A Review and Agenda for Future Research

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CME/CNE Information

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Target Audience: The target audience for this activity is physicians, physician assistants, nursing professionals, rehabilitation professionals, mental health care clinicians, and other health care providers involved in the management of patients with multiple sclerosis (MS).

Learning Objectives:

- 1) Describe the potential benefits of outdoor adventure programs as well as the similarities and differences between outdoor adventure programs and established nonpharmacologic treatments for mood, function, and quality of life in MS.
- 2) Describe future directions for research on outdoor adventure programs tailored to individuals with MS.

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Persons with multiple sclerosis (MS) often experience myriad symptoms that affect functioning and quality of life (QOL). Although there are a growing number of nonpharmacologic interventions designed to improve symptom severity and interference and maximize QOL, these particular treatments are limited by barriers to accessibility and, at times, a poor patient-intervention fit. Thus, it is important to consider alternative or supplemental nonpharmacologic treatments for people with MS. Outdoor adventure programs—group-based outdoor adventures aimed at enhancing QOL and fostering personal growth—could be one such alternative or supplemental approach. This topical review provides an overview of outdoor adventure programs; explores the current literature on these types of programs for the general population and medical populations; examines how outdoor adventure programs could enhance mood, functioning, and QOL for individuals with MS; and suggests future directions for research on outdoor adventure programs tailored to persons with MS. *Int J MS Care*. 2021;23:186-192.

Individuals with multiple sclerosis (MS) experience a constellation of variable, unpredictable, and disabling symptoms that affect functioning and quality of life (QOL).¹ A growing number of nonpharmacologic interventions have been developed to improve symptom severity and interference and maximize QOL.² The existing interventions are primarily delivered through traditional clinic-based models. Although effective, these interventions are limited by issues with accessibility and, at times, a poor patient-intervention fit.³ It is important to consider other approaches to supplement or serve as alternatives to existing approaches.

Outdoor adventure programs, sometimes interchanged with names such as wilderness adventure therapy or outdoor adventure education, are one such alternative with preliminary empirical support. Herein, outdoor adventure programs are defined as programs that use outdoor adventures to enhance QOL and promote personal growth. Such programs are varied in structure but generally offer either single- or multiple-day group excursions where participants actively partake in instructor-led outdoor adventurous activities (eg, whitewater kayaking, skiing, rock climbing). These programs aim to enrich overall QOL and foster personal development through experiential learning in outdoor adventures, during which a group or an individual is provided with stimulating opportunities to successfully accomplish various tasks and goals. These tasks and goals often include challenging one's perceived

capabilities and may require applying and refining one's problem-solving skills.⁴ There is promising evidence for the value and effectiveness of outdoor adventure programs in a variety of populations,⁵⁻⁷ and there is significant growth in their popularity, including outdoor adventure programming specifically for people with disabilities and chronic health conditions. There are even a handful of organizations that offer outdoor adventure trips exclusively for individuals with MS.⁸⁻¹⁰ However, there is also a distinct paucity of rigorous research that explores the benefits of these programs, particularly for people with MS.

The purpose of this review is to explore the existing literature on outdoor adventure programs to understand the extent to which such programs could be beneficial for persons with MS who are seeking to improve symptom management and QOL. Specifically, this topical review 1) provides an overview of outdoor adventure programs; 2) reviews the efficacy of these types of programs for the general population and for medical populations; 3) describes similarities and differences between outdoor adventure programs and established behavioral treatments for mood, function, and QOL in MS; and 4) discusses future directions for research on outdoor adventure programs tailored to individuals with MS.

What Are Outdoor Adventure Programs?

Outdoor adventure programs originated in the early 1940s through the establishment of Outward Bound in Wales.⁴ The first Outward Bound courses used outdoor-based activities such as sea expeditions, orienteering, and obstacle courses to help British sailors prevent unnecessary deaths by improving seamanship, increasing self-confidence and discipline, and teaching leadership skills.^{4,11} Recognizing the benefits of participation in Outward Bound, their programming has expanded to offer an array of outdoor activities and experiences

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worldwide, with an ongoing focus on personal growth and leadership. During the past several decades, outdoor adventure programs have grown in popularity. In addition to Outward Bound, there are now several other similar organizations providing outdoor adventure activities and experiences aimed at personal development. It is difficult to accurately quantify the growth of outdoor adventure programs; however, the following numbers can at least help illustrate the popularity of these types of programs: Outward Bound offered 200 courses in 1975⁶ compared with 2000 courses in 2017,¹² and another well-established outdoor adventure organization, National Outdoor Leadership School, offered courses to 2900 participants in 1998 compared with more than 26,000 participants in 2016.¹³ Likewise, the growth and interest in outdoor adventure programs is demonstrated by the number of programs for specialty populations, including adolescent delinquents, individuals struggling with substance abuse, military veterans, business leaders, college students, young adults with psychosocial concerns, and individuals with medical conditions and disabilities.¹¹

With the growth and popularity of outdoor adventure organizations, scholars have used existing theories and limited empirical research to identify specific factors that are theoretically necessary for outdoor adventure programs to be effective in producing desirable outcomes, such as enhanced personal development and QOL. Commonly identified specific factors of outdoor adventure programs include the following: 1) takes place in a wilderness environment that is unfamiliar and novel to the participants; 2) uses outdoor adventure activities that are physically and/or mentally challenging but also attainable and provide a sense of mastery; 3) consists of a supportive small group of participants, usually seven to 15 people; and 4) is led by trained instructors who ensure group safety and support participants' learning and development.^{6,14,15} These particular components are hypothesized to be important for facilitating participants' personal growth, the field's primary outcome of interest. Personal growth from participation in outdoor adventure programs can be categorized as intrapersonal and interpersonal development.⁴ Intrapersonal growth includes improvement in confidence, self-concept, leadership, willingness to take risks, and reflective thinking, and interpersonal growth includes enhancement in communication skills, trust of others, conflict resolution, and problem-solving ability. Interpersonal and intrapersonal growth could benefit individuals with MS

as they navigate various challenges that arise when living with a complex chronic illness. However, a major limitation of outdoor adventure programs is the paucity of research assessing their hypothesized core components, mechanisms of change, and therapeutic outcomes. Thus, although these programs already exist for persons with MS, rigorous controlled research on outdoor adventure programs for this population is necessary to assess and optimize these programs as impactful interventions for MS-related symptoms and QOL.

To What Extent Are Outdoor Adventure Programs Beneficial?

Benefits for General Population

Although there is no randomized controlled research on outdoor adventure programs for people with MS, there is growing support for the benefits of outdoor adventure programs in the general population. Three meta-analyses examining the overall effect of attending outdoor adventure programs reported small-to-moderate effect sizes on various outcomes. Specifically, Bowen and Neill⁵ found a medium effect size (0.47), with the largest effects on clinical outcomes (eg, anxiety, locus of control) and self-concept (eg, self-control, self-efficacy). Hattie and colleagues⁶ reported a small average effect size of 0.34, with the largest effects on leadership competencies (eg, decision making, organizational ability) and self-concept (eg, self-efficacy, well-being). Cason and Gillis⁷ found a small effect size (0.31) for adolescent programs, with the greatest effects on clinical outcomes (eg, depression, anxiety), grades, and school attendance. Other studies have identified a host of additional benefits, such as improved mental health, including greater life satisfaction and happiness and lower perceived stress¹¹; increased social connectedness and sense of community¹⁶; and enhanced resilience.¹⁷ When tailored to specific populations, outdoor adventure programs have had notable benefits on the target population. For example, military veterans who participated in group outdoor recreation activities reported improved psychological well-being and social functioning,¹⁸ and participation in an outdoor orientation program for first-year college students was associated with increased retention and grade point average.¹⁹

Benefits for Medical Populations

There is a small but promising body of research on the preliminary efficacy of outdoor adventure programs for individuals with chronic conditions and disabilities (cancer, type 1 diabetes, acquired brain injury, MS). Quantitative, qualitative, and mixed-method studies

have identified multiple benefits of outdoor adventure programs tailored to medical populations, including 1) improved subjective QOL²⁰; 2) reductions in anxiety, depression, and distress²¹⁻²³; 3) improvements in self-efficacy, self-esteem, self-confidence, and internal locus of control²⁰⁻²⁵; 4) increased perceived social support and reduced alienation^{21,22}; and 5) increased physical activity (PA) levels.^{21,26} There is also professional interest in and literature discussing best practices for safely conducting outdoor adventure trips with persons with chronic medical conditions and disabilities.²⁷⁻²⁹ Likewise, advancements in adaptive equipment and assistive technology have made outdoor adventure activities more accessible to individuals with disabilities.^{30,31}

To our knowledge, there are no randomized controlled studies examining outdoor adventure programs exclusively for people with MS. However, there is one exploratory study that conducted deductive thematic analysis of blog posts from 86 people with MS who were involved in helping crew a yacht across multiple legs of a 17-month circumnavigation of the globe.²⁴ Although this voyage was described as a “journey” and a “project” rather than as an outdoor adventure program, there are elements of this particular trip that fit with the common core components of outdoor adventure programs, including an outdoor adventure that is physically and mentally challenging and consists of a small group of participants. Results from this particular study identified four major themes: 1) the physical, psychological, and cultural challenges of the sailing journey; 2) teamwork and camaraderie, especially regarding their shared condition; 3) revising mindsets about living with MS; and 4) empowerment, personal growth, and renewed hope. Broadbent and Swalwell²⁴ extrapolated that the blog themes may be indicative of improvements in psychological outcomes (eg, mood, QOL, self-esteem, social support). This qualitative research highlights the potential for outdoor adventure programs to improve the lives of people with MS and, along with the preliminary evidence in other medical populations, supports the rationale for further examination of outdoor adventure programs for people with MS, particularly in the context of a behavioral intervention.

Similarities Between Outdoor Adventure Programs and Established Behavioral Treatments in MS

Outdoor adventure programs differ dramatically in structure and approach from established behavioral therapies, but many of the purported mechanisms of action

in outdoor adventure programs overlap significantly with traditional therapies. Nevertheless, more research is needed to understand the mechanisms of action in outdoor adventure programs, including the extent to which they overlap with traditional approaches to improve mood, function, and QOL in people with MS. The following is a brief summary of potential areas of overlap for future research.

Outdoor adventure programs are built around activity and adventure.⁴ Activity is central to a variety of traditional interventions, including, for example, stand-alone or incorporated behavioral activation, which has been shown to improve PA and management of physical and emotional symptoms in MS.³² Behavioral activation seeks to increase engagement in pleasurable activities that bring positive reinforcement to individuals, building on the understanding that a primary driver of low mood is the lack of access to positive reinforcement.³² Outdoor adventure programs similarly engage participants in challenging but enjoyable and rewarding outdoor activities in a novel and supportive environment.^{6,14,15} Compared with participating in traditional behavioral activation therapy and completing practice at home to change behavior and enhance mood, outdoor adventure programs could provide people with MS with ample opportunities to actively participate in pleasurable activities in a reinforcing environment, if they value immersion in nature and/or outdoor activities. In addition to fun and enjoyment, completing outdoor adventure activities and mastering new outdoor skills promotes a sense of mastery and accomplishment,^{6,14,15} which is reinforcing, with potential downstream beneficial effects on mood and self-efficacy. Indeed, in one small study, an outdoor adventure activity of rappelling down a vertical rock face was found to increase approach motivation (motivation toward desirable goals and appetitive stimuli) during the activity as measured by electroencephalogram³³; approach motivation is associated with positive affect and is considered the opposite of avoidance. Thus, persons with MS who are open to participating in outdoor adventure programs stand to benefit from the activation and positive reinforcement that these programs provide.

Outdoor adventure programs also parallel PA interventions. Increasing PA is especially important for people with MS, as research has consistently found that people with MS are less physically active and more sedentary than is the general population.³⁴ Physical activity education and exposure is especially important

for patients with MS with mobility disability because they are more sedentary than persons without mobility disability.³⁴ In perhaps the fastest growing area of non-pharmacologic MS interventions, PA interventions have been shown to improve strength and endurance, reduce functional decline, enhance QOL, and reduce fatigue and depression among people with MS.² Likewise, outdoor adventure trips promote increased PA after participants' completion of a program.²⁶ Engagement in outdoor activities and sports during these programs could increase exercise self-efficacy and reduce perceived limitations surrounding PA. Specifically, outdoor adventure programs could increase the interest of patients with MS in PA through exposure to novel and/or adaptive outdoor physical activities; there would then be potential to plan for this activity in the patient's home environment/community and/or promote regular involvement in programs such as those provided by the Outdoors For All Foundation³⁵ and the National Veterans Wheelchair Games,³⁶ which is an important factor for maintenance of gains in PA.³⁷

Although behavioral activation and PA are the most likely benefits of outdoor adventure programs in people with MS, there are numerous purported secondary benefits. For example, outdoor adventure programs could yield secondary benefits for problem solving and stress management as well as increased social support.³⁸ With the guidance of instructors, participants learn to problem solve and navigate challenging outdoor activities. These activities are tailored to maximize participants' experience of success and reinforce adaptive problem solving, which could, in turn, lead to improved self-esteem and self-efficacy.³⁸ Problem-solving skills and improved self-efficacy are vital self-management skills for people with MS that could be generalizable to participants' home environment after program completion with comparable effectiveness to cognitive behavioral therapy-based self-management intervention.³⁹ Likewise, engaging in novel and challenging activities in a supportive environment could provide the secondary benefits of improving coping skills and gaining confidence in these skills,³⁸ which are theoretically transferable to the daily stressors of managing a chronic health condition such as MS. Similarly, outdoor adventure programs conducted with groups of individuals who share a challenging medical diagnosis, such as cancer, were reported to improve perceived social support and reduced alienation.^{22,23} Thus, it is possible that similar benefits would occur for individuals with MS, for whom

limited social support is strongly correlated with depression and reduced QOL.⁴⁰

Key Differences Between Outdoor Adventure Programs and Traditional Therapies

Although there are many ways that outdoor adventure programs leverage similar mechanisms as traditional therapies, they are also undoubtedly different. One of the most intriguing differences is that they capitalize on the benefits of time spent in nature. Immersion in nature is associated with increased happiness, subjective well-being, positive affect, positive social interactions, and sense of meaning and life purpose⁴¹; pain reduction⁴²; and improved working memory performance.⁴³ In addition, research on the Eastern practice of forest bathing (shinrin-yoku) shows that immersion in nature has therapeutic effects on the immune, cardiovascular, and respiratory systems, reduces depression and anxiety symptoms, and increases relaxation and feelings of "awe" in healthy adults.⁴⁴ Thus, for persons with MS, spending time in nature could support resilience and pain reduction. In addition, the attention and restoration theory⁴⁵ posits that immersion in nature replenishes one's cognitive resources by using bottom-up attention rather than top-down (effortful focused) attention. Indeed, there has been a call in the traumatic brain injury literature for using outdoor adventure activities/programs as part of a cognitive rehabilitation intervention, which could also be applicable to cognitive changes common in MS.⁴⁶ Last, connectedness to nature is associated with higher mindfulness,⁴⁷ that is, the ability to relate to present moment experience, including sensations, thoughts, and emotions, without judgment or attachment.⁴⁸ Importantly, mindfulness-based interventions for persons with MS have been shown to improve QOL, anxiety and depressive symptoms, and fatigue.⁴⁸ Although correlational, the relationship between mindfulness and immersion in nature suggests that outdoor adventure programs could foster mindfulness in persons with MS, with further benefits for mental and physical health.

Future Directions for Outdoor Adventure Programs for Persons with MS

Taken together, the existing literature on outdoor adventure programs suggests that they may be a promising alternative to traditional therapies for individuals with MS. However, more research is needed, particularly with more rigorous methods and evaluation, to better understand the efficacy of these programs and the mechanisms driving the outcomes. This process will ultimately improve these programs as well as their reach.

First, because little is known about outdoor adventure programs for people with MS, it would be beneficial to first assess patients' interest in and perceptions of outdoor adventure programs as well as their reservations or perceived barriers to participating in these programs. This information could be gathered using qualitative (eg, focus groups, semistructured interviews) or quantitative (eg, survey data) research methods and would be valuable in improving participation in and access to programs. Second, although the field has designed conceptual models of outdoor adventure programs for the general population,^{15,49} there are no existing conceptual models specific to people with chronic illnesses or disability. Thus, the field would benefit from a conceptual model of how outdoor adventure program components affect behavioral targets with downstream effects on mental and physical health and functioning in persons with MS. To construct this conceptual model, researchers should draw from existing models in MS and rehabilitation research (eg, cognitive behavioral model of fatigue in MS⁵⁰) as well as conceptual models of outdoor adventure programs.^{15,49} In addition, the conceptual model should be informed by qualitative interviews with individuals familiar with outdoor adventure programs for medical populations, including outdoor adventure program creators/directors, facilitators, and participants. To test the conceptual model, research should examine hypothesized mechanisms of therapeutic change (eg,

self-efficacy) identified in the literature and qualitative interviews. Third, based on the conceptual model, randomized controlled pilot trials should be conducted to assess efficacy of outdoor adventure programs for relevant outcomes (eg, fatigue, PA, pain, mood) as well as distal outcomes (eg, QOL) and maintenance of gains at follow-up time points (eg, 3 and 6 months) in persons with MS. Importantly, this research should examine any deleterious effects from participation in outdoor adventure programs. Particular attention should be given to risk of MS symptom exacerbation due to physical exertion or environmental factors (eg, exposure to heat). Research should also focus on moderators of treatment effects such as demographics (eg, age⁵), clinical characteristics (eg, disease duration, disability severity), and symptoms (eg, mood, pain, fatigue) to better understand whether outdoor adventure programs work better for certain individuals. Fourth, qualitative research should be conducted to understand the experience of persons with MS during and after participation in outdoor adventure programs to optimize outdoor programs for short- and long-term benefits. Thus, more rigorous research will elucidate whether outdoor adventure programs are a viable alternative or supplemental behavioral intervention for improving mood, functioning, and QOL in individuals with MS. Fifth, with adequate empirical support for the benefits of outdoor adventure programs in people with MS, attention should turn to implementation science, that is, examining ways to improve the use of these community-based programs to augment existing clinical intervention or as an alternative for those who would be better served through these programs.

PRACTICE POINTS

- There is empirical support for nonpharmacologic treatments for MS symptoms and quality of life. However, these interventions are not easily accessible or appropriate for everyone, making it important to consider alternative nonpharmacologic treatments, such as outdoor adventure programs.
- Research on outdoor adventure programs outside of MS shows promising results for improved mental health, enhanced self-efficacy and self-esteem, increased perceived social support, and increased physical activity.
- There are similarities between established behavioral treatments and outdoor adventure programs, as well as additional advantages unique to these programs. Future research examining the efficacy of outdoor adventure programs for persons with MS is recommended.

Conclusions

Persons with MS experience a variety of unpredictable and disabling symptoms that affect functioning and QOL. Fortunately, research has demonstrated that nonpharmacologic interventions can improve MS symptom severity and interference, although there are important barriers to engagement in and benefit from these interventions. Outdoor adventure programs could be an alternative behavioral intervention to improve mood and MS-related symptoms using a radically different structure compared with established behavioral therapies. More research is necessary to understand whether outdoor adventure programs would increase access to and engagement in behavioral interventions in patients with MS. If outdoor adventure programs garner interest from people with MS, then increased efforts are warranted to

assess and optimize the efficacy of outdoor adventure programs to improve mood, functioning, and QOL in persons with MS. □

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