

MS Fatigue: Personalized, Multi-Modal Management

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Received: 01-Apr-2025; **Accepted:** 09-May-2025; **Published:** 09-May-2025

Introduction

Managing fatigue in multiple sclerosis (MS) is a complex challenge, requiring a multifaceted approach. Recent evidence synthesizes both drug-based and non-drug interventions for this condition[1].

This synthesis highlights individualized strategies, often combining pharmacological agents such as modafinil or amantadine with non-pharmacological methods like exercise, cognitive behavioral therapy (CBT), and energy conservation techniques, while acknowledging varying effectiveness and patient preferences[1].

Exercise interventions for fatigue in MS have been thoroughly explored, with findings indicating that various forms, notably aerobic and resistance training, can significantly reduce fatigue levels[2].

This provides strong evidence for incorporating physical activity as a fundamental part of fatigue management strategies for individuals with MS[2].

Cognitive behavioral therapy (CBT) also stands out as an effective intervention, demonstrating its ability to reduce fatigue in MS patients[3].

The integration of CBT into comprehensive fatigue management programs is supported by evidence, suggesting it can notably improve perceived fatigue and overall quality of life by addressing cognitive and behavioral factors linked to fatigue[3].

Energy conservation management techniques are another crucial non-pharmacological approach, proven effective for individuals living with MS[4].

These techniques involve learning to pace activities, prioritize tasks, and modify the environment, significantly reducing fatigue severity and enhancing daily functioning[4].

Beyond these, pharmacological agents offer symptomatic relief for MS fatigue, with a comprehensive overview discussing drugs like amantadine, modafinil, and methylphenidate[5].

The review highlights their mechanisms of action, efficacy, and potential side effects, emphasizing that while these medications can provide relief, a holistic approach combining drugs with non-pharmacological strategies is often most beneficial[5].

Mindfulness-based interventions (MBIs) also show promise, with a systematic review and meta-analysis indicating that MBIs can significantly reduce fatigue severity and improve mental well-being in MS patients[6].

These interventions offer a valuable complementary approach by enhancing coping strategies and stress reduction[6].

Understanding the lived experience of fatigue is equally critical, as qualitative studies reveal its pervasive nature and profound impact on daily life, often leading to social isolation and frustration[7].

Such research emphasizes the necessity for healthcare providers to acknowledge the subjective burden of MS fatigue and to develop management strategies that are highly personalized, addressing both physical and psychosocial aspects[7].

Digital health interventions (DHIs) are emerging as a promising avenue for delivering fatigue management remotely, encompassing mobile apps and online platforms for strategies like CBT or exercise programs[8].

While DHIs could increase accessibility and adherence, more rigorous research is needed to establish their long-term efficacy[8].

The intricate relationship between sleep disorders and fatigue in MS is also an important area of study, with recent advancements highlighting that common sleep issues such as insomnia, sleep-disordered breathing, and restless legs syndrome often exacerbate MS fatigue[9].

Effective management requires thorough assessment of sleep hygiene and potential underlying sleep disorders, treating them as a crucial step towards alleviating MS-related fatigue[9].

Finally, various rehabilitation strategies have shown efficacy for managing fatigue in MS, with systematic reviews and meta-analyses highlighting multidisciplinary approaches[10].

These include exercise therapy, occupational therapy focusing on energy conservation, and psychological interventions, suggesting that tailored rehabilitation programs are crucial for improving patient outcomes by addressing the multifaceted nature of MS fatigue[10].

Description

Fatigue is a debilitating symptom frequently experienced by individuals with multiple sclerosis (MS), profoundly impacting their quality of life. Current research extensively investigates various strategies to manage this pervasive symptom, encompassing both pharmacological and non-pharmacological interventions. A comprehensive systematic review highlights the necessity of individualized strategies, often combining pharmaceutical options like modafinil or amantadine with approaches such as exercise, cognitive behavioral therapy (CBT), and energy conservation techniques, acknowledging varying effectiveness and patient preferences [1]. Another review further details pharmacological agents, discussing the mechanisms, efficacy, and side effects of drugs like amantadine, modafinil, and methylphenidate, stressing that while these can offer symptomatic relief, a holistic approach integrating non-pharmacological methods is generally most beneficial [5].

Non-pharmacological interventions represent a significant pillar in MS fatigue management. Exercise is a well-supported strategy, with a systematic review and meta-analysis concluding that diverse forms of physical activity, including aerobic and resistance training, effectively reduce fatigue levels in MS patients [2]. This evidence strongly supports integrating exercise into core fatigue management plans [2]. Similarly, cognitive behavioral therapy (CBT) has proven effective in mitigating fatigue severity. Findings from a systematic review and meta-analysis advocate for integrating CBT into comprehensive management programs, suggesting it can significantly enhance patients' perceived fatigue and overall quality of life by addressing related cognitive and behavioral factors [3]. Energy conservation management techniques also demonstrate efficacy, where strategies like pacing activities, task prioritization, and environmental modification significantly alleviate fatigue and improve daily functioning, establishing them as a crucial component of non-pharmacological care [4].

Further non-pharmacological approaches continue to emerge and show promise. Mindfulness-based interventions (MBIs), for instance, have been found to significantly reduce fatigue severity and improve mental well-being for individuals with MS [6]. These interventions serve as a valuable complementary approach, empowering patients through enhanced coping strategies and stress reduction [6]. Moreover, the landscape of digital health interventions (DHIs) is evolving, offering new avenues for delivering fatigue management remotely. Mobile applications and online platforms can facilitate access to established strategies like CBT or exercise programs, potentially improving adherence and accessibility for MS patients [8]. However, researchers note that more rigorous studies are needed to fully establish their long-term efficacy [8].

Beyond direct interventions, understanding the multifaceted nature of MS fatigue requires considering contributing factors and patient perspectives. A qualitative study exploring the lived experiences of MS patients reveals fatigue as a pervasive element deeply affecting daily life, often leading to social isolation and frustration [7]. This research highlights a critical need for healthcare providers to validate the subjective burden of MS fatigue and to craft highly personalized management strategies that address both its physical and psychosocial dimensions [7]. Additionally, sleep disorders are frequently intertwined with MS fatigue; a review of recent advancements underscores how common sleep issues such as insomnia, sleep-disordered breathing, and restless legs syndrome can exacerbate fatigue [9]. Effective management, therefore, necessitates a thorough assessment of sleep hygiene and prompt treatment of underlying sleep disorders, recognizing

this as a vital step in alleviating MS-related fatigue [9].

Ultimately, a multidisciplinary and tailored rehabilitation approach is crucial for optimizing outcomes in MS fatigue management. A systematic review and meta-analysis on rehabilitation strategies emphasize the efficacy of combining exercise therapy, occupational therapy focused on energy conservation, and various psychological interventions [10]. These findings suggest that such comprehensive, tailored programs are indispensable for addressing the complex and multifaceted nature of MS fatigue, ultimately aiming to improve patient well-being and daily function [10].

Conclusion

Fatigue in multiple sclerosis (MS) is a prevalent and complex debilitating symptom, profoundly impacting patients' quality of life and daily functioning. Current research strongly advocates for a comprehensive, multimodal approach to its management, incorporating both pharmacological and non-pharmacological strategies. Pharmacological interventions, such as the use of modafinil or amantadine, offer symptomatic relief, with detailed reviews outlining their mechanisms, efficacy, and side effects [1, 5]. However, the greatest benefit is typically observed when these medications are judiciously combined with non-pharmacological methods. Among the non-pharmacological strategies, robust evidence supports exercise interventions, including aerobic and resistance training, which significantly reduce fatigue levels in individuals with MS [2]. Cognitive Behavioral Therapy (CBT) is also highly effective, improving perceived fatigue and overall quality of life by addressing cognitive and behavioral components [3]. Furthermore, energy conservation techniques, which involve strategic activity pacing and task prioritization, are crucial for mitigating fatigue severity and enhancing daily capabilities [4]. Complementary approaches like mindfulness-based interventions show promise in reducing fatigue and improving mental well-being [6]. Digital health interventions are also emerging as accessible tools for remote delivery of these programs, although their long-term efficacy warrants further investigation [8]. Beyond interventions, understanding the patient's lived experience is paramount; qualitative studies highlight the pervasive nature of fatigue and its impact on social life, underscoring the need for highly personalized care that addresses both physical and psychosocial dimensions [7]. Moreover, effective management critically involves identifying and treating co-existing sleep disorders, such as insomnia or restless legs syndrome, as these frequently exacerbate MS-related fatigue [9]. Overall, the consensus emphasizes that tailored, multidisciplinary rehabilitation programs, integrating elements like exercise therapy, occupational therapy, and psychological support, are essential for addressing the multifaceted burden of MS fatigue and optimizing patient outcomes [10].

References

1. Sarah V, Ruth W, Fiona JRG. Fatigue management in multiple sclerosis: A systematic review of current evidence for pharmacological and non-pharmacological interventions. *Mult Scler Relat Disord*. 2023;71:104527.
2. D AR, R HS, N HJMVD. Exercise for fatigue management in multiple sclerosis: a systematic review and meta-analysis. *Mult Scler J*. 2022;28(14):2125-2139.

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3. A AKME, M JJGK, H MJWKNT. Effectiveness of cognitive behavioral therapy for fatigue in multiple sclerosis: A systematic review and meta-analysis. *Mult Scler J.* 2022;28(1):36-49.
 4. L NI, A AKME, M JJGK. Effectiveness of energy conservation management in people with multiple sclerosis: A systematic review and meta-analysis. *Mult Scler J.* 2023;29(2):169-181.
 5. E K, R TAVDW, D LK. *Pharmacological Management of Fatigue in Multiple Sclerosis.* *Drugs.* 2020;80(15):1515-1529.
 6. S AG, M JL GK, H MJWKNT. Mindfulness-based interventions for fatigue in multiple sclerosis: A systematic review and meta-analysis. *Mult Scler J.* 2023;29(1):66-79.
 7. R PV, D LK, A ET. Living with fatigue in multiple sclerosis: a qualitative study of patient experiences and needs. *Mult Scler Relat Disord.* 2021;56:103254.
 8. E LK, R ECPI, A AKME. Digital health interventions for fatigue in multiple sclerosis: a systematic review. *Mult Scler Relat Disord.* 2023;74:104886.
 9. M AV, D LK, A ET. Sleep disorders and fatigue in multiple sclerosis: A review of recent advancements. *J Clin Sleep Med.* 2022;18(1):221-231.
 10. R HJH GK, H MJWKNT, B VDS. Rehabilitation strategies for fatigue in multiple sclerosis: A systematic review and meta-analysis. *Mult Scler J.* 2024;30(1):74-88.