



Prevalence of Sleep Disorders and Depression in Multiple Sclerosis and Their Management: A Literature Review

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Author's contribution

The sole author designed, analyzed, interpreted and prepared the manuscript.

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ABSTRACT

This literature review concentrates on the prevalence of sleep disorders and depression in multiple sclerosis (MS) patients, as well as their effect on health and quality of life. Insomnia, sleep apnea, restless legs syndrome, and narcolepsy are some of the most common sleep disorders experienced by MS patients, according to the review. MS patients have a prevalence of sleep disturbances ranging between 29% and 66%. The review also discusses the various causes of sleep disturbances in MS patients, including physical impairment, nocturnal symptoms, adverse drug reactions, comorbid psychiatric disorders, and sleep-wake cycle abnormalities caused by neurological injury. The review highlights the need for additional research in the interconnected disciplines of sleep disorders, depression, and MS. Future research should concentrate on longitudinal studies, the explanation of underlying mechanisms, and the development of individualized therapies using innovative methodologies. By gaining a deeper understanding of and intervening in sleep disturbances and melancholy, MS patients can receive more comprehensive care.

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1. INTRODUCTION

Sleep and depression are typical comorbidities among people with multiple sclerosis (MS), a chronic neurological condition characterized by demyelination and inflammation of the central nervous system. Multiple sclerosis (MS) patients suffering from depression and insomnia have been identified as a significant medical problem. The primary reason for this is these diseases' detrimental impact on the patients' health and quality of life.

Insomnia, sleep apnea, restless legs syndrome (RLS), and narcolepsy are only some of the sleep disorders frequently seen in people with a diagnosis of multiple sclerosis (MS) [1,2]. Compared to the general population, the prevalence of sleep interruptions in this group varies between 29% and 67% [2]. Multiple sclerosis (MS) patients may experience sleep problems for a variety of reasons [16,17]. Physical impairment, nighttime symptoms (such as pain and spasticity), pharmaceutical side effects, comorbid psychiatric problems, and sleep-wake cycle abnormalities due to neurological injury are all examples of such causes [1,2]. Researchers have observed that sleep disturbances affect sleep quality and can exacerbate other MS symptoms like exhaustion, cognitive dysfunction, and mood changes [2,3].

With a reported frequency between 20% and 50% among patients [4,5], depression is a widely recognized psychiatric condition in those diagnosed with Multiple Sclerosis (MS). Multiple sclerosis (MS) patients can become depressed for a number of reasons [4,20-24]. These causes include the medical, psychological, and social realms. Multiple sclerosis (MS) increases vulnerability to depression [4] due to the disease's chronicity, physical impairment, and functional restrictions. Furthermore, it should be highlighted that the inflammatory and neurodegenerative processes associated with MS can indirectly affect the neurobiological pathways responsible for mood regulation [5].

2. METHODOLOGY

I Searched Pubmed, Scopus, Embase, Central and Web of Science to Find Relevant Articles on Basis of Following Inclusion and Exclusion Criteria.

2.1 Inclusion Criteria

1. Studies published in peer-reviewed journals.
2. Studies that investigate the prevalence of sleep disorders and depression in individuals diagnosed with multiple sclerosis.
3. Studies that examine the management strategies for sleep disorders and depression in individuals with multiple sclerosis.
4. Studies that provide quantitative data on the prevalence rates or management outcomes.
5. Studies conducted in any geographical location.
6. Studies published in the English language.

2.2 Exclusion Criteria

1. Studies published in non-peer-reviewed sources, such as conference abstracts, dissertations, or non-academic websites.
2. Studies that focus solely on other neurological conditions or general populations without specific relevance to multiple sclerosis.
3. Studies that do not specifically address the prevalence or management of sleep disorders and depression in individuals with multiple sclerosis.
4. Studies without clear methodology or insufficient data to extract relevant information.
5. Studies published in languages other than English.
6. Studies published before January 2021.

3. REVIEW OF LITERATURE

3.1 Management of Sleep Disorders and Depression in Multiple Sclerosis

Since sleep problems and depression negatively affect the quality of life for people living with multiple sclerosis (MS), effective management strategies are essential. Pharmacological interventions, such as sedative-hypnotics and wakefulness-promoting agents, are commonly used in the treatment of sleep disorders in people with multiple sclerosis (MS), along with non-pharmacological interventions, such as education on sleep hygiene and cognitive-

behavioral therapy for insomnia [2,18,19]. Depression in people with multiple sclerosis (MS) can be treated with both medication (such as selective serotonin reuptake inhibitors or tricyclic antidepressants) and talk therapy (such as psychotherapy or cognitive-behavioral therapy) [4,5].

Understanding the prevalence and management of sleep disorders and depression in individuals with MS is essential for optimizing their overall well-being. This literature review aims to provide a comprehensive overview, drawing from relevant research studies and clinical evidence published after January 2021.

3.2 Prevalence, Evaluation, and Management of MS Patients with Comorbid Sleep Disorders

A case-control study by Toscano et al. in 2022 [6] revealed the prevalence of sleep issues among MS patients and how often they are disregarded and poorly managed. The aims of the study were to (1) ascertain the frequency with which MS patients report sleep problems and (2) investigate the association between sleep disruptions, weariness, and impairment. Multiple sclerosis (MS) patients receiving standard disease-modifying drug (DMD) treatment were compared to a control group of healthy individuals living in the same area. According to the study, patients with MS who took DMD regularly slept better and suffered less EDS than the control group. This indicates that DMDs may improve sleep quality in MS patients if the disease is well managed. The Episono database utilized in the study acknowledges that it may contain sleep data from people with sleep problems, other neurological conditions, and clinical ailments (1).

Sparasci et al. [7] found that sleep-related breathing disorders were common in MS patients and exhibited strong associations with fatigue, sleep disturbances, cognitive decline, and depressive symptoms after analyzing the characteristics and correlations of sleep disorders in a cohort of 67 people diagnosed with MS (56 with relapsing-remitting subtype) and 67 unaffected individuals. The article does not provide information regarding the frequency or occurrence rates of these disorders among individuals at various stages of multiple sclerosis. Nevertheless, the data provided illustrates that the prevalence of sleep-related breathing disorders is elevated among individuals

diagnosed with multiple sclerosis compared to a control group consisting of individuals without the condition (2).

Moreover, the results of a cross-sectional study in Iran suggest that interventions such as cognitive-behavioral therapy for insomnia, medication management, or lifestyle modifications can promote better sleep hygiene in MS patients [8]. Participants were graded using information gathered from the Global Sleep Assessment (GSA) and Pittsburgh Sleep Quality Index (PSQI). The most common sleep complaints were trouble falling asleep or staying asleep, suggesting that 90% of patients in the research experienced at least one sleep disturbance. However, the text does not provide detailed findings or precise prevalence rates. It is important to note that while the study's results may provide some insights into the prevalence of sleep disturbances in MS patients, individualized treatment plans should be developed in consultation with healthcare professionals based on each patient's specific needs and circumstances (3).

Another study investigating the different management strategies for sleep disorders in patients with MS by Drerup et al. discussed the high prevalence of sleep disorders and the impact of insomnia on fatigue, a common and disabling symptom of MS [9]. Cognitive behavioral therapy for insomnia (CBT-I) was identified in the evaluation as an effective treatment for chronic insomnia in people with MS. They also stressed the importance of adapting common behavioral therapy plans for insomnia to the unique needs of people with MS (4).

3.3 Prevalence, Assessment, and Management of Depression in Individuals with MS

Multiple sclerosis (MS) patients in Saudi Arabia were surveyed cross-sectionally by Al-Jadid R et al. [10] to determine the incidence of anxiety and depression. This research aimed to determine whether or not anxiety and depression were more common in MS patients based on age, disease severity, medication adherence, or social support. The study's authors randomly sampled 184 adults from MS societies around Saudi Arabia to participate in the study. Depression and anxiety were assessed using the General Anxiety Disorder Scale (GAD-7) and the Patient Health Questionnaire-9 (PHQ-9) respectively;

participants completed the surveys independently. The following bar chart displays the study's findings about the significant prevalence of depression among MS patients (5).

The majority of patients had mild depression (31%). Gender differences were observed, as a significantly higher proportion of women (83.1%) experienced depression than men (62.1%). The findings emphasize the urgent need for regular screening and evaluation of MS patients by psychiatrists to enable early detection and treatment of depression and anxiety, aiming to enhance patients' quality of life and overall health outcomes. The study highlights the importance of addressing the psychological well-being of MS patients in Saudi Arabia, urging healthcare providers to integrate mental health support into the comprehensive care of MS patients to improve their overall well-being (6).

Another retrospective chart review study was undertaken by Tardo et al. [11] to investigate the potential association between disease-modifying therapies (DMTs) and PHQ-9 depression levels in patients with multiple sclerosis (MS). The data came from a study of patients examined at UTSW's Multiple Sclerosis and Neuroimmunology Clinic between 2017 and 2020. The total number of participants that filled out the PHQ-9 was 2611. Most of the patients were women, and the median age was 50.37. Patients in this study did not typically use wheelchairs or walkers until after their condition had progressed for a median of 12.74 years. There was a positive correlation between antidepressant use and higher PHQ-9 scores, and 43.86 percent of patients reported using them. For the PHQ-9, the median score was 4, with the interquartile range being 7. Patients receiving interferon therapy had the lowest median PHQ-9 score (2.0) of any treatment group. (7) According to the study's findings, patients treated with interferon for MS appeared to have better mental health than those treated with other disease-modifying medications or who were not treated at all. This suggests that interferon therapy may have a positive influence on the prevalence of depression in people with MS, a finding that merits further study and consideration in treatment strategies aimed at improving the mental health of people with the disease (7).

Concerning depression evaluation, Beswick et al. examined the PHQ-9 as a screening tool for depressive symptoms in people with multiple

sclerosis [12]. They found that the measure met all three reliability, validity, and acceptability criteria. Over the course of four weeks, participants filled out three online questionnaires. As a measure of depression symptoms in MS, the PHQ-9 showed strong internal reliability (Cronbach's $\alpha=0.89$) and test-retest agreement (ICC 0.89, 95% CI 0.85-0.91). At both time points, positive correlations between the PHQ-9 and mental health items on the Multiple Sclerosis Impact Scale (MSIS-29) and the Centre for Disease Control Health-Related Quality of Life Measure (CDC-HQOL-4) support convergent validity. Ninety-three percent of respondents rated the PHQ-9 as either "Very" or "Completely" satisfactory, suggesting its reliability and validity. According to their research, Beswick et al. suggest taking the PHQ-9 as a quick and easy way to screen for depression in MS patients (8).

Furthermore, in their descriptive review, Marcella et al. examined the impact of mindfulness interventions on the psychological well-being of individuals with multiple sclerosis [13]. They highlighted the significant psychosocial challenges individuals with MS face, including anxiety, depression, stress, fatigue, and pain. The authors conducted a thorough search using the PubMed database and additional references, ultimately including 8 studies that met their search criteria. The reviewed studies demonstrated the efficacy of mindfulness interventions in reducing depressive symptoms, improving the mental and physical quality of life, and decreasing fatigue among individuals with MS. Mindfulness was beneficial for managing psychological symptoms and pain, ultimately leading to improvements in coping strategies and adaptation. However, the authors noted the limited availability of clinical evidence and cautioned against concluding that mindfulness interventions are superior to other active interventions for treating psychological symptoms in MS (9).

Learmonth et al. also thoroughly assess the background and present knowledge of exercise as a non-pharmacological symptomatic treatment for MS [14]. Significant medical and institutional improvements in MS care are highlighted during the past three decades. The authors stress the importance of physical activity as the best non-pharmaceutical treatment for controlling MS-related symptoms like difficulty walking, cognitive impairment, fatigue, and depression.

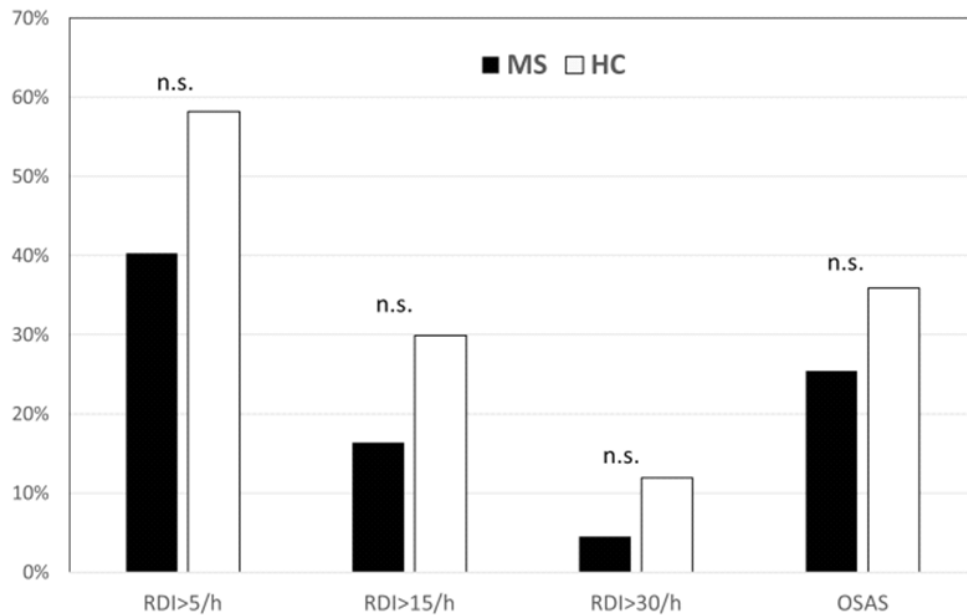


Fig. 1. Frequency of sleep-related breathing disorders in patients with multiple sclerosis and in healthy controls

MS: Multiple Sclerosis; HC: Healthy Controls; RDI: Respiratory Disturbance Index; OSAS: Obstructive Sleep Apnea Syndrome; n.s.: not significant

Learmonth et al. advocates for exercise as an integral component of multidisciplinary MS care. They emphasize the safety and effectiveness of exercise in improving MS symptoms and reducing disease progression. The article encourages neurologists and healthcare providers to prescribe and promote exercise during diagnosis and throughout the disease trajectory. The authors recommend using prescriptive guidelines, clinical education, and behavior change theory to overcome patients' barriers to exercise.

4. DISCUSSION

Sleep disorders and depression frequently occur in individuals diagnosed with multiple sclerosis (MS), necessitating the prioritization of their management in order to enhance the overall well-being and quality of life of individuals affected by MS. The objective of this literature review was to investigate the frequency of sleep disorders and depression in individuals with multiple sclerosis (MS) and analyze the existing approaches to managing these conditions. Moreover, the study successfully identified various scientific research deficiencies and proposed avenues for enhancing the comprehension and treatment of these coexisting medical conditions in multiple sclerosis. The incidence of sleep disorders in individuals with

multiple sclerosis (MS) is consistently documented to be greater in comparison to the general population. The etiology of sleep disorders in multiple sclerosis (MS) is multifaceted, encompassing intricate interplay among neurological, immunological, and psychological components. Depression is a frequently observed co-occurring condition in individuals with multiple sclerosis (MS), as indicated by various studies reporting prevalence rates ranging from 20% to 50%. The comorbidity of depression and multiple sclerosis (MS) can have detrimental effects on various domains of life, such as cognitive functioning, fatigue levels, and social functioning.

Despite the high prevalence of sleep disorders and depression in MS, several gaps in current scientific research must be addressed. Firstly, there is a need for longitudinal studies to determine the temporal relationship between MS, sleep disorders, and depression. Longitudinal research would enable a better understanding of whether sleep disorders and depression are prodromal, concomitant, or a consequence of MS, which can inform early interventions and management strategies. Secondly, more research is required to elucidate the underlying mechanisms linking sleep disorders, depression, and MS. Understanding the neurobiological and immunological pathways

involved can provide insights into potential therapeutic targets for intervention. Furthermore, investigating the impact of sleep disorders and depression on MS disease activity and progression would contribute to the comprehensive management of MS. Regarding management, current approaches primarily focus on symptom relief and improving sleep quality or mood through pharmacological

and non-pharmacological interventions. However, the effectiveness of these interventions varies among individuals, highlighting the need for personalized treatment plans. Future research should explore novel interventions such as cognitive-behavioral therapy, mindfulness-based approaches, and lifestyle modifications to optimize the management of sleep disorders and depression in MS.

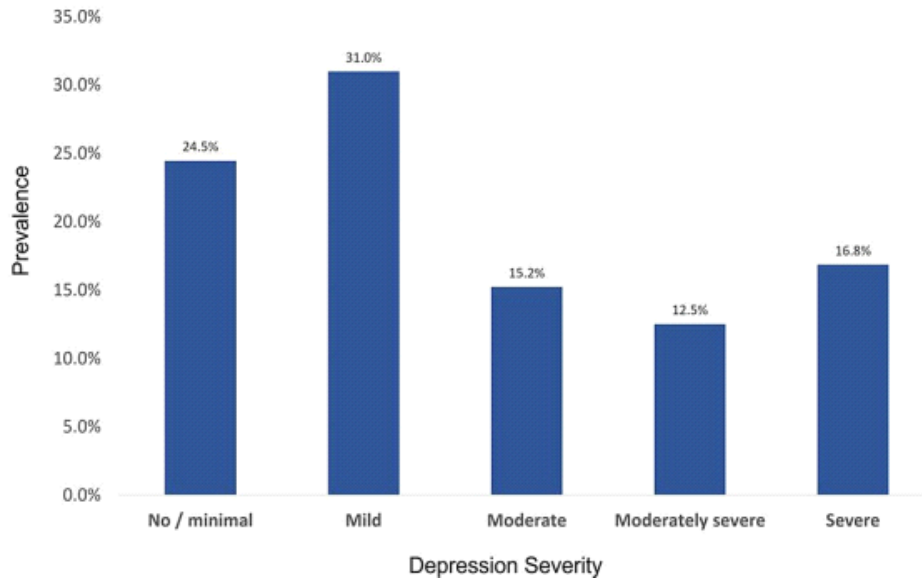


Fig. 2. Distribution of depression according to the severity in patients with multiple sclerosis

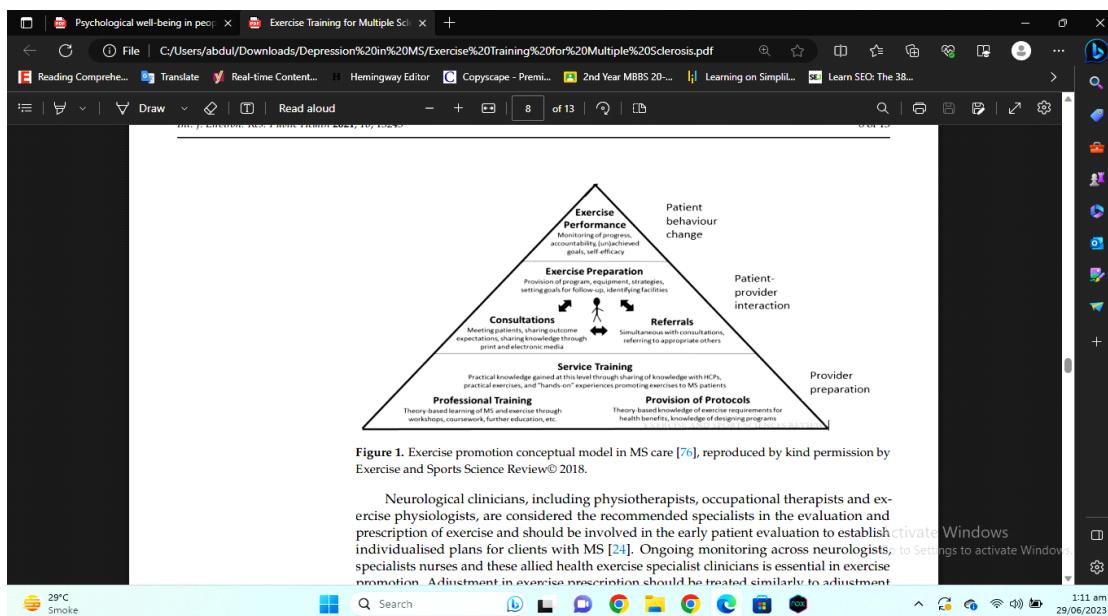


Fig. 3. Exercise promotion conceptual model in MS care [15], reproduced by kind permission by Exercise and Sports Science Review© 2018

Moreover, incorporating telemedicine and digital health technologies in managing sleep disorders and depression in MS can enhance accessibility to care, especially for individuals with limited mobility or living in remote areas. Remote monitoring and intervention programs can provide real-time support and interventions tailored to the specific needs of MS patients, potentially improving adherence and treatment outcomes. Lastly, the impact of sleep disorders and depression on other aspects of MS management, such as medication adherence, rehabilitation outcomes, and healthcare utilization, remains understudied. Future research should aim to investigate these associations to gain a comprehensive understanding of the multifaceted impact of sleep disorders and depression on the overall management of MS.

5. CONCLUSION

Comorbidities such as sleep difficulties and depression are common in MS patients and profoundly impact their quality of life and well-being. This review of the literature emphasizes the need for more investigation into the interconnected fields of sleep problems, depression, and multiple sclerosis. Future research should focus on longitudinal studies, explaining the underlying mechanisms, and devising tailored therapies utilizing novel methodologies. Improved holistic care for people with MS can be achieved through an increased understanding of and intervention in sleep disturbances and depression.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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