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YOGA CAN AMELIORATE QUALITY OF LIFE OF PATIENTS WITH MULTIPLE SCLEROSIS: A REVIEW

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Abstract

Multiple sclerosis (MS) is a condition in which the body's immune system mistakenly attacks the central nervous system (CNS). MS is characterised by the presence of inflammation, demyelination, and the formation of scar (sclerosis) in the white matter of the brain and spinal cord. This leads to a wide range of symptoms associated with multiple sclerosis, encompassing physical, emotional, and psychological manifestations such as fatigue, chronic pain, impaired mobility, imbalance, spasticity, cognitive impairment, depression, bladder and bowel dysfunction, visual and speech impairments and sensory disturbances. Currently, the aetiology and treatment for MS are still unidentified, and it impacts over 2.8 million individuals globally. Disease modifying therapy (DMT) for MS, which aids in reducing the development of lesions in the white matter of the central nervous system (CNS), is expensive and has notable side effects. Consequently, individuals diagnosed with MS are increasingly turning to complementary and alternative medicine (CAM) as a means to alleviate or conquer MS symptoms and improve their overall quality of life. Among the many kinds of CAM, yoga has emerged as a particularly popular choice. The present review aims to elucidate the possible influence of yoga on enhancing the quality of life in individuals diagnosed with MS. A comprehensive search was undertaken on Google Scholar, included fourteen publications published between 2004 and February 2024. Based on the available data of low to moderate quality, yoga seems to be useful in enhancing the quality of life for individuals with MS.

Keywords: *Yoga, Multiple sclerosis, Quality of Life, Demyelination*

INTRODUCTION

Multiple Sclerosis (MS) is a chronic neurological disorder where the immune system mistakenly attacks the central nervous system (CNS), causing relapses, flare-ups, or attacks. The exact cause of MS is still unknown, but it is thought that the immune system damages the protective covering of the brain, spinal cord, and optic nerve called the myelin sheath and the axons in the CNS, disrupting the transmission of nerve signals to and from the brain and spinal cord (Rogers & MacDonald, 2015). MS induces an inflammatory response that affects the myelin, leading to the formation of scarring (sclerosis) along the axons. This condition is characterised by the buildup of amyloid precursor protein (Bitsch, 2000). MS exhibits four distinct forms of the illness. (1) Relapsing-remitting multiple sclerosis (RRMS): This form of MS, which affects 85% of individuals with the condition, is the most prevalent kind. It is classified as episodes of increased intensity followed by periods of improvement. Patients with MS may have intermittent periods of symptom improvement and disappearance, with recovery ranging from partial to total. The severity of the exacerbation may range from moderate to severe, with a duration that can span from a few days to several weeks. (2) Secondary progressive multiple sclerosis (SPMS): This category includes people who have relapsing/remitting illness. Disease-modifying drugs are used in therapies to aid in the postponement of disease development. The illness exhibits a progressive deterioration, regardless of whether there are times of temporary relief or stabilisation of symptoms. (3) Primary progressive multiple sclerosis (PPMS): This kind is the second least common and affects around 10% of individuals with MS. The symptoms progressively deteriorate from the onset, sometimes reaching a stable phase, without any periods of relapse or remission. This is also more resistant to pharmacological interventions often used for the treatment of MS. (4) Progressive-relapsing multiple sclerosis (PRMS): This is the least common kind of MS, impacting less than 5% of people. This condition has a progressive nature from the beginning, characterised by intermittent episodes of more severe symptoms. Plateaus or remissions are absent (Goldenberg, n.d.). More common symptoms of MS in general include fatigue, MS Hug, walking (gait) difficulty, numbness or tingling, imbalance, spasticity, chronic pain and itching, cognitive disability, bladder and bowel dysfunction, impairment of vision and voice, anxiety, depression, sensory disturbance, and muscles weakness. Less common symptom loss of taste and hearing, swallowing problem, seizures, breathing problem, tremor, vertigo,

dizziness (MS Symptoms, n.d.) It is observed that the experience and symptoms of each person undergoing this condition are distinct and varied. The symptoms might vary in severity, ranging from minor to severe physical and neurological impairment. Research suggests that over 90% of people with MS encounter reduced mobility, while fatigue affects around 75% to 95% of persons. Moreover, more than 85% of people with MS endure chronic pain (Zwibel, 2009). Currently, there is no established remedy for Multiple Sclerosis (MS) and no authorised treatment that directly mitigates the harm to the central nervous system or aids in its restoration (Palukuru et al., 2021).

According to the 2020 version of the Multiple Sclerosis International Federation (MSIF) atlas of MS, there are now 2.8 million individuals worldwide who have been diagnosed with MS. This global estimate has risen from 2.3 million persons in 2013. Multiple sclerosis (MS) has a higher prevalence in women compared to males, with a ratio of 2 to 1. The illness is often identified in individuals aged 20 to 50, but it may occur at any age. Globally, there are at least 30,000 children and teens under the age of 18 living with MS, which accounts for 1.5% of the total number of persons with MS in the paediatric prevalence statistics. Multiple studies have shown a correlation between the prevalence of MS and latitude. Individuals residing in countries located closer to the equator have a reduced chance of developing MS, while those living in nations at higher latitudes (closer to the north/south poles) have a higher risk (Simpson et al., 2019). Currently, there is no known remedy for MS. Hence, due to the persistent character of the illness, it is crucial to effectively control the advancement of the disease and alleviate symptoms in order to maintain quality of life. Approved drugs for MS may be costly, and insurance coverage might vary significantly. These drugs are specifically formulated for people who have relapsing types of MS. Relapses are often managed with corticosteroids, which do not provide any long-term advantages. Additionally, there is a diverse selection of drugs usually used to control persistent symptoms. Nevertheless, some people may have unfavourable responses to pharmaceutical therapies (Frank et al., 2017). Certain drugs might cause adverse effects including nausea, fever, headache, exhaustion, depression, and psychological instability (Ahmadi et al., 2010). Due to the high expenses and potential negative effects of some medicines, individuals with MS often turn to complementary and alternative therapies to manage their condition (Goldenberg, n.d.). Approximately 54 to 57% of people in the United States who have MS use various types of complementary or alternative treatments. The prevalence of these therapies may be even greater in other countries, such as Great Britain. The reference is from the work of Hughes and Howard published in 2013. "Complementary" refers to the use of yoga alongside conventional medicine, while "alternative" refers to the use of yoga instead of conventional medicine. The National Centre for Complementary and Alternative Medicine (NCCAM) of the NIH defines yoga as a type of complementary and alternative medical therapy. It is also one of the most widely practiced forms of CAM.

While the impact of yoga on symptom management may differ from person to person, the emphasis on breath, movement, and stretching in yoga might potentially provide therapeutic advantages for those with MS. These benefits may include improvements in self-efficacy, mental well-being, and overall quality of life. Considering this perspective, previous systematic reviews and meta-analyses have shown that yoga enhances the health-related quality of life in individuals with MS (Shohani et al., 2020). The study conducted by Lenoir Dit Caron et al. (2021) examines the impact of yoga on the health-related quality of life in patients with central nervous system disorder. Yoga for MS (Cramer et al., 2014). The aim of this article is to analyse the advantages of yoga in enhancing the quality of life for persons with MS.

IMPROVING QUALITY OF LIFE WITH YOGA IN MULTIPLE SCLEROSIS PATIENTS

Yoga, an age-old tradition, originated in India more than 5000 years ago. The name yoga originates from the Sanskrit word "yukti", which signifies the harmonious integration of the physical, mental, and spiritual aspects of an individual (Mishra et al., 2012). Maharishi Patanjali, recognised as the father of contemporary yoga, first expounded the principles and techniques of yoga in his work, the Yoga Sutras. In this seminal treatise, he delineated an octuple road to individual enlightenment, purpose, and a significant existence known as ashtanga yoga. The practice of yoga encompasses eight components, with the first five aspects (Yamas, Niyama, Asana, Pranayama, Pratyahara) falling under the category of Bahirang yoga, and the last three aspects (Dharana, Dhyana, Samadhi) falling under the category of Antaranga yoga. Hatha yoga and Iyengar yoga are often used in yoga research investigations. The Cramer review included a grand total of 306 randomised controlled trials (RCTs), with 131 (42.8%) of them originating from India. Out of the total number of 123 randomised controlled trials (RCTs), 40.2% of them had subjects who were healthy and from the general community. A grand total of 52 distinct yoga methods were used. The Yoga styles most frequently utilised in the studies were hatha yoga (36 RCTs), Iyengar yoga (31 RCTs), the integrated approach to yoga therapy (15 RCTs). In 118 RCTs, the term "yoga" was used without specifying a particular style, or the applied aspects of yoga were mentioned without explicitly stating the style. Additionally, 26 RCTs focused on various forms of yoga breathing techniques categorised as "pranayama" and did not involve physical postures or meditation (Cramer et al., 2016). An area of mind-body treatment that has garnered significant interest and attention is the discipline of yoga. Yoga, which is now acknowledged in the Western world as a more all-encompassing and thorough method of promoting health, is now being done by over 15.8

million individuals in the United States (Mishra et al., 2012). Many studies showed that yoga-based interventions improve quality of life of MS Patients as given in Supplementary. Quality of life (QoL) is a broad concept, encompassing both physical and mental health components (PHC and MHC). In 2023, a single-blinded RCT was conducted on 45 females with RRMS were randomly assigned to tele-Pilates, tele-yoga, control groups (n=15 each). Tele-yoga group performed 60 min. yoga training 3 days a week for 8weeks, significant increase in the serum levels of prolactin ($p = 0.004$) and a significant decrease in cortisol ($p = 0.04$) in the time group interaction factors. In addition, significant improvements were observed in depression ($p = 0.001$), physical activity levels ($p < 0.001$), QoL (p 0.001), and the speed of walking ($p < 0.001$) (Najafi et al., 2023). Another study done in USA by Cohen et al., showed that yoga philosophy, Pranayama, Asanas, deep relaxation, meditation for 8 weeks improved expiratory muscle strength, balance, walking ability and concentration among 14 people having moderate MS as measured by respiratory pressure meter (MicroRPM-Micro Direct Inc, Lewiston, ME), Multidirectional Reach Test (MDRT), 12-item Multiple Sclerosis Walking Scale (MSWS-12), Timed 25-Foot Walk test (T25FW), 6 Minute Walk Test (6MWT), Paced Auditory Serial Addition Test-3" (PASAT-3"), SF-36 MHC ($P=0.001$) and PHC ($P< 0.001$) in time Group (Cohen et al., 2017). In Russia, 3 arm randomized controlled trial study on 56 MS patients in which they measured SF-36 quality of life questionnaire, the fatigue scale, the Berg balance scale, and the 6-min walking test. A total of 36 patients finished the clinical study; 30 women and 6 men. There was no statistically significant difference between the groups in terms of improvement in MS symptoms as measured by the balance, walking test, and fatigue scales. However, in the analysis of eight criteria of SF-36 quality-of-life questionnaire by the covariation analysis, statistically significant differences were found in favor of the yoga group in terms of physical functioning (PF) ($p = .003$), life activity (VT) ($p < .001$), mental health (MH) ($p = 013$), and social functioning (SF) ($p = .028$) (Lysogorskaia et al., 2023). 26 MS patients (Pilates group = 16, yoga group = 12) received the program once a week for 8 weeks in addition to home exercises. At baseline and the end of the training, participants underwent assessments. The outcome measures were walking speed, mobility, balance confidence, respiratory muscle strength, cognition, and quality of life. Following the program, there was no significant difference in mobility ($p = 0.482$), perceived walking quality ($p = 0.325$), respiratory muscle strength (maximum inspiratory pressure: $p = 0.263$, maximum expiratory pressure: $p = 0.866$), and cognition (Symbol Digit Modalities Test: $p = 0.324$, California Verbal Learning Test-II: $p = 0.514$, Brief Visuospatial Memory Test-Revised: $p = 0.279$) between the two groups. Improvements were higher in balance confidence ($p = 0.006$), walking speed ($p = 0.004$), and quality of life ($p = 0.019$) in the clinical Pilates group compared to the yoga group (Abasıyanık et al., 2021). In 2013, Najafi Doulatabad et al., showed that pranayama, Hatha yoga and Raj yoga training for 12 weeks, the case group showed a significant improvement in physical pain management ($P=0.007$) and the quality of life ($P=0.001$) as compared to the control group (Doulatabad et al., 2012). A study conducted among 57 MS patients, had shown that level of fatigue as measured by Multi-Dimensional Fatigue Inventory (MFI) was not significantly changed in yoga group compared to control group. In QoL SF-36 out of 8sub scale only 2 sub scale Vitality (energy and fatigue) ($P< 0.001$), Health transition ($P<0.01$) significantly improved among patients who performed yoga (Iyengar yoga) and exercise for 6 months in America (Oken et al., 2004). In 31 MS patient (10 in treadmill, 11 in yoga, 10 in control group) Hath yoga training for 8 weeks, within yoga group showed a significant increase in physical function ($P=0.01$), role limitations emotional ($P=0.01$), emotional well-being ($P=0.04$), energy ($P=0.04$), cognitive function ($P=0.00$), overall quality of life ($P=0.02$), physical health composite ($P=0.02$) and mental health composite ($P=0.00$). between yoga and control group physical function ($P=0.03$), cognitive function ($P=0.01$), mental health composite ($P=0.04$) (Ahadi et al., 2013). In two studies of Gerrett et al., 2013a, 2013b one for 12 weeks and another 24 weeks follow-up, 232 MS patients randomly divided in four groups, QoL measured with MSIS-29 V2 outcome were in PHC yoga Within group significant ($P=0.02$) Between group not significant ($P=0.12$), In MHC Significant in both within group ($P<0.01$) Between group ($P= 0.04$). In follow-up study after 24 weeks, PHC not significant, MHC Significant ($P=0.013$) (Garrett et al., 2013a, 2013b). In Turkey, 44 participants (27 persons with MS and 17 healthy family members) participated in the study. 12 persons with MS and 3 healthy family members completed the 6-month yoga intervention, shown significant result in QoL SF-36 in MHC ($P=0.016$) (Kahraman et al., 2018). Eleven MS women in yoga group and ten MS women in the control group after completing 8 weeks Hath yoga program, outcomes were, within group of yoga Physical function ($P=0.01$), Rol limitation emotions ($P=0.01$), Emotional wellbeing ($P=0.04$), Energy ($P=0.04$) cognitive function ($P=0.00$), Over all QoL ($P=0.02$), PHC ($P=0.02$), MHC ($P=0.00$). Between yoga and control group Physical function ($P=0.01$), cognitive function ($P=0.01$), PHC ($P=0.04$), MHC ($P=0.01$), Balance score ($P=0.00$), Walk time sec. ($P=0.04$), Walk distance ($P=0.00$), Fatigue (0.01) (Ahmadi et al., 2010). A three-arm randomized controlled mixed-method trial; participants were assigned to Mindfulness for Multiple Sclerosis (M4MS) (n=18); Chair Yoga (n=18); wait-list control group (n=19) for eight weeks. Daily home practice diaries and weekly reflective journals were collected along with online questionnaires at baseline and post-intervention. Feasibility was assessed using descriptive statistics, multilevel mixed- effects regression, and content analysis. 87% of the participant completed the 8-week online programs. No statistically significant differences in efficacy measures (MSQoL-54) were found among groups (Dunne et al., 2021). A Quasi-experimental study was conducted on 90 patients with MS chosen randomly and divided 3 groups. 61 MS patients completed 12 weeks program (20 in yoga,

20 in aerobic, 21 in control group) in Ireland. The mean score of yoga group was higher than that of aerobic group, and aerobic group showed a higher mean score compared with the control, both component of SF-36 were statistically significant (P<0.001) (Hassanpour-Dehkordi & Jivad, 2014). Markus Self-Efficacy for Physical Activity Scale (MSES), BREQ-2 RAI: Behavioral Regulation in Exercise Questionnaire–Version 2 and QoL survey with 7 sub scale used by 15 MS patient after practicing medical therapy yoga (MTY) for 5 weeks. Outcome were Out of seven sub scale only emotional quality of life indicated significant (P=0.019), MSES (P=0.042), BREQ-2 not significant (Fasczewski et al., 2022).

LIMITATION

1. Out of 14 studies 3 studies, there were no control groups (Abasıyanık et al., 2021; Cohen et al., 2017; Fasczewski et al., 2022) and yoga was combined with other interventions. So, it is difficult to assess the effect of yoga alone.
2. Only Google scholar used for data collection and search methods not mentioned.
3. Most patients were from Middle East and considering that the prevalence and intensity of MS can be affected by ethnic and geographical factors, the results of this study may not apply to other area.
4. Patients were mostly women; therefore, the results may not apply for male patients.
5. There may be high or uncertain risk of bias in studies as only one study (out of fourteen) used biomarkers (Najafi et al., 2023).

CONCLUSION AND FUTURE DIRECTIONS

The precise mechanism by which yoga affects individuals with MS remains uncertain. Based on the research included in this review, it is unknown how the frequency, length, or intensity of yoga practice may influence the QoL of MS patients. More number of in-depth long term follow-up Individualized yoga therapy and case series studies require to build relationship between yoga intervention and the progression of disease which can be analyzed by neuro imaging and analysis of cerebrospinal fluid. Additional research may investigate the effects of Chanting and Ajapa japa on many aspects of MS and the opioid peptide β endorphins.

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