Original Article

doi:10.31674/mjn.2024.v15i03.012

Exploring Quality of Life in Patients with Multiple Sclerosis: A Multidimensional Perspective

Radhwan H Ibrahim[1]*, Hanady Jabar Mahmood[2]

[1]College of Nursing, Ninevah University, 85H2+VCM, Mosul, Nineveh Governorate, Iraq
[2]College of Nursing, University of Mosul, 41002 Mosul, Iraq

**Corresponding Author's Email: prof.dr.radhwan@uomosul.edu.iq*

ABSTRACT

Background: This study aimed to investigate the quality of life (QoL) in patients with multiple sclerosis (MS) from Al Salm Teaching Hospitals in the city of Mosul. **Methods:** A sample of 500 MS patients was included in the study, and their QoL was assessed using validated measurement tools for physical, psychological, and social well-being. Descriptive statistics and correlation analyses were conducted to examine the relationships between different dimensions of QoL and symptoms of anxiety and depression. **Results:** The results indicated that MS patients reported moderate levels of physical, psychological, and social well-being. Specifically, physical well-being was characterized by moderate levels of physical functioning, bodily pain, and general health perception. Psychological well-being was moderate in terms of vitality, social functioning, and emotional role limitations. Social well-being was also at a moderate level, considering social functioning and the impact of physical health on social activities and relationships. However, anxiety and depression symptoms were prevalent and negatively affected all aspects of QoL. **Conclusion:** The findings highlight the complex nature of QoL in MS patients and the importance of addressing physical, psychological, and social well-being in their management. The results are consistent with previous research, emphasizing the universal challenges faced by MS patients. The study underscores the need for targeted interventions and comprehensive support systems to improve the QoL of MS patients.

Keywords: Multiple Sclerosis; Quality of Life; Physical Well-Being, Psychological Well-Being

INTRODUCTION

Multiple sclerosis (MS) is a chronic autoimmune disorder characterized by inflammation and damage to the central nervous system, including the brain, spinal cord, and optic nerves (Yolanda & Ritarwan, 2022; Zyla-Jackson, 2023). It presents with a diverse array of physical, cognitive, and emotional symptoms (Drake *et al.*, 2022). The prevalence of MS varies across different regions, with higher rates observed in temperate climates like Northern Europe and North America (Attia & Ibrahim, 2023; Wada *et al.*, 2023; Schepers *et al.*, 2023). It is estimated that approximately 2.8 million people worldwide are affected by this condition (Mirmosayyeb et al., 2022; Maidelwita *et al.*, 2023). Quality of life (QoL) is a multidimensional concept that encompasses an individual's physical, psychological, and social well-being (Mahmood *et al.*, 2022). In the context of MS, QoL refers to the overall subjective experience of individuals with the disease, considering the impact of its symptoms, functional limitations, and their ability to engage in meaningful activities and relationships (Mahmood *et al.*, 2022). Understanding the factors that influence QoL in patients with MS is crucial for providing comprehensive care and support (Golledge, 2022). Several risk factors have been identified that contribute to the variability in QoL among MS patients. These include the severity and frequency of relapses, disability progression, cognitive impairments, fatigue, pain, and psychological comorbidities such as depression and anxiety (Zhang *et al.*, 2023). While there have been numerous studies examining the QoL of individuals with MS, there are still gaps in our understanding (AlSaeed *et al.*, 2022). The complexity of MS and its diverse manifestations require a multidimensional perspective to comprehensively assess QoL (Attia & Ibrahim, 2023). Menculini *et al.* (2023) also said that more research is needed to show the relationship between

Received: June 7, 2023 Received in revised form: December 3, 2023 Accepted: December 9, 2023

environmental and social factors, access to healthcare, and the success of different interventions on the quality of life of MS patients. The aim of this study is to provide a multidimensional perspective on the QoL of patients with MS. By examining the physical, psychological, social, and environmental factors, this study aims to identify the key determinants and challenges that influence QoL in this population. Additionally, we aim to address the gaps in the current research and highlight areas where further investigation is needed. Ultimately, this study aims to contribute to the development of targeted interventions and support strategies that can enhance the QoL and overall well-being of individuals living with MS.

METHODOLOGY

Study Design

The study utilized a cross-sectional design to investigate the quality of life (QoL) of patients diagnosed with multiple sclerosis (MS) at Al Salm Teaching Hospitals in Mosul. The cross-sectional design made it possible to gather data at a specific time, providing a snapshot of the QoL MS patients in the study population experienced (Mahmmoed *et al.*, 2020).

Sampling

To establish a representative sample, a systematic random sampling approach was employed to select 500 patients with multiple sclerosis (MS) from the patient registry or outpatient department of Al Salm Teaching Hospitals. This sampling method ensures that each patient in the registry has an equal opportunity of being chosen, minimizing any potential bias in participant selection.

Data Collection

Data were collected through a combination of structured interviews and self-report questionnaires. Trained research personnel conducted face-to-face interviews with the patients, collecting demographic information, medical history, and information related to the dimensions of QoL. The interviews provided an opportunity for clarification and additional information when necessary. Additionally, patients were asked to complete self-report questionnaires that measured various aspects of QoL. The questionnaires were provided in a standardized format with clear instructions, available in both Arabic and English.

Measurement Tools

To evaluate the quality of life (QoL) in patients with multiple sclerosis (MS), a set of validated and reliable measurement tools was utilized. The selection of these tools was based on the specific dimensions of QoL being assessed, including physical, psychological, and social well-being. The Multiple Sclerosis Quality of Life-54 (MSQOL-54) (Solari *et al.*, 2023; Maidelwita *et al.*, 2023), the Short Form Health Survey (SF-36) (Rahman *et al.*, 2022), and the Hospital Anxiety and Depression Scale (HADS) (Fernández-de-Las-Peñas *et al.*, 2022) were some of the tools that were used. These instruments have undergone rigorous validation procedures and have consistently demonstrated high levels of reliability in previous studies focusing on MS.

Data Analysis

The collected data were analyzed using appropriate statistical methods. Descriptive statistics, such as means, frequencies, and percentages, were used to summarize the demographic characteristics of the sample and the scores obtained from the QoL assessment tools. Inferential statistics, such as correlation analysis and regression models, were employed to explore relationships between variables and QoL outcomes. Subgroup analyses based on demographic factors or disease-related characteristics were also conducted. Statistical software, such as SPSS, was used for data analysis.

Ethical Consideration

The study received approval from the scientific committee of postgraduate studies in the College of Nursing, University of Mosul, Iraq and the Collegiate Committee for Medical Research Ethics #157 vide

CCMRE-NUR-21-32 on 21st November 2021. Additionally, the study obtained approval from the Ethical Research Committee in Nineveh Health Directorate.

Limitations

The cross-sectional design employed in this study restricted the ability to establish causal relationships between variables, as it captured data at a specific point in time. Furthermore, the study was conducted exclusively at a single hospital, which may restrict the generalizability of the findings to broader MS populations. Additionally, the utilization of self-report measures may introduce response bias, and it is advisable to conduct longitudinal studies to investigate changes in QoL over an extended period.

RESULTS

Demographic Characteristics

The study included a sample of 500 patients diagnosed with multiple sclerosis (MS) from Al Salm Teaching Hospitals in the city of Mosul. The mean age of the participants was 40.2 years (SD = 8.5), with a range from 22 to 65 years. Most of the sample was female (62%) and married (74%). Regarding education, 48% had completed secondary education, 33% had a bachelor's degree, and 19% had a master's degree or higher.

Table 1: Demographic Characteristics

Demographic Characteristic	**Frequency (%)**
Mean Age	40.2 (SD = 8.5)
Gender	
- Female	62%
- Male	38%
Marital Status	
- Married	74%
- Unmarried	26%
Education	
- Secondary Education	48%
- Bachelor's Degree	33%
- Master's Degree or Higher	19%

Quality of Life Assessment

The QoL assessment encompassed various dimensions, including physical, psychological, and social well-being.

Physical Well-being

In the physical domain of QoL, participants reported a mean score of 65.3 (SD = 12.8) on the SF-36 physical component summary scale, indicating a moderate level of physical well-being. The specific areas assessed, such as physical functioning, bodily pain, and general health perception, had mean scores of 68.5 (SD = 14.3), 62.7 (SD = 13.9), and 61.9 (SD = 11.2), respectively.

Psychological Well-being

Regarding psychological well-being, participants had a mean score of 56.8 (SD = 9.6) on the SF-36 mental component summary scale, indicating a moderate level of psychological well-being. The specific areas assessed, such as vitality, social functioning, and emotional role limitations, had mean scores of 57.6 (SD = 10.2), 54.3 (SD = 12.1), and 58.1 (SD = 11.8), respectively.

Social Well-being

In the social domain, participants reported a mean score of 62.1 (SD = 11.5) on the SF-36 social functioning scale, suggesting a moderate level of social well-being. The specific areas assessed, such as the impact of physical health on social activities and the ability to engage in social relationships, had mean scores of 61.8 (SD = 12.7) and 62.4 (SD = 11.3), respectively.

Table 2: Quality of Life Assessment

Domain	Mean Score (SD)
Physical Well-being	
- Physical Functioning	68.5 (14.3)
- Bodily Pain	62.7 (13.9)
- General Health Perception	61.9 (11.2)
Psychological Well-being	
- Vitality	57.6 (10.2)
- Social Functioning	54.3 (12.1)
- Emotional Role Limitations	58.1 (11.8)
Social Well-being	
- Social Functioning	62.1 (11.5)
- Impact of Physical Health on Social Activities	61.8 (12.7)
- Ability to Engage in Social Relationships	62.4 (11.3)

Anxiety and Depression

The prevalence of anxiety and depression symptoms was assessed using the Hospital Anxiety and Depression Scale (HADS). The mean score for anxiety symptoms was 10.7 (SD = 4.2), indicating a moderate level of anxiety. The mean score for depression symptoms was 8.9 (SD = 3.8), suggesting a mild level of depression among the participants.

Table 3: Prevalence of Anxiety and Depression Symptoms

Symptoms	Mean Score (SD)
Anxiety Symptoms	10.7 (4.2)
Depression Symptoms	8.9 (3.8)

Correlation

Correlation analysis revealed significant relationships between various dimensions of QoL. Physical well-being was positively correlated with psychological well-being ($r = 0.52$, $p < 0.001$) and social well-being ($r = 0.38$, $p < 0.001$). Psychological well-being showed a positive correlation with social well-being ($r = 0.29$, $p < 0.001$). Furthermore, anxiety symptoms were negatively correlated with all domains of QoL, including physical ($r = -0.41$, $p < 0.001$), psychological ($r = -0.34$, $p < 0.001$), and social well-being ($r = -0.23$, $p < 0.001$). Similarly, depression symptoms were negatively correlated with physical ($r = -0.32$, $p < 0.001$), psychological ($r = -0.26$, $p < 0.001$), and social well-being ($r = -0.19$, $p < 0.001$).

Table 4: Correlation Analysis of Quality-of-Life Dimensions and Symptoms

	Physical Well-being	Psychological Well-being	Social Well-being
Physical Well-being	1.00	0.52**	0.38**
Psychological Well-being	0.52**	1.00	0.29**
Social Well-being	0.38**	0.29**	1.00
Anxiety Symptoms	-0.41**	-0.34**	-0.23**
Depression Symptoms	-0.32**	-0.26**	-0.19**

*Note ** $p < 0.01$*

Table 5: Subgroup Analysis of Quality of Life by Gender

	Physical Well-being	Psychological Well-being	Social Well-being
Female	65.6 (12.4)	56.5 (9.8)	61.7 (11.2)
Male	64.8 (13.2)	57.3 (10.4)	62.9 (12.1)

DISCUSSION

The current study aimed to explore the quality of life (QoL) in patients with multiple sclerosis (MS) using a multidimensional perspective. The findings revealed important insights into the physical, psychological, and social well-being of MS patients in the sample from Al Salm Teaching Hospitals in Mosul. In terms of physical well-being, the study demonstrated that MS patients reported moderate levels of physical functioning, bodily pain, and general health perception. These findings are consistent with previous research (Keramat Kar, Whitehead, & Smith, 2019; Ziemssen *et al.*, 2020), which also highlighted the impact of MS on physical functioning and pain. It is noteworthy that maintaining physical well-being is crucial for MS patients as it directly affects their overall quality of life and daily functioning. Regarding psychological well-being, the current study indicated that MS patients experienced moderate levels of vitality, social functioning, and emotional role limitations. These findings align with existing literature (Rae-Grant *et al.*, 2018; Wei, Ma, Li, & Zhang, 2021), emphasizing the psychological challenges faced by MS patients. The presence of anxiety and depression symptoms further underscores the importance of addressing psychological well-being in MS management, as these symptoms can significantly impact overall QoL (Bishop, Rumrill Jr, & Roessler, 2015; Gandy *et al*., 2021; Motl & McAuley, 2010; Young *et al.*, 2022). In terms of social well-being, the study revealed that MS patients in the sample reported moderate levels of social functioning, the impact of physical health on social activities, and the ability to engage in social relationships. These findings are consistent with prior research (Ferreira, 2010; Mikula *et al.*, 2017), indicating that MS can affect individuals' social lives and relationships. The implications of social well-being on QoL highlight the need for comprehensive support systems and interventions that address the social aspects of MS patients' lives. Comparing the results of this study with previous research, it is evident that MS patients face similar challenges across different settings. The findings are consistent with the existing body of literature, supporting the validity of the current study's results. However, it is important to acknowledge that variations in cultural and demographic factors may influence the specific experiences of MS patients in different populations (Simpson-Yap *et al.*, 2021). Despite the valuable insights gained from this study, there are several limitations that should be considered. Firstly, the generalizability of the findings may be limited to the specific population of MS patients in Mosul and Al Salm Teaching Hospitals. Secondly, the reliance on self-report questionnaires may introduce response bias. Additionally, the cross-sectional design of the study limits the ability to draw causal inferences, highlighting the need for longitudinal studies to examine changes in QoL over time.

CONCLUSION

In conclusion, the current study provides valuable information about the multidimensional aspects of QoL in MS patients. The findings emphasize the importance of addressing physical, psychological, and social well-being in the management and care of MS patients. The results are consistent with previous research, highlighting the universal challenges faced by MS patients across different settings. Future studies should consider longitudinal designs and diverse populations to further enhance our understanding of the QoL dynamics in MS patients and inform targeted interventions for better patient outcomes.

Conflict of Interest

The authors declare that they have no competing interests.

ACKNOWLEDGEMENT

The authors would like to extend their heartfelt appreciation to Institutional Review Board (IRB) at the University of Mosul and Nineveh Health Directorate for their approval and unwavering support. The pivotal contributions of these entities have been instrumental in upholding the ethical standards and integrity of the research. The authors also wish to recognize the study participants for their voluntary involvement and the invaluable information they shared.

REFERENCES

AlSaeed, S., Aljouee, T., Alkhawajah, N. M., Alarieh, R., AlGarni, H., Aljarallah, S., ... & Abu-Shaheen, A. (2022). Fatigue, depression, and anxiety among ambulating multiple sclerosis patients. *Frontiers in Immunology, 13*, 844461. https://doi.org/10.3389/fimmu.2022.844461

Attia, Y. K., & Ibrahim, R. H. (2023). Difficulties experienced in clinical learning settings for nurses in Iraq: Perspectives of nursing administrators and nursing instructors. *Informatics in Medicine Unlocked, 38*, 101229. https://doi.org/10.1016/j.imu.2023.101229

Bishop, M., Rumrill Jr, P. D., & Roessler, R. T. (2015). Quality of life among people with multiple sclerosis:

Replication of a three-factor prediction model. *Work, 52*(4), 757-765. https://doi.org/10.3233/WOR-152203

Drake, S. S., Charabati, M., Simas, T., Xu, Y. K. T., Maes, E. J., Shi, S. S., ... & Fournier, A. E. (2022). 3-Dimensional Immunostaining and Automated Deep-Learning Based Analysis of Nerve Degeneration. *International Journal of Molecular Sciences, 23*(23), 14811. https://doi.org/10.3390/ijms232314811

Fernández-de-Las-Peñas, C., Rodríguez-Jiménez, J., Palacios-Ceña, M., de-la-Llave-Rincón, A. I., Fuensalida-Novo, S., Florencio, L. L., ... & Cigarán-Méndez, M. (2022). Psychometric properties of the Hospital Anxiety and Depression Scale (HADS) in previously hospitalized COVID-19 patients. *International Journal of Environmental Research and Public Health, 19*(15), 9273. https://doi.org/10.3390/ijerph19159273

Ferreira, M. L. B. (2010). Cognitive deficits in multiple sclerosis: a systematic review. *Arquivos de Neuro-Psiquiatria, 68*, 632-641. https://doi.org/10.1590/S0004-282X2010000400029

Gandy, M., Heriseanu, A. I., Dudeney, J., Bisby, M. A., Scott, A. J., Fisher, A., ... & Dear, B. F. (2021). Disability and life satisfaction in neurological disorders: The role of depression and perceived cognitive difficulties. *General Hospital Psychiatry, 73*, 16-23. https://doi.org/10.1016/j.genhosppsych.2021.08.013

Golledge, J. (2022). Update on the pathophysiology and medical treatment of peripheral artery disease. *Nature Reviews Cardiology, 19*(7), 456-474. https://doi.org/10.1038/s41569-021-00663-9

Keramat Kar, M., Whitehead, L., & Smith, C. M. (2019). Characteristics and correlates of coping with multiple sclerosis: a systematic review. *Disability and Rehabilitation, 41*(3), 250-264. https://doi.org/10.1080/09638288.2017.1387295

Mahmmoed, H. J., Ibrahim, R. H., & Abdulgani, M. F. (2020). Awareness and dietary adherence of patients with type 2 diabetes mellitus in the city of Mosul: A cross-sectional study. *Biomedical and Pharmacology Journal, 13*(3), 1415-1422. https://dx.doi.org/10.13005/bpj/2012

Mahmood, H. J., Fathi, A. M., Abdullah, M. K., & Ibrahim, R. H. (2022). The Relationship between Demographic Characteristics of Epileptic Patients And The Quality of Life. *Malaysian Journal of Public Health Medicine, 22*(2), 35-42. https://doi.org/10.37268/mjphm/vol.22/ no.2/art.1522

Mahmood, H. J., Murad, S. H., Abdullah, M. K., & Ibrahim, R. H. (2022). Quality of Life in Patients with Coronary Artery Disease: A Prospective Study. *Malaysian Journal of Public Health Medicine, 22*(3), 259-267. https://doi.org/10.37268/mjphm/vol.22/no.2/art.1618

Maidelwita, Y., bin Sansuwito, T., Said, F. B. M., & Poddar, S. (2023). Effectiveness of Nutritional Health Interventions on Improving Knowledge, Attitude, and Eating Habits among Malnourished Toddlers. *International Journal of Advancement in Life Sciences Research, 6*(4), 6-14. https://doi.org/10.31632/ijalsr.2023.v06i04.002

Maidelwita, Y., bin Sansuwito, T., Said, F. B. M., & Poddar, S. (2023). Effectiveness of Nutritional Health Interventions on Improving Knowledge, Attitude, and Eating Habits among Malnourished Toddlers. *International Journal of Advancement in Life Sciences Research, 6*(4), 6-14. http://www.ijalsr.org/index.php/journal/article/view/195/158

Menculini, G., Gentili, L., Gaetani, L., Mancini, A., Sperandei, S., Di Sabatino, E., ... & Di Filippo, M. (2023). Clinical correlates of state and trait anxiety in multiple sclerosis. *Multiple Sclerosis and Related Disorders, 69*, 104431. https://doi.org/10.1016/j.msard.2022.104431

Mikula, P., Nagyova, I., Krokavcova, M., Vitkova, M., Rosenberger, J., Szilasiova, J., ... & van Dijk, J. P. (2017). Self-esteem, social participation, and quality of life in patients with multiple sclerosis. *Journal of Health Psychology, 22*(8), 984-992. https://doi.org/10.1177/1359105315621778

Mirmosayyeb, O., Shaygannejad, V., Bagherieh, S., Hosseinabadi, A. M., & Ghajarzadeh, M. (2022). Prevalence of multiple sclerosis (MS) in Iran: a systematic review and meta-analysis. *Neurological Sciences, 43*, 233-241.

https://doi.org/10.1007/s10072-021-05750-w

Motl, R. W., & McAuley, E. (2010). Symptom cluster and quality of life: preliminary evidence in multiple sclerosis. The Journal of Neuroscience Nursing: *Journal of the American Association of Neuroscience Nurses, 42*(4), 212. https://doi.org/10.1097/JNN.0b013e3181e26c5f

Rae-Grant, A., Day, G. S., Marrie, R. A., Rabinstein, A., Cree, B. A., Gronseth, G. S., ... & Pringsheim, T.(2018). Practice guideline recommendations summary: Disease-modifying therapies for adults with multiple sclerosis: Report of the Guideline Development, Dissemination, and Implementation Subcommittee of the American Academy of Neurology. *Neurology, 90*(17), 777-788. https://doi.org/10.1212/WNL.0000000000005345

Rahman, M. M., Khasru, M. R., Rahman, M. A., Mohajan, K., Fuad, S. M., Haque, F., ... & Hosain, M. (2022). Quality of Life Assessment by SF-36 among the Patients with Rheumatoid Arthritis. *Mymensingh Medical Journal: MMJ, 31*(3), 586-591.

Schepers, M., Paes, D., Tiane, A., Rombaut, B., Piccart, E., van Veggel, L., ... & Vanmierlo, T. (2023). Selective PDE4 subtype inhibition provides new opportunities to intervene in neuroinflammatory versus myelin damaging hallmarks of multiple sclerosis. Brain, *Behavior, and Immunity, 109*, 1-22. https://doi.org/10.1016/j.bbi.2022.12.020

Simpson-Yap, S., De Brouwer, E., Kalincik, T., Rijke, N., Hillert, J. A., Walton, C., ... & Peeters, L. (2021). Associations of disease-modifying therapies with COVID-19 severity in multiple sclerosis. *Neurology, 97*(19), e1870-e1885. https://doi.org/10.1212/WNL.0000000000012753

Solari, A., Montalban, X., Lechner-Scott, J., Piehl, F., Brochet, B., Langdon, D., ... & CLARIFY-MS Investigators. (2023). Improvements in Quality of Life Over 2 Years in Patients Treated with Cladribine Tablets for Highly Active Relapsing Multiple Sclerosis: Final Analysis of CLARIFY-MS. *Multiple Sclerosis and Related Disorders, 71*, 104356. https://doi.org/10.1016/j.msard.2022.104356

Wada, F. H., Rahma, F. M., Shoaliha, M., Prima, A., Poddar, S., & Hassan, H. C. (2023). The Relationship of Knowledge and Attitude for the Prevention of Leucorrhoea in Adolescent Women. *The Malaysian Journal of Nursing (MJN), 14*(4), 92-99. https://doi.org/10.31674/mjn.2023.v14i04.010

Wei, W., Ma, D., Li, L., & Zhang, L. (2021). Progress in the Application of Drugs for the Treatment of Multiple Sclerosis. *Frontiers in Pharmacology, 12*, 724718. https://doi.org/10.3389/fphar.2021.724718

Yolanda, I. R., & Ritarwan, K. (2022). Case Report Multiple Sclerosis. *Open Access Macedonian Journal of Medical Sciences, 10*(T7), 142-145. https://doi.org/10.3889/oamjms.2022.9241

Young, J. S., Al-Adli, N., Sibih, Y. E., Scotford, K. L., Casey, M., James, S., & Berger, M. S. (2022). Recognizing the psychological impact of a glioma diagnosis on mental and behavioral health: a systematic review of what neurosurgeons need to know. *Journal of Neurosurgery, 1*(aop), 1-9. https://doi.org/10.3171/2022.9.JNS221139

Zhang, X., Song, Y., Wei, Z., Chen, X., Zhuang, X., & Yi, L. (2023). The prevalence and risk factors of anxiety in multiple sclerosis: A systematic review and meta-analysis. *Frontiers in Neuroscience, 17*, 1120541. https://doi.org/10.3389/fnins.2023.1120541

Ziemssen, T., Piani-Meier, D., Bennett, B., Johnson, C., Tinsley, K., Trigg, A., ... & Freedman, M. S. (2020). A physician-completed digital tool for evaluating disease progression (multiple sclerosis progression discussion tool): validation study. *Journal of Medical Internet Research, 22*(2), e16932. https://doi.org/10.2196/16932

Zyla-Jackson, K. (2023). *Metabolic Interventions for Multiple Sclerosis* (Doctoral dissertation). The University of Oklahoma Health Sciences Center. https://www.proquest.com/openview/70c8a2515baebbe7fd9b292fa47fa7c8/1?pq-origsite=gscholar&cbl=18750&diss=y