

Challenges and Improvement Strategies in Multiple Sclerosis Care: A Qualitative Study among Neurologists in Iraq

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ABSTRACT

Multiple sclerosis (MS) is associated with considerable physical, psychological, and social burdens. In low- and middle-income settings such as Iraq, lack of proper medical infrastructure, delay in diagnosis, and service delivery complicate the best possible management of the disease. The aim of the qualitative study was to get the perceptions of Iraqi neurologists regarding the main challenges and the systemic gaps in MS care and to describe the ways of how the MS patient outcomes and health system performance can be improved. Qualitative research was conducted in the main MS referral center in Iraq at Baghdad Teaching Hospital through semi-structured interviews with the neurologists. Thematic analysis of the transcripts of the interviews was conducted in order to reveal the main challenges, system-level gaps, and suggested solutions. Fifteen neurologists participated in the study. The most frequent restrictions of the daily functioning and active disease management were fatigue, impairment of mobility, and mental health problems. The factors that contributed to systemic failures were access to specialized MS care, lack of multidisciplinary collaboration, lack of educational programmes, poor social integration, and lack of national MS guidelines. This study indicates that Iraqi neurologists encountered significant problems in MS care, including debilitating symptom, difficulty with medication adherence and crucial deficiency in healthcare system. However, this obstacle can be overcome with tailored intervention such as formulating national MS guidelines, instituting multidisciplinary treatment team and creating supervised digital platform or patient education.

Keywords: Challenges, Multiple sclerosis, Management, Mitigation strategies, Neurologists.

INTRODUCTION

Multiple sclerosis (MS) is a non-traumatic cause of disability, malignant, immune-mediated neurological disorder, and a most important cause of non-traumatic disability in the world among young and middle-aged adults. In the past decades, MS has become a major burden in the world with a rising prevalence, disability, and expenditure on health care particularly in low and middle-income countries^{1,2}. MS is distinguished by inflammatory neurodegeneration and demyelination of the central nervous system that leads to a very heterogeneous disease course and clinical range³. Clinical features of MS are not confined to classical neurological impairment which include weakened motions, sensorial and visual issues.

The non-motor symptoms that patients are usually affected by can encompass fatigue, cognitive impairment, depression, anxiety, pain, and sleep disturbance, as well as a bladder or bowel dysfunction that severely affects the quality of life and daily functioning⁴⁻⁶. One of the most disabling symptoms, which is under-recognized and under-treated in everyday clinical practice, is fatigue⁷. The recent articles have highlighted numerous issues affecting individuals with MS: late diagnosis, complicated and shifting treatment patterns, excessive cost of interventions, poor compliance with disease-modifying therapies, and vast caregiver burden⁸⁻¹⁰. These issues are exacerbated by limited health literacy, ineffective provider-provider communication, care

coordination, and ineffective access to mental health and rehabilitative care¹¹.

Effective MS management incorporates long-term follow-up, therapeutic escalation in a timely manner and a patient-centered approach, which is difficult to implement in under-resource-rich environments¹². Other barriers to MS patients in the Middle East include the lack of specialized MS centers, the absence of rehabilitation services, the sociocultural misunderstandings about the neurological diseases, and disparities in health care utilisation, which are conditioned by the educational and socioeconomic background^{13,14}.

The lack of national clinical guidelines, insufficient epidemiological data, inaccessibility to MS-specialized neurologists, as well as, the availability of the sophisticated diagnostic tools, like the MRI and cerebrospinal fluid analysis do not contribute to the management of MS in Iraq. The estimates of Global Burden of Disease show that the prevalence of MS in Iraq is steadily increasing, which means that it is emerging as a problem of public-health concern¹⁵. The Iraqi health care system still faces the problem of political instability, lack of infrastructure and socioeconomic factors, including poverty and inequity of service. The diagnostic and specialist services are centered towards major urban centers thus leading to disparities among patients who are in rural or underserved regions. An enormous financial burden

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on patients and families comes about due to high prices and poor consistency in the accessibility of disease-modifying therapies as well as absence of full reimbursement systems¹⁶⁻¹⁸. The complex issue of MS requires a multi-disciplinary intervention such as neurologists, nurses, pharmacists, rehabilitation specialists, and mental health professionals¹⁹. Neurologists play a vital role in the initial diagnosis, therapeutic decision, disease monitoring, and the eventual outcome of the patient. Their expertise is associated with better diagnostic accuracy, optimized therapeutic strategies, and better disease control²⁰.

Therefore, it is important to understand the perspectives of neurologists to see how there are gaps in the delivery of care for MS. To date, limited qualitative evidence exists regarding neurologists' perspectives on MS management challenges in Iraq, particularly within a healthcare system affected by resource limitations and post-conflict infrastructure constraints. Unlike neighboring countries with more stable healthcare systems, Iraqi neurologists navigate systemic gaps including the absence of national MS guidelines, insufficient multidisciplinary care models, and restricted access to advanced diagnostic and rehabilitation services. This study uniquely addresses these gaps by capturing specialist perspectives directly from Iraq's primary MS referral center. This study examines the experiences and perspectives of Iraqi neurologists facing the major problems involved in the management of MS in Iraq and assesses the possible approaches to improve patient-centered care and health system responsiveness.

MATERIALS AND METHODS

Study Design: A qualitative research design was used to examine the perception of neurologists about the obstacles and challenges that face Iraqi MS patients, and suggested approaches to enhance the management of the disease. Semi-structured interviews were carried out to obtain in-depth accounts of participants' experience and perspectives, through probing questions used where needed to clarify unclear statements or to obtain further information. The interview guide was developed through a systematic review of the relevant literature. To assist in preliminary topic generation, an artificial intelligence tool (ChatGPT, GPT-4; OpenAI) was used solely to identify potentially relevant thematic domains based on the literature review. The AI tool did not generate or finalise any interview questions, and played no role in data collection, analysis, coding, or interpretation of findings. All proposed topics were independently reviewed, critically evaluated, and substantially revised by an expert panel comprising five academic clinical pharmacists holding PhD degrees with experience in qualitative research, and two board-certified neurologists. The last and confirmed guide consisted of 6 questions. The first five questions covered: (1) challenges encountered daily by the MS patients; (2) how the neurologists perceive the patient about their knowledge of their disease and their capability to manage it; (3) gaps that exist in the health system that affect how the MS are managed; (4) the role of technology to assist the patient; and (5) the role of socioeconomic factors to facilitation of sick management. The sixth and final question allowed neurologists to discuss any additional challenges, insights, or perspectives they deemed relevant but not previously covered.

Setting and Particular Recruitment: Fifteen face to face interviews with the neurologists in the largest MS center in Iraq, at Baghdad Teaching Hospital were conducted. Data collection started on) 21/10/2025 (and continue to)15/12/2025(. The convenience and purposive sampling were used to recruit the participants. The inclusion criteria included a minimum of two-year clinical experience in the treatment of MS patients with willingness to take part in the study. The exclusion criteria were unwillingness to take part in the study, absence of clinical experience working with MS patients, or insufficient experience in the work with MS patients. Of 18 neurologists approached, 15 agreed to participate

(response rate: 83.3%); three declined due to time constraints. All interviews were conducted face-to-face in the participants' offices or consultation rooms at Baghdad Teaching Hospital, providing a private and clinically familiar environment. No repeat interviews were conducted. Individual interviews ranged from approximately 20 to 45 minutes, with a mean duration of approximately 30 minutes.

Data Analysis and Collection: The primary researcher is a master's degree male student in clinical pharmacy. While new to conducting formal qualitative interviews he received comprehensive structured training from the second researcher, an experienced qualitative researcher with five years of experience in qualitative research. Ethical approval for this study was granted by the Ethical Committee of the College of Pharmacy, University of Baghdad (approval number: RECAUBCP610202506R). Verbal informed consent was obtained from all participants prior to each interview and was audio-recorded as documentation. Written consent was not applied; verbal consent was employed in lieu of written consent due to cultural factors that could cause some participants to feel uneasy with formal documentation. This approach was approved by the institutional ethics committee as consistent with qualitative research at minimal risk. No relationship was established with participants prior to the commencement of the study. At the beginning of each interview, the researcher identified himself as a master's student in clinical pharmacy conducting research under supervision to investigate systemic challenges in multiple sclerosis care. Participants were informed of the study's academic purpose but were not made aware of the researcher's personal objectives or specific hypotheses to reduce social desirability bias.

The researcher's background as a pharmacist influenced the interview context, likely steering discussions toward medication-related challenges such as treatment adherence and access to DMTs. This expertise enabled a thorough examination of pharmacological management, while maintaining critical reflexivity during the analysis. To mitigate this potential bias, the research team systematically reviewed emerging codes after each interview to ensure that themes concerning non-pharmacological, psychosocial, and systemic gaps were adequately captured and emphasized. A reflective journal was maintained throughout the study period to document interview decisions and analytical reflections, further supporting methodological transparency. Individual face-to-face interviews were conducted and audio-recorded using an iPhone 14 Pro. Data collection continued until thematic saturation was reached. Saturation was determined when the final three consecutive interviews yielded no new codes or themes; both the first and second authors independently reviewed the evolving codebook after each interview and mutually agreed that thematic redundancy had been achieved after 15 interviews. Qualitative data were analyzed through manual coding. The preliminary coding structure was prepared by the first author, a postgraduate MSc candidate in Clinical Pharmacy, and later reviewed and verified by the second author, who holds a PhD in Clinical Pharmacy. Thematic analysis was conducted following the approach proposed by Braun and Clarke. This process involved familiarization with the data, generating initial codes, identifying potential themes, reviewing and refining these themes, defining and naming the themes, and finally presenting the findings in a structured report²¹. The [QDA Miner Lite] software was applied to facilitate the search of codes and frequencies. The study period had a reflective journal that contained the details of the interviews and analytical decisions to encourage reflexivity and methodological rigor. To enhance the credibility and accuracy of the data the following steps we're taking transcript were carefully checked against audio recording for fidelity and coding was reviewed and discussed by both the first and second authors. However, due to the demanding clinical schedules of the participating neurologist's transcripts were not returned to them for formal comments or corrections.

RESULTS

Fifteen neurologists were involved in this qualitative study. The thirteen participants were all board-certified neurologists with the other two at the final year of board training in neurology. All respondents were members of Baghdad Teaching Hospital. Detailed demographic information of the participants is presented in Table 1 and Table 2. The major themes and related subthemes identified through the analysis are illustrated in Figure 1.

Patient Level Challenges

Disease symptoms emerged as the most prominent challenge, with the overwhelming majority of neurologists which represent 93% (14/15) highlighting fatigue and mobility problems as central to patients' daily difficulties. Treatment adherence was identified as another dominant and clinically consequential challenge, described by most neurologists (12/15) as one of the most significant barriers to effective MS management. Several neurologists (6/15) highlighted mental-health problems, and the cited statistics illustrate the psychological burden (stress, anxiety, and low mood) that could complicate self-management and quality of life. A smaller number of neurologists described relapses as unpredictable events that disrupt stability and add significant uncertainty to patients' everyday functioning.

"The main challenge is the disease symptoms themselves, especially fatigue and exhaustion, which are some of the most common MS symptoms. These prevent patients from performing daily tasks, fulfilling work responsibilities, and managing family duties. As well as, Fatigue is associated with mobility difficulties, mental health decline, and reduced treatment adherence, as persistent exhaustion diminishes

patients' psychological well-being, motivation, and ability to follow prescribed therapies consistently". – N5

"Treatment adherence represents another major challenge, as many patients discontinue their medications and later return with complications"- N 14

"Mental health problems are highly prevalent, with many patients suffering from anxiety and depression related to both the disease itself and its treatments. These psychological issues require closer monitoring and greater involvement of psychiatric services. – N1

Relapses present another major challenge because they occur unpredictably—at home, at work, or outdoors. Patients who live alone or have mobility impairments may reach medical care late during relapse episodes. - N15

Knowledge Assessment of MS Patients

Assessments of disease-specific knowledge and self-management capabilities of the patients were made by all the neurologists (15/15). They were assessed at three levels of competence of high, moderate and low level of competence (33.3% (5/15) each). One of the neurologists stated that the patients who attending the public MS clinic in Baghdad Teaching Hospital have adequate amounts of education regarding the disease in question that are facilitated by highly trained nursing staff, which results in decent knowledge levels in general. In contrast, another participant noted that most patients were found to be deficient in self-management skills at the time of diagnosis, with healthcare providers providing information on disease pathophysiology, disease-

Table 1. Sociodemographic characteristics of the study participants (N = 15)

Parameter	Category	Value n (%)
Age (years)	Mean $\pm$ SD	42.5 $\pm$ 8.5
Gender	Male	11 (73.3%)
	Female	4 (26.7%)
Experience	Less than 6 years	2 (13.3%)
	6–10 years	7 (46.7%)
	More than 10 years	6 (40.0%)
Academic degree	Board-certified neurologist	13 (86.7%)
	Final-year neurology resident	2 (13.3%)
Working place	Baghdad Teaching Hospital	15 (100%)

Data presented as Mean $\pm$ SD for continuous variables or as number (frequency) for categorical variables.

Table 2. Participant Characteristics

Participant ID	Age (years)	Gender	Experience (years)	Academic Degree	Working Place
N1	47	male	26	Board-certified neurologist	Baghdad Teaching Hospital
N2	41	Male	8	Board-certified neurologist	Baghdad Teaching Hospital
N3	46	male	15	Board-certified neurologist	Baghdad Teaching Hospital
N4	56	male	26	Board-certified neurologist	Baghdad Teaching Hospital
N5	59	male	5	Board-certified neurologist	Baghdad Teaching Hospital
N6	39	female	5	Board-certified neurologist	Baghdad Teaching Hospital
N7	38	male	10	Board-certified neurologist	Baghdad Teaching Hospital
N8	47	male	25	Board-certified neurologist	Baghdad Teaching Hospital
N9	33	male	5	Final-year neurology resident	Baghdad Teaching Hospital
N10	46	male	15	Board-certified neurologist	Baghdad Teaching Hospital
N11	35	male	6	Board-certified neurologist	Baghdad Teaching Hospital
N12	33	male	4	Final-year neurology resident	Baghdad Teaching Hospital
N13	39	female	5	Board-certified neurologist	Baghdad Teaching Hospital
N14	34	female	3	Board-certified neurologist	Baghdad Teaching Hospital
N15	45	female	20	Board-certified neurologist	Baghdad Teaching Hospital

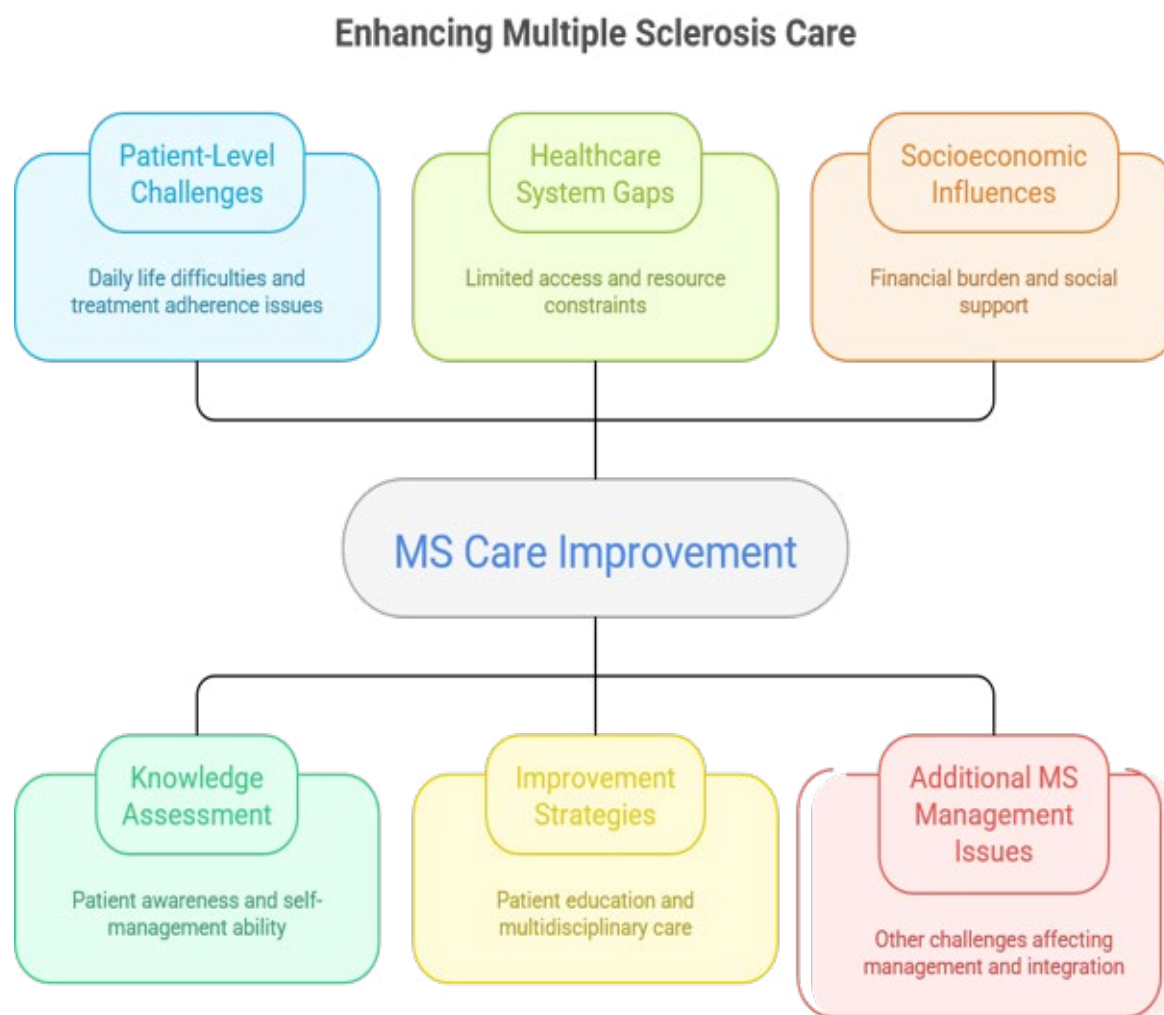


Figure 1. Thematic map that reflects the views of neurologists regarding the barriers to engaging patients in controlling multiple sclerosis. The map represents six key themes found in the qualitative interviews that have many subthemes obtained in the process of thematic analysis.

modifying therapies, and physiotherapy, but with limited emphasis on active self-management.

“Patients attending the public MS clinic at Baghdad Teaching Hospital generally receive good disease-related knowledge, supported by skilled and specialized nursing staff; therefore, the overall level of patient education in this setting is satisfactory” – N2.

“Most patients lack adequate self-management skills. At the time of diagnosis, healthcare providers explain the disease, disease-modifying therapies, and physiotherapy” –N 7

Healthcare system gaps

As seen in Figure 2, neurologists identified several critical gaps within the healthcare system that negatively affect the management of patients with MS. The most commonly reported gap was the absence of psychological support (40.0% of neurologists 6/15). Poor education measures on MS patients were also widely reported with 33.3% (5/15) which means that there is no well-organized education on the management of the disease.

One-fifth of neurologists (3/15) reported limited access to specialized MS care, whereas 1-fifth (3/15) reported delayed MS diagnosis, lack of patient support groups (3/15), and insufficient number of MS centers

(3/15). Moreover, 13.3% (2/15) of neurologists expressed restrictions in regular appreciation and follow up, which indicates the problem of continuity of care.

Rarely reported shortages were the shortage of neurologists (6.7%, 1/15), shortage of specialized nurses (6.7%, 1/15), and the shortage of a multidisciplinary approach to care (6.7%, 1/15). Another unmet need that was highlighted by neurologists in MS management was the absence of physiotherapy assistance.

“There is a shortage of neurologists and neurology resident doctors in Iraq, which limits MS patients’ access to specialized care. In addition, the infrastructure of existing MS centers is inadequate. Ideally, MS centers should be equipped with on-site blood laboratories, walking, balance, and movement assessment facilities, and MRI services with advanced imaging protocols.” -N1.

“The biggest gap is delayed diagnosis, which weakens treatment response. Some patients take years before discovering the disease. Some do not comply with referrals to specialized diagnostic committees of MS”. -N2.

“There is a significant lack of MS-specialized nurses and physiotherapists, as well as an absence of dedicated psychosocial support units. Occupational therapy represents another major gap,

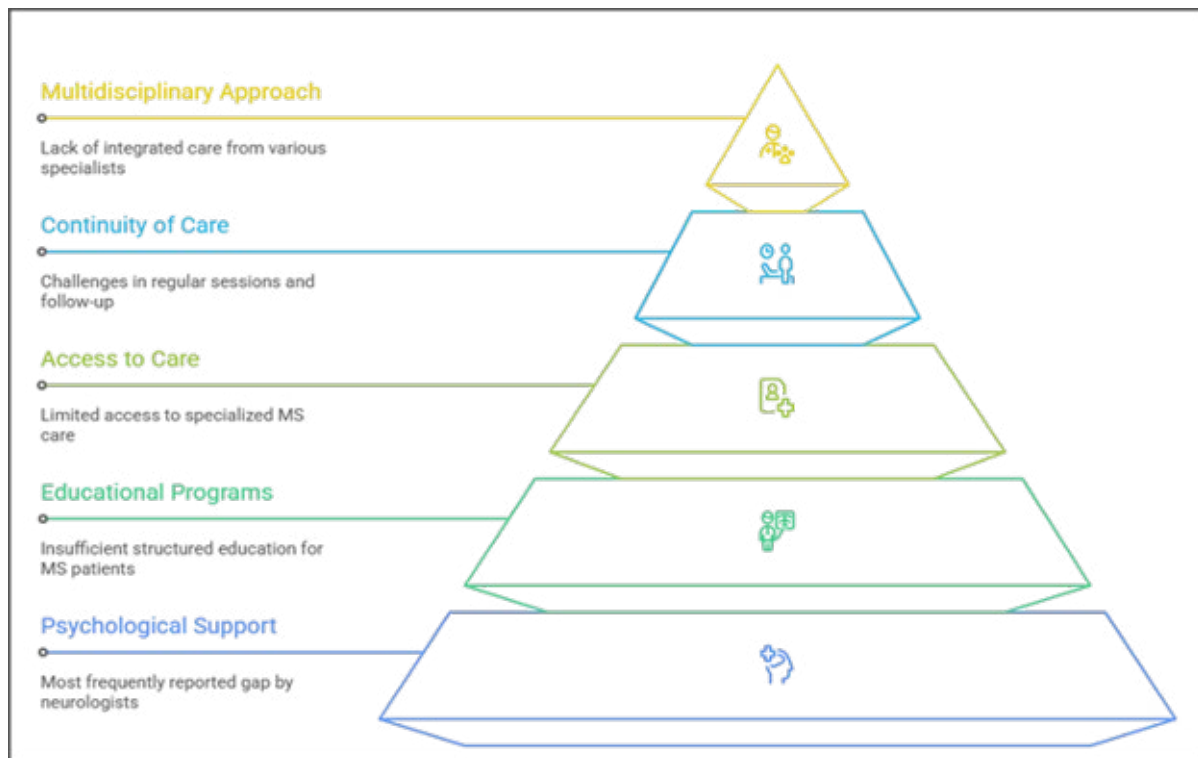


Figure 2. Healthcare gaps in MS management

as MS patients are often unable to perform physically demanding jobs and require proper vocational assessment and suitable job recommendations. Overall, the absence of occupational therapists, MS-specialized physiotherapists, and psychosocial support teams creates substantial challenges in MS care.” – N7.

“There are no official or well-organized support groups, although some patients have formed informal peer groups. While individual physicians have established awareness groups, these initiatives remain insufficient.” – N14.

Strategies for improvement

Neurologists argued that it is necessary to use several measures to empower patients with multiple sclerosis (MS) and make them more active in managing their disease. Others (53.3% 8/15) mentioned shared decision-making as one of the empowerment tools, which is important to note because it shows how important it is to involve patients in the process of making treatment-related decisions. The strongest recommended intervention was utilizing MS patient awareness digital platforms, which were mentioned by 80.0% of neurologists (12/15) reflecting the importance of accessible and continuous education and communication. A 26.7% (4/15) focus on a multidisciplinary approach to care showed that the coordination of care between healthcare professionals is an important element. Also, the use of MS patient monitoring booklets (20.0%, 3/15) and the introduction of a National MS Electronic System (20.0%, 3/15) were proposed to enhance the follow-up and continuity of care. Regarding physical and functional recovery, neurologists also suggested the creation of advanced MS rehabilitation facilities (20.0%, 3/15), the increase in the number of MS centers (13.3%, 2/15) and the amplification of patient support groups (13.3%, 2/15). Rarely, neurologists emphasized on the significance of training of healthcare providers (6.7 %, 1/15) in empowering patients and optimizing the management of MS.

“There is a clear need for official, supervised platforms that provide

reliable medical information, educational videos, structured learning materials, and psychological support” -N14.

“The number of MS centers is inadequate, and the high patient load limits healthcare providers’ ability to allocate sufficient time for comprehensive disease education and psychological support”. – N15

“When newly diagnosed, patients are allowed to choose between available treatment options, such as injectable or oral therapies. Shared decision-making in this context is beneficial and may improve treatment acceptance” - N11.

“Effective communication and honesty between patients and physicians are essential for optimal MS management. One practical approach is to provide each patient with a personal booklet to document symptoms, dates, sensory changes, numbness, weakness, and relapses. When patients return after several months, these records help physicians identify patterns and deliver more accurate follow-up care.”-N 13

The socioeconomic factors of MS management

The results show that socioeconomic factors are a significant and interdependent issue in treating MS. The most commonly reported factor was income influence which was reported by 86.7% of neurologists (13/15). Despite the fact that some neurologists stated that disease-modifying therapies were free of the charges at the Ministry of Health, income still was a determining factor in receiving non-covered services, such as the advanced diagnostic tests, rehabilitation services, transportation, and the utilization of the private laboratory tests. Health literacy and educational level proved to be named as significant determinants by 73.3% of neurologists (11/15) and were frequently viewed as the more significant determinant compared to income. A higher education level was linked to better understanding of the disease, medication adherence, identification of relapse, and self-management. On the contrary, a low educational level was associated with misinformation, discontinuation of treatment inappropriately, use

of non-scientific sources and non-consistent follow-up. Neurologists (4/15) responded that employment status was an important factor in influencing MS management. Neurologists used the term employment as a contextual factor that had positive and negative impact based on the job demands and workplace support. The occupations that were physically demanding and lacked sick leave were linked with excessive fatigue, increased chances of relapse, and disease inadequate management. Family and household support were found to support disease management by one-fifth of neurologists (3/15) and social impact on a broader level was less common (6.7%, 1/15). Although less frequent, these aspects were identified as significant to the coping ability and persistence of care of patients.

“Yes, of course. Patients with higher income, better education, and stable employment tend to have greater awareness of their disease and are better able to manage various aspects of care. In contrast, patients with limited financial resources and lower educational levels often face significant challenges in managing their condition. Overall, well-educated and financially stable patients are generally able to care for themselves more effectively than those with fewer resources.” -N1

“Income does not appear to have a significant effect on disease management, as all multiple sclerosis medications are provided free of charge by the Ministry of Health with sufficient stock reserves. Most laboratory investigations are also offered free of cost, and tests that are unavailable in public facilities are covered through agreements with private laboratories.” -N11

“Education plays a crucial role, as understanding the disease course and recognizing relapses are essential for effective management; in this regard, education has a greater influence than income” -N4

“Employment conditions further influence disease outcomes, as jobs involving physical exertion may increase the risk of disease relapse” -N15

Additional challenges encountered MS patients.

The most common extra challenge was social integration, which was noted in 2 cases (13.3%), pointing to the complications with community participation, employment, accessibility, and psychological support despite the preserved cognitive capabilities. There was 1 case (6.7%) in which disability benefit barriers were reported, which were primarily associated with challenges in the review process of patients in advanced MS. General (non-specialist) social media advice was present in 1 case (6.7%), and this was related to misinformation causing unsuitable dietary or lifestyle limitations. The shortage of occupational therapists was reported in 1 case (6.7%), which also revealed the absence of vocational testing and occupational adapting of MS patients. Lack of national Iraqi MS guidelines was observed in 1 case (6.7%) emphasizing reliance on international guidelines and the need for a unified national framework.

“There are many misconceptions spread by non-specialists on social media, such as advising patients to avoid certain foods, drinks, or exercise. Many patients trust this misinformation more than medical professionals, which can lead to unproven diets, unnecessary restrictions, and financial burdens. Medical advice for multiple sclerosis should only be provided by neurologists who specialize in the management of MS patients.” -N2

“Occupational therapy represents another major gap, as MS patients are often unable to perform physically demanding jobs and require proper vocational assessment and suitable job recommendations” -N13

DISCUSSION

Using the viewpoints of the neurologists in this research, the multiple sclerosis (MS) management in Iraq is influenced by the multifactorial interaction of disease-related, patient-related, healthcare system constraints, and socioeconomic factors. This result is consistent with the existing literature that underscores the fact that MS care goes beyond relapse control and disease-modifying therapeutic interventions and includes life-long adherence, continuous education, multidisciplinary contribution, and psychosocial support²²⁻²⁴. The most common challenge that was reported daily (93.3%), was the disease symptoms, and the most burdensome symptom was fatigue. This observation goes in line with the bulk of the literature that illustrates that fatigue is among the most common and debilitating symptoms experienced in MS, which severely affect mobility, work performance, and involvement of social life²⁵⁻²⁷. As reported before, neurologists highlighted that there is a strong correlation between fatigue and mental health issues (40.0%), such as depression and anxiety, which in turn, decrease motivation and treatment adherence. Again, mobility impairment, optical disturbance, bladder dysfunction, and residual impairment of earlier relapses have been noted, which is in line with reports that describe the cumulative effect that they have on functional dependence and quality of life in MS patients²⁷. Relapses (20.0 %) were said to be unforeseeable and psychologically tormenting episodes which is consistent with the previous research pointing to their emotional and clinical cost²². Neurologists invariably characterized treatment adherence problems as the most important challenge, which is underpinned by its high prevalence (80.0%). The outcome is consistent with the previous research that showed that inadequate compliance with disease-modifying treatments is prevalent in MS and is closely linked with a higher rate of relapses, higher rates of hospitalization and a faster deterioration of disability²⁸. Like the literature reports, neurologists in the current study described bad adherence to fluctuation of symptoms, adverse effects of medication especially injectable treatment, long distance of travel to MS centers, and lack of awareness about MS being a lifelong disease²⁹. Regarding neurologists' perspective, the knowledge and self-management skills on the part of the patient are yet to be addressed even though MS is a long-term disorder. The result is consistent with the prior research that indicated the low-to-moderate level of disease-related knowledge in MS patients, especially in terms of relapse recognition, lifestyle change, and long-term medication adherence²⁹⁻³¹. Neurologists explained these gaps by overcrowded MS clinics, lack of time to consult with patients, intermittent follow-up (13.3%), and lack of structured education programs (33.3%), which is also in line with previous evidence that indicated that poor patient education is a contributing factor to misinformation and unsafe patient self-management³². Neurologists emphasized the ineffective healthcare system gaps as key factors that obstruct effective MS care. Over and over again access to specialized MS services (20.0%), delayed diagnosis (20.0%), insufficient numbers of neurologists and MS-specialized nurses (6.7% each), and unavailability of psychological support services (40.0%), were highlighted. The results are supported by the global evidence that proves the lack of response to the treatment and deterioration of the long-term prognosis of MS in case the illness is diagnosed late and does not receive care of specialists¹⁸. On the same note, the lack of a holistic multidisciplinary care model (6.7%) reflects the gaps in the delivery of MS services identified in the past to include low and middle-income conditions³³.

Another significant issue was the small number of MS centers (20.0%). This observation is also supported by the evidence throughout the world that limited geographical access to special MS services has adverse impacts on adherence, attendance of follow up, and timely relapse management³⁴. In line with the rehabilitation literature, the

neurologists showed the idea to enlarge the MS centres and build upgraded rehabilitation centres incorporating physical therapy, psychological assistance, and diagnostic services under one system¹⁸.

Concerning empowerment, neurologists advocated shared decision-making (53.3%), which is consistent with the current literature that patient participation in treatment decisions enhances patient satisfaction and compliance in MS³⁵. Similarly, the employment of digital awareness (80.0 %) is correlated with the recent literature provided in Favor of the use of supervised digital tools to improve communication, symptom monitoring, and reassurance of patients, especially in remote locations³⁰. Nonetheless, it was in line with the international recommendations that neurologists underlined that such platforms could not be left unsupervised by doctors to avoid misinformation and improper self-management.

The socioeconomic determinants have been found to be potent disease management modifiers. The result is consistent with the earlier researches that have established that income and education determine adherence to care and disease outcomes in MS³⁵. Consistent with the literature, level of education (73.3%), was deemed to be more significant than income (86.7%), with educated patients showing better understanding of the disease, adherence, and follow-up²⁹ behaviours. Other significant protective factors identified were employment (40.0%), and family support (20.0%) again in agreement with reports that showed their relevance in the ability to cope and quality of life³⁵.

Lastly, neurologists also pointed out other systemic and social issues, such as social integration issues (13.3%), especially with young, wheelchair-bound yet mentally intact patients. This observation is in line with findings that have focused on the importance of social involvement and work in relation to quality of life in MS. Other issues such as disability benefit blockers (6.7%), non-specialist counsel in social media (6.7%), insufficient supply of occupational therapists (6.7%), and the lack of national Iraqi MS guidelines (6.7%), are reflected in the gaps in other health care systems. According to international guidelines, the neurologists supported the development of national MS guidelines accompanied by electronic MS registry to standardize the care and to enhance the long-term outcome³³. The primary weaknesses of this study were the single-center nature of the study, the possibility of recall bias, and the view of the perspective of neurologists alone (no patient or caregiver perspectives were taken). The barriers identified in this study which is also identified in previous study³⁶ are not merely reflections of general resource-limited settings; they are shaped specifically by Iraq's post-conflict healthcare fragmentation, the disproportionate concentration of specialist services in Baghdad, and the chronic political instability that has impeded systematic health system reform.

Unlike neighbouring countries such as Kuwait or Saudi Arabia- which have made measurable investments in dedicated MS infrastructure and national registries- Iraq lacks a unified national MS framework, resulting in wide variation in care quality and outcomes. These findings carry important policy implications. There is an urgent need for the development of an Iraqi national MS registry and contextually adapted clinical guidelines. Investment in digital health platforms to extend MS service reach to underserved regions is strongly supported by neurologist consensus in this study. Furthermore, clinical pharmacists represent an underutilised but critical resource in Iraqi MS care. Given the high prevalence of treatment non-adherence identified by neurologists, pharmacist-led medication adherence counselling and medication therapy management programs could meaningfully reduce relapse rates and hospitalisation. Proactive pharmacist counselling on the adverse effects of disease-modifying therapies

-particularly injectable treatments- may prevent unnecessary treatment discontinuation. Structured patient education programs delivered by clinical pharmacists can address the identified gaps in disease knowledge, supplementing the limited consultation time available to neurologists in high-volume MS clinics. Tele-pharmacy offers a viable model to extend these services to rural and underserved patients who face geographic barriers to specialist care. Integration of clinical pharmacists into multidisciplinary MS care teams -alongside neurologists, specialist nurses, physiotherapists, and psychologists- is aligned with international MS care standards and represents a feasible, high-impact intervention within the Iraqi context.

CONCLUSIONS

This study indicates that Iraqi neurologists encountered significant problems in MS care, including debilitating symptom, difficulty with medication adherence and crucial deficiency in healthcare system. However, this obstacle can be overcome with tailored intervention such as formulating national MS guidelines, instituting multidisciplinary treatment team and creating supervised digital platform or patient education. Future research must integrate patient perspectives to guarantee that these techniques effectively address the patient most impacted by the condition.

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