

FUNCTIONAL ABILITIES OF PATIENTS WITH MULTIPLE SCLEROSIS

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Article Received on 20/02/2025

Article Revised on 10/03/2025

Article Accepted on 30/03/2025

ABSTRACT

Background: Multiple sclerosis (MS) is one of the most widespread neurological conditions in the globe. It causes non-traumatic neurologic impairment, which impacts the patient's functional abilities, mental wellness, and performance daily tasks which have a detrimental effect on their quality of life (QOL). **Objective:** To assess functional abilities of patients with multiple sclerosis. **Study design:** A descriptive research design was adopted for this study. **Setting:** The study was conducted at neuropsychiatric outpatient clinics El- Hadara Orthopedic and Traumatology Alexandria University Hospital. **Subjects:** A convenience sample of 110 adult patients diagnosed with multiple sclerosis. **Tools:** Two tools were used: Tool I: Patients' assessment; Tool II: Functional abilities for MS patients; it consisted of two parts; Part (A): Functional abilities scale; Part (B): Expanded disabilities status scale score (EDSS). **Results:** According to the study, approximately 25% of MS patients performed their ADLs independently, which resulted in a moderate level of expanded disability status scale (EDSS) score. **Conclusion:** MS raises the likelihood of co-morbidity and mortality while also causing a continuous loss in functional capacities.

KEYWORD:- Functional abilities, Patients, Multiple sclerosis.**INTRODUCTION**

Multiple sclerosis is a long-term, insulating, neurodegenerative illness of the central nervous system marked by demyelination, or the breakdown of the myelin sheath, followed by damage to axons in the central nervous system, eventually resulting in neurons damage in the brain and spinal cord. Patients face an unclear future due to the disease's unpredictable nature and wide range of symptoms, which makes early detection and lifestyle changes crucial.^[1,2]

Even though the exact cause of MS is undetermined, environmental risk factors, immunological reaction, and genetic susceptibility all contribute a significant part. MS can cause an extensive variety of adverse consequences and incapacitating symptoms, which are based on the location of inflammatory lesions in the central nervous system. These symptoms can be physical (Vision and motor deficits, pain, as well as somatosensory alteration), cognitive (attention span, processing rate, learning, memory, and executive functions), and emotional (Depression and anxiety).

The prevalence of MS has grown substantially globally in recent years, indicating the disease's increasing

influence on public health. Globally, MS caused 1.2 million DALYs, 22.4 thousand deaths, and 1.8 million prevalent cases in 2019.^[4] Men may have less favorable outcomes and a more prolonged course of illness. The expected lifespan of MS patients is only marginally shortened, despite the early onset of the disease and the possibility of neurologic impairment. On the other hand, MS has significant financial implications, including those associated with medical care and treatment options, the adaptation of homes and lives for patients as well as family members, and reduced job performance.^[5]

Furthermore, MS patients frequently face disability and significant work efficiency reduction, as well as crucial effects on their mental health, including higher rates of depression that lower their quality of life, inadequate resolution following recurrent episodes, new limitations development, and the gradually nature of MS that interferes with daily events involving self-care and family members care, all of which have an adverse effect on the patients' wellbeing.^[3,7]

Importance of research

Much current research suggest that assessing MS patient's functional abilities is essential to promoting

independence. This can be accomplished by offering a patient a customized, well-planned, and logical treatment regimen that will alleviate their symptoms and offer continuous guidance.^[8,9]

Research objective

Assess the functional abilities of patients with multiple sclerosis.

MATERIALS AND METHODS

Research design

A descriptive research design was adopted for this study.

Setting

The present study was conducted at neuropsychiatric outpatient clinics El-Hadara Orthopedic and Traumatology Alexandria University Hospital.

Subjects

A convenience sample of 110 adult patients with the diagnosis of multiple sclerosis.

*Inclusions criteria

- Age group from ≥ 21 -60 years old.
- Willing to participate in the study.
- Free from any impairment that affects functional abilities and neurological status before diagnosis of multiple sclerosis.

Two tools were used to collect the necessary data

Tool I: Patients' Assessment

It was designed by the researcher. It includes data related to age, sex, and current occupation.

Tool II: Functional abilities for MS patients

The researcher modified the Functional Abilities Scale, which was designed by Craven and Hirnle (2009).^[10] It was used to evaluate daily living activities and to provide information about subject's functional abilities. It involved data about self-care activities as sitting activities, transferring, standing, walking, toileting, bathing, dressing, grooming, eating and opening doors. It was established on a 5-point rating scale ranging:

0. Unable to perform, dependent.
1. Needs equipment or devices and supervision.
2. Needs supervision.
3. Needs to use equipment or devices.
4. Full self-care, independent.

The scale consisted of 28 statements scored on 5-point rating system. Possible rating varied from zero - 112, after that all ratings added up together for each subject. Percentage was computed as a % of possible score and categorized as previously stated.

Part B: Expanded disabilities status scale score (EDSS).

Designed by Kurtzke (1983)^[11] it was intended to assess the neurological consequences of MS patients. It was created using a rating system with 20 points, which ranged from the following:

Score	Criteria
0	Normal neurological exam (all grades 0 in Functional Systems [FS]; cerebral grade 1 acceptable).
1	No disability, minimal signs in one FS.
1.5	No disability, minimal signs in more than one FS.
2	Minimal disability in one FS.
2.5	Mild disability in one FS or minimal disability in two FS.
3	Moderate disability in one FS, or mild disability in three or four FS. No impairment to walking.
3.5	Moderate disability in one FS and more than minimal disability in several others. No impairment to walking.
4	Significant disability but self-sufficient and up and about some 12 hours a day. Able to walk without aid or rest for 500m.
4.5	Significant disability but up and about much of the day, able to work a full day, may otherwise have some limitation of full activity or require minimal assistance. Able to walk without aid or rest for 300m.
5	Disability severe enough to impair full daily activities and ability to work a full day without special provisions. Able to walk without aid or rest for 200m.
5.5	Disability severe enough to preclude full daily activities. Able to walk without aid or rest for 100m.
6	Requires a walking aid – cane, crutch, etc. – to walk about 100m with or without resting.
6.5	Requires two walking aids – pair of canes, crutches – to walk about 20m without resting.
7	Unable to walk beyond approximately 5m even with aid. Essentially restricted to wheelchair; though wheels self in standard wheelchair and transfers alone. Up and about in wheelchair some 12 hours a day.
7.5	Unable to take more than a few steps. Restricted to wheelchair and may need aid in transferring. Can wheel self but cannot carry on in standard wheelchair for a full day and may require a motorized wheelchair.
8	Essentially restricted to bed or chair or pushed in wheelchair. May be out of bed itself much of the day. Retains many self-care functions. Generally has effective use of arms.
8.5	Essentially restricted to bed much of day. Has some effective use of arms retains some self-care functions.

9	Confined to bed. Can still communicate and eat.
9.5	Confined to bed and totally dependent. Unable to communicate effectively or eat/swallow.
10	Death due to MS.

Each patient ratings in the sample were totaled, expressed to a percentage, and then computed.

Administrative Design and Ethical Considerations

Following an explanation of the study's purpose, the hospital authorized officials at the research setting issued official permission to conduct the study. After obtaining informed consent, the researcher conducted one individual interview with each patient to gather the information required using the study materials on the day of the follow-up.

Statistical study

Data was fed to the computer and analyzed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp). Qualitative data were

defined using number and percent. Quantitative data were expressed in range mean, standard deviation. The significance of the results obtained was criticized at the 5% level.

RESULTS

Distribution of the sample according to age, gender, and current occupation

This table shows that, with $\bar{X} \pm SD$ 37.05 ± 9.04 , over half of the patients (53.6%) were between the ages of 30 and 40, and 6.4% were between the ages of 50 and 60. Additionally, around one-third of the patients were men (33.6%) and women (66.4%). However, according to the current table, (31.8%) were housewives and 2.7% business work.

Table 1: Socio- demographic characteristics of the studied sample (n = 110).

Variables	No.	%
Age (years)		
20 < 30	23	20.9
30 < 40	59	53.6
40 < 50	21	19.1
50 – 60	7	6.4
$\bar{X} \pm D = (37.05 \pm 9.04)$		
Gender		
Male	37	33.6
Female	73	66.4
Occupation		
Not work	30	27.3
Retired	6	5.5
Businesses	3	2.7
Housewife	35	31.8
Clerical work	26	23.6
Manual work	10	9.1

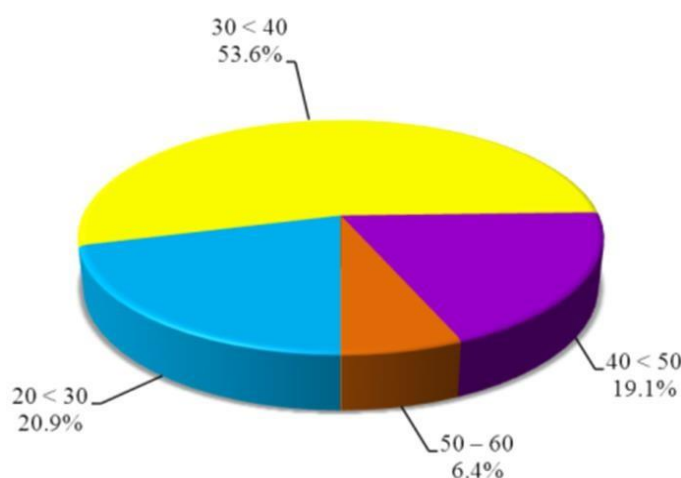


Figure 1: Distribution of the MS patients, according to Age (in years) (n=110).

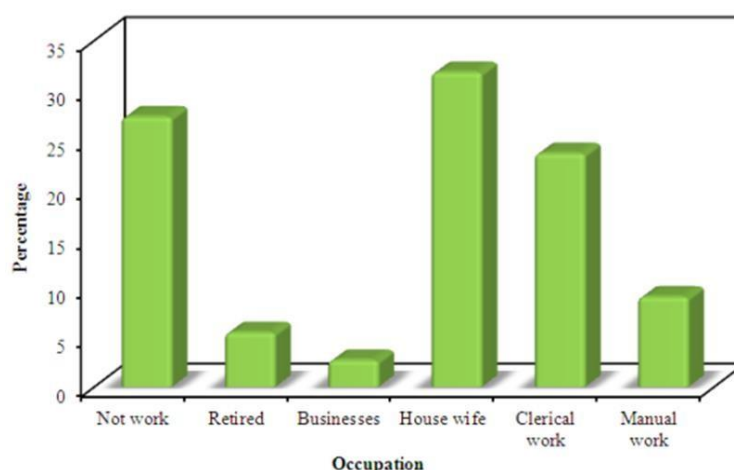


Figure 2: Distribution of the MS patients according to occupation.

Distribution of the sample according to their functional abilities

Approximately a third (38.2%) of both males and females found to be independently regards sitting activities, even with just (9.1%) required the use of equipment or devices. However, the current table shows that (12.7%) of individuals required assistance for transfer, and (28.2%) of patients needed equipment or devices or\and supervision. Nearly half of them (45.5%) stated that they required supervision and equipment or devices to stand.

Additionally, (27.3%) of subjects stated their demands for supervision to walk, as well as (28.2%) added their urgency for supervision as they use toilets. Also, when bathing, (30%) of subjects use equipment or devices as well as (10.0%) needed for equipment or devices and supervision. On the other hand, this result reflected that (22.7% & 31.8%) needed supervision regarding dressing and grooming according to sequence. (28.2%) were dependent on eating, and only (15.5%) needed for supervision, equipment or devices to open the doors.

Table (2): Functional abilities scale of the studied subjects.

Variables (n = 110)	(A)		(B)		(C)		(D)		(E)	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sitting activities	21	19.1	16	14.5	21	19.1	10	9.1	42	38.2
Transferring	21	19.1	17	15.5	31	28.2	14	12.7	27	24.5
Standing	29	26.4	50	45.5	19	17.3	10	9.1	2	1.8
Walking	21	19.1	17	15.5	30	27.3	20	18.2	22	20.0
Toileting	21	19.1	17	15.5	31	28.2	14	12.7	27	24.5
Bathing	13	11.8	11	10.0	25	22.7	33	30.0	28	25.5
Dressing	10	9.1	11	10.0	25	22.7	36	32.7	28	25.5
Grooming	17	15.5	17	15.5	35	31.8	14	12.7	27	24.5
Eating	31	28.2	25	22.7	29	26.4	11	10.0	14	12.7
Opening doors	21	19.1	17	15.5	31	28.2	14	12.7	27	24.5

A= Unable to perform, dependent activities of daily living B= Needs equipment or devices or\and supervision C= Needs supervision D= Needs use of equipment or devices E= Full self-care, independent

Expanded disabilities status scale score (EDSS) of studied sample

According to the current table, (23.6%) of subjects had mild disability in one (Functional Systems) FS or minimal disability in two FS and (17.3 %) disability severe enough to preclude full daily activities. Additionally, to (10.9%) of them were able to walk without aid or rest for 100m and requires two walking aids (pair of canes, crutches) – to walk about 20m without

resting.

Furthermore, able to walk without aid or rest for 300m. Additionally to, essentially restricted to bed or chair or pushed in wheelchair & may be out of bed itself much of the day, the retains many self-care functions, generally has effective use of arms; found to have the same ratio (1.8%).

Table (3): Expanded disabilities status scale score (EDSS) of the studied sample (n=110).

Score	0	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
No	0	3	4	2	26	7	10	3	2	5	19	7	12	5	3	2	0	0	0	0
%	0	2.7	3.6	1.8	23.6	6.4	9.1	2.7	1.8	4.5	17.3	6.4	10.9	4.5	2.7	1.8	0	0	0	0

Relationship between socio-demographic Characteristics and Expanded disability status score

The present results showed that there was a highly significant correlation between socio-demographic characteristics of subjects and expanded disability status

score with ($p < 0.001^*$). ($\bar{X} \pm D$) was (5.74 ± 0.98) of subject's expanded disability status score in group of age between 30 to less than 40 years old. While ($\bar{X} \pm D$) was equal (5.33 ± 1.34 & 6.90 ± 0.74) for of female subjects with manual work consecutively.

Table 4: The relationship between socio-demographic characteristics and expanded disability status score.

Variables (n=110)	EDSS
Age (years)	
20 < 30	2.09±0.58
30 < 40	5.74±0.98
40 < 50	3.52± 1.54
50 – 60 or more	2.50±0.0
F(p) 86.418* (<0.001*)	
Sex	
Male	2.41±1.07
Female	5.33±1.34
t(p) 12.4025* (<0.001*)	
Occupation	
Not work	2.18±0.53
Retired	3.42±0.25
Businesses	3.0 ± 0.0
Housewife	4.47±1.14
Clerical work	6.06±0.43
Manual work	6.90±0.74
F(p) 70.036* (<0.001*)	

t: student t-test F: for ANOVA test *: statistically significant at $p \leq 0.05$

DISCUSSION

According to the current study's findings, approximately three quarters (73.5%) of the participants were middle-aged, and over half (59.1%) of them were housewives without jobs. These findings are coherent with Rooddehghan et al (2024)^[8] and Cores et al (2022)^[9] as they detected, that, highest percentage of MS subjects unemployed. This finding reflects that MS is a long-term disability affecting the young patients during their productive years which reflected negatively on their quality of life.

As evidenced, the age has greatest effect on MS, while there are other factors that should be taken into account as sex, and occupation. On the other hand, this study noticed that more than half of subject female (66.4%). These finding contradict to findings of Kapucu et al (2011).^[12] mentioned that two third of MS subjects were female and one third male.

Furthermore, it was detected that around one quarter of MS subjects were independent (fully self-care) in their (ADLs) leading to low expanded disabilities status scale score (EDSS) level. This result was indeed with Rakhshani et al (2024)^[13] and Sobhy et al (2024)^[14] as they documented that, more than half of MS subjects had low expanded disabilities status scale score (EDSS) level thus they usually need for supervision and equipment for performing their (ADLs). This can be attributed to motor and balance impairments, muscle weakness, fatigue, spasticity as well as visual disturbances which are

considered the most common symptoms of MS disease process. Finally, this disease process can lead to lot of altered abilities and limitations as well as constrains the daily routine activities with increased the falling risk among MS subjects.

As regards, the MS management considered as a long-term process requiring continuous efforts by patients and their families as well as health care providers to learn the MS regarding disease and the urgency for acquiring specific skills for caring themselves so can live with most comfortable way. Thus, great efforts must be made by nurses to help MS patients to fully comprehend their condition, through their responsibility for encouraging them to comply with the therapeutic regimen with suggested lifestyle modifications. As evidenced, effective patient education reflects positively on MS health and finally can improve their quality of life.^[15]

In this context, Sahebalzamani (2012)^[15] emphasized that, the nurses' role regarding the MS subjects' health education as a corner stone of MS therapeutic strategy. Furthermore, Abulaban (2019)^[3] proven that nursing practice is a very important factor in caring the MS patients. They mentioned that without proper patient's education there is no positive effect among MS patient progress. aspects, as well as processing the efforts of implementing the desired changes when it is must be focused on the optimal state of health among the MS subjects.

The current study aims to assess functional abilities of MS subjects. Based on the study findings, we conclude that around one quarter of MS subjects were independent (fully self care) in their (ADLs) leading to low expanded disability status scale score (EDSS) level. Moreover, there was a statistically positive relationship between socio-demographic characteristics of subjects and expanded disability status score (EDSS) of the MS subjects.

The present study highlighted the urgent need of the MS subjects for nurse s' health education regarding their disease and self- care methods for better health outcome. Effective health education improves patients' knowledge and awareness about the disease, increases the patients' sense of control over the disease, and improves their quality of life.^[6,8]

ACKNOWLEDGMENT

None.

Consent to publish

Written informed consent for publication was obtained from all authors.

Availability of data and materials

Upon reasonable request, the corresponding author will provide the datasets used and/or analyzed in the current study.

Funding and financial support

were not obtained from any individual, institution, agency, drug industry, or organization.

Conflict of Interest

No possible conflicts of interest were disclosed by the authors.

Transparency statement

I confirm that this manuscript is an honest, accurate, and transparent report of the study; that no significant details of the investigation have been left out; and that any deviations from the planned (and, if applicable, registered) study have been explained.

Author's contribution

Conceptualization, Methodology, Validation, Formal analysis, Data curation, Writing original draft preparation, Visualization: **Omima Halawa**

Writing review and editing, Supervision: **Omima Halawa, Afaf Shehata**

All authors have read and agreed to the published version of the manuscript.

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