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ORIGINAL ARTICLE

Prevalence of Depression and Anxiety in Patients with Multiple Sclerosis

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Abstract

Background: ***Individuals with multiple sclerosis (MS) frequently experience depression and anxiety, which can negatively impact their quality of life and adherence to therapy. These symptoms also increase as the illness progresses.***

Aim: ***To detect the prevalence of depression and anxiety among multiple sclerosis patients.***

*Patients and methods****: A cross-sectional study of 154 patients who were diagnosed with MS from the MS Unit of Al-Azhar University hospitals (Al-Hussien and Bab El-Shaeria) from January 2023 to June 2023. The recruited patients were interviewed by semi-structured clinical interview and assessed by the Beck Depression Inventory-II (BDI-II), Hamilton Anxiety Rating Scale (HAM-A), Symbol Digit Modality Test (SDMT), and Expanded Disability Status Scale (EDSS).***

Results: ***The current study included 154 patients; their ages ranged between 26-58 years. Most of them, 70%, have depression, While 54.9% have anxiety. There was a statistically significant association between depression, anxiety being not working, having a high lesion load, a higher number of relapses, and greater disability. Moreover, the current study found a significant positive correlation between depression and anxiety scores and duration of illness, number of relapses in the last two years, Extended Disability Status Scale (EDSS), and a significant negative correlation between depression and anxiety scores and time from onset of neurological symptoms till diagnosis of MS.***

Conclusion: ***Depression and anxiety among MS patients in our study are in an elevated level, clinicians should pay more attention to the symptoms of anxiety and depression in this population.***

Keywords: Depression; Anxiety; Multiple sclerosis (MS)

1. Introduction

Depression is an important public health problem affecting approximately 350 million people worldwide, gaining ground as the fourth leading cause of disease load. Several chronic diseases were found to be associated with depression. A positive relationship between de pression and some chronic diseases has been established in adult populations, especially in the developed countries.[1]

Multiple sclerosis (MS) is a condition characterized by inflammation and damage in the central nervous system, the cause of which is unknown.[2] Recent statistics indicate that its prevalence has escalated to 120 cases per 100,000 inhabitants, with women experiencing it at a higher rate than men (3:2).[3] MS is the leading cause of disability among individuals aged 20 to 40; It results in substantial impairments to patients' quality of life and substantial healthcare expenses.[4] Patients diagnosed with multiple sclerosis frequently experience depression and anxiety, which have detrimental effects on their quality of life and adherence to treatment. Furthermore, these conditions tend to increase in frequency as the disease advances.[5]

MS is a chronic and incapacitating condition affecting the central nervous system, often diagnosed in individuals between the ages of 20 and 40. The incidence rate of (MS) is between 57 and 78 cases per 100,000 individuals; Global estimates suggest that over 2.5 million individuals are affected by this condition.[6] Since the majority of MS patients experience stress, worry, and despair, psychological issues are one of their main concerns.[7]

The objective of this study is to identify the prevalence of anxiety and depression among those diagnosed with multiple sclerosis.

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2. Patients and methods

In a cross-sectional study, 154 patients who were diagnosed with MS were confirmed by neurologists and also fulfilled our inclusion criteria from the MS Unit of Al-Azhar University hospitals (Al-Hussien and Bab El-Shaeria) from January 2023 to June 2023.

We included patients aged between 18 and 60 years who were diagnosed with MS according to clinical, laboratory, and MRI and matched the McDonald criteria 2017.

We excluded patients with medical or neurological conditions other than multiple sclerosis, those with a history of previous psychiatric disorders earlier than being diagnosed by multiple sclerosis, and those with a history of substance use.

The recruited patients were interviewed by semi-structured clinical interview to be diagnosed with depression or anxiety according to DSM 5. The severity of depression was assessed by the Beck Depression Inventory-II (BDI-II), while the severity of anxiety was assessed using the Hamilton Anxiety Rating Scale (HAM-A). The Symbol Digit Modality Test(SDMT) was used to assess information processing speed (IPS), and the Expanded Disability Status Scale (EDSS) was used to assess disability in all recruited patients. The Ethics Committee of the Al-Azhar Faculty of Medicine approved this investigation. Prior to enrolling in this trial, we acquired written informed permission from patients or their families.

STATISTICAL ANALYSIS

The acquired data was analyzed using SPSS version 25.0 (Statistical Package for the Social Science). For quantitative variables, inferential analyses were conducted using the independent t-test for instances involving two independent groups with parametric data and the Mann-Whitney U test for situations involving two independent groups with non-parametric data. The qualitative data underwent inferential analysis using the Chi-square test for independent groups. The ANOVA test was employed to compare quantitative data from several independent samples. Additional examination of the examined subgroups was conducted utilizing a post hoc test. The Kruskal-Wallis Test was employed to compare quantitative data from more than two independent samples of non-normally distributed data.

3. Results

Table 1. Population demographics statistics.

		(N = 154)	
AGE (YEAR)	Range	26-58	
	Mean±SD	40.14 ± 8.39	
AGE GROUP	20-29 year	16	10.4%
	30-39 year	69	44.8%
	40-49 year	45	29.2%
	>50 year	24	15.6%
SEX	male	61	39.6%
	female	93	60.4%
EDUCATION	Illiterate	13	8.5%
	Read and write	18	11.7%
	1rt & 2ry	45	29.2%
	Diploma	39	25.3%
	University	39	25.3%
OCCUPATION	Working	69	45.10%
	Not working	84	54.90%
EDUCATION DURATION (YEAR)	Range	1-18	
	Mean ±SD	9.90 ± 5.34	

The current study included 154 patients; their age ranged between 26-58 years with mean value of 40.14 ± 8.39 years. Most of them 74.51% were in age group 30-49 years old. Most of them 60.13% were females and 39.87% were males. Most of them were educated diploma and university in 25.3% for each. The majority of them 54.9% was not working.

Table 2. Clinical characteristics of the studied population

		(N = 154)	
DURATION OF ILLNESS (YEAR)	Range	0.5-13	
	Mean ±SD	7.48 ±2.09	
FREQUENCY OF RELAPSES WITHIN THE PAST 2 YEARS	1	22	14.3%
	2	27	17.6%
	3	30	19.4%
	4	31	20.3%
	5	35	22.7%
	6	9	5.7%
LESION LOAD	Mild	48	31.2%
	Moderate	51	33.1%
	High	55	35.7%
EDSS SCORE	Range	2-7	
	Mean ±SD	4.72 ± 1.62	

The duration of MS ranged between 0.5-13 years with mean value of 7.48 ±2.09 years. Relapses number in the last 2 years ranged between 1-6 times. Most of them 35.7%have high lesion load, 33.1%have moderate and 31.2% have mild. EDSS score ranged between 2-7 with mean value of 4.72 ± 1.62.

Table 3. depression and anxiety frequency of the studied population.

		(N = 154)	
SDMT	Range	9-47	
	Mean±SD	32.6±8.9	
BDI-II SCORE	Range	2-57	
	Mean±SD	22.48 ± 17.12	
DEPRESSION	Yes	106	68.63%
	No	48	31.37%
DEPRESSION SEVERITY	Mild	27	17.65%
	Moderate	34	21.57%
	Severe	45	29.41%
HAM-A SCORE	Range	2-44	
	Mean±SD	15.42 ± 12.76	
ANXIETY	Yes	85	54.90%
	No	69	45.10%
ANXIETY SEVERITY	Mild	13	7.84%
	Moderate	33	21.57%
	Severe	39	25.49%
TIME FROM ONSET OF NEUROLOGICAL SYMPTOMS TILL DIAGNOSIS OF MS	Range	1 month - 6 years	
	Mean±SD	2.39 ± 1.37	

The SDMT score ranged between 9-47 with mean value of 32.6±8.9. Most of MS patients 70% have depression, that was mild in 17.65%, moderate in 21.57% and severe in 29.41%. Time from onset of neurological signs till diagnosis of MS ranged between 1 month to 6 years. while 54.9% have anxiety that was mild in 7.84%, moderate in 21.57% and severe in 25.49%.

Table 4. Comparison of demographic data in relation to depression.

		NO DEPRESSION		HAVE DEPRESSION		INDEPENDENT STUDENT T TEST/ CHI SQUARE TEST	
		No.= 48		No.= 106		x2	P-value
SEX	Male	19	39.5%	43	40%	0.002	0.964
	Female	29	60.4%	63	60%		
OCCUPATION	Working	40	83.3%	22	20%	11.127	0.0001
	Not working	8	16.7%	84	80%		
EDUCATION	Illiterate	6	12.5%	9	8.5%	3.943	0.414
	Read & write	5	10.4%	11	9.5%		
	1ry & 2ry	18	37.5%	27	25.7%		
	Diploma	9	18.7%	30	28.5%		
	University	10	20.8%	29	27.6%		
		Mean	SD	Mean	SD	t	P-value
AGE YEAR		38.66	7.74	43.60	9.10	-1.838	0.079
EDUCATION YEAR		9.69	5.22	10.40	5.75	-0.413	0.683

There is statistically significant association between development of depression and non-working in patients with MS. While there was statistically insignificant association between development of depression and age, sex, education grade and education duration in patients with MS.

Table 5. Comparison of the clinical data in relation to depression.

		NO DEPRESSION		HAVE DEPRESSION		INDEPENDENT STUDENT T TEST/ CHI SQUARE TEST	
		No.= 48		No.= 106		x2	P-value
LESION LOAD	Mild	35	72.9%	11	9.5%	30.230	0.00001
	Moderate	10	20.8%	42	40%		
	High	3	6.3%	53	50.5%		
		Mean	SD	Mean	SD	t	P-value
DURATION OF ILLNESS		7.81	2.13	6.72	1.82	3.261	0.001
NUMBER OF RELAPSES IN LAST 2YS		4.17	1.01	1.47	0.52	12.454	0.00001
EDSS		5.57	1.09	2.73	0.46	12.946	0.00001
SDMT		36.91	6.31	32.07	5.57	4.9571	0.0001
BDI-II SCORE		30.74	13.71	3.20	0.86	11.829	0.00001

There is statistically significant association between development of depression and high lesion load, Duration of illness, higher number of relapse and greater disability (worse EDSS score) and SDMT and BDI-II score in patients with MS.

Table 6. Comparison of demographic data in relation to anxiety.

		NO ANXIETY		HAVE ANXIETY		INDEPENDENT STUDENT T TEST/CHI SQUARE TEST	
		No.= 69		No.= 85		x2	P-value
SEX	Male	30	43.48%	32	36.90%	0.683	0.406
	Female	39	56.52%	53	63.10%		
OCCUPATION	Working	46	66.67%	24	27.38%	23.614	0.0001
	Not working	23	33.33%	61	72.62%		
EDUCATION	Illiterate	9	13.04%	7	7.14%	1.954	0.744
	Read & write	9	13.04%	6	7.14%		
	1ry & 2ry	20	28.99%	25	29.76%		
	Diploma	19	27.54%	20	23.81%		
	University	18	26.09%	21	25.00%		
		Mean	SD	Mean	SD	t	P-value
AGE YEAR		40.89	7.06	39.26	9.83	0.662	0.512
EDUCATION YEAR		10.33	5.30	9.39	5.46	0.616	0.541

There is statistically significant association between development of anxiety and non-working in patients with MS. While there was statistically insignificant association between development of anxiety and age, sex, education grade and education duration in patients with MS.

Table 7. Comparison of the clinical data in relation to anxiety.

		NO ANXIETY		HAVE ANXIETY		INDEPENDENT STUDENT T TEST/CHI SQUARE TEST	
		No.= 69		No.= 85		x2	P-value
LESION LOAD	Mild	38	55.1%	9	9.52%	74.269	0.00001
	Moderate	29	42%	23	27.38%		
	High	2	2.9%	53	63.10%		
		Mean	SD	Mean	SD	t	P-value
DURATION OF ILLNESS		8.17	2.12	6.67	1.76	2.733	0.009

NUMBER OF RELAPSE IN LAST 2 YEARS	3.93	1.27	2.70	1.58	3.001	0.005
EDSS	5.33	1.41	4.00	1.57	3.136	0.003
SDMT	33.52	3.99	35.70	7.10	1.9931	0.042
HAM-A SCORE	25.93	7.58	3.09	0.67	15.585	0.00001

4. Discussion

Our goal in this study was to find out how common depression and anxiety were among MS patients.

Regarding demographic data, the current study included 154 patients whose ages ranged between 26 and 58 years with a mean value of 40.14 ± 8.39 years; 74.51% were in the age group 30 to 49. Most of them (60.13%) were females, 25.3% had diplomas, 25.3% were university-educated, and 54.9% were non-working.

Comparable with the current study, Karimi et al.,[5] revealed that among 87 Iranian MS patients, the mean age was 35.5 ± 9.2 years, with an age range of 20-62 years. Seventy-one percent of the participants (n = 61) were female. In addition, 49 (56.3%) of the patients were homemakers, 54 (62.1%) were married, 35 (40.2%) had a high school degree, and 11 (12.6%) had a family history of multiple sclerosis.

Regarding the clinical characteristics, the current study showed that the Duration of MS ranged between 0.5-13 years with a mean value of 7.48 ±2.09 years. Relapse numbers in the last two years ranged between 1 and 6 times. Most of them, 35.7%, have high lesion load, 33.1% have moderate, and 31.2% have mild. The EDSS score ranged between 2-7, with a mean value of 4.72 ± 1.62 in our study. In the Canadian study of Pham et al.,[8] Among 244 multiple sclerosis patients, the mean score on the EDSS was 3.3 (SD: 2.4, median: 2.8, range 0-9).

Regarding depression and anxiety frequency of the included population, Most MS patients (70%) have depression that was mild in 17.65%, moderate in 21.57%, and severe in 29.41%. Time from onset of neurological signs till diagnosis of MS ranged between 1 month to 6 years. However, 54.9% have anxiety that was mild in 7.84%, moderate in 21.57% and severe in 25.49%.

In agreement with our study, Alswat et al.,[9] in Saudi Arabia, showed that the incidence of severe depression was 42.7% (n = 82), with the majority of participants having moderate depression (30%) among 192 MS patients. The prevalence of generalized anxiety disorder was 26.1%, with the majority of participants having minimal anxiety (40%).

The present study found that a statistically significant correlation exists between the development of depression and non-working MS patients. On the other hand, there was a statistically insignificant association between the development of depression and age, sex, education grade, and education duration in MS patients.

In line with our study, Karimi et al. [5] found a significant association between occupation and depression among Iranian patients with MS. However, there were no significant associations between depression with age or sex. Moreover, the study revealed that Patients' work, level of education, and financial situation were all substantial risk factors for depression. However, Alswat et al.,[9] in Saudi Arabia showed that no significant associations were found between depression and occupation, age, or sex. The contrast with the current study may be related to differences in sample size and social and environmental factors.

Regarding the association between clinical data and depression, the current study discovered a statistically significant association between the development of depression and high lesion load, duration of illness, a higher number of relapses, and greater disability (worse EDSS score), and SDMT and BDI-II score in MS patients.

Murphy et al.,[10] showed that there are more brain lesions in the frontal, right parietal, and right temporal lobes in those with concomitant MDD. Therefore, it has been hypothesized that lesions in brain areas that project into the basal-limbic system cause a disturbance in limbic-cortical pathways, which raises the possibility of MDD in MS patients. On the other hand, a number of more recent investigations have not been able to confirm this correlation between the existence of comorbid MDD and lesion burden in any area of the brain.

The present study proved that a statistically significant correlation exists between the development of depression and a higher number of relapses. This was supported by Moore et al.,[11] who revealed that the prevalence of depression was high during relapse and gradually decreased after relapse.

study found that a statistically significant correlation exists between the development of depression and greater disability (worse EDSS score) in MS patients, which can be indicative that the level of disability influences the patient's mood. This claim received support from Askari et al.,[12] who observed a strong correlation between depression and a higher degree of impairment in MS patients.

According to the current study, there was a statistically significant correlation between the development of depression and SDMT in patients with MS. This comes in disagreement with Siegert

& Abernethy[13] who revealed that there was no association between cognitive impairment and depression in patients with MS.

The current study showed a statistically significant relationship between the development of depression and the development of anxiety and greater severity and higher HAM-A in patients with MS. In agreement with the current study, Askari et al.[11] showed that there was a significant association between the development of depression and greater severity and higher anxiety scores in patients with MS.

Regarding the association between demographic data and anxiety, the current study showed that there was a statistically significant association between the development of anxiety and non-working in patients with MS. While there was a statistically insignificant association between the development of anxiety and age, sex, education grade, and education duration in patients with MS.

In agreement with the present study, AlSaeed et al.,[14] showed that there was a statistically significant association between the development of anxiety among patients with MS and being unemployed and having a lower educational level. However, there were no significant associations were found between depression and age or sex.

Regarding the relation between clinical data and anxiety, the current study showed that There was a statistically significant association between the development of anxiety and high lesion load, duration of illness, a higher number of relapses, and greater disability (worse EDSS score), and SDMT in patients with MS.

Rossi et al.,[15] revealed an association of distinct regional lesion load measurements with anxiety among patients with MS.

The current study showed that there was a statistically significant association between the development of anxiety and greater disability (worse EDSS score) in patients with This was supported by Askari et al.,[12] who showed that there was a significant association between anxiety and higher disability levels among MS patients.

The current study showed that there was a statistically significant association between the development of anxiety and the number of relapses; this was supported by AlSaeed et al.,[14] who revealed that anxiety was significantly affected by short Duration since the last MS relapse.

The current study showed that there was a statistically significant association between the development of anxiety and the development of depression and greater severity and higher depression scores in patients with MS. This comes in agreement with Pham et al.,[8] who revealed that depression was associated with higher odds of anxiety.

Our study's findings have significant value in enhancing the clinical care of individuals with multiple sclerosis. Our findings need to be confirmed by bigger sample sizes and longer follow-up studies in order to pinpoint the risk factors for anxiety and depression in MS patients.

4. Conclusion

The current study's findings demonstrate that multiple sclerosis (MS) affects a person's physical and mental well-being in all facets of their life. According to the current study, anxiety affected 54.9% of MS patients, and depression affected 70% of them. The study's findings have significant value in enhancing the clinical care of individuals with multiple sclerosis. Furthermore, to provide effective therapies for patients with MS illness, future physicians should concentrate more on the symptoms of anxiety and sadness in that population. It is essential to provide MS sufferers with support services so they may effectively manage their condition.

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