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Research Article

Depression, Disability, and Quality of Life in Patients With Multiple Sclerosis: A Cross-Sectional Study From an Eastern Province in Turkey

Aysun Aras,[1] **Nuray Bige**,[2] **and Sinan Yimaz**[1]

[1]*Public Health Department, Atatürk University Medical Faculty, Erzurum, Turkey*
[2]*Neurology Department, Atatürk University Medical Faculty, Erzurum, Turkey*

Correspondence should be addressed to Aysun Aras; aysun.aras@atauni.edu.tr

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Purpose: Patients with multiple sclerosis (MS) experience disabilities which significantly affect their quality of life (QOL). Anxiety, depressive, and disability symptoms are one of the most common psychiatric conditions in MS patients. The aim of this study was to evaluate the level of QOL in MS patients and to assess the impact of physical disability on QOL in an eastern province of Turkey.
Methods: In this cross-sectional study used a questionnaire designed by the authors, which contained questions about socio-odemographic, as well as the following standardized questionnaires: Expanded Disability Status Scale (EDSS), Hospital Anxiety and Depression Scale (HADS) and QOL scale (WHOQOL-BREF) were used in 100 inpatients in the study.
Results: The average age of the patients was 35.5 ± 8.6 years and 68 (68.0%) were women. The mean of EDSS scores was 2.05 ± 1.6 (min-max: 0–6.5). 64% of the patients were married, 33% were university graduates, 43% were housewives, and 66% were middle-income. Mean scores for HAD_D and all WHOQOL-BREF domains decreased with income level, and there were significant differences between income groups ($p < 0.05$).
Conclusion: Examining the relationships between depression, disability and QOL in people with MS highlights the psychosocial challenges that these patients face in their daily lives. From a clinical practice perspective, these findings support health professionals in conducting more comprehensive assessments of depression and QOL in people with MS. Healthcare professionals can develop individualized treatment plans to improve patients' QOL.

Keywords: demyelinating diseases; mental health; multiple sclerosis; quality of life

1. Introduction

Multiple sclerosis (MS) is a demyelinating disease of the central nervous system. Due to its prevalence, MS is the leading cause of nontraumatic neurological disability in young and disability in young and middle-aged people. MS is a disease with a variable clinical course [1]. Psychopathological symptoms have a more powerful influence on the quality of life (QOL) of MS patients than physical impairment, also these symptoms influence men's and women's QOL with different power [2] It is a disease that can significantly affect all physical, mental and social well-being. High number of symptoms and association with other chronic diseases, and the lack of a complete cure all affect the daily psychological state of patients [3].

The fact that MS is considered as the second cause of disability in young adults after traffic accidents increases the interest in studies related to the disease [4].

In recent years, changing medical principles moving toward a biopsychosocial model of healthcare have resulted in a better understanding of the social and psychological aspects of the disease process [5]. It is now widely recognized

that MS is more than a disease requiring medical treatment. It is considered a traumatic life event that leads to significant psychosocial impacts on almost all aspects of QOL [6].

The World Health Organization (WHO) defines QOL as how people perceive their situation within the totality of their goals, expectations, interests and the culture and value judgments in which they live. QOL is influenced in a complex way by the person's physical health, mental state, social relations, level of independence and personal beliefs on the one hand, and the relations with his/her environment on the other hand [7]. Progressive and expected physical disability and related social and emotional problems negatively affect the QOL of the patient. Psychiatric disorders occur very frequently during the course of MS [8]. Depression is the most common psychiatric disorder and is suggested to be significantly higher in MS patients compared to the general population and other chronic diseases [7].

MS is a chronic disease that causes physical disability, affects young people, progresses with attacks and remissions, and has important psychosocial consequences. Progressive and anticipated physical disability and related social and emotional problems negatively affect the patient's QOL. The Expanded Disability Status Scale (EDSS) [9] is the most common measure of impairment and is used in clinical trials of disability and outcome for MS patients.

It has been reported that psychiatric problems are experienced more frequently in MS compared to other chronic diseases [10]. In the first stage of the disease; when the patient learns the diagnosis, a shock reaction occurs in the patient [7]; Uncertainties about the course of the disease and the future, anxiety may occur due to the fear of relapse, the patient may worry that he/she cannot control his/her life and experience loss of control [7]. This situation negatively affects the QOL and mental health of patients. Depression and anxiety are quite common in MS patients and are more common compared to healthy people. The results of the most recent meta-analysis on this subject revealed that the prevalence of depression in MS patients was 30.5% and the prevalence of anxiety was 22.1% [11].

In our study, we aimed to compare the physical causes and psychological depressive symptoms, the relationship between anxiety and depression, QOL and physical disability measured by EDSS, and the demographic characteristics of patients with MS.

2. Materials and Methods

In our study, 100 patients who were followed up in the MS outpatient clinic of Atatürk University Faculty of Medicine, Neurology Clinic and who were diagnosed with definite MS according to the Mc Donald diagnostic criteria and who were approved by the Ethics Committee were included in the study. We conducted our study with face-to-face questionnaires from MS patients who applied to the neurology out-patient clinic.

Inclusion criteria were a diagnosis of MS for at least 1 year, being in remission, and an EDSS score of 0–5.0. Demographic characteristics of the participants were collected using a simple questionnaire. The duration of the disease was determined from the file records and by asking the participants.

2.1. Outcome Measures. The WHOQOL brief form (WHOQOL-BREF), EDSS, hospital depression scale (HAD_D), hospital anxiety scale (HAD_A), and sociodemographic an information form was applied to determine the characteristics.

2.1.1. EDSS. The neurological disability level of the patients was determined by using the EDSS, a scale widely used worldwide in the evaluation and follow-up of neurological examinations of MS patients [9]. The neurological examinations and EDSS calculations of the participants were performed by the same neurologist.

2.1.2. The Hospital Anxiety and Depression Scale (HADS). The HADS was developed by Zigmon and Saith in 1983 and validated [12]. It is a reliable anxiety and depression assessment scale [12]. Turkish adaptation has been made and it has been shown that the Turkish version is also valid and reliable [13]. The patients who participated in the study were divided into two groups as those with and without anxiety and depression according to the cut-off value (≥ 8) of the HADS.

2.1.3. QOL Scale (WHOQOL-BREF). Turkish validity and reliability study was conducted by Eser et al. [14]. Higher scores obtained from the questionnaire indicate a better QOL. In addition, the questionnaire consists of four different subcategories: physical health, psychological health, social relationships, and environment.

2.2. Ethical Considerations. The study was IRB-approved (Date: 13/02/2019 Number: 01-40). This research was carried out according to the principles of the Declaration of Helsinki.

2.3. Statistical Analysis. All data were analyzed using SPSS V22 (IBM, USA). Categorical variables were presented as frequencies and percentages, while continuous variables were presented as means and standard deviations. The Shapiro–Wilk test was used to determine normal distribution. Nonparametric two independent groups were analyzed by Mann–Whitney U test, and three groups were compared by Kruskal–Wallis test. Correlations between two continuous groups were assessed by Spearman's correlation test. Statistical significance was set at $p < 0.05$.

3. Results

The mean age of the patients included in the study was 35.5 ± 8.6 years and 68 (68.0%) of them were female. The age distribution of men and women was similar ($p = 0.961$). Sixty-four percent of the patients were married, 33% were university graduates, 43% were housewives, and 66% had a middle-income level.

We examine that in our study MS patients' age > 18 was performed to determine that the age at onset of MS and the EDSS (Figure 1).

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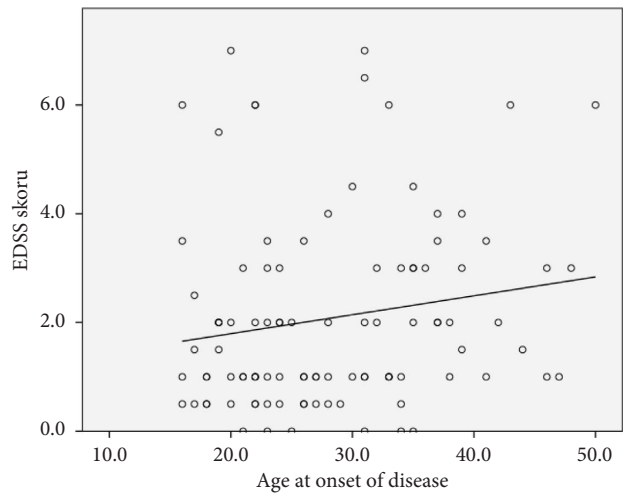


Figure 1: Scatter plot showing the EDSS and age at onset of MS.

We general demographic and clinical characteristics of the study group are summarized in Table 1. The mean EDSS of patients with children was significantly higher than those without children ($p = 0.014$). The EDSS score of the patients decreased as the level of education increased and there was a significant difference between those with less than primary school education and university graduates ($p = 0.009$).

Again, there was a significant difference between the mean physical, mental, and environmental domain scores according to the level of education ($p < 0.05$). Mean scores for HAD_D and all WHOQOL-BREF domains decreased with income level and there were significant differences between income groups ($p < 0.05$). The distribution of EDSS, HAD, and WHOQOL-BREF domain scores according to demographic and clinical characteristics of the patients are presented in Table 1.

There were positive and moderate relationships between age and EDSS ($r = 0.441$, $p < 0.001$) and negative and weak relationships between age and physical and mental domain scores ($r = -0.258$, $p = 0.009$ and $r = -0.238$, $p = 0.017$, respectively). EDSS increased with age at onset of MS and duration of MS, and there was a weak relationship ($r = 0.214$, $p = 0.033$ and $r = 0.377$, $p < 0.001$, respectively) (Table 2).

There were correlations between EDSS and physical and mental domain scores ($r = -0.411$, $p < 0.001$ and $r = -0.272$, $p = 0.006$, respectively) and between HAD_A and mental and environmental domain scores ($r = 0.262$, $p = 0.009$ and $r = 0.221$, $p = 0.027$, respectively). In addition, moderate-high correlations were observed between physical domain and mental, social and environmental domain scores, between mental domain and social and environmental domain scores, and between social domain and environmental domain scores ($p < 0.001$) (Table 2).

4. Discussion

Physical disability has a negative effect on QOL in MS. Our study showed that another factor similar to the effect of EDSS on QOL is depressive symptoms and depressive symptoms affect QOL independently of other factors. It was found that depressive symptoms frequently occurred in female MS patients and women had more fatigue effect than men [15].

In our study, no gender difference was observed between depression and QOL in MS patients. It is known that the QOL of MS patients is affected more than both healthy people and patients with other chronic diseases such as diabetes and epilepsy [16]. It has been reported that there are many physical and psychosocial factors affecting QOL in MS, which is a multisystemic chronic disease. For example, in a recent study conducted in 260 MS patients, 66.9% of whom were diagnosed with RRMS, it was reported that EDSS-physical disability negatively affected QOL [17]. The results in our study also support the literature.

However, in studies conducted on MS patients in 2006 and 2009, it was observed that disease duration and QOL were negatively related, and it was stated that disability would increase and QOL would be affected when disease duration increased [18].

Although recent studies have reported that QOL is not related to functional status, there are also publications suggesting that poor functional status predisposes to depression. Chen et al. emphasized that depression impairs QOL and especially depression has negative effects on mental capacity [19].

In many articles in the literature investigating the relationship between neurologic dysfunction evaluated by EDSS and depression, a significant negative relationship was observed. In our study, similar to the negative effect of physical disability on QOL in MS patients, depressive findings were observed to play a negative role in this regard, demonstrating the importance of a multidisciplinary approach to patients ($p > 0.001$ and $r = -0.508$). Fatigue is frequently observed in 70% of patients with MS and brain lesions and psychological factors play a role in its etiology. Studies have shown that fatigue is positively associated with depression, anxiety, and disability and negatively affects QOL. Depression and anxiety are quite common in MS patients and are more common compared to healthy people [20]. A moderate relationship was observed with EDSS, while a stronger relationship was observed with depression. It has also been reported that fatigue, depression and disability are independent risk factors affecting QOL in MS patients.

Our study is similar to the findings of Benedict et al. who found that sociodemographic variables affect the QOL of patients with MS and that the QOL of patients decreases as the level of education and income level decreases [21, 22].

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Table 1: Distribution of EDSS, HAD, and WHOQOL-BREF scores according to demographic and clinical characteristics of patients.

Variables	*n* (%)	EDSS	HADS		WHOQOL-BREF			
			HAD_A	HAD_D	Physical	Psychological	Social	Environmental
Gender		$p = 0.357$	$p = 0.768$	$p = 0.742$	$p = 0.662$	$p = 0.419$	$p = 0.827$	$p = 0.271$
Male	32 (32.0)	2.4 ± 2.0	16.3 ± 2.4	17.3 ± 1.9	12.7 ± 3.2	13.8 ± 2.6	13.5 ± 3.9	14.1 ± 2.5
Female	68 (68.0)	1.9 ± 1.5	16.1 ± 2.5	17.2 ± 2.0	13.1 ± 3.3	13.2 ± 3.0	13.5 ± 4.0	13.4 ± 2.6
Marital status		$p = 0.082$	$p = 0.586$	$p = 0.206$	$p = 0.482$	$p = 0.568$	$p = 0.326$	$p = 0.445$
Married	64 (64.0)	2.3 ± 1.8	16.3 ± 2.6	17.0 ± 1.9	12.6 ± 3.2	13.3 ± 2.8	13.5 ± 4.0	13.4 ± 2.4
Single	30 (30.0)	1.6 ± 1.5	16.0 ± 1.9	17.8 ± 2.0	13.8 ± 3.3	13.9 ± 2.9	14.1 ± 3.4	14.1 ± 2.7
Widowed/divorced	6 (6.0)	1.3 ± 0.8	15.3 ± 2.8	17.3 ± 2.8	12.8 ± 4.1	12.6 ± 4.3	10.9 ± 5.2	12.8 ± 3.6
Education		$\mathbf{p = 0.009}$	$p = 0.195$	$p = 0.484$	$\mathbf{p = 0.002}$	$\mathbf{p = 0.004}$	$p = 0.057$	$\mathbf{p = 0.001}$
Below primary school	11 (11.0)	2.7 ± 2.0	14.9 ± 2.7	16.5 ± 1.6	11.8 ± 2.9	11.4 ± 2.4	11.8 ± 3.5	11.4 ± 1.5
Primary school	30 (30.0)	2.4 ± 1.6	16.7 ± 2.4	17.2 ± 2.4	11.4 ± 3.0	12.6 ± 3.0	12.4 ± 4.3	12.8 ± 2.8
High school	26 (26.0)	2.1 ± 1.6	16.2 ± 2.6	17.6 ± 2.0	13.6 ± 3.3	14.0 ± 2.5	14.5 ± 3.6	14.5 ± 2.4
University	33 (33.0)	1.5 ± 1.6	16.1 ± 2.2	17.3 ± 1.7	14.2 ± 3.0	14.4 ± 2.9	14.4 ± 3.7	14.4 ± 2.2
Level of income		$p = 0.903$	$p = 0.092$	$\mathbf{p = 0.048}$	$\mathbf{p = 0.009}$	$\mathbf{p = 0.001}$	$\mathbf{p < 0.001}$	$\mathbf{p = 0.004}$
Good	20 (20.0)	2.2 ± 1.6	16.1 ± 2.8	18.1 ± 1.7	14.3 ± 3.2	14.9 ± 2.9	15.4 ± 3.8	15.0 ± 2.9
Middle	66 (66.0)	2.0 ± 1.7	16.5 ± 2.2	17.2 ± 1.9	13 ± 3.2	13.4 ± 2.8	13.7 ± 3.7	13.5 ± 2.3
Bad	14 (14.0)	2.0 ± 1.6	14.9 ± 2.7	16.2 ± 2.5	10.9 ± 2.6	11.1 ± 2.0	10.0 ± 3.1	11.9 ± 2.6
Smoking		$p = 0.436$	$p = 0.312$	$p = 0.388$	$p = 0.507$	$p = 0.828$	$p = 0.832$	$p = 0.925$
Smoking	26 (26.0)	2.1 ± 1.8	15.5 ± 2.6	17.4 ± 2.1	13.3 ± 3.5	13.2 ± 3.1	13.0 ± 4.4	13.6 ± 2.9
Quit smoking	16 (16.0)	2.6 ± 2.0	16.1 ± 2.5	16.7 ± 1.7	11.9 ± 3.6	13.7 ± 3.2	13.5 ± 3.9	13.4 ± 3.0
Never smoking	58 (58.0)	1.9 ± 1.5	16.5 ± 2.3	17.3 ± 2.0	13.2 ± 3.1	13.4 ± 2.8	13.8 ± 3.8	13.6 ± 2.3
MS type		$\mathbf{p < 0.001}$	$p = 0.258$	$p = 0.978$	$\mathbf{p = 0.011}$	$p = 0.284$	$p = 0.965$	$p = 0.287$
RR	86 (86.0)	1.6 ± 1.1	16.3 ± 2.5	17.3 ± 1.9	13.4 ± 3.1	13.5 ± 3.0	13.5 ± 4.0	13.7 ± 2.6
SP	12 (12.0)	4.6 ± 1.7	15.4 ± 2.4	17.3 ± 2.5	10.9 ± 2.8	12.6 ± 2.6	13.9 ± 3.4	13.0 ± 2.3
PP	2 (2.0)	6.5 ± 0.7	18.0 ± 0.1	16.5 ± 0.7	6.6 ± 1.2	12.0 ± 3.8	12.0 ± 5.7	13.3 ± 4.4

Note: EDSS: Expanded Disability Rating Scale and WHOQOL-BREF: World Health Organization quality of life scale brief form. Bold p values indicate statistical significance less than 0.05.

Abbreviation: HADS, Hospital Anxiety and Depression Scale.

Table 2: Correlation analysis results of some demographic and clinical variables and EDSS, HAD, and WHOQOL-BREF field scores.

Variables		EDSS	HADS		WHOQOL-BREF			
			HAD_A	HAD_D	Physical	Psychological	Social	Environmental
Age	*r*	0.441	−0.074	0.003	−0.258	−0.238	−0.069	−0.156
	p	**0.001**	0.462	0.980	**0.009**	**0.017**	0.495	0.122
	n	100	100	100	100	100	100	100
Number of children	*r*	0.207	−0.012	0.045	−0.099	−0.035	0.061	−0.137
	p	0.104	0.923	0.723	0.439	0.783	0.635	0.283
	n	63	63	63	63	63	63	63
Age at onset of MS	*r*	0.214	−0.063	−0.04	−0.181	−0.171	−0.086	−0.141
	p	**0.033**	0.532	0.692	0.072	0.088	0.394	0.161
	n	100	100	100	100	100	100	100
Duration of MS	*r*	0.377	−0.066	0.012	−0.128	−0.048	0.109	0.039
	p	**< 0.001**	0.517	0.903	0.204	0.639	0.28	0.698
	n	100	100	100	100	100	100	100
EDSS	*r*		−0.114	−0.108	−0.411	−0.272	−0.03	−0.111
	p		0.258	0.286	**< 0.001**	**0.006**	0.766	0.273
	n		100	100	100	100	100	100
HAD_A	*r*			0.167	0.192	0.262	0.092	0.221
	p			0.097	0.056	**0.009**	0.362	**0.027**
	n			100	100	100	100	100
HAD_D	*r*				0.182	0.029	0.088	0.095
	p				0.070	0.771	0.385	0.350
	n				100	100	100	100
Physical	*r*					0.682	0.599	0.542
	p					**0.001**	**0.001**	**0.001**
	n					100	100	100

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Table 2: Continued.

Variables		EDSS	HADS		WHOQOL-BREF			
			HAD_A	HAD_D	Physical	Psychological	Social	Environmental
Psychological	*r*						0.711	0.633
	p						**0.001**	**0.001**
	n						100	100
Social	*r*							0.636
	p							**0.001**
	n							100

Note: EDSS: Expanded Disability Status Scale and WHOQOL-BREF: World Health Organization quality of life scale brief form. Bold *p* values indicate statistical significance less than 0.05.
Abbreviation: HADS, Hospital Anxiety and Depression Scale.

Depression may contribute to morbidity in MS patients. Wang et al. [23] recently found that the QOL of MS patients was significantly impaired compared to those without lifetime depression.

There is a relationship between elevated levels of anxiety and/or depression with a reduction in MS [24]. In our study, there was a relationship between anxiety and mental and environmental QOL of the participants.

In our study, the EDSS level was found to be higher in married patients, similar to the study by Al-Asmi et al. Similar to our study, there was a negative correlation between age at onset of MS and EDSS [25]. As in the study of Amato, there was an inverse correlation between education level and EDSS level and between HAD [26, 27]. It can be thought that as the education level decreases, anxiety and depression increase and it is difficult to get information about the problems that this disease may bring.

As the EDSS level increased, physical and mental QOL scores decreased and it was reported that EDSS-physical disability negatively affected QOL in a study conducted in MS patients [17, 18, 28].

4.1. Limitations. Our data may have been susceptible to recall difficulties given that responses were self-reported and participants were asked questions regarding their disease. The results should not be generalized to all people with MS, as the group of respondents involved in the study applied our survey to patients presenting to our hospital.

5. Conclusion and Recommendations

A comprehensive, multidisciplinary approach is required to improve the QOL of people with MS. Physical rehabilitation, psychological support, and improving social relationships can make a significant contribution to improving their QOL and helping them cope with disability, depressed mood, and anxiety. Recognizing and addressing factors that affect the QOL of people with MS is essential for holistic care. Healthcare professionals and support networks can play a vital role in improving people's overall well-being by implementing strategies that target disability, depressed mood, and anxiety.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Ethics Statement

MS outpatient clinic of Atatürk University Faculty of Medicine, Neurology Clinic and who were diagnosed with definite MS was conducted in accordance with the Ethical considerations. The study was IRB-approved Date: 13/02/2019 Number: 01-40. This research was carried out according to the principles of the Declaration of Helsinki.

Consent

Informed consent was obtained from all individual participants included in the study.

Conflicts of Interest

The authors declare no conflicts of interest.

Author Contributions

A.A. and N.B. contributed to the conception and design of the study, S.Y. contributed to the acquisition and analysis of data, A.A. contributed to drafting the text or preparing the tables.

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