

Original Article

The Relationship between Disability Levels and Psychological States of Multiple Sclerosis Patients

Duygu Ozer, MsN, PhD Candidate

University of Health Sciences, Sultan II. Abdulhamid Han Training and Research Hospital, Department of Psychiatry, Istanbul, Turkey

Ozlem Sahin Altun, PhD

Assoc. Prof., Ataturk University, Faculty of Nursing, Department of Psychiatric Nursing, Erzurum, Turkey

Correspondence: Duygu Ozer: University of Health Sciences, Sultan II. Abdulhamid Han Training and Research Hospital, Department of Psychiatry, Istanbul, Turkey. E-mail: duyguozer2016@hotmail.com

Abstract

Background: Disabilities and mental problems are common in Multiple Sclerosis (MS).

Objective: This research aimed to determine the relationship between disability levels and psychological states of MS patients.

Method: This descriptive, cross-sectional, relational study was conducted with 117 Relapsing-remitting MS patients. A Personal Information Form, Brief Disability Questionnaire (BDQ) and Brief Symptom Inventory (BSI) were used in data collection. Expanded Disability Staircase Scale (EDSS) scores which were evaluated by neurology specialists were gathered from patients records.

Results: It was determined that the average age of the patients participating in this study was (37.44 ± 10.64) , they had been diagnosed with the disease for an average of (8.44 ± 6.66) years, and 71.8% were women. MS patients were found to have moderate disability. Respectively, the symptoms of depression, anxiety, somatization, interpersonal sensitivity and hostility symptoms were found to be high in MS patients. There was a positive significant relationship between BDQ mean scores, all subscale scores of BSI of the patients ($p < 0.05$).

Conclusion: There was a relationship between disability levels and psychological states of MS patients.

Key words: Multiple Sclerosis, disability, mental health, nursing care.

Introduction

Multiple Sclerosis (MS) is an autoimmune disease of the central nervous system (CNS) characterized by myelin sheath destruction (Thompson et al., 2018). In the literature, MS ranks first among the diseases that cause non-traumatic neurological disability in young adults (Newsome et al., 2017). In the disease process, depending on CNS damage, individuals have different levels of disability, and as the years of disease increase, the disability levels of patients increase (Newsome et al., 2017; Turkish Neurology Association, 2018). Patients who experience attacks due to the illness have to adapt to their current conditions with new

disabilities that may occur during and after the attack periods (Newsome et al., 2017). With the progression of the disease and the occurrence of permanent losses, the increase in addiction and the drugs used continuously increase the development of mental problems and complicate adaptation (Marrie et al., 2015; Newsome et al., 2017).

In the study conducted by Hyphantis et al. (2008), it was found that the mental problems occurring in MS patients are 6.7 times higher than the normal population. When the mental problems experienced by MS patients are examined, depression, anxiety, bipolar disorder, substance use disorders and psychosis are

frequently listed (Marrie et al., 2015; Boeschoten et al., 2017). Studies have shown that depression is the most common mental disorder in MS patients (Marrie et al., 2015), while anxiety ranges between 19-34% (Boeschoten et al., 2017). Anxiety is thought to be more manifest in the early stages of the disease due to concerns of experiencing attacks, uncertainty of the process, probability of disability, and long-term treatments, whereas depression sets in with the increase of disability as the years of disease increase (Marrie et al., 2015; Boeschoten et al., 2017). Beyond symptomatic treatment, the individual who becomes dependent due to the disease needs to be presented with holistic care, which also deals with psychosocial dimensions (Boeschoten et al., 2017; Roberts, 2017). Taking a multidisciplinary approach with pharmacotherapy, psychotherapy and social support all together will be more effective in coping with the disease (Roberts, 2017). Nurses, who are in constant interaction with the patient, play an important role in reducing psychological symptoms by making approaches such as determining the current condition of the patient, compliance with disease and making them aware of their value, positive thinking and setting achievable goals (Tulek, 2016). With the care plans to be prepared by nurses, it can contribute to the increase of the patients' coping mechanisms and functionality, and to decrease the clinical symptoms (Tulek, 2016; Roberts, 2017). In this study, the aim was to find out the relationship between disability levels and mental states of patients diagnosed with MS. We think that our findings will contribute to the planning and implementation of the care of patients with MS, thereby increasing the diversity and functionality of the mechanisms of the patients to cope with the disease and reducing their clinical symptoms.

Research Questions: In this study, answers are sought to the following fundamental questions:

1. What are the levels of disability of MS patients?
2. What are the mental states that occur with MS patients?
3. Are disability levels and mental states of MS patients correlated?

Method

The aim of the study: This research aimed to determine the relationship between disability

levels and psychological states of Multiple Sclerosis patients.

Type of the Research: This descriptive, cross-sectional and correlational study was held between December 2017 and May 2018.

Population and Sample of the Research: The study population comprised 185 MS patients being followed up in the neurology outpatient clinic of a training and research hospital in Istanbul. The study sample consisted of 117 patients who attended follow-up visits in the neurology outpatient clinic between the specified dates and volunteered to participate in the study.

Inclusion criteria were as follows; diagnosis of MS (According to McDonald criteria (2017)) at least one year ago, no other severe chronic or psychological disorders, aged 18 years and older, no communication dysfunction and being open to cooperating and participating in the research.

Data Collection Tools

Personal Information Form, BDQ, BSI and EDSS were used in data collection.

Personal Information Form: This form included 10 questions determining medical history and sociodemographic features such as age, sex, marital status, current residence, educational background and employment status of the MS patients.

Brief Disability Questionnaire (BDQ): Developed by the World Health Organization (WHO) and the Turkish validity-reliability study conducted by Kaplan (1995) evaluates physical and social disability. Disability in a triple Likert scale consisting of a total of 11 questions is scored by the patient as 0 (none), 1 (sometimes or a little) or 2 (always or quite). Total points gave the total disability score. The total score varied between 0 and 22 and was evaluated as follows: (0-4= no disability), (5-7= mild disability), (8-12= moderate disability), (13 points and above =severe disability). The Cronbach's Alpha value of Brief Disability Questionnaire was 0.91 in this research.

Brief Symptom Inventory (BSI): The inventory which was developed by Derogotis (1992) is a Likert-type scale consisting of 53 items and scored between 0 and 4 points. The Turkish adaptation of the BSI, which was developed to determine some multi-dimensional psychological symptoms, was performed by Sahin and Durak (1994). Individuals were asked to mark one of

the options: 0: not at all, 1: a little bit, 2: moderately, 3: quite a bit and 4: extremely. Total point distribution is between 0 and 212. The higher the total scale score, the more common that symptom is seen in the individual. The BSI consisted of five subscales identified as; “anxiety”, “depression”, “interpersonal sensitivity”, “somatization” and “hostility”. The Cronbach’s Alpha internal consistency coefficients of the BSI were found to be 0.89 for the anxiety, depression and somatization subscales and 0.80 for the interpersonal sensitivity and hostility sub-scales.

Expanded Disability Stade Scale (EDSS): It is the most widely used scale for evaluating MS patients disability in clinic. The patients score between 0 and 10 according to this scale and the higher the scores, the higher the degree of disability. A range of 0-1.5 points indicates mild disability, 2-3.5 points indicates moderate disability, 6-7.5 points indicates severe disability, 8-9.5 points indicates severe disability, and 10 points indicates death.

Data Analysis: The data were analyzed using IBM SPSS Statistics version 20.0 (IBM Corp, Armonk, NY). The results of Kolmogorov–Smirnov test to assess whether the data were normally distributed indicated nonnormal distribution. Descriptive data were analyzed using number, percentage, mean, and standard deviation. Mann–Whitney U test and Kruskal–Wallis test were used in comparisons of scale items; Spearman correlation analysis was used to evaluate the relationships between scales; and Cronbach’s alpha coefficient was used to calculate the reliability coefficients of the scales.

Ethics: Before the study, approval was obtained from the Marmara University Clinical Trials Ethics Committee (number 09.2017.666, dated November 03, 2017) and institutional permission was obtained from the hospital where the study was conducted.

Results

The patients in the study sample had a mean age of 37.44 ± 10.64 years, 71.8% were female, 61.5% were married, 54.7% were not working, 81.2% perceived their economic level as medium, 78.6% did not smoke, and 86.3% did not use alcohol. Mean time since MS diagnosis was 8.44 ± 6.66 years and EDSS scores mean were 2.50 ± 1.80 . (Table 1).

The patients participating in the study, total BDQ scores mean was (9.09 ± 5.87) and 36.8% of them have moderate disability; BSI anxiety subscale was determined as (11.47 ± 9.18) , depression subscale was (14.25 ± 9.72) , ne interpersonal sensitivity was (8.14 ± 7.69) , somatization subscale was (8.75 ± 6.24) , hostility subscale was (5.22 ± 4.50) and scale total score mean was (47.84 ± 33.11) (Table 2).

When the relationship between BDQ and BSI mean scores were examined (Table 2); there was a positive relationship between the mean scores of BDQ and subscales of anxiety, depression, interpersonal sensitivity, somatization, hostility and total scores of both scales ($p < 0.05$).

When the mean scale scores of the patients participating in this study were compared in terms of their sociodemographic characteristics, a statistically significant difference was found ($p < 0.05$) between the mean total BDQ scores of the groups in terms of years of disease diagnosis, EDSS score, marital status, employment status and alcohol consumption status. BSI mean depression subscale scores were statistically significantly different between the groups in terms of income level and alcohol consumption status ($p < 0.05$). BSI mean somatization subscale scores were statistically significantly different between the groups in terms of gender, and BSI mean hostility subscale scores in terms of income level and alcohol consumption status ($p < 0.05$) (Table 3). The mean total BDQ scores of patients diagnosed with MS for 11 years or more were higher than patients diagnosed with MS for 1-5 years; mean total BDQ scores of patients with high EDSS scores were higher than patients with low EDSS scores. The mean total BDQ scores of married patients were higher than single patients; and unemployed patients were found to have higher BDQ scale scores than employed patients; mean total BDQ scores of the patients using alcohol were higher than those who did not use alcohol. It was determined that patients with moderate income levels had higher mean depression scores than patients with high income levels, and mean depression scores of patients using alcohol were higher than those who did not use alcohol. The mean somatization scores of women were higher than the men; the patients with moderate income levels had higher mean hostility scores than patients with high income levels; and patients using alcohol were found to have higher mean hostility scores than those who did not use alcohol.

Table 1. Sociodemographic Characteristics of the Patients

Characteristics	Number	%
Gender		
Female	84	71.8
Male	33	28.2
Duration of the Disease(years)		
1-5	51	43.6
6-10	29	24.8
≥11	37	31.6
EDSS Score		
0-1.5	49	41.9
2-3.5	38	32.5
4-5.5	23	19.6
6-7.5	7	6.0
Marital Status		
Married	72	61.5
Single	45	38.5
Education Level		
Primary School Graduate	24	20.5
High School Graduate	44	37.6
University Graduate	49	41.9
Place of Residence		
Village/Town	-	-
Province	117	100.0
Working Status		
Working	53	45.3
Non-working	64	54.7
Perception of Income Level		
Good	20	17.1
Medium	95	81.2
Poor	2	1.7
Smokes		
Yes	25	21.4
No	92	78.6
Drink Alcohol		
Yes	16	13.7
No	101	86.3
		Mean±SD
Age		37.44±10.64
Duration of the Disease		8.44±6.66
EDSS Score		2.50±1.80

Table 2. Correlations between the Patients' BDQ and BSI Scores

Scales		Min-Max	Mean± SD	BDQ	
BDQ	Total	0-22	9.09±5.87	-	-
	Anxiety	0-38	11.47±9.18	r=0.318**	p<0.00
	Depression	0-41	14.25±9.72	r=0.416**	p<0.00
BSI	Interpersonal Sensitivity	0-32	8.14±7.69	r=0.312**	p<0.00
	Somatization	0-27	8.75±6.24	r=0.368**	p<0.00
	Hostility	0-20	5.22±4.50	r=0.261**	p<0.00
	Total	0-132	47.84±33.11	r=0.388**	p<0.00

**p<0.001

Table 3. Comparison of Patients' Mean BDQ and BSI Scores According to Sociodemographic Characteristics

Characteristic	BDQ $\bar{x} \pm SD$	BSI				
		Anxiety $\bar{x} \pm SD$	Depression $\bar{x} \pm SD$	Interpersonal Sensitivity $\bar{x} \pm SD$	Somatization $\bar{x} \pm SD$	Hostility $\bar{x} \pm SD$
Gender						
Female	9.55±6.14	11.61±8.85	15.01±9.76	9.01±8.72	9.44±6.33	6.92±5.08
Male	7.81±5.00	11.12±10.11	12.33±9.50	7.42±6.90	7.00±5.78	7.42±6.25
Test	U: 1176.500 p:0.203	U: 1277.000 p:0.509	U:1171.500 p:0.193	U:1235.500 p:0.361	U:1056.000 p:0.045*	U:1370.000 p:0.923
Duration of the Disease (years)						
1-5 ⁽¹⁾	6.74±5.46	12.03±10.35	13.88±9.51	8.72±9.21	9.19±7.00	6.94±5.33
6-10 ⁽²⁾	9.72±5.51	12.68±9.59	16.48±11.95	9.75±8.40	8.41±5.57	8.51±6.86
≥11 ⁽³⁾	11.75±5.53	9.72±6.81	13.02±7.86	7.40±6.62	8.40±5.73	6.08±3.92
Test	X²: 17.893 p:0.000** 1<3	X ² :0.979 p:0.613	X ² :0.851 p:0.653	X ² :1.046 p:0.593	X ² :0.056 p:0.972	X ² :1.134 p:0.567
EDSS Score						
0-1.5 ⁽¹⁾	4.89±3.60	10.71±9.96	12.88±10.42	7.31±8.11	7.67±6.2	5.96±5.14
2-3.5 ⁽²⁾	10.21±4.88	12.21±9.3	14.71±9.9	9.34±8.21	10±6.54	7.97±5.65
4-5.5 ⁽³⁾	13.86±4.99	12.09±8.35	16.96±8.92	10.3±8.44	9.09±5.96	8.52±5.78
6-7.5 ⁽⁴⁾	16.28±5.02	10.71±6.02	12.57±3.78	7.43±9.07	8.43±5.77	5±2.58
Test	X²:51.968 p:0.000** 1<2. 1<3. 1<4. 2<3 2<4. 3<4	X ² :1.256 p:0.481	X ² :3.658 p:0.183	X ² :3.100 p:0.212	X ² :2.236 p:0.352	X ² :3.984 p:0.125
Marital status						
Married	9.97±5.59	11.51±8.87	14.13±10.13	8.55±7.79	9.34±6.00	7.20±5.16
Single	7.62±6.08	11.40±9.76	14.44±9.12	8.57±9.02	7.80±6.57	6.82±5.82
Test	U: 1184.000 p: 0.014*	U: 1553.000 p:0.707	U:1562.000 p:0.745	U:1528.000 p:0.605	U:1339.500 p:0.115	U:1454.000 p:0.351
Education Level						
Primary	10.50±5.86	11.87±7.89	14.58±7.14	9.08±8.52	10.54±7.09	8.08±4.96

school	9.59±5.17	10.43±8.13	13.56±8.13	8.50±7.10	8.86±5.59	6.68±4.30
High school	7.89±6.34	12.20±10.63	14.71±11.99	8.36±9.18	7.77±6.29	6.89±6.44
University	X ² : 6.907 p: 0.075	X ² : 0.751 p:0.687	X ² :0.775 p:0.679	X ² : 1.126 p:0.569	X ² : 3.312 p:0.191	X ² : 3.100 p:0.212
Test						
Working Status						
Working	7.75±5.19	13.24±11.26	15.18±11.19	9.90±8.84	8.88±6.81	8.07±6.17
Non-working	10.15±6.21	10.00±6.76	13.48±8.32	7.45±7.61	8.64±5.78	6.21±4.55
Test	t: 2.239 p: 0.027***	t:1.841 p:0.069	t:0.943 p:0.361	t:1.611 p:0.110	t:0.211 p:0.833	t:1.817 p:0.072
Perception of Income Level						
Good ⁽¹⁾	7.60±6.23	9.25±9.27	10.25±9.17	6.10±7.92	7.25±6.11	4.75±4.70
Medium ⁽²⁾	9.40±5.77	11.97±9.21	15.07±9.76	9.07±8.33	9.14±6.29	7.60±5.47
Poor ⁽³⁾	8.00±8.48	9.50±4.94	15.50±3.53	9.00±5.65	5.00±2.82	4.50±2.12
Test	X ² : 2.206 p:0.332	X ² : 2.474 p:0.290	X²: 6.312 p:0.043** 1<2	X ² : 3.678 p:0.159	X ² : 2.477 p:0.290	X²: 6.384 p:0.041** 1<2
Smokes						
Yes	9.11±6.09	10.35±7.88	13.75±9.24	7.90±8.02	8.36±5.95	6.96±5.30
No	8.88±5.09	15.56±12.22	16.12±11.33	11.00±8.78	10.16±7.19	7.40±5.88
Test	U: 1131.000 p: 0.899	U: 890.000 p:0.083	U: 1035.500 p:0.446	U: 891.000 p:0.084	U: 999.000 p:0.315	U: 1081.500 p:0.648
Drinks alcohol						
Yes	9.63±5.90	11.82±9.16	14.74±9.27	8.58±7.99	9.16±6.22	7.40±5.52
No	5.50±4.30	9.25±9.27	11.18±12.08	8.43±10.01	6.12±5.89	4.56±3.88
Test	U: 436.500 p:0.003*	U: 623.000 p:0.142	U: 548.500 p:0.039*	U: 744.500 p:0.613	U: 564.000 p:0.053	U: 560.500 p:0.050*

*:Mann Whitney U Test, **:Kruskal Wallis Test, ***:Independet Sample t Test

Discussion

In this study the mean BDQ scores of the patients participating in the study were (9.09 ± 5.87), 36.8% of them were found to have moderate disability. In the study of Dahl et al. (2009) MS patients were found to have moderate disability, whereas in the study conducted by Motl et al. (2009) MS patients were reported to experience mild to moderate disability. In Multiple Sclerosis, with the damage of CNS, patients suffer from different degrees of disability and it is observed that the disability of patients increase as the years of diagnosis increase (Turkish Neurology Association, 2018). It is possible to state that the year of diagnosis of patients

participating in this study may affect their disability.

The mean EDSS scores of the patients participating in the study were (2.50 ± 1.80). While the disability level of the patients were measured in the clinic with EDSS score, we measured the disability status with the BDQ scale. According to the results of the mean EDSS scores of the patients have mild disability, the mean BDQ scores of the patients have moderate disability. From this results, we wanted to draw attention to the patients' ability to evaluate themselves and their level of awareness about themselves. According to this results, patients evaluate their disability more severely.

In this study the mean total BSI scores of the patients were found as (47.84 ± 33.11) , and when the mean subscale scores were examined, it was observed that the patients had highest mean scores of depression, anxiety, somatization, negative self-concept and hostility, respectively. According to the mean scores obtained, it was found that patients' moods were affected and they showed particularly high levels of depression symptoms. These findings are similar to those of previous studies in the literature. In a study comparing the mental states of patients diagnosed with MS and the healthy population, symptoms of depression, anxiety, somatization and negative self-concept were found to be significantly higher in MS patients (Shamsaei, Cheraghi, Salavati, & Rezaie, 2015). Similarly, in a study conducted in our country it was reported that MS patients had higher symptoms of depression than the healthy population (Boeschoten et al., 2017). These findings show that MS patients are in risk group in terms of mental problems. In the study conducted by Seki Oz (2019), while depression was most common in MS patients, anxiety and negative self-concept ranked just below. In a study conducted outside Turkey, it was found that in MS patients symptoms of depression and anxiety are most commonly observed (Panda, Das, Srivastava, Ratnam, & Sharma, 2018). Considering these studies conducted in different cultures and regions, it can be said that cultural differences, living conditions and the environment has an effect on the mental state of the individual. In addition, it was stated that factors such as disability, inability to work, and lack/absence of social support that occur due to the disease may be effective in the emergence of depression (Marrie, 2015).

When the relationship between mean BDQ and BSI scores was examined a significant positive correlation was found between mean BDQ score and anxiety, depression, interpersonal sensitivity, somatization, hostility subscales, as well as the mean total scores of both scales. This shows that as the patient's disability level increases, the severity of her/his mental symptoms increases. Although there are no studies conducted directly on this subject in our country, similar studies have shown that MS patients with higher disability have higher levels of depression than patients with lower disability (Tuncay, Kaygısız, Borman, Kurt, & Ergun, 2017). When the studies conducted outside Turkey were examined, it was

found that MS patients with high levels of disability had higher levels of depression and anxiety, which is in line with our study data (Askari, Ghajarzadeh, Mohammadifar, Azimi, Sahraian, & Owji, 2014; Jones, & Amtmann 2015; Sabanagić-Hajrić, Suljić, & Sulejmanpasić-Arslanagić, 2016). In the study of Jones et al. (2014), it was indicated that MS patients experienced depression the most, and that depression symptoms of the patients increased due to the increase in disability. Although disability does not immediately develop at the moment patients become ill, they may experience intense anxiety and stress like patients who develop disability as a result of future complications. With the disabilities that develop with the disease, problems such as feelings of worthlessness, lower self-esteem and loneliness also emerge. Related to all these problems, the incidence of mental disorders increases during the disease process (Newsome et al., 2017; Boeschoten et al., 2017). In this study, results that are in line with the literature were obtained and it was determined that as the disability of patients increased, the severity of mental problems increased. We believe that this data is an important finding in planning the care to be given to the patients.

In our study symptoms of somatization were higher in female patients. In the study conducted on MS patients by Seki Oz (2019), symptoms of somatization were higher as well in female patients. Considering the family structure in our country, it is generally women who assume the responsibility of taking care of family members. In case the woman is ill, the care given to family members suffers, as a result of which domestic problems begin, leading to divorces. It is thought that female patients resort to somatization more in order to obtain secondary gain from being ill and to keep themselves at the center of attention, as feelings of inadequacy and fear of abandonment increase in these patients due to domestic problems. It is also indicated that somatization is a behavior that women commonly utilize as a form of self-expression (Turkles, Yılmaz, Ozcan, Oncu, & Karatas, 2013).

It has been shown that the level of disability experienced increases as the duration of the disease increases. In the study conducted by Ytterberg et al. (2008) it was determined that the disability levels of MS patients increased as the years of disease increased. With the increase of

the years of disease, the complications developing in the patients increase as well as their disability levels. From the moment the disease is diagnosed, the level of independence of the patient can be increased and the complications that may develop can be reduced through the care given to the patient with a multidisciplinary team approach (Roberts, 2017). Disability levels of married patients were found to be higher. In the study conducted by Motl et al. (2009) MS patients with high disability were found to live with their family. Due to increasing disability the person requires social support during her/his illness. It is also noted that with the presence of social support, the risk of mortality in patients decreases, and there is an improvement in healing and health behaviors (Roberts, 2017).

Disability levels of unemployed patients were found to be higher. In the study of Brooks et al. (2013), it was reported that MS patients quit working and their quality of life was negatively affected due to disability. Depression and hostility levels were observed to be higher as the income level decreased. Balance of income and expenses changes as the person's working life is impacted (Brooks et al., 2013). It is possible to claim that adverse conditions such as deterioration in work performance, job loss, feelings of becoming a burden and guilt cause depression and hostility in MS patients.

Disability levels of patients using alcohol were found to be higher. In the study conducted on MS patients by Gedizlioglu et al. (2010), it was found that smoking was twice higher in MS patients than in the normal population, and disability scores were higher in smoking patients. Besides, depression and hostility levels of patients using alcohol were found to be higher. It has been reported that the substance use disorder that we observe among the mental problems encountered by MS patients is a means patients resort to in order to deal with the complications caused by the disease (Boeschoten et al., 2017). Alcohol/substance use is high among patients as they resort to it to cope with depression and hostility caused by having a chronic and ambiguous disease at young age, the perceived social stigma for chronic diseases and the feeling of injustice resulting from having a severe disease (Boeschoten et al., 2017; Roberts, 2017). Nurses can train the patients on effective coping methods and plan occupational activities in order for them to overcome adversities and increase

their psychological resilience (Roberts, 2017). As a result, patients can be more able to cope with the disease effectively and mental problems can be reduced.

Conclusion: In this study found that patients suffered from moderate levels of disabilities and had depression, anxiety, somatization, interpersonal sensitivity and hostility symptoms. There was a positive relationship between disability levels and the psychological states of the patients.

This study shows that MS patients are in the risky group in terms of psychiatric problems. Nurses, who communicate with patients constantly, should understand that these patients are a high-risk group with regards to psychological disorders. Nurses may be advised to take prevention of mental health measures for their patients at an early stage. They should provide the necessary guidance for these issues from the first encounter with MS patients. In addition, MS patients can be trained about the disease process, possible complications and effective coping methods. Adjustments to patients' living conditions, home environment, and daily life activities can be made to facilitate adaptation to their current circumstances.

Acknowledgements: The authors have no substantial direct or indirect commercial financial incentive associated with publishing the article, and the manuscript or portions thereof are not under consideration by another journal and have not been previously published. The authors are deeply grateful to the participants for their cooperation. We confirm that all the listed authors meet the authorship criteria and that all the authors are in agreement concerning the content of the manuscript.

References

- Askari, F., Ghajarzadeh, M., Mohammadifar, M., Azimi, A., Sahraian, M.A., & Owji, M. (2014). Anxiety in patients with Multiple Sclerosis: Association with disability, depression, disease type and sex. *Acta Medica Iranica*, 52(12):889-92.
- Boeschoten, R.E., Braamse, A.M.J., Beekman, A.T.F., Cuijpers, P., van Oppen, P., ... Uitdehaag B.M.J. (2017). Prevalence of depression and anxiety in Multiple Sclerosis: A systematic review and meta-analysis. *Journal of the Neurological Sciences*, 372:331-341. doi:10.1016/j.jns.2016.11.067

- Brooks, B.R., Crumacker, D., Fellus, J., Kantor, D., & Kaye, R.E. (2013). PRISM: a novel research tool to assess the prevalence of pseudobulbar affect symptoms across neurological conditions. *PLoS One*, 8(8), e72232. doi: 10.1371/journal.pone.0072232
- Dahl, O.P., Stordal, E., Lydersen, S., & Midgard, R. (2009). Anxiety and depression in Multiple Sclerosis. a comparative population based study in Nord, Trøndelag County, Norway. *Multiple sclerosis*, 15(12):1495-1501. doi:10.1177/1352458509351542
- Derogatis, L.R. (1992). The Brief Symptom Inventory (BSI) administration, scoring and procedures manual-II. Baltimore, MD: Clinical Psychometric Research Inc. 2:217-48.
- Gezizlioglu, M., Çe, P., & Ekmen, D. (2010). Cigarette smoking in Multiple Sclerosis and its impact on the disability. *Turkish Journal of Neurology*, 16:27-30.
- Hyphantis, N.T., Christou, K., Kontoudoki, S., Mantas, C., Papamicheal, G., Mavreas, V. (2008). Disability status, disease parameters, defense styles and ego strength associated with psychiatric complications of Multiple Sclerosis. *The International Journal of Psychiatry in Medicine*, 38:307-327. doi: 10.2190/PM.38.3.g
- Jones, K.H., Jones, P.A., Middleton, R.M., Ford, D.V., Tuite-Dalton, K., ... Noble, J.G. (2014). Physical disability, anxiety and depression in people with MS: An internet-based survey via the UK MS register. *Plos One*, 9:1-9. doi:10.1371/journal.pone.0104604
- Jones, S.M., & Amtmann, D. (2015). The relationship of age, function and psychological distress in Multiple Sclerosis. *Psychology, Health & Medicine*, 20(6):629–34. doi:10.1080/13548506.2014.979209
- Kaplan, İ. (1995). Mental disorders and disability in a primary health care clinic in semi-rural area. *Turkish Journal of Psychiatry*, 6:169-79.
- Marrie, R.A., Reingold, S., Cohen, J., Stuve, O., Trojano, M., ... Reider, N. (2015). The incidence and prevalence of psychiatric disorders in multiple sclerosis: a systematic review. *Multiple Sclerosis*, 21(3):305–317. doi:10.1177/1352458514564487
- Motl, R.W., & McAuley, E. (2009). Pathways between physical activity and quality of life in adults with Multiple Sclerosis. *Health Psychology*, 28(6):682-689. doi:10.1037/a0015985
- Newsome, S.D., Aliotta, P.J., Bainbridge, J., Bennett, S.E., Cutter, G., Fenton, K., ... Jones, D.E. (2017). Framework of Care in Multiple Sclerosis, Part 2: Symptomatic Care and Beyond. *International Journal of MS Care*, 19(1):42–56. doi:10.7224/1537-2073.2016-062
- Panda, S.P., Das, R.C., Srivastava, K., Ratnam, A., & Sharma, N. (2018). Psychiatric comorbidity in Multiple Sclerosis. *Neurologia i Neurochirurgia Polska*, 52(6):704-709. doi:10.1016/j.pjnns.2018.09.003
- Roberts, M. (2017). An overview of Multiple Sclerosis and its holistic management. *Nursing Times*. 113(1):19-23.
- Sabanagić-Hajrić, S., Suljić, E., & Sulejmanpasić-Arslanagić, G. (2016). Depression during Multiple Sclerosis relapse: relation to disability and relapse severity. *Medicinski Glasnik*, 13(1):44-49. doi: 10.17392/839-16
- Sahin, N.H., & Durak, A. (1994). Brief Symptom Inventory adapted for Turkish youth. *Turkish Journal of Psychiatry*, 9:44-56.
- Seki, Oz, H., & Oz, F. (2019). The coping methods for stress of Multiple Sclerosis patients and the related psychiatric symptoms. *Journal of Psychiatric Nursing*, 10:251-261. doi:10.14744/phd.2019.19970
- Shamsaei, F., Cheraghi, F., Salavati, M., & Rezaie, A.A. (2015). Comparison of psychological symptoms of patients with Multiple Sclerosis and healthy people. *Neurology Asia*, 20:269–274.
- Thompson, A.J., Banwell, B.L., Barkhof, F., Carroll, W.M., Coetzee, T., ... Cohen, J.A. (2018). Diagnosis of Multiple Sclerosis: 2017 revisions of the McDonald criteria. *The Lancet Neurology*, 17(2):162-273. doi: 10.1016/S1474-4422(17)30470-2
- Tulek, Z. (2016). Multiple Sclerosis and nursing care. *Turkish Clinics Internal Medicine Nursing-Special Topics*, 2(2), 26-36.
- Tuncay, F., Kaygısız, F., Borman, P., Kurt, E.E., & Ergun, U. (2017). Quality of life in patients with Multiple Sclerosis: Relationship with clinical variables. *Turkish Journal of Physical Medicine and Rehabilitation*, 20(1):16-23.
- Turkish Neurology Association. (2018). MS Diagnosis and treatment guide. [cited 2020 May 01]. Retrieved from: https://www.noroloji.org.tr/TNDDData/Uploads/files/MS_tan%C4%B1%20ve%20tedavi%202018.pdf
- Turkles, S., Yilmaz, M., Ozcan, A., Oncu, E., & Karatas, B.(2013). Factors affecting mental health and family functions of women.

Journal of Anatolia Nursing and Health Sciences, 16(3):154-163.
Ytterberg, C., Johansson, S., Gottberg, K., Holmqvist, L.W., & von Koch, L. (2008).

Perceived needs and satisfaction with care in people with multiple sclerosis; A –two-year study. *BMC Neurology*, 8:36.
doi:10.1186/1471-2377-8-36