

# A Psychoeducation Program for Stress Management and Psychosocial Problems in Multiple Sclerosis

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## ABSTRACT

**Background:** Multiple Sclerosis (MS) patients should cope effectively with problems of life and with problems originating from the disease. This is important because it affects the course of the disease, psychiatric morbidity, and quality of life. **Objective:** This study was carried out as an intervention design with a control group to assess the effects of psychoeducation on MS patients' ways of coping with stress, psychiatric symptoms, and qualities of life. **Subjects and Methods:** A total of 80 MS patients affiliated with the MS Association of Turkey were included and randomly assigned into intervention and control groups. An 8-week psychoeducation program was offered to the intervention group, whereas the control group was not given any treatment during the same period. Data were collected using a Descriptive Information Form, the Ways of Coping Inventory, the Brief Symptom Inventory, and the MS Quality of Life-54 scale. **Results:** Based on the study, among the ways of coping with stress, problem-focused approach increased, whereas the emotional-focused approach decreased statistically significantly in the intervention group. Among the psychiatric symptoms, the levels of anxiety, depression, and somatization decreased. However, there was no significant change in the negative self-concept and hostility symptoms. The total quality-of-life scores increased significantly ( $P < 0.05$ ). In the intervention group, these effects continued in the three-month-follow-up measurement. The control group showed no statistically significant change in the same parameters during the same periods. It is recommended that group psychoeducation programs should be carried out extensively in order for MS patients to cope with stress effectively and improve their mental health and quality of life.

**KEYWORDS:** Coping with stress, multiple sclerosis, psychiatric symptoms, psychoeducation, quality of life

**Received:**  
06-Dec-2019;  
**Revision:**  
05-Feb-2020;  
**Accepted:**  
16-May-2020;  
**Published:**  
21-Nov-2020

## INTRODUCTION

Multiple sclerosis (MS) is a chronic disease that frequently occurs in the adolescent period. The symptoms that arise due to inflammation and demyelination in the central nervous system in MS differ depending upon the disease involvement, and adversely affect all areas of the individual's life, such as fatigue, pain, sensory, motor, and cognitive problems.<sup>[1,2]</sup>

It has been found that stress is an effective factor on the emergence and course of the disease.<sup>[3-6]</sup> In a study, 47.4% of the patients who were recently diagnosed with MS stated that their initial attacks were triggered


by stress, and 39% of those in the postdiagnosis period stated that the attacks they experienced were triggered by stress.<sup>[3]</sup> In a prospective study, stressful events of life were found to increase the risk of attack by 2.2 times.<sup>[4]</sup> It is important for these patients to cope effectively with stress because stress load increases with the disease, and negatively affects the progression of the disorder.

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**How to cite this article:** Öz H, Öz F. A psychoeducation program for stress management and psychosocial problems in multiple sclerosis. Niger J Clin Pract 2020;23:1598-606.

Access this article online	
<b>Quick Response Code:</b>	<b>Website:</b> www.njcponline.com
	<b>DOI:</b> 10.4103/njcp.njcp_462_19

In a study, patients who were recently diagnosed with MS were found not to be able to cope effectively with their problems compared to healthy individuals and that their coping levels decreased even more after 5 years.<sup>[7]</sup> In another study, these patients were found not to use effective methods for coping and that the resulting depression was associated with ineffective coping.<sup>[8]</sup>

Depression is the most common psychiatric symptom occurring during the course of MS and is seen in 15%–47% of patients.<sup>[9,10]</sup> The presence of depression negatively affects the patient's perception of and coping with stressful life events, and can accelerate the progression of the disease.<sup>[8]</sup> A study has revealed that depression is more prevalent in young, unemployed, highly educated, and single patients.<sup>[11]</sup> It has been reported in a systematic review that MS patients have psychiatric disorders such as anxiety, bipolar disorder, psychosis, and alcohol and substance abuse in addition to depression.<sup>[10]</sup>

Myriad etiological factors may contribute to the etiology of psychiatric symptoms in MS including biological mechanisms (e.g. hippocampal microglial activation, lesion burden, and regional atrophy), as well as stressors, threats, and losses that accompany life with an unpredictable and often disabling disease.<sup>[12]</sup> From the standpoint of clinical practice, psychiatric comorbidity is known to be associated with poorer quality of life in MS patients.<sup>[13]</sup> Increased mobility problems, disease symptoms, and cognitive losses in conjunction with psychiatric problems lead to a decrease in the quality of life of patients and an increase in psychosocial problems.<sup>[14-17]</sup> In a study, fatigue was found to be positively correlated with disability and depression and to worsen patients' quality of life.<sup>[14]</sup> In another study, the quality of life of MS patients have been found to be poorer than that of healthy individuals, and factors affecting it have been found to include depression, handicap, fatigue, and deterioration in sleep quality.<sup>[15]</sup> It has been emphasized in a study that depression is decisive in the mental perception dimension of quality of life and that the presence of depression should be investigated particularly in such patients.<sup>[18-20]</sup>

Patients diagnosed with MS should cope effectively with problems of life and with problems originating from the disease, and they should get stronger. One of the methods to be used for strengthening patients in this context is group psychoeducation.<sup>[21]</sup> When the literature was examined, it was seen that significantly positive changes had been achieved in the parameters measured after psychoeducation sessions and group interventions administered to patients with MS.<sup>[22-27]</sup> The aim in this study was to evaluate the effect of a group

psychoeducation program offered to patients diagnosed with MS on the way the patients cope with stress, their psychiatric symptoms, and their quality of life.

## MATERIALS AND METHOD

### Participants

The research population consisted of the patients affiliated with the Ankara Branch of the Multiple Sclerosis Association of Turkey. At the beginning of the study, information about patients was taken from the MS association, and a SMS message was sent to 321 registered patients, informing them about the study. Preliminary interviews were conducted with 96 patients who were willing to participate in the study. The researchers interviewed the patients face-to-face and assessed them in terms of the criteria for inclusion in the study (explained below). A total of 89 patients met the criteria for inclusion in the study. The inclusion criteria of the study were to have a definite diagnosis of MS (McDonald Criteria),<sup>[28]</sup> to be willing to participate in the study, not to have a psychiatric diagnosis (medical reports and patient statements were reviewed), not to be involved in a different support group, to be literate, to be between 18 and 65 years old, and to have an Expanded Disability Status Scale (EDSS)<sup>[29]</sup> score assigned by a neurologist (medical reports were checked; the participants had to have an EDSS score). EDSS is a method of quantifying disability in multiple sclerosis and monitoring changes in the level of disability over time. It is widely used in clinical trials and in the assessment of people with MS.<sup>[29]</sup> Simple randomization method was used in order to equally distribute 89 patients to the intervention and control groups. Randomization was performed using the method from the "Random.org" site. Accordingly, 45 patients were assigned to the intervention group, and 44 patients were assigned to the control group. Five patients in the intervention group who did not attend the sessions regularly, and four patients in the control group who could not be reached during the repeated measures were not included in the study. Thus, the study was completed with a total of 80 patients — 40 in the intervention group and 40 in the control group.

### Data collection instruments

#### *Descriptive information form*

This form included questions about variables such as age, gender, marital status, educational status, employment status, income status, the duration of the disease, the medications used for disease treatment, and the presence of comorbidities.

#### *Ways of coping inventory (WCI)*

WCI was developed by Folkman and Lazarus in 1984.

The scale consists of 30 four-point Likert-type items. The validity and reliability study of the scale in Turkey was carried out by Şahin and Durak.<sup>[30]</sup> The scores on the scale are not evaluated according to a total score but rather based on total scores on each individual subscale. A high total score on a subscale means that the specific approach addressed in that subscale is used more often. The internal reliability coefficients calculated for the sub-scales of the WCI consisting of 5 sub-scales were  $\alpha = 0.68$  for the optimistic approach,  $\alpha = 0.80$  for the self-confident approach,  $\alpha = 0.73$  for the helpless approach,  $\alpha = 0.70$  for the submissive approach, and  $\alpha = 0.47$  for seeking of social support. If the sub-scales in the scale are divided into two groups, the problem-focused approaches consist of self-confident, optimistic, and seeking of social support approaches, and emotion-focused approaches are composed of helpless and submissive approaches.

### Brief symptom inventory (BSI)

BSI was developed by Derogatis in 1992, and its validity and reliability in Turkey was tested by Şahin and Durak.<sup>[31]</sup> BSI is a multidimensional scale for screening psychiatric symptoms developed to identify certain psychological symptoms. The scale is composed of 53 four-point Likert-type items. For the 5 subscales of BSI, answers given to the questions of each subscale are rated and summed to calculate the score of that subscale. In addition, the scores on all questions are summed to calculate the total score of the scale. One can score between 0 and 212 on the scale, and it does not have any predefined, standard cut-off point. Higher total scores are interpreted as that the individual has that symptom more predominantly. The internal reliability coefficients calculated for the sub-scales of BSI were found to be  $\alpha = 0.87$  for anxiety,  $\alpha = 0.88$  for depression,  $\alpha = 0.87$  for negative self-concept,  $\alpha = 0.75$  for somatization, and  $\alpha = 0.76$  for hostility.

### Multiple sclerosis quality of life 54 scale (MSQOL-54)

MSQOL-54 was developed by Vickrey *et al.* in 1995. The validity and reliability study of the scale in the Turkish society was carried out by Idiman *et al.*<sup>[32]</sup> MSQOL-54 consists of two main groups (composite physical health and composite mental health), 12 subgroups and two independent items. In this study, the internal consistency was found to be quite high, similar to the original study, as. 89 for the composite mental health.,94 for the composite physical health.

### Implementation of the study

The study was implemented as four separate 120-min sessions in a group psychoeducation program for 8 weeks between 11/16/2016 and 01/27/2017 in the meeting room of the MS Association. The measurement

instruments were administered at the beginning of the first session, at the end of the last session, and at the three-month follow-up between 04/04/2017 and 04/21/2017. All instrument forms were filled out by the patients personally.

The psychoeducation program was developed by the researchers. It had not been used in any other program/research study before. The content of the sessions of the psychoeducation program was created based on the current literature about MS and the current knowledge on the cognitive behavioral approach.

The group psychoeducation sessions were created in the context of each session's subject, overall goal, objectives, and instructional methods. The following are the subjects of the sessions:

Session 1	Getting to know each other, introduction of the program, and creating group consciousness
Session 2	General information about MS, the perception of the disease, and adaptation to the disease
Session 3	Symptom management, fight against fatigue, and effective time/energy management,
Session 4	The concept of stress, cognitive processes, and the importance of stress management in MS
Session 5	Coping with stress, and problem-focused and emotion-focused coping
Session 6	Coping with stress, effective communication, assertiveness, strengthening the perception of self
Session 7	The ability to manage uncertainty and improving the quality of life
Session 8	General evaluation and ending

### Ethical dimension of the study

Prior to the implementation of the study, in order to assess ethical compliance, the ethics committee permission was received from the Scientific Research Ethics Board of Hacettepe University, and the Turkish MS Association. Ethics committee is obtained at 13-July-2016. Verbal and written consent was also obtained from the patients who volunteered to participate in the study.

### Data analysis

The SPSS 21.0 statistical software program was used to analyze data. A *P* value of  $< 0.05$  was considered the acceptable significance level of the statistical tests. Means, standard deviations, and percentages were used for the presentation of the data. Two-way repeated measures analysis of variance was used to compare the mean scores on the WCI, BSI, and MSQOL-54 scales in pretest, posttest, and follow-up measurements of the patients. Bonferroni tests were conducted to do further analyses.

## RESULTS

Table 1 shows the socio-demographic characteristics of

the MS patients participating in the study. The mean age of the patients was 41.5 ( $\pm 10.6$ ) in the intervention group and 40.95 ( $\pm 8.6$ ) in the control group. Expanded Disability Status Score (EDSS) was 2.4 ( $\pm 1.8$ ) in the

intervention group and 3.07 ( $\pm 2.05$ ) in the control group. The mean number of years since diagnosis was 9 ( $\pm 5.05$ ) in the intervention group and 13 ( $\pm 5.51$ ) in the control group.

**Table 1: Distribution of the patients in the intervention and control groups according to sociodemographic characteristics (n=80)**

Variables	Subgroups	Intervention		Control		P
		n	Percentage	n	Percentage	
Age	30 or under	7	17.5	3	7.5	0.311
	31 or over	33	82.5	37	92.5	
EDSS	5 or under	32	80.0	28	70.0	0.181
	5.5 or over	8	20.0	12	30.0	
Number of years since diagnosis	10 or under	28	70.0	12	30.0	0.001*
	11 or over	12	30.0	28	70.0	
Gender	Female	29	75.5	28	70.0	0.999
	Male	11	27.5	12	30.0	
Educational Status	Elementary School	8	20.0	8	20.0	0.557
	High School	12	30.0	8	20.0	
	University and higher	20	50.0	24	60.0	
Marital Status	Single	12	45.0	13	32.5	0.359
	Married	28	55.0	27	67.5	
Employment Status	Employed	20	50.0	19	47.5	0.882
	Unemployed	11	27.5	13	32.5	
	Retired	9	22.5	8	20.0	
Economic Status	Income < Expenses	7	17.5	9	22.5	0.846
	Income=Expenses	25	62.5	23	57.5	
	Income > Expenses	8	20.0	8	20.0	
Medicine used	No medication	9	22.5	11	27.5	0.382
	Copaxone	2	5.0	0	.0	
	Gilenya	7	17.5	8	20.0	
	Interferon	22	55.0	21	52.5	

\*P<0.05

**Table 2: Distribution of WCI scores of the patients in the intervention and control groups according to measurements (n=80)**

WCI	Intervention Group				Control Group				P4
	Pretest X±SD	Posttest X±SD	Follow-up X±SD	P	Pretest X±SD	Posttest X±SD	Follow-up X±SD	P	
Self-Confident approach	2.01±0.64	2.35±0.50	2.32±0.50	P1=<.001* P2=<.001* P3=0.257	2.25±0.45	2.23±0.42	2.21±0.39	P1=0.852 P2=0.856 P3=0.780	.001*
Optimistic approach	1.86±0.60	2.16±0.47	2.08±0.46	P1=0.001* P2=0.004* P3=0.247	1.79±0.58	1.81±0.56	1.78±0.57	P1=0.762 P2=0.852 P3=0.880	.004*
Helpless approach	1.35±0.67	1.05±0.60	1.08±0.57	P1=0.001* P2=0.001* P3=0.110	1.28±0.53	1.24±0.50	1.39±0.54	P1=0.856 P2=0.156 P3=0.130	.001*
Submissive approach	1.13±0.60	.77±0.53	.79±0.52	P1=<.001* P2=<.001* P3=0.0450	1.19±0.52	1.15±0.49	1.20±0.52	P1=0.669 P2=0.980 P3=0.780	<.001*
Seeking of social support	1.81±0.63	2.08±0.36	2.06±0.41	P1=<.001* P2=<.001* P3=0.960	2.09±0.68	2.11±0.58	2.00±0.57	P1=0.408 P2=0.560 P3=0.230	.001*

P1: Comparison of the pretest and posttest, P2: Comparison of the pretest and follow-up, P3: Comparison of the posttest and follow-up, P4: Comparison of the difference between the intervention group and the control group. \*P < 0.05

In Table 2, the differences between the pretest and posttest, and between the pretest and follow-up (P1 and P2) in all sub-scales of WCI in the intervention group were statistically significant, whereas the difference between the posttest and follow-up (P3) was not statistically significant. In the control group, there was no statistically significant difference between any of the measurements made during the same period in the WCI sub-scales ( $P < 0.05$ ).

The difference between the two groups (P4) was also statistically significant when the levels of change in the pretest (P1), posttest (P2), and follow-up (P3) measurements of the patients in both groups were compared ( $P < 0.05$ ).

In Table 3, the distribution of the BSI scores of the patients in both groups was examined according to the measurements. The differences between the pretest and posttest scores, and between the pretest and follow-up scores (P1, P2) were statistically significant for anxiety, depression, somatization symptoms, and overall scale total of the patients in the intervention group, whereas the differences between pretest and posttest, between pretest and follow-up, and between posttest and follow-up (P1, P2, P3) were not statistically significant for the negative self-concept and hostility symptoms ( $P < 0.05$ ). In the control group, there was no statistically significant difference between these three measurements in any of the sub-scales of BSI and the scale total.

The difference between the two groups (P4) was also found to be statistically significant when the levels of change in anxiety, depression, somatization, and scale total from the pretest (P1) to the posttest (P2) and follow-up (P3) measurements of the patients in the intervention and control groups were compared ( $P < 0.05$ ).

Table 4 shows the distribution of the MSQOL-54 scores of the patients according to the measurements. The differences between the pretest and posttest and between the pretest and the follow-up in terms of physical and mental health total scores of the patients in the intervention group (P1, P2) were statistically significant ( $P < 0.001$ ). The difference between the posttest and follow-up scores in the same group (P3) was not statistically significant. There was no significant difference between any of the three measurements for the physical and mental health in the control group ( $P < 0.05$ ). When the difference of change in the physical and mental health total scores of the patients in the intervention and control groups was compared, the difference between the two groups was statistically significant (P4) ( $P < 0.05$ ).

Figures 1 and 2 show the distribution of the MSQOL-54 scores of the patients in the intervention and control groups according to sub-scales and measurements. The sub-scales, for which there were differences among the pretest, posttest and follow-up measurements in the intervention group, were health perceptions, energy/

**Table 3: Distribution of BSI scores of the patients in the intervention and control groups according to measurements (n=80)**

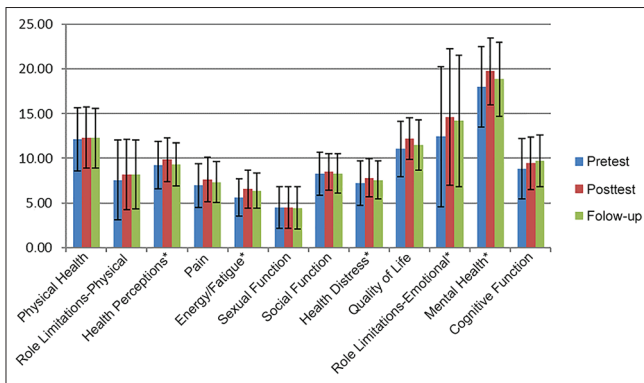
BSI	Intervention Group				Control Group				P4
	Pretest X±SD	Posttest X±SD	Follow-up X±SD	P	Pretest X±SD	Posttest X±SD	Follow-up X±SD	P	
Anxiety	12.75±8.55	8.57±6.47	9.10±6.22	P1=<.001* P2=<.001* P3=0.280	5.50±4.99	5.50±4.99	5.60±5.19	P1=0.329 P2=0.903 P3=0.389	<.001*
Depression	15.87±10.12	12.15±8.27	11.57±8.27	P1=<.001* P2=<.001* P3=0.396	8.45±7.44	8.35±6.17	8.55±6.44	P1=0.065 P2=0.112 P3=0.386	<.001*
Negative self-concept	8.27±6.44	9.07±7.55	8.24±7.44	P1=0.110 P2=0.845 P3=0.376	5.90±2.32	5.57±1.92	5.75±2.39	P1=0.192 P2=0.452 P3=0.376	.095
Somatization	7.15±5.40	5.45±4.11	5.85±4.45	P1=0.001* P2=0.004* P3=0.434	7.25±5.06	6.62±4.50	7.29±5.06	P1=0.919 P2=0.980 P3=0.919	<.001*
Hostility	5.85±4.45	5.75±4.66	5.75±4.47	P1=0.118 P2=0.860 P3=0.325	7.25±5.06	6.62±4.50	7.25±5.06	P1=0.174 P2=0.956 P3=0.325	.256
Scale Total	56.88±35.32	40.55±27.38	39.30±26.88	P1=<.001* P2=<.001* P3=0.843	30.98±20.69	29.45±19.47	31.93±20.97	P1=0.104 P2=0.254 P3=0.104	<.001*

P1: Comparison of the pretest and posttest, P2: Comparison of the pretest and follow-up, P3: Comparison of the posttest and follow-up, P4: Comparison of the difference between the intervention group and the control group. \* $P < 0.05$

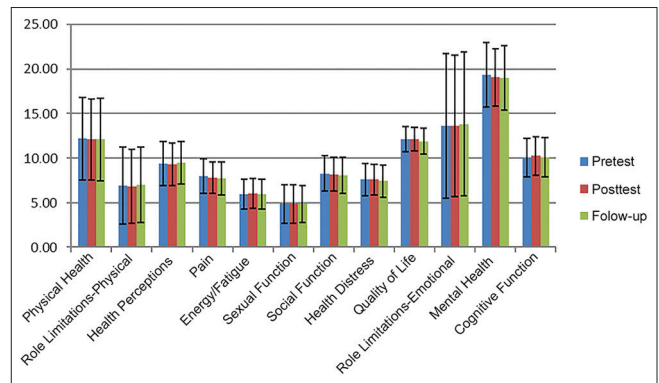
**Table 4: Distribution of MSQOL-54 scores of the patients in the intervention and control groups according to measurements (n=80)**

MSQOL-54	Intervention Group				Control Group				P4
	Pretest X±SD	Posttest X±SD	Follow-up X±SD	P	Pretest X±SD	Posttest X±SD	Follow-up X±SD	P	
Physical Health Total	61.407±14.78	65.469±14.48	63.855±14.23	P1 < 0.001* P2 < 0.001* P3=0.089	63.194±12.86	62.860±12.91	62.553±13.56	P1=0.197 P2=0.107 P3=0.870	<.001*
Mental Health Total	59.347±15.74	65.993±14.32	64.123±14.27	P1 < 0.001* P2 < 0.001* P3=0.076	64.845±12.24	64.744±12.30	62.264±12.68	P1=0.865 P2=0.564 P3=0.348	<.001*

P1: Comparison of the pretest and posttest, P2: Comparison of the pretest and follow-up, P3: Comparison of the posttest and follow-up, P4: Comparison of the difference between the intervention group and the control group. \*P < 0.05



**Figure 1:** Distribution of the MSQOL-54 scores of the patients in the intervention group according to sub-scales and measurements (n = 40). \*The sub-scales, which had statistically significant changes among the pretest, posttest, and follow-up measurements in the intervention group



**Figure 2:** Distribution of the MSQOL-54 scores of the patients in the control group according to sub-scales and measurements (n = 40)

fatigue, health distress, role limitations due to emotional problems, and mental health.

## DISCUSSION

According to the information presented in Table 1, the patients in the intervention and control groups may be said to have similar characteristics, other than the number of years since diagnosis, and were homogeneously distributed to the groups. Some studies have shown that patients are of similar age and have similar disabilities. It can be said that patients' being at a productive age and being able to walk affect their willingness in participating in studies.<sup>[33-35]</sup>

Problem-focused coping of the MS patients in the intervention group was found to increase significantly in the posttest and follow-up compared to that of the control group, and their emotion-focused coping was found to decrease significantly. In the control group, there was no significant change in the measurements in the same period. Moreover, when the levels of change from the pretest to posttest and follow-up were evaluated in the intervention and control groups, the differences between the two groups were found to be statistically significant. This result is important in that it shows that

the psychoeducation offered to the intervention group enhanced the problem-focused coping and reduced the emotion-focused coping in the patients with MS.

The psychoeducation program covered the concept of stress, the importance of stress management in MS, the ability to make peace with stress, to be effective in coping with stress, and the consequences of the problem-focused and emotion-focused coping. In addition, it can be said that stress management practices and group interactions implemented together with the patients improved their ability to cope with stress positively. Again, the same findings show that the patients in the intervention group improved their ability to cope with stress by trusting themselves more, by having a more positive perspective, and by seeking for more social support, and they reduced their helpless and submissive ways of coping with stress at the end of the psychoeducation. It was found at the follow-up measurement that the positive outcome of this effect also continued in the 3-month period after the intervention. Therefore, the fact that the effects of these programs to be offered to such patients continues is important in terms of the expected effectiveness.

In our study, the emotion-focused approaches of the patients decreased after the psychoeducation, whereas

their problem-focused approaches increased. The psychoeducation program targeted the development of skills such as time management, self-observation, problem solving, relaxation techniques, breathing exercises, social support, use of humor, effective communication, assertiveness, and being able to say no. Alternative approaches were developed by addressing the problems the participants had experienced and evaluating the results of emotion- and problem-focused coping. This result is important to demonstrate that effective problem-solving and coping skills can be gained. The findings of the study are similar to the findings in the relevant literature. In a stress management study that lasted 13 weeks, it was found that patients' stress management improved and psychosocial distress decreased.<sup>[36]</sup> In a randomized controlled trial, a stress management program was offered to an intervention group, and the patients were provided with diaries to record the stressful events they perceived. At the end of the study, the number of stressful incidents, anxiety, and depression levels perceived by the intervention group were statistically significantly lower than those perceived by the control group.<sup>[22]</sup> In another study, the patients in the intervention group who were offered an adaptation-to-stress program were found to more frequently use problem-focused coping and have lower levels of anxiety and depression than the control group.<sup>[37]</sup> Although different designs have been used in stress management programs offered to MS patients in the literature, methods such as the following have revealed positive changes in the ways patients manage stress, as implemented in our study: The ability of the patients to recognize their reactions during their stressful moments, to cognitively reconfigure stressful states, to use deep breathing and relaxation techniques that enable them to manage the feelings/behaviors that occur in stressful moments, to seek social support, to use problem-solving techniques, and to manage symptoms in MS.

A review of the psychiatric symptoms revealed that there was a statistically significant reduction in the levels of change in the anxiety, depression, somatization, and scale total of the patients in the intervention group from the pretest to the posttest and follow-up measurements. In the same period, the difference in the level of change between the intervention group and the control group was statistically significant. Moreover, it was found at the follow-up measurement that the effect continued for 3 months. In the psychoeducation program, essential information was provided for stress management, adaptation to the chronic disease, and the control of symptoms associated with the disease. In addition, how to strengthen self-perception was discussed. When

stress management was addressed, the relationship among thoughts, emotions, and behaviors according to the cognitive behavioral approach was explained. It can be said that the development of a rational thinking style to overcome perceptual failures led to positive changes in the meanings attributed to events and in the resulting emotions and behaviors. In a study conducted by Crawford and McIvor, psychiatric symptoms such as depression and anxiety were found to decrease as stress management was improved.<sup>[36]</sup> When studies in this field with different designs were examined, studies in which patients were offered cognitive/behavioral therapy (CBT),<sup>[23]</sup> awareness-based therapy,<sup>[24]</sup> and problem-solving therapy<sup>[25]</sup> were found. Postoperative and follow-up measurements in all these studies have shown a significant reduction in the level of psychiatric symptoms such as anxiety and depression, and the results are consistent with our study.

In the intervention group, there was no significant difference in the negative self-concept and hostility scores — two sub-scales of BSI — based on the psychoeducation. The perception of negative self-concept is defined as a negative assessment of the person's own identity, and this situation may arise with psychological difficulties such as illness and depending on the person's settled schemes.

In another study carried out in Turkey, negative self-concept and hostility complaints of MS patients were found to be affected by factors such as the number of years since diagnosis, marital status, income level, and educational status; and the negative self-concept and hostility complaints were found to decrease as the educational level and income level increased.<sup>[38]</sup> Although the sociodemographic characteristics of patients cannot be influenced, it is possible to change and flex their perception of this situation and their subjective judgments. It is seen that the eight-week psychoeducation was not able to positively change the negative self-concept and hostility complaints. We think that long-term programs with more comprehensive content are needed in order to create change.

Considering the measurements of the patients' quality of life, there were statistically significant increases in the patients' total physical and mental health scores from the pretest to the posttest and follow-up. However, there were no changes in the control group. The difference between the levels of change between the two groups was statistically significant, and the effect was found to continue also after 3 months. Quality of life is a complex process of self-assessment that is influenced by a person's psychological state, expectations, standards

of life, level of freedom, and social relationships, as well as his or her physical health. The sub-scales that had a difference in the quality of life based on the psychoeducation that was implemented in our study were health perceptions, energy/fatigue, health distress, role limitations due to emotional problems, and mental health. It can be said that, in the positive shift in this subjective perception in the study, the improvement of stress management and the reduction of psychological symptoms were successful, as were the measures for the improvement of physical health, such as adaptation to the disease and symptom management. The fact that these sub-scales were the areas that could be assessed through subjective perceptions can be interpreted as a positive change in patient perspectives. The presence of change in the areas of subjective perceptions is also consistent with the decline of depression and anxiety — the sub-scales of BSI — which were also among the results of the study. In the intervention group, there was a statistically significant increase in the total scores of physical and mental health in quality of life, but no significant change was found in the control group. In a study investigating the effect of psychoeducation on quality of life and depression, MS patients had significant changes in depression, anxiety, general mental health, perceived stress and pain levels, whereas they had no change in social support, cognitive problems, and fatigue levels.<sup>[35]</sup> In a study with a different research design on quality of life, patients were given biofeedback, and similar results were found about their psychiatric problems and quality of life.<sup>[39]</sup> In our study, there was also a statistically significant increase in the fatigue/energy level and seeking of social support. It can be said that this was possible through the fact that the program content created a more positive perspective on subjective perceptions and raised awareness of negative loads.

In line with these results, it can be said that the psychoeducation program — covering the subjects such as stress and symptom management, fight against fatigue, energy conservation techniques, and time management — had a positive effect on coping with stress, psychiatric symptoms, and quality of life by positively changing the subjective perceptions of the patients. Based on the results of the study, it is recommended that studies of similar type be conducted through hospitals and associations on patients who have been diagnosed with MS, that studies be planned to determine the longer-term effects regarding the persistence of MS, and that the impact of longer-lasting programs with different content and methods be evaluated to ameliorate problems such as negative self-concept and hostility.

### Author contributions

Our contributions to the paper were as follows. H.S.Ö.: Planning of the study, implementation of psychoeducation sessions, data collection, data analysis and interpretation, literature review, preparation of the article for publication; F.Ö.: Planning and implementation of the study, data analysis and interpretation, preparation of the article for publication, critical evaluation of the article report.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patients have given his/her/their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

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