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Original Research

The effect of self-acupressure on quality of life, physical and cognitive function in relapsing remitting multiple sclerosis patients: A randomized controlled study

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ABSTRACT

Objective: This study was conducted to evaluate the effectiveness of self-acupressure on quality of life, physical and cognitive functions in individuals with Relapsing-Remitting Multiple Sclerosis (RRMS).
Methods: In our randomized controlled study; participants in the study group were asked to perform self-acupressure on 6 points. They were asked to perform a total of 16 sessions, 2 days a week, for an average of 27 min each session in the morning and evening. No intervention was made in the control group during the study. Data were collected using Descriptive Information Form, Multiple Sclerosis Functional Composite Test (MSFC), and Multiple Sclerosis Quality of Life 54 Scale (MSQL-54).
Results: Thirty-one individuals with RRMS in each group, 25 women in the study group and 21 women in the control group, were included in the study. After the self-acupressure application, a positive and significant difference was detected in all MSFC sub-parameters (9-Hole Peg Test, Timed 25-foot Walk Test, Paced Auditory Serial Addition Test) values of the study group compared to the control group. In addition, after self-acupressure application, the study group was found to have statistically significantly higher scores in both the combined physical health and composite mental health sub-parameters of MSQOL-54 compared to the control group ($p < 0.05$).
Conclusion: We found that self-acupressure was effective in improving physical function, cognitive function and quality of life in RRMS patients. Additionally, self-acupressure is a feasible, accessible and inexpensive method in the disease management of multiple sclerosis, which needs to be treated or supported continuously.

Introduction

Multiple sclerosis (MS), which is the leading cause of neurological dysfunction and disability in young adults, is a chronic autoimmune, neurodegenerative disease of the central nervous system characterized by inflammation, demyelination and axon loss.[1] The form of "relapsing-remitting MS" (RRMS), which constitutes 85% of MS patients, progresses in the form of recurrence and improvement of neurological symptoms.[2] These neurological symptoms experienced by persons with MS (PwMS) cause deterioration in cognitive and physical functions.[3] At the same time, psychosocial problems are common in PwMS due to the unpredictability of the course of the disease.[4–6] These symptoms negatively affect the quality of life of PwMS.[5]

In the treatment of individuals with MS, it is necessary to develop affordable, feasible strategies to control symptoms and prevent disease-related complications and increased disability.[7] The spectrum of potential symptoms (fatigue, spasticity, bladder dysfunction, ataxia, cognitive impairment, etc.) is very wide, from the first to the most advanced stages of MS. Therefore, symptomatic treatment should be carefully planned and appropriate for each patient. These approaches, in particular, must be multidisciplinary, actively involve the patient, and include pharmacological and non-pharmacological treatments.[7,8]

Acupressure, which is one of the non-pharmacological applications, is a complementary medicine method that ensures the proper functioning of energy channels by applying pressure to the points on the energy-carrying meridians (these points are the same as acupuncture points) with fingers, palms or wrist bands without using needles, unlike acupuncture.[9] Acupressure is a pain-relieving, relaxing analgesic and a method that supports physical functions rather than its therapeutic effect. As a result, the purpose of acupressure; stimulating blood circulation, reducing muscle contraction, reducing

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neuromuscular excitability, reducing pain and relaxing the person.[10,11]

Acupressure, which is an easy-to-use, non-invasive method, is an integrated approach that can be used in symptom management.[9] There are limited studies on the efficacy of acupressure in controlling symptoms related to PwMS.[3,6,12] However, there is no study on the effect of self-acupressure on quality of life, physical and cognitive function in PwMS. In conclusion, this study aims to evaluate the effectiveness of self-acupressure on quality of life, physical and cognitive functions of individuals with RRMS.

Material and methods

Participants

The research population consisted of individuals with RRMS who applied to the Neurology Outpatient Clinic between June and September 2021. The sample group consisted of patients who met the inclusion criteria and accepted the study between these dates. In our study, 85 patients were reached between these dates. However, we completed our study with a total of 62 patients, as 18 patients did not meet the research criteria and 5 did not want to participate in the study (Fig. 1). Posthoc power analysis was performed using the G-Power 3.1.9.4 program to determine that the sample size was sufficient. According to the posthoc analysis, it was determined that the effect size was 0.422 (high effect size) and the power was 0.95 at the 95% confidence interval of the study, at a significance level of 0.05. These values indicate that the sample size is at the desired level.[13]

Individuals who were over 18 years of age, who did not receive steroid treatment or whose steroid treatment was discontinued 3 months before participating in the study, who had a definite diagnosis of RRMS according to the McDonalds criteria, who had an Expanded Disability Status Scale (EDSS) value between 1.0 and 5, who did not have a defined psychiatric disorder and who did not use acupressure and similar integrative treatment methods were included in the study. Exclusion criteria from the study are; the presence of scratches or deformation in the area to be applied, the disability of verbal communication (hearing and speech), and the presence of an orthopedic or neurological problem that will prevent the participant from self-acupressure.

In order to carry out the research; Approval from the Fırat University Non-Interventional Research Ethics Committee (dated 16.03.2021, numbered 26915) was obtained. In addition, an official permission letter was obtained from the hospital where the application would be made. After the patients included in the study were informed about the study, their verbal and written consents were obtained. Within the framework of the protection of individual rights in the research, the Helsinki Declaration of Human Rights was adhered to throughout the study.

Study design and procedure

This study is a randomized experimental study with a control group with the pretest-posttest application. The patients were divided into 2 groups as study group (Self-acupressure) and control group (no application was made) using the stratified randomization method. Stratification was randomly assigned to early MS (age 18≤ and <30 years) and late MS (30≤ and 50 years) using the Windows-based SPSS 22.0 (IBM Corporation, Armonk, NY, USA) package program. Various variables were analyzed: gender, age, duration of illness, etc. In addition, EDSS was used as a data collection tool. The flowchart of the study is shown in Fig. 1.

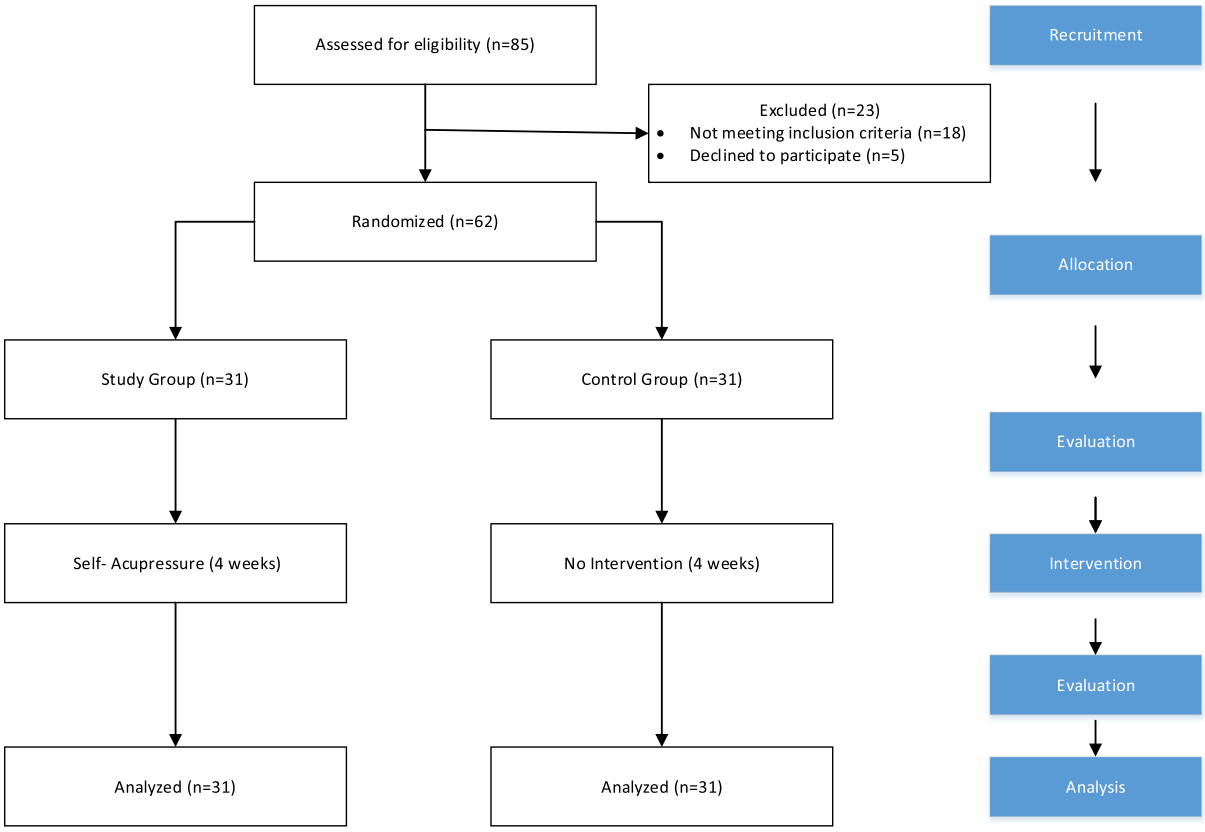

Fig. 1. Flowchart of the study.

The training program

Study group

Before starting the practice, the researcher received 16 h of theoretical and practical acupressure training from the Academicana Training Center. In the acupressure application described by the researcher; First of, patients were given the most suitable position they would be comfortable in before the application. afterwards, the researcher showed the patients the locations of the application points and the way they were made. For this acupressure application, the area, duration and frequency of acupressure were determined by considering the studies carried out by the researcher according to the effectiveness of the intervention. In the application, the pressure was applied to each point for 2 min with an average of 3-5 kg using the thumb, index finger and/or middle finger (in (in the form of breathing rhythm)[10,14] HT 7 (Shenmen), SP36 (Zusanli), LI4 (Hegu), and SP6 (Sanyinjiao), LV3 (TaiChong), DU20 (Baihui) points were used for self-acupressure.[9,15,16] Since these points will be applied to the other extremities, a total of 12 points were applied. The application was done for 2 min at each point, with a 15-s warm-up process for each point for a total of 27 min (135 × 12 = 1620 s = 27 min). Afterwards, the self-acupressure practices of the patients were followed. The application was repeated until each patient was able to perform the application correctly. The patients were given a leaflet showing the application points. In addition, a video recording of acupressure points prepared by the researcher was sent to the patients via WhatsApp. Patients were asked to watch this video. Patients were asked to perform a total of 16 sessions for 4 weeks, 2 days a week in the morning and afternoon, depending on the preparation and compression time on 6 selected points. A WhatsApp group was established by the researcher for the regular follow-up of the patients in the study group. Reminder messages were sent to the patients in the study group 2 days a week, in the morning and in the afternoon. Feedback was received from the patients and recorded. One day a week, the participants were called by the researcher and asked if they had any problems with the applications.

Acupressure points

HT 7 (Shenmen): It is located in the inner wrist fold at the level of the little finger (ulnar). ST36 (Zusanli): It is located on the outer side of the body, four fingers below the patella, 1-1.5 fingers away from the tibia. SP6 (Sanyinjiao): It is the point just behind the tibia on the 3 cun from the tip of the malleus facing the inside of the foot. Li4 (Hegu): It is the peak of the swollen area in the middle of the area that looks like the line between the index finger and thumb on the dorsal of the hand. LV3 (TaiChong): Located on the dorsal of the foot, between the 1st and 2nd metatarsal bones. DU20 (Baihui): Located at the top of the head.[10,11,17]

Control group

No intervention was made in the control group during the study. However, at the end of the study, there were 3 patients who requested the self-acupressure training program. These patients received a 4-week self-acupressure program (in the same protocol as the study group) applied to the study group.

Data collection tools

Participants in the study and control groups were evaluated with MSFC and MSQL-54 before and after the study (4 weeks later) by face-to-face interview technique. Evaluation time is approximately 12–18 min. Data were collected using the Descriptive Information Form, the Multiple Sclerosis Functional Composite Test (MSFC) and the Multiple Sclerosis Quality of Life 54 Scale (MSQL-54).

Descriptive Information Form: This form, prepared by the researchers, includes personal information such as age, gender, marital status, as well as disease-related information such as disease duration, attack status in the last year, medications used, and EDSS value.

Multiple Sclerosis Quality of Life scale (MSQL-54)

This scale was used in the study to evaluate the quality of life of PwMS. Turkish validity and reliability of the scale was performed by Tülek in 2007. There are 54 questions in total on the scale and it consists of 2 main groups, 12 subgroups and 2 independent items, namely physical health composite (PHC) and mental health composite (MCH). There are 8 subgroups in the PHC group. There are 5 subgroups in the MHC group. The independent items are two items, 'change in health' and 'satisfaction with sexual function', each consisting of one item. A score between 0-100 is taken from the scale, and the higher the score, the higher the quality of life.[18]

Multiple sclerosis functional composite (MSFC)

MSFC enables the objective determination of the functional and cognitive disability value and establishes a certain standard in patient follow-up. It consists of three subtests; The “9-Hole Peg Test” which evaluates the functions of the upper extremities, the “Timed 25-Foot Walk” which evaluates the functions of the lower extremities, and the “Paced Auditory Serial Addition Test” which evaluates the immediate memory and cognitive functions.[1]

Timed 25-Foot Walk (T25FW): The T25FW test is a test that measures lower extremity functions. The participant is instructed to walk as quickly and safely as possible (i.e. maximum walking speed) along a clearly marked track. The T25FW score is the average in seconds of two consecutive trials.[1]

Hole-Peg Test (9-HPT): The 9-HPT is a test that measures upper extremity function and motor speed. The patient is asked to insert the nine nails one by one into the nine holes and then remove them one by one without waiting. This process is repeated twice for the patient's right and left hands. In the scoring stage, a single score is obtained for both hands by taking the average of the two attempts made for each hand.[1]

Paced Auditory Serial Addition Test (PASAT): It is used to measure auditory information processing speed, computational skills and attention from executive functions. It was developed to assess cognitive functions in PwMS and is one of the subtests of the MSFC. It has two forms, A and B, and is applied with a standard sound recording. In the PASAT test, we used in our study, the numbers are repeated every three seconds and the patient is expected to add the number heard from the previous number. The correct number obtained in the calculation is used.[1]

Self-acupressure application recording chart

The recording chart was prepared in order to enable the patients in the intervention group to record their home practices for 4 weeks after the acupressure training and to enable the employee to follow these records. The chart is designed to show morning and afternoon, 2 days a week for 4 weeks.

Statistical analysis

The analysis of the data obtained in the research was carried out using the SPSS (Statistical Package for Social Sciences) 22.0 program. Chi-square analysis was used to compare demographic characteristics (categorical measurements) between the study and control groups. Independent groups t-test was used to compare the MSQOL-54 sub-parameter averages and MSFC score averages between the study and control groups. Kurtosis and Skewness coefficients were used in the analysis of the normality distribution of the t-test data in dependent groups, and the Cronbach α coefficient was used in the determination of internal consistency. According to Kurtosis and

Skewness analysis, our data showed normal distribution (between -2 and +2).

Results

Participant characteristics

The mean age of the patients in the study group was 32.58±9.78 and the EDSS value was 1.87±0.64. It was determined that 80.6% of the participants in the study group were women, 38.7% had an MS duration of 1-5 years, 54.8% had an attack in the last year, 74.2% perceived their health as moderate (Table 1).

The mean age of the patients in the control group was 34.22±9.30 and the EDSS value was 1.98±0.55. It was determined that 67.7% of the patients were women, 38.7% had an MS disease duration between 1-5 years, 41.9% had an attack once in the last year, and 74.2% perceived their health as moderate. In line with these results, it was found that the groups were homogeneous except for the employment status (Table 1).

The effects of Self-Acupressure on MSQOL-54

Table 2 shows the comparison of the MSQOL-54 sub-parameter score averages of the study and control groups within and between groups. A significant difference was observed in all sub- parameters in the study group after the study compared to the pre-study ($p < 0.05$). In the control group, a significant difference was found in the post-study mean scores of MSQL-54-MHC compared to the pre-study ($p < 0.05$) (Table 2).

When we examine the differences between the groups; while no significant difference was found at the mean scores of any MSQOL-54 sub- parameters before the study, a significant difference was found in all sub- parameters except sub- parameter in satisfaction with sexual functioning after the study ($p < 0.05$) (Table 2).

The effects of Self-Acupressure on MSFC

When the pre-study and post-study MSFC sub-parameters (9-HPT, T25FW, and PASAT) were compared in the study group, a significant difference was found in all sub-parameters ($p < 0.05$). In the control group, no significant difference was found in the MSFC sub-parameter values compared to the pre-study ($p > 0.05$). When we examine the differences between the groups; while there was no significant difference in any value before the study ($p > 0.05$), there was a significant difference in all values after the study ($p < 0.05$) (Table 3).

Discussion

In the literature, there is no study investigating the effect of self-acupressure in PwMS. However, our study is the first to evaluate the effect of self-acupressure on quality of life, physical and cognitive function in PwMS. There is insufficient evidence to fully determine the impact of self-acupressure as well as self-management interventions on quality of life, cognitive and physical function in PwMS. Our

Table 1
Sociodemographic characteristics of the patients ($n = 62$).

Variables		Groups		
		Study *n* (%)	Control *n* (%)	Test / *p*
Gender	Female	25(80.6%)	21(67.7%)	$x^2 = 1.348$; p = 0.246
	Male	6(19.4%)	10(32.3%)	
Educational status	Primary education	10(32.3%)	12(25.8%)	$x^2 = 2.508$; p = 0.285
	Secondary education	10(32.3%)	6 (19.4%)	
	High school and above	11 (35.5%)	17(54.8%)	
Marital status	Married	14 (45.2%)	15(48.4%)	$x^2 = 0.065$; p = 0.799
	Single	17 (54.8%)	16 (51.6%)	
Employment status	Yes	8 (23.8%)	19(61. %3)	$x^2 = 7.939$; p = 0.005*
	No	23 (74.2%)	12(38.7%)	
Income status	Good	4 (12.9%)	4(12.9%)	$x^2 = 0.000$; p = 1.000
	Moderate	17 (54.8%)	17 (54.8%)	
	Low	10 (32.3%)	10 (32.3%)	
Family structure	Nuclear family	25 (80.6%)	29 (93.5%)	$x^2 = 2.296$; p = 0.130
	Extended family	6 (19.4%)	2 (6.5%)	
Disease duration	0–6 months	1 (3.2%)	4 (12.9%)	$x^2 = 2.267$; p = 0.687
	6–12 months	2 (6.5%)	1 (3.2%)	
	1–5 years	12 (38.7%)	12 (38.7%)	
	5–10 years	8 (25.8%)	7 (22.6%)	
	10 years and above	8 (25.8%)	7 (22.6%)	
The state of going to controls	I went to all my controls	27 (87.1%)	25 (80.6%)	$x^2 = 0.477$; p = 0.490
	I did not go to some of my controls	4 (12.9%)	6 (19.4%)	
The state of having attacks in the past year	1 time	17 (54.8%)	13 (41.9%)	$x^2 = 1.200$; p = 0.549
	2 times	10 (32.3%)	14 (45.2%)	
	3 times and more	4 (12.9%)	4 (12.9%)	
The state of using medication	Yes	31 (100%)	31 (100%)	-
The state of getting information about the disease	Yes	31 (100%)	31 (100%)	-
How health is perceived	Bad	7 (22.6%)	6 (19.4%)	$x^2 = 0.410$; p = 0.815
	Moderate	23 (74.2%)	23 (74.2%)	
	Good	1 (3.2%)	2 (6.5%)	
Continuous Variables		X ± SD	X ± SD	
Age		32.58 ± 9.78	34.22 ± 9.30	t* = 0.504; p = 0.500
EDSS		1.87 ± 0.64	1.98 ± 0.55	t* = 0.739; p = 0.463

X: mean, SD: standart deviation, t*: Independent groups t test, EDSS: Expanded Disability Status Scale, *$p<0.05$.

Table 2
Comparison of MSQOL-54 parameters mean scores of the patients within and between groups.

MSQOL		Group	In-group				Between groups			
			Before application	After application	t^y	p	Before application		After application	
			X±SD	X±SD			t^x	p	t^x	p
MSQOL-54-PHC and parameters	Physical health	SG	7.21 ± 3.10	13.87 ± 2.88	-13.439	0.000***	0.382	0.703	-6.255	0.000***
		CG	7.57 ± 4.22	8.22 ± 4.11	-1.580	0.125				
	Role limitation due to physical problems	SG	2.22 ± 3.28	7.35 ± 3.45	-8.891	0.000***	-0.487	0.628	-7.308	0.000***
		CG	1.83 ± 2.96	1.45 ± 2.88	-1.680	0.103				
	Pain	SG	4.21 ± 1.15	7.98 ± 1.20	-12.253	0.000***	-0.805	0.424	-13.683	0.000***
		CG	4.21 ± 1.15	3.98 ± 1.10	0.956	0.347				
	Energy /fatigue	SG	6.06 ± 0.58	8.26 ± 0.98	-11.423	0.000***	-1.766	0.083	-9.852	0.000***
		CG	5.77 ± 0.71	5.28 ± 1.36	1.878	0.70				
	Social functioning	SG	5.70 ± 1.13	6.67 ± 1.22	-3.364	0.002**	1.344	0.184	-2.077	0.042*
		CG	6.09 ± 1.13	6.03 ± 1.22	0.373	0.712				
	Health perception	SG	7.10 ± 1.84	11.35 ± 1.32	-9.384	0.000***	-0.942	0.350	-12.853	0.000***
		CG	6.71 ± 1.32	6.66 ± 1.53	0.246	0.807				
	Health distress disorder	SG	2.66 ± 1.07	7.73 ± 1.08	-17.269	0.000***	1.690	0.096	-14.064	0.000***
		CG	3.19 ±.1.38	2.98 ± 1.54	-1.460	0.155				
	Sexual functioning	SG	4.20 ±.1.99	5.10 ± 1.19	-3.907	0.000***	0.998	0.322	-1.408	0.165
		CG	4.66 ±.1.60	4.57 ± 1.75	1.038	0.308				
	MSQOL-54-PHC	SG	39.63 ±.6.91	68.36 ±.7.29	-24.814	0.000***	-0.224	0.824	-13.748	0.000***
		CG	40.06 ±.8.37	39.18 ± 9.29	1.551	0.131				
MSQOL-54-MCH and parameters	Role limitation due to emotional problems	SG	4.12 ± 6.48	9.54 ± 8.36	-2.899	0.007**	0.802	0.426	-2.018	0.048*
		CG	5.18 ± 8.63	5.18 ± 8.63	1.350	0.187				
	Emotional well-being	SG	13.39 ± 2.25	17.58 ± 2.011	-8.182	0.000***	1.164	0.249	-5.558	0.000***
		CG	14.18 ± 3.00	13.28 ± 3.78	1.870	0.071				
	Health distress	SG	3.38 ± 1.36	9.84 ± 1.37	-17.269	0.000***	1.690	0.096	-14.064	0.000***
		CG	4.06 ± 1.76	3.79 ± 1.96	1.460	0.155				
	Cognitive functioning	SG	3.75 ± 1.50	10.66 ± 1.56	-18.337	0.000***	0.123	0.903	-17.800	0.000***
		CG	3.79 ± 1.59	3.53 ± 1.58	1.362	0.183				
	General quality of health	SG	5.90 ± 2.15	12.35 ± 3.32	-8.226	0.000***	-0.420	0.676	-8.562	0.000***
		CG	6.19 ± 3.21	5.85 ± 2.60	0.756	0.455				
	MSQL-54-MCH	SG	30.56 ± .8.96	60.00 ± 9.75	-12.448	0.000***	1.187	0.240	-9.746	0.000***
		CG	33.91 ± 12.91	31.65 ± 12.93	3.083	0.004**				
II	Changes in health	SG	27.41 ± .9.90	68.12 ± 20.35	-9.665	0.000***	1.865	0.067	-7.274	0.000***
		CG	33.87 ± 16.51	31.45 ± 19.33	0.571	0.572				
	Satisfaction with sexual functioning	SG	41.12 ± 16.51	54.03 ± 11.35	3.542	0.001**	1.441	0.155	-1.409	0.164
		CG	47.58 ± 18.65	50.00 ±.11.18	0.828	0.414				

MSQOL-54: Multiple Sclerosis Quality of Life scale, MSQOL-54-PHC: MSQOL-54' Physical health composite, MSQOL-54-MHC: MSQOL-54 Mental Health Composite, II: Independent items, SD: standard deviation, X: mean, SG: study group, CG: control group. $t^{(y)}$: Dependent groups t test; $t^{(x)}$: Independent groups t test, *: $p<0.05$, **: $p<0.01$, ***: $p<0.001$.

results show that self-acupressure application provides significant improvements in quality of life, physical and cognitive function in PwMS.

Self-management intervention is a potential approach that can alleviate MS-related symptoms. Self-management interventions are a relatively new method in the field of health research. However, it is thought that it will play a key role in the effective management of long-term chronic diseases.[4] There is substantial evidence that self-management interventions are effective treatment approaches for long-term diseases such as diabetes, arthritis, and heart disease.[19] It is also accepted in the literature that self-management strategies are applicable for PwMS.[7] However, there is no study in the literature investigating the effect of acupressure application on quality of life in PwMS. In addition, when we examine other studies on acupressure in MS, it has been proven that acupressure is an effective method in reducing pain severity, fatigue, stress, and anxiety.[6,12] When we examine the studies on other diseases due to the limited literature, positive effects of acupressure on reducing depression, functional status and daily living activities were reported in stroke patients.[9] In a study of elderly women, it was stated that Acupressure is an effective method to improve dynamic balance and maintain maximum autonomy.[20] Extensive physical disabilities, behavioral, mental, and social

Table 3
Comparison of the patients' intragroup and between-group MSFC mean scores.

MSFC	Group	Intragroup				Between-groups			
		Before Study	After Study	$t^{(y)}$	p	Before Study		After Study	
		X ± SD	X ± SD			t^x	p	t^x	p
T25FW (sec)	SG	14.15 ± 5.22	11.99 ± 2.56	4.245	0.000**	0.464	0.644	3.938	0.000**
	CG	14.65 ± 2.81	14.64 ± 2.73	0.052	0.959				
9-HPT (sec)	SG	21.01 ± 6.08	18.28 ± 4.79	6.054	0.000**	0.265	0.792	2.510	0.015*
	CG	21.38 ± 4.84	21.03 ± 3.76	0.914	0.368				
PASAT (CN)	SG	23.38 ± 10.48	31.12 ± 10.99	-10.050	0.000**	0.069	0.945	-3.542	0.001**
	CG	23.54 ± 7.64	22.87 ± 6.90	1.793	0.83				

MSFC: Multiple Sclerosis Functional Composite, T25FW: Timed 25-Foot Walk, 9-HPT: Nine Hole-Peg Test, PASAT: Paced Auditory Serial Addition Test, CN: correct number, SD: standart deviation, X:mean, SC: study group, CG: control group, $t^{(y)}$: Dependent groups t test; $t^{(x)}$: Independent groups t test, *: $p<0.05$, **: $p<0.001$.

factors and unknown causes of MS provide compelling evidence of the impact on the quality of life of PwMS. This study showed that self-acupressure can significantly improve quality of life in PwMS.

The mechanism of action of self-acupressure in improving function in PwMS can be explained in various ways. It is suggested that acupressure improves physical function by increasing regional circulation and helping to increase nerve conduction velocity.[21] It can also improve somatosensory function, which is considered the main factor for improvement in physical function, through the stimulation of mechanoreceptors in joints, muscles and tendons.[22,23] Somatosensory sense is also critical for upper extremity function.[24] It is known that foot, ankle and knee joint proprioception provides important information about postural posture during standing. Considering the disorder in the sensory feedback system, which is generally observed in PwMS, application of acupressure to these areas can be shown as an important sensory resource and treatment method for PwMS.[5,25] In the light of these studies, the mechanism underlying the improvement in the physical functions of PwMS, to whom we apply self-acupressure, can be explained.

It has been stated that acupressure plays an effective role in improving mental and psychological conditions, reducing stress and anxiety, and improving the cognitive state of the person.[26] So much so that the DU20 acupressure point, which is located at the very top of the head region, which we used in our study, is widely used in the treatment of dementia.[16] Studies have shown that acupressure applied to individuals with dementia and traumatic brain injury showed statistically significant improvement in cognitive function.[27,28] However, Mariko et al. found that acupressure therapy had no effect on cognitive function.[29] With the results of our study, it has been proven for the first time that self-acupressure improves cognitive function in PwMS. Although the mechanism of the effect of acupressure on cognitive functions has not been fully elucidated in the literature, it has been argued that cognitive function develops secondary to the improvement of psychological factors such as sleep and stress.[27,30] Although our results are pleasing, we emphasize the lack of studies describing the mechanism of action of acupressure on cognitive function in future studies.

A few limitations should be noted. First, although patients have been trained by a specialist in accordance with the administration protocol, differences in patients' performance may occur. Second, our study included individuals with EDSS values in the 1 to 5 range and RRMS types. Therefore, the generalizability of our results may be limited as we did not include other types of MS and individuals with high levels of disability. Our groups were separated by stratified randomization and the groups were similar in terms of sociodemographic characteristics. However, after the first session of the study, the participants were followed up by phone with a reminder timeline. Thus, these practices can be the strengths of our study in terms of verifying the regular performance of self-acupressure and not losing participants.

In conclusion, our findings prove that self-acupressure applied in individuals with RRMS is an effective and feasible method to improve physical function, cognitive function and quality of life. Due to its low cost, easy accessibility and safety, clinicians are recommended to apply the self-acupressure training program in order to improve the cognitive and physical functions of PwMS, as well as their quality of life. Due to its low cost, easy accessibility and safety, the self-acupressure training program is recommended in the routine treatment of MS in order to improve the cognitive and physical functions of PwMS, as well as their quality of life. Long-term (6–12 months) studies are needed to determine whether self-acupressure has the potential to provide longer-term positive effects in MS.

Ethical approval

The study was approved by the local ethical committee, Ethics Committee of Fırat University (16.03.2021 - 26915).

Informed consent

Informed consent was obtained for each participant prior to their involvement in the study

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Declaration of Competing Interest

The Authors declare that there is no conflict of interest.

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