

Investigating the Comparative Effectiveness of Yoga and Relaxation Therapy on Chronic Pain and Chronic Fatigue in MS Patients

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ABSTRACT

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Introduction:

Many MS patients report dissatisfaction with pain management programs, and it is urgent to identify other treatments that impact pain and chronic fatigue in these patients. The objective of this investigation is to compare the effectiveness of yoga and relaxation therapy in improving chronic pain and fatigue in MS patients.

Materials and Methods:

The current research is designed to be semi-experimental, consisting of a pre-test, post-test, two-month follow-up, and a four-month follow-up phase. Three groups were studied, including two yoga therapy test groups (with a sample size of 15), a relaxation therapy group (with a sample size of 16), and a control group (with a sample size of 17). The statistical population of this research consisted of all MS patients who were referred to the Iranian MS Association in Tehran between May and October 2023. The statistical sample was made up of 60 individuals who were chosen through purposive sampling and assigned randomly to the research groups. The yoga therapy group received twelve 90-minute sessions twice a week, while the relaxation therapy group received six 90-minute sessions weekly. The McGill Pain Questionnaire (MPQ) and the Chronic Fatigue Syndrome Questionnaire (CFS) were used as research tools. Repeated measures ANOVA, Bonferroni, and Tukey post hoc tests, MANCOVA, and Kruskal-Wallis H were used for statistical analysis of the research data by using SPSS.27 software.

Results:

According to the current research, the Emotional Dimension component ($P=0.113$) was not significantly different between the Yoga therapy and Relaxation therapy groups. However, there was a significant difference between the experimental groups and the control group ($P<0.001$). Relaxation therapy had a more lasting effect on chronic fatigue, with a significant difference between the experimental groups and the control group ($p<0.001$).

Conclusion:

The study concluded that both yoga therapy and relaxation therapy have an impact on sensory, emotional, and chronic fatigue, and can reduce them. Despite the comparison between yoga therapy and relaxation therapy, relaxation therapy had a more lasting impact on sensory dimensions and chronic fatigue.

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Introduction

Multiple sclerosis is a disease that causes demyelination of the central nervous system, which is one of the most common neurological illnesses in humans and is the most debilitating for young individuals. The onset of this disease often occurs in early adulthood and has a negative impact on the quality of life and physical and psychological functions (1). MS affects 2.8 million individuals worldwide (2). Iran has a prevalence rate of 5.78 per 100 people for this disease. The usual time frame for it is between 23 and 43, and women are twice as likely to be infected as men. Chronic pain, which affects 50 to 63% of adults with this disease, is a common and debilitating symptom that can vary greatly from person to person (4).

The mental state of chronic pain is influenced by behavioral, emotional, and cognitive factors (5). In this context, the findings of Kim et al. (2020) indicated the existence of chronic pain in multiple sclerosis patients (6). Also, research stated that chronic pain affects most people with multiple sclerosis in all stages of the disease (5). Chronic fatigue syndrome, which is a common symptom in MS patients, is also a problem that affects their quality of life (7). Extreme fatigue, lethargy, restless sleep, and cognitive impairment are some of the debilitating symptoms of chronic fatigue (8). MS patients experience fatigue due to emotional stress, sleep disorders, pain, the coexistence of other diseases, and the utilization of disease-modifying treatments (9). Approximately 70–80% of MS patients report this symptom, and 55% report it as the most disabling symptom (10). In the study of Wu et al. (2022), it was stated that MS is associated with chronic fatigue (11). In research, it was also stated that Fatigue is the most common and debilitating symptom for MS patients, and it is reported by nearly one-third of patients during the first three years of diagnosis. MS patients may experience psychological disturbances right after being diagnosed. The quality of life of patients is significantly impacted by this disorder, which is present at all stages of this disease. Considering that the majority of individuals with MS are young and part of society's effective force, it is essential to pay

attention to treatment methods (13). In addition to drug treatments, non-drug treatments may also be suggested as complementary treatments to enhance MS disease. Some of the complementary treatments for MS include acupuncture, feedback therapy, hypnosis, massage therapy, Tchi technique, yoga, and relaxation (14). The National Center for Complementary and Eclectic Health estimates that thirteen million adults practice yoga as a complementary therapy (15). Yoga brings together the mind-body connection and incorporates physical exercises (asana), breathing techniques (pranayama), and meditation and relaxation techniques (16). In their research, Lysogorskaia et al. (2023) concluded that regular yoga classes are a promising method for non-pharmacological rehabilitation of MS patients with movement disorders (17). According to another study, yoga has a positive impact on the overall health of MS patients (18). Donnelly et al. (2022) also stated that yoga may improve a range of MS symptoms and provide a means of acquiring new skills for stress reduction, anxiety management, and overall well-being (19).

The relaxation technique is also one of several effective complementary therapies. Which is described as a physical state of deep relaxation that reduces the body's oxygen consumption, relaxes the muscles, and creates a feeling of relaxation (20). In their study, Saifan et al. (2021) concluded that adding relaxation techniques to routine therapy is a cost-effective adjunctive therapy to reduce depression, anxiety, and stress among MS patients and improve their quality of life (21). Kesik et al. (2022) also concluded that relaxation techniques are recommended for managing symptoms of pain, fatigue, and agoraphobia in MS patients (22). Individuals with MS face a wide range of physical, emotional, and social challenges that impact not only their own lives but also the lives of their families. Given the lack of a definitive treatment for MS, focusing on effective methods to alleviate pain and fatigue in these patients is of paramount importance. Although some research has been conducted in this field, there is no study that simultaneously compares the effects of yoga and relaxation therapy on improving

chronic pain and fatigue in MS patients. This creates a significant research gap, and the current study is one of the initial investigations aimed at addressing it. The primary objective of this study is to examine how yoga and relaxation therapy affect chronic pain and fatigue in MS patients when compared to each other. The innovation of this study lies in its simultaneous comparison of these two therapeutic approaches and their impact on two major issues in MS: chronic pain and fatigue. This research is an important step toward filling this scientific gap and providing effective therapeutic strategies for MS patients.

Materials and Methods

The present study was a quasi-experimental design with a pretest, post-test, two-month follow-up, and four-month follow-up phase with three experimental groups including two experimental groups including yoga therapy training, and group with training in relaxation therapy, and a control group. The statistical population of this study included all patients with MS disease who had been referred to the Iranian MS Society in Tehran between May and September 2023.

The statistical sample consisted of 60 patients with MS disease, who were selected by purposive sampling method and randomly selected in two experimental groups and one control group (each group having 20 people). The sufficiency of sample size was evaluated using G-Power software, considering $\alpha = 0.05$, effect size = 1.11, and power test = 0.90 (23). Inclusion criteria included the presence of M.S disease in individuals, having at least 20 years of age, having sufficient physical health to participate in educational sessions, as well as having medical records in the Iranian M.S Association.

Exclusion criteria were: having any impairment that prevents regular attendance in training sessions, absence of attendance at training sessions (more than two sessions in person), and lack of home exercises in the relaxation therapy group caused withdrawal from the study. The researchers, after obtaining the approval of the university, first referred to the Iranian Association of M.S. After the necessary

coordination, a notice was posted on the social networks of the Association and the site of the Association for Patients' Membership. Patients who met the initial requirements for the research were intentionally selected among those who sent their data to the researchers. 100 cases were chosen by the researcher. Due to the patient's disease, the probability of shedding the sample size was very high, which led to the choice of a larger sample size. During the initial interview, which was conducted face-to-face in an M.S. Association office, patients were briefed on the research objectives and ethical principles, and their potential inquiries were addressed. Subjects were screened at this stage, and patients who did not meet the inclusion criteria (such as poor physical conditions) were excluded from the options. A few individuals have also stopped working. The researchers eventually recruited 40 people. Then, a pre-test was taken from subjects using research tools. A random selection was made from among the participants in the M.S community to form the control group. These subjects did not have any diseases related to MS. At the same time, the reason for choosing these people in the M.S. community was easier access to them during the implementation of the measurement process.

Data was collected from 60 subjects in the pre-test phase. After the intervention, the intervention group was randomly divided into yoga therapy and relaxation therapy groups, and they were ready to receive the training. The yoga therapy group (sample size = 15) received twelve 90-minute sessions twice a week, while the relaxation therapy group (sample size = 16) received six 90-minute sessions once a week. There was no training given to the control group (sample size=17). The difference between the methods of yoga therapy and relaxation therapy is that in the relaxation therapy group, in addition to receiving training in person, subjects also received special home exercises. The researcher observed the implementation of home exercises and answered any questions regarding their implementation after weekly in-person sessions through social networks and

educational groups. Some of the relaxation therapy trainings were offered in virtual groups of individuals. The training was conducted in person at one of the appropriate offices of the workshops under the supervision of the MS Association. At the end of the study, an intensive course of yoga training sessions and home exercises of relaxation therapy was provided to the control group via video. Tables 1 and 2 provide a summary of therapy sessions for the yoga therapy group (24) and relaxation group (25-26). At the end of the final

session, the experimental groups responded to the research questionnaires by post-test method, and two months after the intervention, they responded to the research questionnaires again. Also, in the next stage, four months after the intervention, the researcher repeated the measurement again from the research groups. The researcher used virtual groups, especially for video tutorials, and performed the follow-up measurements online. the flow chart of the consort is shown in figure 1.

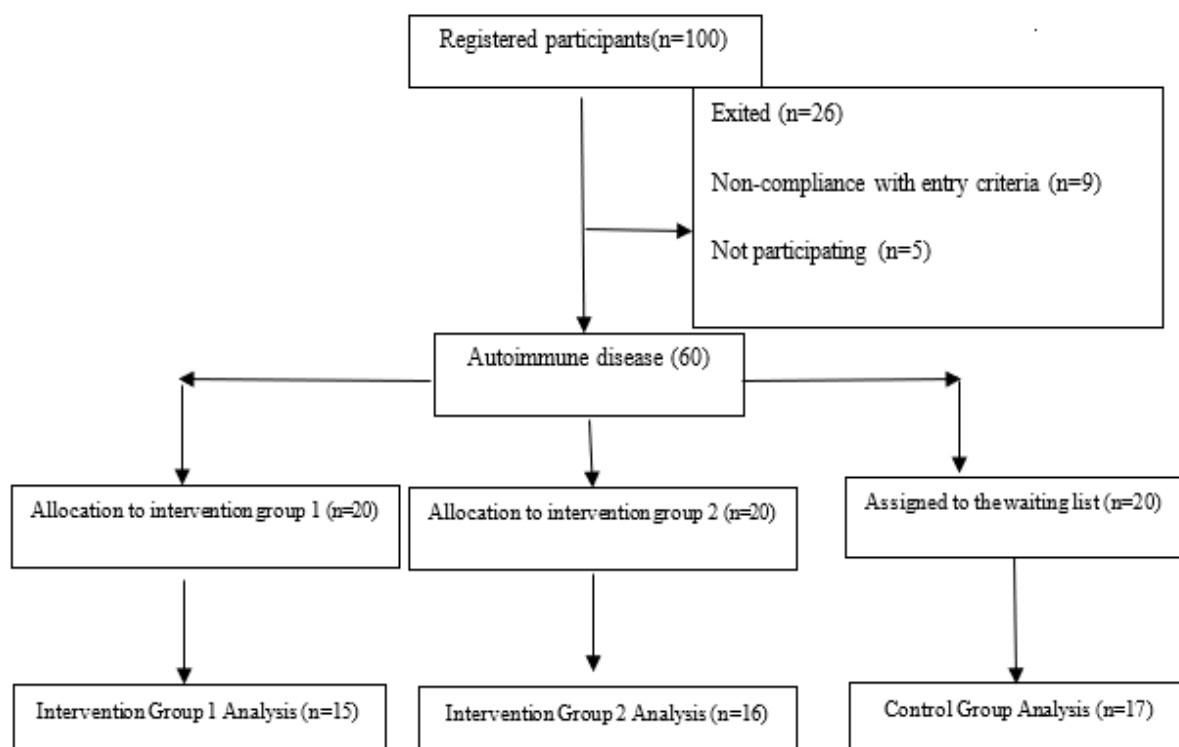


Figure 1: the flow diagram of the study

Tools

McGill Pain Questionnaire (MPQ): Melzack designed the McGill Pain Questionnaire (MPQ), a self-assessment questionnaire that has a 12-item short form, in 1975 to measure pain(27). The questionnaire's questions examine the impact of pain on patients' lives, the response of others to their pain communication, and the level of patients' participation in everyday activities. Two main components make up this scale. There are 9 words in the sensory component and 3 words in the emotional component. Answers range from 0 to 3. 0 is the equivalent of nothing, 1 is mild, 2 is medium,

and 3 is severe. The minimum score is 0, while the maximum score is 36. According to the researchers, the scale had an internal consistency of 0.76 (28). In Iran, Test-Retest (29) used the same scales to evaluate and confirm the correlation coefficient of this scale. The alpha coefficient of Cronbach in this study was 0.71.

Chronic Fatigue Syndrome Questionnaire (CFS): A self-assessment questionnaire which has 54 items, developed by Jason et al. In 2012 with the aim of measuring chronic fatigue(30). The questionnaire examines the following: low physical activity, actual levels of physical activity, and fatigue. The

scores in this questionnaire range from 1 to 5. The minimum score on this test is 54 and the maximum is 270. The sequence of the scale has been verified by the manufacturer itself (31). Also, the validity and reliability of this scale were evaluated by researchers using Cronbach's alpha, and the values of

0.83 and 0.86 were obtained. The content validity of the CVR was measured using the ratio and content validity index and the obtained CVR value was 0.7 and CVI was 0.85 respectively (32). In this study, Cronbach's alpha coefficient was found to be 0.77

Table 1. Summary of Yoga Therapy Sessions

Session	Content
First	The purpose of this meeting was to introduce the yoga method and teach breathing techniques. Breathing techniques were taught in the upper body and lower breathing (abdominal and diaphragmatic).
Second	The purpose of this session was to teach middle breathing techniques. Middle breathing techniques were taught in the chest area.
Third	The purpose of this session was to teach full breathing. In this session, a review of the previous two sessions was performed, and then the three-step breathing technique was performed.
Fourth	The purpose of this session was to teach deep breathing. In this session, the deep breathing technique was taught in a state where both the surface and the lungs are full and empty.
Fifth	The purpose of this session was to practice breathing techniques. In this session, the previous breathing techniques were practiced and the client's problems were solved.
Sixth	The purpose of this session was to teach Kaplabhati breathing techniques. In this session, the breathing technique was performed with strong contraction and making sound.
Seventh	The purpose of this session was to teach Kaplabhati breathing techniques, and basically, it is a continuation of the previous sessions. In this session, the breathing technique was performed with strong contraction and making sound.
Eighth	The purpose of this session was to teach Bhastrika breathing techniques, and basically, this exercise causes blowing and spreading heat in the body.
Ninth	Practicing the breathing techniques of the previous sessions and solving the client's problems.
Tenth	The purpose of this session was to teach breathing techniques and basically, this exercise makes the client hear his own voice and become aware of it.
Eleventh	The purpose of this session was to teach alternating breathing techniques, and basically, this exercise causes inhaling and exhaling during breathing.
Twelfth	The purpose of this meeting is to provide a summary of the previous meetings and an overview of all methods done.

Table 2. Summary of relaxation therapy sessions

Session	Content
First	In the first session, teaching the main concepts and familiarization with the treatment method and teaching tension and systematic relaxation of 16 muscle groups with a regular breathing pattern to increase relaxation. Each participant received a video therapy guide to facilitate practice at home.
Second	In the second training session, the participants performed the relaxation technique on their own using the therapist's instructions. Participants took home audio cassette tapes with the same instructions to practice twice a day during the study period. They were asked to quickly record their relaxation exercises in an exercise log.
Third	In the third training session, the presenter took the name of a part of the body, and people should stretch and contract that muscle for 5 to 10 seconds at the same moment. Then by saying the word release, they could return to the original state.
Fourth	In the fourth training session, first, a review of the previous sessions was done, and then the therapist taught special stretching exercises for the elbows as much as possible, as well as training for pulling the shoulders back and tightening and pulling the abdomen in.
Fifth	A workshop was held to review the skills taught and after the implementation of the taught methods, a re-evaluation of the skills learned by the participants and home exercises was carried out.
Sixth	In the final session, an overview of the learned skills was done and special exercises were given to people to implement the methods at home.

Statistical analyses

The use of descriptive measures like mean and standard deviation of descriptive statistics and analysis of covariance for inferential statistics was employed in this study. The collected data were analyzed with Kruskal-Wallis H, repeated measures ANOVA, and MANCOVA at a significance level of 0.05. SPSS.27 was used for all statistical analyses. The Kolmogorov-Smirnov test was conducted to evaluate the normal distribution, while Levene's test was used to evaluate the homogeneity of

variances. The means were compared using Bonferroni's post-hoc test and Tukey test.

Results

The study consisted of four stages, including pre-test, post-test, two-month follow-up, and four-month follow-up phase of yoga therapy, relaxation therapy, and control groups. The Kruskal-Wallis test revealed that there were no significant differences in demographic variables between participants ($P > 0.05$) (Table 3).

Table 3. Demographic characteristics in the experimental and control groups

Variables	Demographic information	Yoga therapy	%	Relaxation therapy	%	Control	%	Kruskal-Wallis H	P value
Age	20 to 30 years	3	20.0%	3	18.8%	3	17.6%	0.101	0.951
	31 to 40 years	8	53.3%	8	50.0%	10	58.8%		
	41 and up	4	26.7%	5	31.3%	4	23.5%		
	Total	15	100.0%	16	100.0%	17	100.0%		
Grade	Diploma	7	46.7%	8	50.0%	4	23.5%	1.539	0.463
	Bachelor	4	26.7%	4	25.0%	8	47.1%		
	Higher education	4	26.7%	4	25.0%	5	29.4%		
Gender	Man	8	53.3%	10	62.5%	11	64.7%	0.465	0.793
	Female	7	46.7%	6	37.5%	6	35.3%		
Duration of infection	1-2 years	1	6.7%	1	6.3%	2	11.8%	0.120	0.942
	3-4 years	9	60.0%	8	50.0%	9	52.9%		
	4-5 years	1	6.7%	3	18.8%	0	0.0%		
	+5	4	26.7%	4	25.0%	6	35.3%		

Table 4. Description of research variables

Variable	Groups	Mean ± SD			
		Pre-test	Post-test	Follow up 1	Follow up 2
Emotional dimension	Yoga therapy	6.46 ± 1.55	6.46 ± 1.55	1.187 ± 5.53	3.93 ± 1.22
	Relaxation therapy	6.81 ± 1.60	6.81 ± 1.60	3.43 ± 0.629	3.31 ± .873
	Control	7.29 ± 1.26	7.29 ± 1.26	1.611 ± 6.70	6.35 ± 1.83
Sensory dimension	Yoga therapy	22.60 ± 2.19	22.60 ± 2.19	15.66 ± 1.34	15.60 ± 1.18
	Relaxation therapy	21.00 ± 3.36	21.00 ± 3.36	13.62 ± 3.63	10.68 ± .873
	Control	21.23 ± 3.19	21.23 ± 3.19	3.344 ± 21.05	21.76 ± 2.65
Chronic fatigue	Yoga therapy	225.93 ± 17.25	225.93 ± 17.25	185.26 ± 5.09	186.73 ± 4.43
	Relaxation therapy	228.43 ± 15.15	228.43 ± 15.15	138.56 ± 8.51	126.00 ± 7.62
	Control	225.00 ± 16.89	225.00 ± 16.89	222.58 ± 17.27	223.76 ± 18.34

Table 4 displays the mean emotional dimension variable for all three groups, Yoga therapy, relaxation therapy, and control, did not differ significantly during the pre-test

phase. Compared to the control group, the mean scores in this component decreased in the yoga and relaxation therapy groups' 1 follow-up and 2 follow-up stages.

Nevertheless, there were no changes observed in the control group. The sensory dimension variable showed little difference between the three groups: yoga therapy, relaxation therapy, and control during the pre-test stage. In comparison to the control group, the mean scores in this component were decreased in three post-test stages, one follow-up, and two follow-up yoga therapy and relaxation therapy groups. However, the control group did not experience any changes.

At the same time, in all three groups, yoga therapy, relaxation therapy, and control in the pre-test stage did not differ in the chronic fatigue variable. The mean score for this variable declined during the three phases of post-test, 1 follow-up, and 2 follow-ups in yoga therapy and relaxation therapy groups as compared to the control group. However, no changes were observed in the control group. In Table 5, the researcher examined the results of covariance analysis.

Table 5. Tests of Between-Subjects Effects and Covariance Analysis Test

Variable	Source	Dependent Variable	Sum of Squares	Mean Square	F	P-value
Emotional dimension	Pre-test	Post-test	0.099	0.099	0.038	0.846
		Follow up 1	0.663	0.663	0.439	0.511
		Follow up 2	0.220	0.220	0.113	0.739
	Group	Post-test	9.018	4.509	1.753	0.185
		Follow up 1	87.148	43.574	28.815	p < 0.001
		Follow up 2	80.731	40.365	20.644	p < 0.001
Sensory dimension	Pre-test	Post-test	20.153	20.153	3.233	0.079
		Follow up 1	59.782	59.782	7.686	0.008
		Follow up 2	12.070	12.070	4.023	0.051
	Group	Post-test	289.982	144.991	23.257	p < 0.001
		Follow up 1	500.698	250.349	32.186	p < 0.001
		Follow up 2	1015.253	507.627	169.175	p < 0.001
Chronic fatigue	Pre-test	Post-test	17.124	17.124	0.129	0.721
		Follow up 1	1492.629	1492.629	13.884	0.001
		Follow up 2	2465.629	2465.629	26.666	p < 0.001
	Group	Post-test	10264.927	5132.464	38.704	p < 0.001
		Follow up 1	59526.395	29763.197	276.846	p < 0.001
		Follow up 2	81791.126	40895.563	442.292	p < 0.001

Based on the results of the multivariate analysis of covariance in Table 5, the P-value in between-subjects' effects in emotional dimension were significant (p<0.001) in both 1 follow-up and 2 follow-up stages. As a result, by keeping the effects of the pre-test stage, there was a significant difference between the research groups, so there was a significant difference between the research groups. Also, in the significant level in the

components of sensory dimension, there was significant (p<0.001) in all three stages: post-test, 1 follow-up, and 2 follow-ups. Therefore, there was a significant difference between the research groups in terms of the components of chronic pain. In the chronic fatigue variable, there was a significant difference between the research groups in all three stages of post-test, 1 follow-up and 2 follow.

Table 6. Bonferroni's post hoc test to check the difference between the three phases of the research

Variables	(I) TIME	(J) TIME	Mean Difference	Std. Error	P-value
Emotional dimension	Pre-test	Post-test	0.566	0.317	0.487
		Follow up 1	1.632*	0.263	p < 0.001
		Follow up 2	2.325*	0.285	p < 0.001
	Post-test	Follow up 1	1.066*	0.272	0.002
		Follow up 2	1.758*	0.315	p < 0.001
Sensory dimension	Pre-test	Post-test	3.683*	0.489	p < 0.001
		Follow up 1	4.828*	0.478	p < 0.001
		Follow up 2	5.594*	0.434	p < 0.001
	Post-test	Follow up 1	1.145*	0.335	0.008
		Follow up 2	1.911*	0.313	p < 0.001
Chronic fatigue	Pre-test	Post-test	29.893*	2.819	p < 0.001
		Follow up 1	44.318*	2.141	p < 0.001
		Follow up 2	47.624*	1.897	p < 0.001
	Post-test	Follow up 1	14.425*	2.268	p < 0.001
		Follow up 2	17.731*	2.326	p < 0.001

According to Table 6, emotional dimension scores were significantly different between 1 follow-up and 2 follow-ups with pre-test and post-test ($p < 0.05$). However, there was no significant difference between the pre-test and post-test stages ($p = 0.487$). Interventional approaches to the emotional dimension are found to be effective over time, as evidenced by these results. When considering the significant differences in stages, it is evident that changes in emotional dimension scores in two months after interventions and four-month returns after interventions were steady.

The sensory dimension component scores showed significant differences between 1 follow-up and 2 follow-up stages, as well as between pre-test and post-test. ($p < 0.05$). This component experienced stable changes as a result. The chronic fatigue variable showed significant changes at every stage of the study ($p < 0.001$).

The two-month and four-month returns after interventions showed stable changes in chronic fatigue scores. In Table 7, the researcher examined the paired comparison between the groups using the Tukey test.

Table 7. Post hoc Tukey test to examine differences between three groups

Variables	(I) Group	(J) Group	Mean Difference	Std. Error	P-value
Emotional dimension	Yoga therapy	Relaxation therapy	0.528	0.247	0.113
		Control	-1.359*	0.243	p < 0.001
	Relaxation therapy	Control	-1.887*	0.239	p < 0.001
Sensory dimension	Yoga therapy	Relaxation therapy	1.901*	0.703	0.029
		Control	-3.907*	0.693	p < 0.001
	Relaxation therapy	Control	-5.808*	0.681	p < 0.001
Chronic fatigue	Yoga therapy	Relaxation therapy	26.046*	3.371	p < 0.001
		Control	-26.090*	3.322	p < 0.001
	Relaxation therapy	Control	-52.136*	3.267	p < 0.001

According to Table 7, there was no significant difference between the Yoga and relaxation therapy groups ($P=0.113$). However, there was a significant difference between the experimental and control groups ($P<0.001$). Accordingly, it can be concluded that the interventional approaches of Yoga therapy and relaxation therapy were effective on the emotional dimension and reduced it, however, due to the lack of significant difference between the experimental groups, it can be concluded that there was no significant difference between the experimental groups. Table 7 showed a significant difference between the yoga and relaxation therapy groups ($P=0.029$). Also, there was a significant difference between the experimental and control groups ($P<0.001$).

Accordingly, it can be concluded that the interventional approaches of yoga therapy and relaxation therapy have been effective on the sensory dimension. However, due to the greater reduction in mean in the research stages in the two months after the interventions and four months after the interventions, relaxation can be confirmed. Therapy has a more lasting effect on the sensory dimension, resulting in a significant difference between the experimental groups. The study revealed a significant difference between the Yoga therapy and relaxation therapy groups in the chronic fatigue variable ($p<0.001$). Also, there was a significant difference between the experimental and control groups ($P<0.001$). Therefore, it can be concluded that the interventions involving yoga therapy and relaxation therapy have been effective in reducing chronic fatigue. However, due to the higher mean decrease in the mean stages of the study in the two months after the intervention and four months after the interventions, it can be confirmed that relaxation therapy has more lasting and more lasting effects on chronic fatigue and as a result, it can be concluded that there was a significant difference between the experimental groups.

Discussion

The present study aimed to investigate the comparative effectiveness of yoga and relaxation therapy in improving chronic

pain and chronic fatigue in MS patients. The study's results indicate that the interventional methods of yoga therapy and relaxation therapy have been effective in reducing emotional dimensions and their impact. However, there was no significant difference between the two groups, Yoga therapy and relaxation therapy. According to the study's findings, yoga therapy and relaxation therapy have been effective in reducing the sensory dimension. The sensory dimension received longer-lasting effects from relaxation therapy than from yoga therapy. Both therapeutic approaches in the present study were effective in reducing chronic fatigue variables, as shown by the results of the study.

The interventional approach of relaxation therapy had a more lasting and effective impact on the chronic fatigue variable than yoga therapy. Previous research (35-33) is implicitly consistent with the findings of this present study of the effect of yoga therapy and relaxation therapy on the emotional dimension and its reduction. According to a study, yoga has a significant impact on emotion regulation, self-esteem, and emotional components (33). According to a study, yoga has the potential to affect several psychological mechanisms that affect emotional well-being (34). Relaxation therapy is effective in reducing anxiety or negative emotions, according to a study's findings (35).

In explaining this finding, it can be stated that apart from a wide range of treatments such as biomedical interventions, electrical therapy, and drugs, yoga has gained popularity as an effective intervention to improve mental health and cope with depression and anxiety. Yoga allows practitioners to control their emotions and alter their physical, mental, and emotional dimensions. Emotional functioning is improved by yoga in both healthy and physically ill individuals. Yoga has the potential to help people calm themselves, regulate their emotions, and recover from emotional distress when they are hospitalized (33).

Relaxation therapy is a complementary therapy that focuses on relaxing different muscles by contracting and relaxing specific muscles. The use of relaxation therapy

regulates nerve function and fosters optimal mental focus and emotions. Patients can save money, avoid special facilities, and do their work more easily with this method (14). This treatment addresses both mental and physical conditions, and by completely relaxing muscles, it affects a variety of physiological and psychological signs and symptoms, such as stress. (20) The findings of other research regarding the effects of yoga and relaxation therapy on reducing sensory dimensions and improving relaxation therapy's effectiveness on this component are in line with previous research (37-36). According to research, yoga therapy can improve anxiety measures, social-emotional behavior, and attention (36). According to a study, relaxation therapy exercises can significantly decrease negative emotions like anxiety and depression and improve sleep quality in patients during treatment.

In explaining this finding, it should be stated that among the proposed mechanisms of yoga, the increase of psychological resources (mindfulness, body awareness, self-transcendence, spiritual peace, and social connection) may have beneficial effects on emotional health. Yoga is a complex practice that involves meditation, active and restorative postures, and breathing techniques designed to enhance positive emotions and reduce negative emotions. Yoga exercise increases positive participation, relaxation, and physical fatigue, improves mood, and improves the emotional dimensions of individuals by strengthening awareness of the body, movements, and internal states. (34).

Relaxation therapy exercises, unlike yoga therapy, allow patients to experience two different states of feeling by stretching and relaxing the muscles in sequence. It can strengthen muscle relaxation and put the whole body in a relaxed state, which can effectively eliminate negative emotions such as tension, fear, and anxiety, since patients' emotional stress status is associated with their immune function, relaxation therapy can have the greatest impact on the sensory dimension. Relaxation therapy exercises can improve mood by relieving patients' pain, which is an effective way to relieve pain in patients (37). Yoga therapy and relaxation

therapy are found to have a beneficial effect on chronic fatigue in MS patients, as per the other findings of this study. Relaxation therapy has a more lasting effect on chronic fatigue than yoga therapy. The previous findings (38-39) show this to be the case. According to a study, yoga has been found to reduce fatigue and improve sleep quality in chronic diseases (38). Also, the results of the research of Yoo et al. (2022) showed that relaxation therapy is a suitable rehabilitation treatment for pain, fatigue, and stress symptoms in patients (39).

To explain this finding, it can be said that yoga involves breathing exercises, relaxation, meditation, and asanas (poses). By performing breathing exercises, meditation, and gestures, a connection is made between mind and body, and balanced health is achieved. Through these regular exercises, the spine is stretched, muscles become stronger, and the brain finds more oxygen by removing the drug toxins, raising awareness and enabling people to focus on themselves gain a positive outlook, and be able to reduce stress.

These exercises are also effective in strengthening the respiratory muscles, regulating sleep, and relieving fatigue (38). In contrast to yoga therapy, relaxation therapy can decrease oxygen consumption by decreasing sympathetic nerve activity, leading to muscle relaxation and a sense of relaxation and comfort. The parasympathetic system is dominant, allowing patients to feel more comfortable and overcome psychological symptoms like anxiety, depression, and fatigue (20). Despite their simplicity, relaxation therapy techniques are effective, inexpensive, and easy to learn. They don't call for any special equipment, resources, or skills. They are also very useful in reducing the activity of the autonomic nervous system, improving the balance between the anterior and posterior hypothalamus, reducing sympathetic activity and catecholamine secretion, relieving muscle tension, reducing blood pressure and heart rate, and regulating breathing. Inducing a sense of calmness can help reduce fatigue through relaxation therapy techniques (21). The high cost of the study design made it impossible to compare different yoga methods, which was one of

the limitations of the current study. A significant implementation restriction was the lack of resources and time to conduct a broader comparison of various yoga techniques. Despite providing thorough and appropriate explanations about the goals and safety of the treatment method, another implementation limitation was the reluctance of some patients to engage in yoga and relaxation therapy.

Additionally, logistical issues such as difficulties in scheduling regular therapy sessions and providing suitable space for yoga practice presented challenges during the study. Problems related to coordination with physicians and staff for close monitoring of patient health and ensuring proper treatment execution also emerged as another implementation limitation. Some patients declined to complete questionnaires due to fatigue and lack of interest, and a few were excluded from the study due to specific medical conditions. Furthermore, limitations in access to appropriate facilities and equipment in certain areas also impacted the execution of the study. Future research could address these limitations by controlling factors such as economic, social, and psychological status, as well as geographical location, in the design and implementation of the study.

Conclusion

The study revealed that both yoga therapy and relaxation therapy have an impact on sensory, emotional, and chronic fatigue dimensions and can reduce them. Although compared to yoga therapy, relaxation therapy had a more lasting effect on sensory dimensions and chronic fatigue.

According to these findings, yoga and relaxation therapy classes are recommended for MS patients to reap both physical and psychological benefits. It is also suggested that more research be done with larger samples and a longer follow-up period so that by comparing the results, a regular exercise program can be prepared and implemented to improve the health of these patients.

Ethical Considerations

Ethical guidelines were followed in the research involving human subjects

according to the code IR.IAU.KHUISF.REC.1403.138.

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Conflict of Interest

No competing interests were present.

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