

# Mindfulness-based stress reduction (mbsr) training improves some dimensions of the quality of life in patients with multiple sclerosis

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## Abstract

Multiple Sclerosis, an autoimmune disease, can significantly impact a person's daily functioning and overall well-being. Patients often experience emotional disorders and find it challenging to regulate their cognitive-emotional responses during the course of their illness. The objective of this current study was to evaluate the impact of MBSR training on quality of life of patients with Multiple Sclerosis (MS). The study consisted of 40 participants with multiple sclerosis, all of whom were enrolled in the MS Society of Shiraz in Fars Province, Iran. The participants were evenly divided into two groups: an experimental group of 20 individuals and a control group of 20 individuals. The experimental group underwent a series of eight MBSR training sessions, held once a week for 60 minutes over a period of 60 days. The control group did not receive any interventions. The findings of the present study demonstrate a notable disparity between the experimental and control groups in terms of quality of life, specifically in areas such as physical function, pain management, mental well-being, energy levels, health perception, and cognitive function in relation to health changes ( $P < 0.05$ ). However, while these differences were statistically significant, no significant differences were noted among the dimensions of role limitation caused by physical problems, mental challenges, and social functioning ( $P > 0.05$ ). The results of the present study showed that MBSR training improves some dimensions of the quality of life in patients with Multiple Sclerosis and reduced negative emotion regulation strategies.

**Keywords:** mbsr; emotion; quality of life; multiple sclerosis

## Introduction

### Cognitive Emotion Regulation Questionnaire (CERQ)

The CERQ is a comprehensive survey designed to assess an individual's use of cognitive emotion regulation strategies, also known as cognitive coping strategies, following a negative experience or situation (Garnefski et al., 2001). In contrast to other coping questionnaires that do not explicitly distinguish between an individual's thoughts and behaviors, various versions of the CERQ have been developed for adults, adolescents, and children. The survey measures nine components: Self-blame, Blaming others, Acceptance, Refocusing on planning, Positive refocusing, Rumination, Positive reappraisal, Putting into perspective, and Catastrophizing. Participants respond using a 5-point Likert scale ranging from 1 (almost never) to 5 (almost always). Based on a prior research, the questionnaire's reliability was established with a Cronbach's

alpha coefficient of 0.87. The individual items in the questionnaire exhibited a range of 0.86 to 0.89 in terms of their reliability (Jermann, 2006).

### MS quality of life - MSQOL-54

MSQOL-54 is a multidimensional, widely-used, health-related quality of life (HRQOL) measure that combines both generic and MS-specific items into a single instrument. This 54-item survey produces 12 subscales and two summary scores, as well as two single-item measures. The subscales include physical function, role limitations-physical, role limitations-emotional, pain, emotional well-being, energy, health perceptions, social function, cognitive function, health distress, overall quality of life, and sexual function (Vickrey et al, 1995).

The summary scores consist of the physical health composite summary and the mental health composite summary, while the single item measures include satisfaction with sexual function and change in health. Furthermore, the 12 subscales of the MSQOL-54 demonstrate strong internal consistency, with Cronbach's alphas ranging from 0.74 to 0.95 (Vickrey et al, 1995).

To conduct an analysis of the research data, the information gathered from the questionnaires was processed in SPSS26 software. This involved dividing the data into descriptive and inferential sections. The descriptive section involved calculating measures such as mean, standard deviation, skewness, and kurtosis for the variables. In addition, to test the hypotheses, the statistical method of analysis of covariance was utilized. The research hypotheses included the following: a) MBSR training has a significant impact on emotion regulation strategies b) MBSR training has a significant impact on life quality of patients.

## Results

Prior to testing the research hypotheses, an examination of the normal distribution of research variables was conducted using measures of skewness and kurtosis in order to contextualize the status of the studied groups. The results indicated that all variables fell within an acceptable range of +2 to -2, confirming that the distribution of research variables can be considered normal for this study. Hence, it is reasonable to assume that the lack of normality in the data has been accounted for in conducting covariance analysis. To assess the homogeneity of variances, the Levin test was employed (see Table 1). The data analysis for the variables of cognitive emotion regulation strategies, perceived stress, and dimensions of quality of life in patients with multiple sclerosis revealed a significant F statistic value above 0.05. This suggests that the error variance among the groups was equal and no significant differences were observed between them. Based on our analysis, we confirm that there is no significant difference in the homogeneity of variance among all variables in both the experimental and control groups. Therefore, we can conclude that the assumption of homogeneity of variance is valid. Furthermore, our examination using Box's M test also indicates that there are equal variances across the groups (Box's  $M=16.86$ ,  $P=0.119$ ).

Variable	df	F static	P value	Result
Positive emotion regulation strategies	1	0.231	0.67	approve
Negative emotion regulation strategies	1	0.070	0.71	approve
Perceived Stress	1	0.252	0.61	approve
Physical function	1	3.624	0.06	approve
Role limitation due to physical problems	1	2.364	0.14	approve
Role limitation due to mental problems	1	2.229	0.13	approve
Pain	1	3.695	0.06	approve
Psychological well-being	1	2.310	0.15	approve
Energy	1	3.540	0.06	approve
Understanding health	1	3.297	0.09	approve
Social Performance	1	0.040	0.80	approve
Cognitive function	1	0.600	0.65	approve
Health changes	1	1.171	0.24	approve
Health stress	1	0.061	0.91	approve
Sexual function	1	0.203	0.61	approve
Satisfaction with sexual function	1	1.432	0.23	approve
Overall quality of life.	1	0.0651	0.42	approve

**Table 1: Levin test results to investigate homogeneity of variance.**

findings from the covariance analysis on the impact of MBSR treatment on emotion regulation strategies are presented in Table 2. The findings presented in Table 2 indicate a significant contrast between the experimental and control groups in terms of self-blame, other-blame,

acceptance, positive reappraisal, and reassess variables. However, there were no notable distinctions observed between the two groups in relation to the variables of mental rumination, adopt a perspective, catastrophic perception, and refocus on planning.

Variable	Total squares	df	F static	P value	Eta coefficient
Self-blame	549.22	1	21.44	0.001	0.345
Other-blame	457.43	1	18.80	0.001	0.298
Mental rumination	122.17	1	1.81	0.511	0.021
Catastrophic perception	99.35	1	1.09	0.653	0.035
Acceptance	673.11	1	26.65	0.005	0.35
refocus on planning	143.61	1	1.90	0.463	0.06
positive reappraisal	873.30	1	31.42	0.001	0.44
Reassess	672.39	1	27.24	0.001	0.37
Adopt a perspective	87.61	1	1.00	0.725	0.02

**Table 2: Results of covariance analysis for the effect of MBSR treatment on emotion regulation strategies**

Results of covariance analysis for the effect of MBSR treatment on perceived stress showed in Table 3. The test results in Table 3 show that after adjusting the effects of the pretest, the value of F for the group became significant ( $F = 32.078$ ), ( $P < 0.001$ ). In other words, after

removing the effects of the pretest, there was a significant difference between the scores of all subjects in the posttest and the partial square (effect size) for the effect of the independent variable on the dependent variable is 0.543, which shows 54.3% of the changes in the dependent variable are explained by the independent variable.

Variable	Total squares	df	F static	P value	Eta coefficient
Pre-test	49.62	1	6.03	0.02	0.18
Group	263.70	1	32.03	0.000	0.54
Error	222.97	27	-	-	-

**Table 3:** Results of covariance analysis for the effect of MBSR treatment on perceived stress.

The findings of the covariance analysis on the impact of MBSR treatment on quality of life dimensions are presented in Table 4. The results demonstrate a significant difference between the experimental and control groups for various variables related to quality of life, including physical function, pain, mental well-being, energy level, health perception,

cognitive function related to health changes, and overall quality of life. However, there was not a significant difference observed between the dimensions of role limitation due to physical problems and social function was not revealed. This finding indicates the effectiveness of mindfulness-based stress reduction therapy on increasing the variables of quality of life in patients with multiple sclerosis.

Variable	Total squares	df	F static	P value	Eta coefficient
Physical function	231.25	1	9.520	0.005	0.26
Role limitation due to physical problems	417.69	1	1.174	0.241	0.06
Role limitation due to mental problems	652.87	1	1.729	0.764	0.05
Pain	942.14	1	9.438	0.065	0.26
Psychological well-being	763.12	1	11.651	0.005	0.29
Energy	743.65	1	6.639	0.026	0.19
Understanding health	851.32	1	8.420	0.017	0.24
Social Performance	142.34	1	2.240	0.006	0.07
Cognitive function	2098.31	1	21.611	0.123	0.44
Health changes	4473.21	1	23.171	0.001	0.47
Health stress	144.62	1	2.168	0.001	0.09
Sexual function	2178.29	1	22.253	0.110	0.47
Satisfaction with sexual function	4328.70	1	24.622	0.001	0.56
Overall quality of life.	967.89	1	15.352	0.001	0.36

**Table 4:** Results of covariance analysis for the effect of MBSR treatment on dimensions of quality of life.

## Discussion

The aim of this study was to evaluate the effectiveness of stress reduction therapy based on MBSR training on emotion regulation strategies, perceived stress and quality of life in patients with MS in Shiraz. The research hypotheses are examined below. Hypothese a) MBSR treatment has a significant impact on emotion regulation strategies

The results of covariance analysis for the effect of MBSR treatment on negative emotion regulation strategies showed that MBSR could have an increasing effect on positive emotion regulation strategies and also a reducing effect on negative emotion regulation strategies in patients with multiple sclerosis. Similar results have been reported in other studies (Malinowski, 2013; Kumar et al, 2014). It has been reported that mindfulness training leads to increased metacognitive awareness and reduced rumination, stress, dysfunctional skills and negative thoughts (Wells, 2013; Anvari, 2017). According to a previous study in Iran, the MBSR program has continuous significant effects on emotion regulation ( $P < 0.00$ ) (Shahidi et al, 2017). Mindfulness leads to a decrease in the

frequency of negative automatic thoughts and an increase in the ability to drive out those thoughts and ultimately psychological well-being. Observing, describing, action with awareness, and nonjudgmental acceptance are components that highly correlated to mindfulness skills (Dekeyser, 2008).

Hypothese b) MBSR treatment has a significant impact on perceived stress.

About the effect of MBSR treatment on perceived stress, the results of this study showed that the perceived stress score of the MBSR-experimental group was significantly lower than that of the control group. Therefore, MBSR training has been able to reduce perceived stress in patients with MS. Consistent with the study results, a significant positive association between MBSR training and stress reduction reported (Venkatesan et al, 2021; Chen et al 2021). In MBSR, people learn to develop acceptance and compassion rather than judging their experience; and create momentary awareness instead of automatic guidance. These abilities contribute to increased psychological flexibility and reduced in depressive symptoms and perceived stress (Janusek, 2019).

Hypothese c) MBSR treatment has a significant impact on life quality of patients.

About the effect of MBSR treatment on quality of life of patients with multiple sclerosis, our results revealed that increases the overall quality of life in these patients. However, in some subscales, no significant relationship was observed between this treatment and those subscales (role limitation due to physical, mental, and social functioning problems). The results of Ghazagh study showed that MBSR treatment is effective in reducing fatigue and increasing some of the subscales including; physical functioning, role in relation to physical and mental energy, mental well-being, health threats, and satisfaction with sexual function

( $P < 0.05$ ). Similar findings reported in Senders et al and Kolahkaj et al studies. In explaining the above results, it should be supposed that performing mindfulness exercises creates new patterns of self-regulation. Health-related effects of mindfulness include improving immune function, lowering blood pressure, reducing headaches, reducing muscle tension and disability, lowering cholesterol, and lowering cortisol (Tatta et al, 2022). Pain is one of the strongest predictors of poor quality of life in MS patients. Meditation exercises can divert the patient's attention to the recipient of the muscles being targeted, and bring together the sensory dimensions of the pain experience from the stimulus assessment warning reaction and reduce the pain experience through cognitive reassessment (Oded, 2018; Koh, 2018). In addition to pain, another factor that affects the health of these patients is the rejection of the disease. This therapy helps patients become aware of their thoughts, feelings, and body senses and accept their illness by increasing awareness through mindfulness exercises and accepting experiences without judgment (Gil-González et al, 2020). Studies have shown that psychosocial factors such as mood and self-efficacy and coping problems affect patients' quality of life more than biological variables such as weakness (Farahzad Boujeni et al, 2021; Gil-González et al, 2020). Therefore, paying attention to psychological, social and psychiatric issues is a vital part of health-related quality of life. The main limitations of the study included the following: drugs used by these patients could have an effective role in the process of their recovery, it was not possible to control the drug and eliminate its effect. Excessive physical restraint and lack of supervision of members outside of the sessions prevented them from performing some behavioral exercises, including relaxation in the interval between sessions.

## Conclusion

Finally, it can be concluded that MBSR therapy increases positive emotion regulation strategies and quality of life dimensions (physical function, pain, mental well-being, energy, health perception, cognitive function, health changes, health stress, function sexual satisfaction and sexual quality and overall quality of life) and reduces negative emotion regulation strategies and perceived stress.

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