



The Effectiveness of Mindfulness-Based Stress Reduction Group Therapy in Rumination Among Multiple Sclerosis Patients

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Abstract

Background: Multiple sclerosis (MS) is a disabling neurological disorder, which in addition to neuro-motor disorders, accompanies a variety of symptoms, such as anxiety, asthenia, and reduced levels of problem-solving, and leads to a number of physical and mental disorders. This is while rumination is among psychological problems that can negatively affect MS patients' mental health. Rumination is known as a permanent engagement in a thought or an issue and is categorized as a conscious thought focused on a specific topic.

Objectives: This study aimed at investigating the effectiveness of mindfulness-based stress reduction group therapy in rumination among MS patients

Methods: This quasi-experimental study was followed by a pretest, post-test, and follow-up design with a control group. The current study had a statistical population including all patients with MS, who referred to Sistan and Baluchestan MS Community from December 2016 to February 2017. Among them, 30 patients were selected as the sample using the convenience sampling method and were randomly assigned to a control group and an experimental group (each including 15 patients). Eight 60-minute sessions of mindfulness-based stress reduction group therapy were conducted on the experimental group. A post-test was carried out after completing all sessions and a follow-up was performed a month later. Yousefi rumination scale was used as the data collection tool. An analysis of covariance was applied to analyze the obtained data.

Results: The results indicated that mindfulness-based stress reduction group therapy reduced rumination in patients with MS in the post-test and follow-up ($P < 0.05$).

Conclusions: Authorities are recommended to apply the mindfulness-based stress reduction group therapy to improve rumination among patients with chronic diseases.

Keywords: Mindfulness, Stress, Rumination, Multiple Sclerosis

1. Background

Multiple sclerosis (MS) is a chronic, progressive, and disabling disease that destroys the nerve cells of the myelin sheaths in the central nervous system (1, 2). In 2001, the National MS Association announced that more than 1.2 million people worldwide are affected by this disease. Nowadays, the number of MS patients is increasing such that this disease is considered the third major cause of disability in the United States and nearly 50 000 people have MS in Iran (3). In Sistan and Baluchestan, its minimum prevalence rate is six per 100 000 population. Multiple sclerosis peaks in people aged 20 to 30 years (4). Its prevalence rate is higher in females compared to males (5). Given this disease's high mortality rate, huge costs imposed on patients, and various issues related to it, paying attention to the patients affected by it and reducing their problems and symptoms are essential.

Rumination is among psychonervous abnormalities that influence MS (6). Rumination is referred to as persistent and recurring thoughts associated with a common issue. These thoughts enter consciousness involuntarily and divert people's attention from their current goals (7). Rumination is a cognitive mechanism that binds stressful life events with depressive symptoms and anxiety (8). Many people believe that when they become sick, they have to try to focus on their inner strengths because they think that such a concentration will give them the insight to find a solution to their problem (9).

Recent studies have demonstrated that the nature of these thoughts, no matter how negative they are, is not a problem per se, rather the way a person reacts to them leads to aggravation of these negative thoughts. Hence,

mindfulness is a technique that applies a patient's ability for cognitive reconstruction (10). Mindfulness originates from extensive research aimed at identifying cognitive factors and processes, which predict depression relapses and it was initially introduced by Segal et al. in 1995 (11). Mindfulness-based cognitive therapy is an integral part of mindfulness-based stress reduction therapy presented by Kabat-Zinn and Beck's cognitive therapy. This therapy was developed as a group therapy for people, who have a history of depression (12).

A study carried out by Rostami et al. showed that there were significant diverse relationships between self-efficacy and rumination, and between mindfulness and rumination. This means that when self-efficacy and mindfulness increase by 0.23 and 0.21, respectively, rumination decreases, however, there was a significant direct correlation between self-efficacy and mindfulness by 0.56 (13). In another study, Moghtader suggested that mindfulness-based cognitive therapy was effective in reducing rumination, inefficient attitudes, and negative dimensions of negative automatic thoughts among people with anxiety disorders (14). In the same line, Heidarian et al. indicated the effectiveness of the intervention in increasing resilience and reducing rumination among cancer patients (10). Abbasi and Khadamlou found that mindfulness-based cognitive therapy moderated the defectiveness/shame schema and decreased rumination, social isolation, and perfectionism in their experimental group in the post-test (15).

In their study, Fix and Fix concluded that mindfulness-based cognitive therapy triggered an area of the brain that affects a number of variables, such as increasing distress tolerance, coping with life management, changing beliefs, and decreasing rumination (16). Results of a study conducted by Feldman et al. showed that training mindfulness reduced rumination and increased distress tolerance in people (17). Hilt and Villa reported that mindfulness training, conducted as a treatment on females, improved rumination among them. Amberly et al. demonstrated that mindfulness-based cognitive therapy was effective in reducing rumination. Svendsen et al. claimed that mindfulness training affected depressive symptoms, rumination, and high levels of self-compassion (18). Conley et al. showed that mindfulness training reduced rumination and mental pressure among students (19). In another study, Jury found showed that of five dimensions of mindfulness training, three dimensions, i.e. acting with awareness, non-judging, and non-reacting, decreased depressive symptoms and rumination (20).

2. Objectives

Given that rumination and negative stress-induced thoughts in MS patients lead to hopelessness and affect the patients' mental health, finding suitable therapeutic interventions for modifying their problems is of significant importance. Hence, according to what was mentioned earlier, this study sought to answer the following research question:

Does mindfulness-based stress reduction group therapy significantly affect rumination among patients with MS?

3. Methods

This quasi-experimental study was followed by a pretest, post-test, and follow-up design with a control group. The current study had a statistical population, including 40 patients with MS, who referred to Zahedan MS Community from December 2016 to February 2017. Questionnaires were distributed among all MS patients. Next, 30 MS patients, who were willing to take part in the training workshop and had the inclusion criteria required for entering the study and obtained high scores on the rumination scale, were selected as the sample. Considering these patients' scores in the rumination scale, they were randomly assigned to an experimental group and a control group, each including 15 patients. Inclusion criteria of this study were being diagnosed with MS by a neurologist, not suffering from any diseases other than MS, according to a physician's opinion, and not undergoing any other psychological interventions. Exclusion criteria were dealing with mental disorders, like personality disorders, being unwilling to take part in the workshop and not being diagnosed with MS. Moreover, ethical considerations, including obtaining the patients' informed consent, explaining the objectives of carrying out the study, and the freedom to leave the study, were observed. In addition, the patients' information was kept confidential and codes were used instead of their names.

Contents and objectives of these sessions were extracted from a perspective proposed by Kabat-Zinn in 1990 (21). These sessions aimed at reducing rumination and they were held in the form of questions and answers and group discussions. At the end of each session, some homework assignments were assigned and at the beginning of each session, these assignments and topics discussed in the previous session were reviewed. The content and summary of each session are presented in Table 1.

Table 1. Summary of the Structure and Contents of the Therapy Sessions of the Mindfulness-Based Stress Reduction Therapy

Session	Description of the Intervention Sessions
First	Becoming familiar with other participants, explaining the sessions of the mindfulness-based stress reduction group therapy, establishing relationships with and conceptualizing the issue, providing some explanations about emotions (emotion regulation) and automatic thoughts, highlighting the necessity of mindfulness training, providing explanations about the auto-guidance system, and taking the pretest
Second	Checking the homework assigned last week, determining automatic mind and active and dynamic mind, practicing body checking, giving feedbacks on body checking, and practicing mindful breathing
Third	Checking the homework assigned last week, practicing (an active and dynamic observation and description) sitting meditation with awareness of thoughts, rehearsing the exercise, practicing 3-minute breathing space, and discussing paying attention to thoughts in a different way or substitute thoughts
Fourth	Checking the homework assigned last week, practicing (flexible, non-judgmental, and dynamic) 5-minute exercise of observing and listening, and rehearsing mindful breathing and body checking
Fifth	Checking the homework assigned last week, practicing rational mind and computational mind, practicing breathing, practicing sitting meditation (awareness of breathing, body, sounds, and thoughts), explaining stress and its relationships with pain, and examining the effects of awareness on pleasant and unpleasant events on emotions and body sensations
Sixth	Checking the homework assigned last week and practicing wise mind, mindful yoga, and sitting meditation (the mindful presence of sounds and thoughts)
Seventh	Checking the homework assigned last week, talking about sleep health, rehearsing exercises taught in the other six sessions, and making a list of enjoyable activities
Eighth	Checking the homework assigned last week, practicing body checking, summing up the sessions, checking and discussing plans for continuing the exercises, taking the post-test, and expressing gratitude to the participants for their cooperation

3.1. Data Collection Tools

3.1.1. The Rumination Scale

This scale was developed by Yousefi in 2005. It includes 39 multiple-choice items, each of which is scored based on a scale ranging from 0 to 3. Each respondent's score is obtained by adding these scores. Its concurrent validity was calculated using the Beck depression inventory and the Oxford happiness test. Its structural validity was assessed using a factor analysis via carrying out the varimax rotation procedure. Its differential validity was examined by an internal consistency test conducted on a clinically depressed group and a non-clinical group. Its internal consistency was calculated using the Cronbach's alpha method and the reliability of this scale was obtained by conducting the test-retest method. Examining its concurrent validity indicated that its coefficients with the Beck depression inventory ($r = 0.051$) and the Oxford happiness test ($r = 0.53$) were both statistically significant. Moreover, results have shown that this scale had a very good internal stability with a Cronbach's alpha coefficient of 0.92 (22, 23).

Analyzing the data was performed at two descriptive and inferential levels. In the descriptive level, frequencies, percentages, means, and standard deviations were used and, in the inferential level, an analysis of covariance was applied.

4. Results

The demographic data related to the patients in the experimental and control groups are presented in Table

2. The results presented in Table 3 indicate that the mean score of rumination in the experimental group decreased in the post-test and follow-up in comparison with the control group. To study the homogeneity of variance in the main variable of the present study, Levene's test was used. The significance level of Levene's test for rumination is greater than 0.05, therefore, the assumption of the homogeneity of variance was confirmed.

Table 2. Frequencies and Percentages Related to Age and Level of Education of the MS Patients (The Experimental and Control Groups)

Variables	Group, No. (%)	
	Experimental	Control
Age range, y		
23 - 31	7 (46.80)	6 (40.10)
32 - 39	5 (33.30)	5 (33.30)
40 - 49	3 (20.00)	4 (26.80)
Level of education		
No diplomas	9 (60.00)	2 (13.30)
Diploma	1 (6.70)	6 (40.00)
Bachelor degree	5 (33.40)	7 (46.70)

The results presented in Table 4 demonstrate that after eliminating the effects of pretest on the dependent variable and considering the F values of rumination obtained in the post-test ($F = 43.53$, $P \leq 0.001$) and follow-up ($F = 67.02$, $P \leq 0.001$), it can be stated that there is a significant difference between the adjusted mean scores of the patients in the post-test and follow-up. Therefore, the re-

Table 3. Means and Standard Deviations of Rumination in the Experimental and Control Groups

Rumination	N	Pretest	Posttest	Follow-Up
Experimental	15	132 ± 10.86	58.93 ± 8.59	56.20 ± 8.94
Control	15	111.73 ± 27.11	107.53 ± 27.19	104.26 ± 25.15

search hypothesis was confirmed and it can be concluded that this change between the mean scores of the experimental group in the post-test and follow-up, compared to the control group, is the result of the intervention. According to the Eta coefficients, the highest effect on rumination was 86% in the follow-up, which means that 86% of the variances in rumination is related to mindfulness-based stress reduction therapy.

5. Discussion

This study aimed at examining the effectiveness of the mindfulness-based stress reduction group therapy on rumination. The findings of this study showed that the mindfulness-based stress reduction group therapy, in the post-test and follow-up, decreased rumination in the MS patients. This finding is consistent with the results of several studies (10, 13-20).

Rostami et al. (13) and Moghtader (14) demonstrated that mindfulness training reduced rumination. In the same line, Heidarian et al. (10) showed that mindfulness training was effective in increasing resilience and decreasing rumination among cancer patients. Abbasi and Khademlou (15) found that mindfulness-based cognitive therapy moderated the defectiveness/shame schema and reduced rumination and social isolation in the experimental group in the post-test. Moreover, Fix and Fix (16) and Feldman et al. (17) reported that mindfulness-based cognitive therapy led to changes in the participants' beliefs and decreased rumination among them. Findings of studies carried out by Feldman et al. (17), Hilt and Villa, Amberly et al., Svendsen et al. (18), Conley et al. (19), and Jury (20) proved that mindfulness training reduced rumination and increased distress tolerance among individuals.

To explain this finding, it can be noted that a reduction in physical and social functions following the diagnosis of a disease and the course of treating affect people's lives. Mindfulness via the use of several techniques, like training relaxation techniques, accepting without having any judgments of the status quo, and being aware of oneself, increases awareness of the present moment, and consequently, reduces anxiety and rumination among patients. Patients with MS have to deal with a lot of problems during

the course of treatment, which usually causes severe physical fatigue and imposes high expenses on these patients. In most cases, these patients are involved in rumination, related to their recoveries. In addition, this new condition, which leads to the loss of mobility, affects these patients' appearances, identities, and self-confidence and can create psychological problems and lead to the continuation of involvement in rumination, especially when this condition is intentionally or unintentionally worsen by others in social situations. Accordingly, mindfulness aims to help a person by focusing on the present instead of the future and by increasing self-monitoring and awareness of his/her body, which may lead to a significant reduction in psychological symptoms, including anxiety and improved self-care. Training mindfulness skills and yoga, as adaptive skills, can reduce many of these patients' problems and increase their ability to adapt themselves to their current conditions. Therefore, according to what was mentioned earlier, the findings obtained from this study related to the effectiveness of mindfulness-based stress reduction group therapy can help therapists, doctors, and counselors improve patients' conditions. It is recommended that mindfulness-based stress reduction group therapy should be commonly used for MS patients, and authorities of MS associations of hospitals and other organizations that have direct contact with this group of patients should develop and equip mentoring mindfulness-based training workshops since they are effective and constructive measures that improve these patients' well-being. On the other hand, positive interventions can aid people in increasing their attention to themselves and control themselves in a way that they experience low levels of stress. Successful coping with stressful factors and difficult situations can improve people's ability to face various problems.

5.1. Limitations and Recommendations

Limitations of this study was that the study was limited to MS patients referred to Zahedan MS Community. Caution should be exercised when generalizing the results obtained from this study.

Footnotes

Conflict of Interests: It is not declared by the author.

Table 4. Results of the Analysis of Covariance Conducted to Examine the Effect of the Mindfulness-Based Stress Reduction Therapy on Rumination in the Post-Test and Follow-Up

Dependent Variable	Sum of Squares	Df	Mean of Squares	F	P Value	Eta-Squared
Rumination	17714.70	1	17714.70	43.53	0.001	0.60
Rumination	23412.49	1	23412.49	67.02	0.001	0.86
Rumination	1139.66	1	406.88			
	3784.76	1	140.17			

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References

- Harison T. Principles of internal medicine. *Digestive diseases*. Tehran: Institute Salman Print, Arjomand; 2005. Persian.
- Esmaeili M, Hosseini F. [Multiple sclerosis and stressful thought habit]. *Nurs Res*. 2008;**3**(10, 11):25-32. Persian.
- Khayeri F, Rabiei L, Shamsalinia A, Masoudi R. Effect of fordyce happiness model on depression, stress, anxiety, and fatigue in patients with multiple sclerosis. *Complement Ther Clin Pract*. 2016;**25**:130-5. doi: [10.1016/j.ctcp.2016.09.009](https://doi.org/10.1016/j.ctcp.2016.09.009). [PubMed: [27863602](https://pubmed.ncbi.nlm.nih.gov/27863602/)].
- Ghorbani E, Issazadegan A, Saffarinia M. [The relationship between cognitive emotion regulation strategies and perceived social support among individuals with multiple sclerosis]. *Int Res J Appl Basic Sci*. 2012;**3**(5):2647-50. Persian.
- Prokopova B, Hlavacova N, Vlcek M, Penesova A, Grunnerova L, Garafova A, et al. Early cognitive impairment along with decreased stress-induced BDNF in male and female patients with newly diagnosed multiple sclerosis. *J Neuroimmunol*. 2017;**302**:34-40. doi: [10.1016/j.jneuroim.2016.11.007](https://doi.org/10.1016/j.jneuroim.2016.11.007). [PubMed: [27979325](https://pubmed.ncbi.nlm.nih.gov/27979325/)].
- Bakhshani NM, Khosravi M, Raghbi M. Cognitive status of MS patients. *Congress of the Iranian Psychological Association*. 2010.
- Joormann J. Differential effects of rumination and dysphoria on the inhibition of irrelevant emotional material: Evidence from a negative priming task. *Cogn Therap Res*. 2006;**30**(2):149-60. doi: [10.1007/s10608-006-9035-8](https://doi.org/10.1007/s10608-006-9035-8).
- Mitchell AJ, Benito-Leon J, Gonzalez JM, Rivera-Navarro J. Quality of life and its assessment in multiple sclerosis: Integrating physical and psychological components of wellbeing. *Lancet Neurol*. 2005;**4**(9):556-66. doi: [10.1016/S1474-4422\(05\)70166-6](https://doi.org/10.1016/S1474-4422(05)70166-6). [PubMed: [16109362](https://pubmed.ncbi.nlm.nih.gov/16109362/)].
- Nolen-Hoeksema S, Morrow J. Effects of rumination and distraction on naturally occurring depressed mood. *Cogn Emotion*. 2008;**7**(6):561-70. doi: [10.1080/02699939308409206](https://doi.org/10.1080/02699939308409206).
- Heidarian A, Zahrakar K, Mohsenzadeh F. [The effectiveness of mindfulness training on resilience and reduced ruminating rates in female patients with breast cancer: A randomized trial]. *Iran Breast Dis order*. 2016;**9**(2):52-9. Persian.
- Segal Z, Williams J, Teasdale J. *Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse*. New York: Guilford Press; 2002.
- Kabat-Zinn J, Hanh TN. *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. Delta; 2009.
- Rostami A, Shariatnia K, Khavajvand Khoshli A. [Examining the relationship of self-efficacy and mindfulness with rumination among students of the Islamic Azad University of Shroud Branch]. *J Med Sci Islam Azad Univ*. 2004;**24**(4):254-9. Persian.
- Moghtader L. [Investigating the effectiveness of cognitive therapy based on mindfulness-based cognitive therapy in decreasing rumination, ineffective attitude, and negative automatic thoughts in people with generalized anxiety disorder]. *Urmia Med J*. 2016;**27**(9):825-35. Persian.
- Abbasi R, Khadamlou M. [The effectiveness of mindfulness-based cognitive therapy on the defectiveness/shame schema, rumination, and social exclusion of perfectionist women]. *Psychol Stud*. 2018;**14**(1):127-45. Persian.
- Fix RL, Fix ST. The effects of mindfulness-based treatments for aggression: A critical review. *Aggress Violent Behav*. 2013;**18**(2):219-27. doi: [10.1016/j.avb.2012.11.009](https://doi.org/10.1016/j.avb.2012.11.009).
- Feldman G, Dunn E, Stemke C, Bell K, Greeson J. Mindfulness and rumination as predictors of persistence with a distress tolerance task. *Pers Individ Dif*. 2014;**56**. doi: [10.1016/j.paid.2013.08.040](https://doi.org/10.1016/j.paid.2013.08.040). [PubMed: [24298196](https://pubmed.ncbi.nlm.nih.gov/24298196/)]. [PubMed Central: [PMC3843486](https://pubmed.ncbi.nlm.nih.gov/PMC3843486/)].
- Svendsen JL, Kvernenes KV, Wiker AS, Dundas I. Mechanisms of mindfulness: Rumination and self-compassion. *Nordic Psychol*. 2016;**69**(2):71-82. doi: [10.1080/19012276.2016.1171730](https://doi.org/10.1080/19012276.2016.1171730).
- Conley SL, Faleer HE, Raza GT, Bailey BE, Wu KD. The moderating effects of rumination facets on the relationship between mindfulness and distress reduction. *Cogn Therap Res*. 2018;**42**(4):436-46. doi: [10.1007/s10608-018-9896-7](https://doi.org/10.1007/s10608-018-9896-7).
- Jury TK. *Does rumination function as a longitudinal mediator between mindfulness and depressive symptoms?* Victoria University of Wellington; 2018.
- Kabat-Zinn J. *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain and, illness*. New York: Dell Publishing; 1990.
- Azargoon H, Kajbaf MB, Molavi H, Abedi MR. [The effect of mindfulness training on mental rumination and depression of the students of Isfahan University]. *Daneshvar Behav*. 2009;**16**(34):13-21. Persian.
- Yousefi Z. [Rumination: Definitions and theories]. *J Psychotherap*. 2009;**15**(51):128-36. Persian.