



The Impact of Imagery Rescripting and Reprocessing Therapy on Emotional Processing in Women with Multiple Sclerosis

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Abstract

Introduction: Multiple sclerosis (MS) is a chronic disease that affects the central nervous system and causes numerous psychological issues in patients. The present study aimed to investigate the effect of imagery rescripting and reprocessing therapy (IRRT) on emotional processing in women with MS.

Methods: This was a quasi-experimental, pretest-posttest study with two groups (intervention and control). The statistical population comprised MS-afflicted women registered with the Tehran MS Association. Thirty women with MS were selected via convenience sampling and were placed into experimental and control groups (n=15). The intervention group received seven 90-minute sessions of imagery rescripting and reprocessing therapy, whereas the control group received no educational intervention during this period. The Emotional Processing Scale was used to collect data, and the Repeated measures ANOVA procedure was used for data analysis.

Results: As regards emotional processing, there was a significant difference between the IRRT group and the control group ($P < 0.001$). The results demonstrated that imagery rescripting and reprocessing improved emotional processing in MS patients, whereas the control group exhibited no significant change over time.

Conclusions: IRRT assists individuals in managing negative emotions. Therefore, imagery rescripting and reprocessing training is recommended to improve emotional processing in MS patients.

INTRODUCTION

Multiple sclerosis (MS) is a highly common chronic condition of the central nervous system, causing myelin sheath degeneration and axon damage [1]. It is one of the most prevalent neurological diseases in humans and the most debilitating disease in youth [2, 3]. MS symptoms are classified into either visible or invisible. Visible symptoms include impaired balance, unbalanced walking, and vision impairment, while invisible MS symptoms comprise cognitive disorders, mental disorders, fatigue and pain [4, 5]. MS affects a person's life in a variety of ways and causes significant stress. Therefore, the patient must be taught effective adaptation strategies to survive in life [6, 7]. Due to the problems and side effects associated with pharmacotherapy, non-pharmacological and psychological methods have also been considered, which can reduce anxiety, stress and emotional problems in MS patients [8, 9].

Emotional regulation is the ability to better control our emotional state and experience or express them. Emotional regulation is the process of initiating, maintaining, adjusting, or altering the incidence, intensity, or continuity of inner feelings and emotions related to social, psychological, and physical processes to achieve one's goals. Further, emotional regulation is a crucial component of emotion management skills [10]. Emotional processing is the outcome of a process that facilitates other experiences and behaviors by reducing emotional disturbance [11, 12]. There are four categories of potential causes of emotional processing problems: cognitive avoidance, in which the mind refuses to accept events and incidents, incompatibility with short-term occurrences, depression, and the formation of overvalued opinions [13]. Some people have weaker emotional processing abilities when dealing with anxiety, emotional problems, rumination, and self-

blame [14]. Patients with MS suffer from more cognitive problems and are more exposed to psychological damage [15]. Before diagnosis of MS, MS patients typically experience various unpleasant sensations. After passing through this period of uncertainty, a diagnosis of MS is confirmed. This issue presents its challenges and elicits a range of feelings and emotions, such as fear and anxiety [16]. After diagnosis of MS, most patients exhibit a strong emotional response; while, some individuals, instead of exhibiting strong and long-lasting emotional reactions, seek to find a solution and obtain information about the disease and the way to deal with this problem effectively [17, 18].

Imagery rescripting and reprocessing therapy (IRRT) is one of the relatively recent therapeutic interventions, which contribute to reducing emotional problems in MS patients [19]. IRRT was developed by Smucker [20] for victims of rape or those with post-traumatic stress disorder. This method helps patients eliminate stress following the expression of negative thoughts and disturbing images [21]. The rationale for IRRT skills training is that thoughts and emotions play a crucial and fundamental role in behavior. For instance, a person who spends a lot of time thinking about plane crashes, may avoid air travel [20]. The purpose of IRRT skills training is to teach patients that although they cannot control all aspects of their environment, they can control how they interpret and interact with those aspects [19]. IRRT techniques, such as mental rotation, mental screening, muscle relaxation, and cognitive reprocessing, not only target reflecting on a specific topic, image, or thought, but also by replacing negative thoughts and images, they play a crucial role in improving psychological well-being, raising the quality of life, and alleviating internal conflict, incompatible schemas, and sleep-related issues [21-23]. Bray et al. [24] concluded that imagery rescripting could prevent emotional and behavioral responses in chronic patients. Murphy et al. [25] noted that creating positive mental images can influence self-compassion or self-kindness, and the level of emotional processing and mood.

It is becoming increasingly relevant to use psychotherapy as a complementary treatment for drug therapy as the number of patients increases and there are no definitive medical treatments available. In addition, the issues, problems, and limitations caused by MS overshadow the individual's mental health. Therefore, it seems necessary to employ efficient psychological treatments. Given that IRRT is a novel psychotherapy approach, investigating its effectiveness in improving mental disorders seems necessary and can level up psychotherapy. Accordingly, the present study aimed to investigate the effect of IRRT on emotional processing in patients with MS.

METHODS

This is a controlled, quasi-experimental, pretest-posttest study with a follow-up and control group. The IRRT was used as an intervention in this study. The statistical population of the present study included all women with MS, referred to the Tehran MS Association in 2020. Among these women, 30 individuals were selected by convenience sampling and were placed to experimental and control groups ($n=15$). The sample size consisted of 15 patients with MS per group, based on G-Power software with test power (0.90), alpha (0.05), and effect size (1.13). The inclusion criteria were as follows: 1. female gender; 2. MS as diagnosed by a neurologist and Magnetic Resonance Imaging (MRI); 3. the age range of 20 to 40 years; and 4. a high school diploma or higher. Exclusion criteria included: 1. concurrent treatment training; 2. coexisting mental disorders, such as addiction and depression, or chronic diseases, such as diabetes. To comply with ethical principles, the participants signed consent forms for participation in the research. Moreover, the intervention was implemented for the control group after the study. The experimental group underwent seven IRRT sessions (for seven 90-minute sessions), whereas the control group received no educational intervention. The intervention sessions are summarized in Table 1. The emotional processing of both groups was assessed before the intervention, one week after the conclusion of treatment sessions, and 45 days after the post-test.

Instruments

Emotional Processing Scale

The 25-item Emotional Processing Scale was developed by Baker et al. [26]. This scale consists of five subscales: suppression, signs of unprocessed emotion, controllability of emotion, avoidance, and impoverished emotional experience. On this scale, a score of 1 indicates strong disagreement, 2 moderate disagreements, 3 neutral response, 4 agreement, and 5 strong agreement. Additionally, the scores for the subscales are computed as follows: suppression (items 7, 9, 16, 19, and 25); unpleasant emotional experience (items 3, 8, 11, 12, and 22); signs of unprocessed emotion (items 1, 5, 2, 20, and 24); avoidance (items 4, 13, 14, 21, and 23); controllability of emotion (items 6, 10, 15, 17, and 18). The validity and reliability of this scale have been deemed optimal by Kharamin et al. [27]. In our research, the reliability of the scale was accept ($\alpha=0.84$).

Data Analysis

The data were analyzed in SPSS using the Repeated measures ANOVA procedure. Levine's test was employed to examine the homogeneity of variance, while the Shapiro-Wilk test assessed the normality of the distribution of the variables.

Table 1. Summary of imagery rescripting and reprocessing therapy sessions

Session	Contents
1	Group members introduced to one another; a general overview of imagery rescripting and reprocessing and its role in psychological symptoms such as negative, spontaneous thoughts, insomnia, unpleasant feelings
2	Identification of negative thoughts and disturbing images and their impact on mood, thinking, behavior, and insomnia
3	Visualization of vexing thoughts and images in minute detail and with closed eyes under muscle relaxation conditions and its relationship to mood and insomnia
4	Guided and instructed mental imagery training by a therapist to control negative thoughts and distracting images and generate positive images
5	Cognitive reprocessing and training in cognitive review and mental rotation techniques to eliminate negative spontaneous thoughts and generate positive thoughts and emotions
6	Utilization of cognitive review, mental rotation, and reprocessing to control recurring flashbacks and alter the meanings of traumatic events
7	Control of recurring flashbacks, flashbacks, continuous use of mental rotation technique, and meaning changes of disturbing thoughts and images to achieve positive thoughts, emotions, and moods

Table 2. Mean and standard deviation (SD) of the emotional processing components in the experimental and control groups

Variables / Phases	IRRT Group	Control Group
	Mean $\pm$ SD	Mean $\pm$ SD
Suppression		
Pre-test	21.33 $\pm$ 2.06	20.96 $\pm$ 1.22
Post-test	18.86 $\pm$ 2.08	21.00 $\pm$ 1.19
Follow-up	18.20 $\pm$ 2.37	21.00 $\pm$ 1.19
Unpleasant emotional experience		
Pre-test	21.53 $\pm$ 2.62	21.66 $\pm$ 1.88
Post-test	18.53 $\pm$ 2.76	22.00 $\pm$ 1.51
Follow-up	18.66 $\pm$ 1.97	22.06 $\pm$ 1.32
Signs of unprocessed emotion		
Pre-test	21.00 $\pm$ 1.13	20.93 $\pm$ 1.71
Post-test	17.80 $\pm$ 1.96	21.40 $\pm$ 1.95
Follow-up	18.13 $\pm$ 1.56	21.53 $\pm$ 1.68
Avoidance		
Pre-test	20.93 $\pm$ 2.06	21.20 $\pm$ 2.24
Post-test	18.73 $\pm$ 2.08	21.73 $\pm$ 2.15
Follow-up	18.33 $\pm$ 2.37	21.73 $\pm$ 2.04
Controllability of emotion		
Pre-test	21.00 $\pm$ 1.80	21.20 $\pm$ 1.71
Post-test	18.26 $\pm$ 1.93	21.73 $\pm$ 1.95
Follow-up	18.13 $\pm$ 1.56	21.80 $\pm$ 1.68
Emotional processing (total)		
Pre-test	105.80 $\pm$ 2.88	105.93 $\pm$ 2.21
Post-test	92.20 $\pm$ 3.36	107.86 $\pm$ 3.99
Follow-up	91.46 $\pm$ 3.04	108.13 $\pm$ 4.05

RESULTS

The Means and standard deviation (SD) age and duration of the disease in the participants were 36.69 ± 6.12 and 5.61 ± 2.39 , respectively. Table 2 displays the mean and SD of emotional response scores per group during the pre-test, post-test, and follow-up phases. In the pre-test, the mean and SD of emotional processing were 105.80 ± 2.88 and 105.93 ± 2.21 in the IRRT and control groups, respectively. However, the scores were 92.20 ± 3.36 for the IRRT group and 107.86 ± 3.99 for the control group in the post-test stage. In the follow-up stage, the mean and SD of emotional processing were 91.46 ± 3.04 for the IRRT group and 108.13 ± 4.05 for the control group. According to Table 2, the intervention led to improved emotional expression in MS patients, whereas no significant changes occurred in the control group. The experimental group scored lower than the control in the total mean scores of emotional processing, as well as the

subscales of suppression, signs of unprocessed emotion, controllability of emotion, avoidance, and impoverished emotional experience. The Shapiro-Wilk test was utilized to examine the distribution normality of the variable in the pre-test, post-test, and follow-up. The results indicated that the significance level for emotional processing components exceeded 0.05. Consequently, the variables under study were normally distributed, and the analysis of variance could be applied to the data. Levine's test examined the homogeneity of the pre-test data's variances. The results of Levin's test on the homogeneity of the variance of the research variables in the experimental and control groups indicated that the F statistic was insignificant.

The significant differences between pre-test, post-test, and follow-up measurements for emotional processing were confirmed based on the results of Table 3 and the significance of within-group parameters ($P < 0.001$). In terms of emotional processing, there was a significant difference between the IRRT and the control groups ($P < 0.01$).

Table 3. Results of repeated-measures analysis of variance for the effect of the IRRT on the studied variables

Variables / Source	SS	df	MS	F	P	η^2
Suppression						
Group	126.05	2	63.03	9.37	0.001	0.31
Time	150.30	1.60	93.52	180.50	0.001	0.81
Time $\times$ group	86.69	3.21	26.97	52.05	0.001	0.71
Unpleasant emotional experience						
Group	202.53	2	101.27	24.86	0.001	0.54
Time	149.91	1.36	109.60	360.47	0.001	0.89
Time $\times$ group	108.62	2.73	39.70	130.59	0.001	0.86
Signs of unprocessed emotion						
Group	234.90	2	117.45	25.06	0.001	0.54
Time	147.57	1.40	104.94	267.15	0.001	0.86
Time $\times$ group	119.23	2.81	42.39	107.92	0.001	0.84
Avoidance						
Group	190.05	2	95.03	26.31	0.004	0.56
Time	93.21	2	46.60	95.23	0.001	0.69
Time $\times$ group	83.67	4	20.91	42.74	0.001	0.67
Controllability of emotion						
Group	220.01	2	110.00	33.11	0.001	0.61
Time	114.77	2	57.38	134.06	0.001	0.76
Time $\times$ group	99.94	4	24.98	58.37	0.001	0.74
Emotional processing (total)						
Group	4801.89	2	2400.89	78.83	0.001	0.79
Time	3220.90	1.73	1856.02	533.71	0.001	0.93
Time $\times$ group	2452.29	3.47	706.56	203.17	0.001	0.91

DISCUSSION

The present study aimed to investigate the effect of IRRT on emotional processing in women with MS. The results demonstrated the efficacy of IRRT in the improvement of emotional processing in women with MS. These results are consistent with the results of previous studies [29, 30]. Slofstra et al. [28] reported that imagery rescripting reduced the unpleasant memories in university students. Bosch and Arntz [29] reported that imagery rescripting is effective for posttraumatic stress disorder due to childhood trauma. The IRRT is defined as the reconstruction of mental images and disturbing memories in the absence of an unpleasant stimulus. In actuality, the imagery rescripting method is used in conjunction with cognitive reprocessing to overcome upsetting memories [20]. Given that the presence of negative mental images is one of the major problems of MS patients, this method assists patients in retelling the disturbing images that have occupied their consciousness in the form of mental preoccupation and painful and spontaneous rumination to alleviate their mental pressures. The most important explanation for the effectiveness of this treatment lies in the technical principles and treatment steps involved in the implementing IRRT, the first step is mental imagery rescripting [22].

IRRT aims to minimize the negative effects of inhibition or emotional suppression on cognitive abilities, which may provide a further explanation for this finding. When compared to situations involving cognitive evaluation of emotion, the ability to perform tasks requiring executive function is impaired, when suppressed or inhibited emotions are used [21]. In fact, during imagery rescripting sessions, patients must first represent, describe, visualize, and cognitively review their

disturbing mental images and ruminations about their health condition. Then, as a result of the modifications, they think about the meanings of their condition, and replace their previous negative mental images and thoughts with positive ones. Thus, they are better able to deal with stress and have a higher pain tolerance; on the other hand, they experience less inner strife, negative emotions, and disturbing thoughts. As such, they eliminate the negative thoughts and images that have occupied their consciousness. This procedure results in the development of two significant changes in MS patients. First, the patient's mental and psychological distress is alleviated; second, the patient's strategies for coping with negative mental images, impulses, and thoughts are altered. The result of these two factors is an improvement in the patient's emotional performance in the face of setbacks.

This study done on patients within MS and geographically limited to Tehran and female in terms of gender. Consequently, caution should be exercised when generalizing the results to other groups. Therapeutic use of drugs to control the symptoms of the disease during intervention sessions, was another limitation of this study.

CONCLUSION

IRRT improves emotional processing in women with MS. In light of such efficacy and the fact that emotional regulation and processing involves initiating, maintaining, adjusting, or changing the emergence, intensity, or continuity of inner feelings and emotions related to social, psychological, and physical processes in achieving one's goals, it is recommended that IRRT techniques be used to treat women with MS.

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AUTHOR'S CONTRIBUTIONS

Mahtab Dizaj Khalili: Study concept and design, acquisition of data, analysis and interpretation of data, and statistical analysis. Shahrokh Makvand Hosseini: Administrative, technical, and material support, study supervision. Parviz Sabahi: Critical revision of the manuscript for important intellectual content.

ETHICAL CONSIDERATION

The study was approved by the Ethics Committee of Islamic Azad University, Semnan branch (code: IR.IAU.SEMNAN.REC.1399.009).

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interests.

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