Effectiveness of Group Hypnotherapy on Stress and Metacognitive Beliefs in Individuals with Multiple Sclerosis

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A B S T R A C T

The objective of the present study was to investigate the effectiveness of group hypnotherapy on stress and metacognitive beliefs in individuals with multiple sclerosis. The research method was experimental (pre-test, post-test design with an equal control group). The research sample consisted of 30 individuals with multiple sclerosis, selected through purposive sampling. Subsequently, from the research sample, 15 individuals with multiple sclerosis were randomly assigned to the experimental group and 15 individuals with multiple sclerosis were assigned to the control group. The research instruments included the Cohen et al. (1983) Stress Questionnaire and the Wells (2004) Metacognitive Beliefs Questionnaire. Data were analyzed using multivariate analysis of covariance (MANCOVA) and analysis of covariance (ANCOVA) methods. The results of data analysis indicated that group hypnotherapy resulted in a reduction of perceived stress and metacognitive beliefs in individuals with multiple sclerosis in the experimental group compared to the control group. Consequently, it can be concluded that group hypnotherapy with hypnotic techniques is an effective method for reducing perceived stress and metacognitive beliefs in individuals with multiple sclerosis.

Keywords: Hypnosis, Stress, Metacognitive Beliefs, Multiple Sclerosis.

1.   Introduction

Multiple sclerosis (MS) is a chronic illness where physical and psychological disorders are very common among patients. MS is a disease of the central nervous system and one of the most prevalent neurological diseases in humans, and it is the most common disease leading to disability. The clinical course of MS varies, ranging from a completely benign course to a progressive and disabling course (1). These patients deal with both psychological and physical challenges. One of the significant psychological aspects affected by the disease is stress. The psychological pressures resulting from MS are highly damaging and cause substantial stress to the patients. These patients face numerous challenges and have various cognitive-emotional and social problems. It should be noted

that these patients perceive high levels of stress and psychological tension (2-4). Research shows that perceived stress encompasses physical, mental, and emotional reactions experienced due to changes and life demands. These changes can be large or small and can disrupt individuals. Stress is a psychological state or process wherein an individual perceives a threat to their physical and psychological well-being. In other words, stress disrupts an individual's perceived ability and confidence in dealing with environmental demands. It is worth mentioning that patients who perceive high levels of stress also experience high emotional exhaustion (1, 5-7).

On the other hand, it should be noted that high levels of concern about the disease in MS patients increase metacognitive beliefs and cause these patients to have negative evaluations of themselves. It should be noted that in these patients, metacognitive beliefs lead to reduced mental health (8). Metacognitive beliefs are influential factors in psychological health. Metacognitive beliefs that increase maladaptive negative thinking patterns or general negative beliefs jeopardize psychological health. Metacognitive beliefs pertain to the uncontrollability, importance, and dangerousness of thoughts and cognitive experiences. These beliefs cause disorders that affect the style of thinking and individual adaptability, leading to involuntary emphasis and reinforcement of emotional responses, often due to repetitive rumination and worry. According to the metacognitive perspective, metacognitive beliefs are key components in the onset of depression. Due to maladaptive thinking styles, metacognitive beliefs predict the experience of negative emotions such as anxiety, stress, and depression (9).

Furthermore, it should be noted that to mitigate cognitive and emotional problems in MS patients, one of the treatments that can have significant effects in controlling cognitive issues is group hypnotherapy. Numerous research findings have shown that the benefits of psychological methods cannot be overlooked. Krisch et al. (2015) concluded in their study that hypnotherapy is an effective intervention. It should be noted that in these patients, hypnosis-based treatment can create significant impacts (10). Group hypnotherapy is one therapeutic method that can considerably moderate cognitive problems (11). Group hypnotherapy is an advanced concentration state where the

individual focuses on a specific stimulus and disregards other stimuli, such as environmental or bodily stimuli (12). Group hypnotherapy can be seen as a state of focused attention, high suggestibility, and reduced environmental awareness, wherein the cognitive evaluations of the subject are relatively suspended. During hypnotherapy, suggested movements and sensations occur involuntarily and automatically. Suggested perceptions alter and replace the usual perceptions of the subject. One can enter or exit hypnosis within a few seconds. This therapeutic intervention creates a strong and sensitive connection, suspending the subject's critical judgment. This strong focus can be actively organized and directed to achieve therapeutic goals (12). In conclusion, given the issues discussed, MS patients struggle with psychological problems, and the levels of stress and metacognitive beliefs in these patients due to disease-related challenges cause severe problems. It is essential to control these aspects to improve the quality of life for these patients. To improve the cognitive state of these patients, group hypnotherapy, which has been recognized as an effective treatment in research, can be effective in addressing these patients' challenges. Therefore, this study aims to investigate the effectiveness of group hypnotherapy on perceived stress and metacognitive beliefs in individuals with multiple sclerosis and to determine whether group hypnotherapy is effective on perceived stress and metacognitive beliefs in individuals with multiple sclerosis.

2. Methods and Materials

2.1. Study Design and Participants

This study used an experimental research method (pre-test, post-test design with an equal control group). Data were analyzed using multivariate analysis of covariance (MANCOVA) and analysis of covariance (ANCOVA) methods. The statistical population of this study included all individuals with multiple sclerosis in Karaj city in 2021. The sample size consisted of 30 individuals with multiple sclerosis, selected through purposive sampling. Initially, a list of individuals with multiple sclerosis was prepared based on inclusion criteria, which included a minimum disease duration of 6 months, the ability to attend therapy sessions, a minimum education level of a high school diploma, and no severe neuropsychological disorders such as epilepsy, severe

visual or auditory problems, or personality disorders. Exclusion criteria included psychotic disorders, cognitive-personality disorders, starting another psychotherapy simultaneously, and absence from more than two therapy sessions. Based on these criteria, 52 individuals with multiple sclerosis were identified, and 30 individuals were purposively selected. Then, from the research sample, 15 individuals with multiple sclerosis were randomly assigned to the experimental group and 15 individuals with multiple sclerosis were assigned to the control group.

2.2. Measures

2.2.1. Perceived Stress

This questionnaire was developed by Cohen et al. (1983) to assess stressful situations. It includes 14 items, scored on a scale from 1 (never) to 5 (very often). Items 4, 5, 6, 7, 9, 10, and 13 are reverse scored. In Pasha and Bozorgian's (2011) study, the questionnaire's validity was confirmed with 66.01% of the total variance explained through factor analysis, indicating high validity. The reliability of the questionnaire was reported as 0.87 and 0.88 using Cronbach's alpha and split-half methods, respectively (13). In this study, the questionnaire's reliability was found to be 0.91 using Cronbach's alpha.

2.2.2. Metacognitive Beliefs

This self-report tool consists of 30 items assessing individuals' beliefs about their thinking, developed by Wells in 2004. The scale includes five subscales: 1) positive beliefs about worry, 2) beliefs about uncontrollability and danger of thoughts, 3) cognitive confidence, 4) beliefs about the need to control thoughts, and 5) cognitive self-consciousness. In Wells' (2004) research, the Cronbach's alpha coefficients for the subscales ranged from 0.72 to 0.93, and test-retest reliability for the total score after 18 to 22 days was 0.75, with subscale reliabilities ranging from 0.59 to 0.87. Shirinzadeh Dastgiri et al. (2008) reported internal consistency using Cronbach's alpha coefficients for the total scale of 0.91 and for subscales ranging from 0.28 to 0.68. Subscale correlations with the total test ranged from 0.58 to 0.52, and inter-subscale correlations ranged from 0.26 to 0.62, all significant at the 0.001 level. In Zamanzadeh's (2013) study, the questionnaire's reliability was found to be

0.77, 0.74, 0.84, 0.86, and 0.79 for the subscales of positive beliefs about worry, uncontrollability-danger, cognitive confidence, need to control thoughts, and cognitive self-consciousness, respectively. The validity was confirmed through significant correlations with the Rumination Questionnaire (0.40, 0.42, 0.41, 0.44, and 0.46 at the 0.001 level) (14). In this study, the questionnaire's reliability was found to be 0.82, 0.85, 0.87, 0.84, and 0.83 for the subscales of positive beliefs about worry, uncontrollability-danger, cognitive confidence, need to control thoughts, and cognitive self-consciousness, respectively.

2.3. Intervention

2.3.1. Group Hypnotherapy

The group hypnotherapy intervention sessions were conducted based on Wilkinson's (1981) practical guide for group hypnotherapy over six 60-minute sessions with the experimental group (12).

Session 1: Participants were given explanations about hypnosis, trance, and what changes they should expect during the sessions. A general relaxation training was provided.

Session 2: After entering a trance, suggestions were given for deeper relaxation, stress and anxiety reduction, and deepening the trance. Conditioning to enter a trance with counting to ten was initiated to reduce time spent entering a trance in future sessions.

Session 3: The trance was deepened with further suggestions, followed by 10 minutes of visualization focusing on pleasant and calming scenes, concluding with bedtime visualization and repeated conditioning suggestions.

Session 4: Participants were led into hypnosis using conditioning cues and engaged in mental imagery related to bedtime and awakening, accompanied by suggestions for greater relaxation and focus, and these suggestions were reinforced with relevant imagery.

Session 5: Hypnotic suggestions were reinforced with relevant mental imagery to enhance effectiveness.

Session 6: Participants were conditioned to use counting to ten and taking three deep breaths as a cue for achieving relaxation and reducing stress and anxiety before sleep or

upon waking. Final discussions, suggestions, and post-test administration were conducted.

2.4. Data Analysis

Data were analyzed using multivariate analysis of covariance (MANCOVA) and analysis of covariance (ANCOVA) methods via SPSS-26.

3. Findings and Results

First, the descriptive findings of the mean and standard deviation of the research variables are presented, followed by the inferential findings of the study, with assumptions tested using multivariate and univariate analysis of variance methods.

Table 1

Mean and Standard Deviation of Perceived Stress and Metacognitive Beliefs in Experimental and Control Groups

Variable	Group	Stage	Mean	Standard Deviation	N
Perceived Stress	Experimental	Pre-test	63.60	4.08	15
		Post-test	17.01	2.32	15
	Control	Pre-test	52.60	4.54	15
		Post-test	54.10	4.37	15
Positive Belief about Worry	Experimental	Pre-test	21.26	2.18	15
		Post-test	8.40	1.54	15
	Control	Pre-test	20.73	1.48	15
		Post-test	20.53	1.76	15
Uncontrollability-Danger Belief	Experimental	Pre-test	22.40	1.18	15
		Post-test	8.60	0.98	15
	Control	Pre-test	21.20	2.07	15
		Post-test	21.86	1.35	15
Cognitive Confidence Belief	Experimental	Pre-test	23.13	1.06	15
		Post-test	7.93	1.09	15
	Control	Pre-test	20.32	1.87	15
		Post-test	21.26	1.16	15
Need to Control Thoughts Belief	Experimental	Pre-test	22.33	1.49	15
		Post-test	6.66	1.39	15
	Control	Pre-test	21.20	2.04	15
		Post-test	21.26	2.12	15
Cognitive Self-consciousness Belief	Experimental	Pre-test	23.13	0.91	15
		Post-test	6.93	1.75	15
	Control	Pre-test	22.01	1.46	15
		Post-test	21.66	1.87	15

The null hypothesis of normal distribution for the scores of the experimental and control groups in perceived stress and metacognitive beliefs was confirmed. This means the assumption of normal distribution of scores in the pre-test for both the experimental and control groups was validated. The interaction F value for perceived stress and metacognitive beliefs was not significant. Therefore, the assumption of regression homogeneity was confirmed.

Levene's test for the variables of perceived stress and metacognitive beliefs was not significant, indicating that the variance of the experimental and control groups in these variables was not significant. Hence, the assumption of homogeneity of variances was confirmed. The null hypothesis for the equality of variances in perceived stress and metacognitive beliefs was validated.

Table 2

Multivariate Analysis of Covariance (MANCOVA) Results on Mean Post-test Scores of Perceived Stress and Metacognitive Beliefs in Experimental and Control Groups, Controlling for Pre-test

Test Name	Value	df	Error df	F	p	Effect Size	Power
Pillai's Trace	0.98	6	15	124.69	.001	0.78	1.00

Wilks' Lambda	0.01	6	15	124.69	.001	0.78	1.00
Hotelling's Trace	58.19	6	15	124.69	.001	0.78	1.00
Roy's Largest Root	58.19	6	15	124.69	.001	0.78	1.00

As shown in Table 2, after controlling for pre-test levels, the significance levels of all tests indicate a significant difference between the experimental and control groups in at least one of the variables of perceived stress and metacognitive beliefs in individuals with multiple sclerosis (F = 124.69, p < .001). The effect size or difference is 0.78, meaning that 78% of the individual differences in the post-test scores of perceived stress and metacognitive beliefs in individuals with multiple sclerosis are due to the effect of group hypnotherapy. The statistical power is 1, indicating no possibility of a Type II error. To determine which variables differ between the experimental and control groups, a one-way analysis of covariance was conducted, and the results are presented in Table 3.

Table 3

Univariate Analysis of Covariance (ANCOVA) Results on Mean Post-test Scores of Perceived Stress and Metacognitive Beliefs in Experimental and Control Groups, Controlling for Pre-test

Variables	Source of Variation	Sum of Squares	df	Mean Square	F	p	Effect Size	Power
Perceived Stress	Group	3328.01	1	3328.01	241.24	.001	0.81	1.00
Positive Belief about Worry	Group	167.68	1	167.68	135.43	.001	0.86	1.00
Uncontrollability-Danger Belief	Group	327.91	1	327.91	149.18	.001	0.85	1.00
Cognitive Confidence Belief	Group	443.35	1	443.35	315.15	.002	0.82	1.00
Need to Control Thoughts Belief	Group	502.61	1	502.61	163.83	.004	0.84	1.00
Cognitive Self-consciousness Belief	Group	427.29	1	427.29	127.07	.007	0.72	1.00

As shown in Table 3, after controlling for pre-test levels, the significance levels of all tests indicate significant differences between the experimental and control groups in terms of perceived stress (F = 241.24, p < .001), positive belief about worry (F = 135.43, p < .001), uncontrollability-danger belief (F = 149.18, p < .001), cognitive confidence belief (F = 315.15, p < .001), need to control thoughts belief (F = 163.83, p < .001), and cognitive self-consciousness belief (F = 127.07, p < .001). In other words, group hypnotherapy, considering the mean perceived stress and metacognitive beliefs in individuals with multiple sclerosis in the experimental group compared to the control group at the post-test stage, led to a reduction in perceived stress and metacognitive beliefs. The effect sizes for perceived stress, positive belief about worry, uncontrollability-danger belief, cognitive confidence belief, need to control thoughts belief, and cognitive self-consciousness belief are 0.81, 0.86, 0.85, 0.82, 0.84, and 0.72, respectively. This means that 81%, 86%, 85%, 82%, 84%, and 72% of the individual differences in the post-test scores of perceived stress and metacognitive beliefs are due to the effect of group hypnotherapy.

4. Discussion and Conclusion

The aim of the research was to examine the effectiveness of group hypnotherapy on stress and metacognitive beliefs in individuals with multiple sclerosis. The results showed that there were significant differences between the experimental and control groups in terms of perceived stress and metacognitive beliefs. In other words, group hypnotherapy, considering the mean stress and metacognitive beliefs in individuals with multiple sclerosis in the experimental group compared to the control group, resulted in a reduction in stress and metacognitive beliefs in the experimental group. The obtained result is consistent with a few conducted prior research (10-12).

In explaining this result, it can be said that MS patients perceive high levels of stress and metacognitive beliefs due to the psychological challenges and stressful conditions of the disease. This study showed that group hypnotherapy is effective in reducing the stress and metacognitive beliefs of MS patients. It can be said that the group hypnotherapy intervention, by changing thought patterns and placing patients in a hypnotic trance, caused the patients' minds to show the least resistance to new thoughts and ideas. Group

hypnotherapy, through suggestion and mental imagery, planted the seeds of new ideas and behavior changes in the patient's mind, discovering metacognitive thoughts regarding flexibility in dealing with stressors. This led to better structural recognition of the stress perceived by patients and increased their ability to cope, resilience, and internal resistance to stress, reducing rumination. In this treatment, physical relaxation techniques such as eye movements, hand movements up and down, and backward movements helped patients reduce stress and metacognitive beliefs resulting from the disease, enabling them to recognize their stress symptoms and actively moderate their problems and stressors, increasing their internal resistance to stress and reducing feelings of isolation and helplessness (11). This treatment positively affected the patients' well-being, stress resistance, relaxation, and hope, reducing metacognitive beliefs.

Hypnotherapy caused patients to value their increased resilience and facilitated mental order, leading to cognitive resistance to perceived stresses and negative thoughts. It can be said that group hypnotherapy helped patients identify disease-related stress and control ineffective metacognitive beliefs. Group hypnotherapy, along with medication, is beneficial as it positively affects how patients adapt to stress and corrects metacognitive beliefs, leading to gradual improvement and reduction of stress and metacognitive beliefs in MS patients (11). In conclusion, group hypnotherapy is effective in reducing stress and metacognitive beliefs in individuals with MS.

The results cannot be generalized to all patients due to the limited sample size. Controlling the patients' social, economic, and family conditions was beyond the researcher's control. It is recommended that counseling and treatment centers consider the effectiveness of group hypnotherapy due to its positive impact on reducing stress and metacognitive beliefs in individuals with MS. In educational workshops, group hypnotherapy should be taught to therapists by treatment providers to fundamentally address stress and metacognitive beliefs in individuals with MS. Treatment providers should consider the impact of group hypnotherapy in their referral policies, recognizing its effectiveness in treatment centers and preparing centers to optimize this method for moderating cognitive problems in patients.

Authors' Contributions

E.H.K. conceptualized the study, designed the research methodology, and supervised the implementation of the group hypnotherapy sessions. F.N., the corresponding author, conducted the data analysis using MANCOVA and ANCOVA methods, interpreted the results, and led the drafting and revising of the manuscript. S.B. assisted in the recruitment of participants, facilitated the hypnotherapy sessions, and contributed to the literature review and data collection. N.S.K. supported the data analysis process, helped with the interpretation of the findings, and participated in the critical review of the manuscript. All authors discussed the findings, critically reviewed the manuscript for important intellectual content, and approved the final version for publication.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

Ethics Considerations

The study placed a high emphasis on ethical considerations. Informed consent obtained from all participants, ensuring they are fully aware of the nature of the study and their role in it. Confidentiality strictly maintained, with data anonymized to protect individual privacy. The study adhered to the ethical guidelines for

research with human subjects as outlined in the Declaration of Helsinki.

References

1.   Donisi V, Poli S, Berti L, Gobbin F, Giusto G, Capurso M, et al. Combining acceptance and commitment therapy with adventure therapy to face vulnerability: Examples and insights from a sailing experience. Journal of Contextual Behavioral Science. 2024:100759. [DOI]
2.   Prakash RS. Mindfulness Meditation: Impact on Attentional Control and Emotion Dysregulation. Archives of Clinical Neuropsychology. 2021;36(7):1283-90.
3.   Rezaei Z, Abolghasemi S, Khalatbari J, Zarbakhsh R. The effectiveness of a training package based on motivational interviewing, therapy based on acceptance and commitment, and therapy focused on compassion on tolerance of failure and health anxiety in patients with multiple sclerosis. Journal of Adolescent and Youth Psychological Studies (JAYPS). 2023;4(2):86-96. [DOI]
4.   Sadovnick AD, Dyment DA, Ebers GC, Risch NJ, the Canadian Collaborative Study G. Evidence for genetic basis of multiple sclerosis. The Lancet. 1996;347(9017):1728-30. [PMID: 8656905] [DOI]
5.   Marsool MDM, Prajjwal P, John J, Keluskar HS, Sivarajan VV, Kundiri KA, et al. Association of multiple sclerosis with stroke: A comprehensive review. Health Science Reports. 2024;7(1):e1837. [PMID: 38264155] [PMCID: PMC10804671] [DOI]
6.   Sandesjö F, Tremlett H, Fink K, Marrie RA, Zhu F, Wickström R, et al. Incidence rate and prevalence of pediatric-onset multiple sclerosis in Sweden: A population-based register study. European Journal of Neurology. 2024;31(5):e16253. [PMID: 38369806] [DOI]
7.   Schlindwein MAM, Campos MHdM, Breis LC, Chara BS, Scherer CS, Caminski VAP, et al. Impacts of environmental tobacco smoke on the onset and progression of multiple sclerosis: a systematic review. Arquivos de Neuro-psiquiatria. 2024;82(3):s00441779271. [DOI]
8.   Goli ZS, Mirseify fard LS. The role of Metacognitive Beliefs and Resilience on Predicting Marital Adjustment in Both Groups of Patients with Chronic and Acute Pain. Journal of Assessment and Research in Applied Counseling (JARAC). 2021;3(3):55-63. [DOI]
9.   Wells A. Metacognitive therapy for anxiety and depression. New York, NY, US: Guilford Press; 2009. xvii, 316-xvii, p
10.   Kirsch I, Montgomery G, Sapirstein G. Hypnosis as an adjunct to cognitive-behavioral psychotherapy: A meta-analysis. Journal of Consulting and Clinical Psychology. 1995;63(2):214-20. [PMID: 7751482] [DOI]
11.   Patterson DR, Everett JJ, Burns GL, Marvin JA. Hypnosis for the treatment of burn pain. Journal of Consulting and Clinical Psychology. 1992;60(5):713-7. [PMID: 1383302] [DOI]
12.   Moghtaderi S, Mirzamani S-M, Bahrami H. The effectiveness of hypnotherapy in the treatment of subjective tinnitus. Auditory and Vestibular Research. 2017;21(4).
13.   Pasha G, Bozorgian R. The Relationship Between Metacognition, Perfectionism And Self-Efficacy, With Perceived Stress In The Students Of Azad Ahvaz University. Journal of Social Psychology (New Findings in Psychology). 2011.
14.   Kianpour Barjoee L, Amini N, Keykhosrovani M, Shafiabadi A. Effectiveness of Positive Thinking Training on Perceived Stress, Metacognitive Beliefs, and Death Anxiety in Women with Breast Cancer: Perceived Stress in Women with Breast Cancer. Archives of Breast Cancer. 2022;9(2):195-203. [DOI]