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Comparison of the Effectiveness of Group-Based Acceptance and Commitment Therapy and Mindfulness-Based Cognitive Therapy on Post-Traumatic Growth in Patients with Multiple Sclerosis

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Abstract: The objective of this study was to compare the effectiveness of two group therapies, namely Acceptance and Commitment Therapy (ACT) and Mindfulness-Based Cognitive Therapy (MBCT), on post-traumatic growth in patients with multiple sclerosis. The study followed an experimental-experimental design with a pre-test, post-test approach and included a control group. A total of 45 patients were purposefully selected and randomly assigned to either the experimental or control group, with each group comprising 15 individuals. Data was collected using post-traumatic growth inventory (Tedeschi and Calhoun, 1996). The findings revealed that both the group therapy based on Acceptance and Commitment Therapy (ACT) and Mindfulness-Based Cognitive Therapy (MBCT) were effective in promoting post-traumatic growth. Furthermore, there was no significant difference in the effectiveness of the two therapies in improving post-traumatic growth in patients with multiple sclerosis ($p > 0.05$). These results have important implications for psychologists and counselors involved in the treatment and rehabilitation of individuals with multiple sclerosis.

Keywords: Post-traumatic growth, Group therapy based on acceptance and commitment, Mindfulness-based cognitive therapy, Patients with multiple sclerosis

Introduction

Multiple Sclerosis (MS) is a common disease that occurs when the myelin sheath of nerve cells in the central nervous system breaks down. In Iran, the prevalence of MS is 40 per 100,000 people, with women being affected two to three times more than men (Rolak, 2003). This chronic and progressive disease follows an unpredictable and consistent course, with an advanced secondary phase and a common mild phase (van Nierop et al., 2017). It leads to a range of neurological symptoms including blurred vision, loss of balance, muscle weakness, and sensory disturbances (Doshi & Chataway, 2017). Recent research has identified environmental, genetic, immunological, and microbiological factors as the causes of MS (Dobson & Giovannoni, 2019). MS is categorized as an autoimmune disease, where the immune system attacks the brain and spinal cord, disrupting their function. As the central nervous system controls all bodily actions and activities, MS can have various consequences for an individual (Milo & Kahana, 2010).

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While the exact cause of MS is not clear, it is evident that environmental factors, including stress, play a significant role. Psychological stressors contribute to exacerbating the disease and triggering new attacks. In addition to medication and complex treatments, it is recommended that MS patients avoid anxiety, stress, and psychological tension (Khezri-Moghaddam et al., 2012). MS affects personality, cognition, and overall psychological well-being, and psychological distress is known to worsen the disease. Studies have also shown that psychological distress in these individuals is accompanied by biological changes (Dennison et al., 2009). MS patients tend to become more passive if they perceive their disease as dangerous, chronic, and uncontrollable. They may experience greater disability, weaker social functioning, and more psychological problems. Therefore, health psychology emphasizes the examination of positive psychological impacts on individuals facing adverse events and the identification of variables that facilitate these effects (Goretti et al., 2009).

Post-traumatic growth can help reduce psychological disturbances in individuals with MS. It is a phenomenon that occurs in some individuals after experiencing incidents such as chronic diseases, and it is influenced by psychological factors (Jayawickreme et al., 2021). In the literature on trauma, this term refers to changes in how one sees themselves, their relationships with others, their life philosophy, fundamental beliefs, altered identity, and their perception of themselves and their abilities ((Joseph et al., 2012). Mark et al. (2018) describe post-traumatic growth as experiencing significant positive changes as a result of the risks associated with extraordinary and critical life events. Post-traumatic growth can be seen in various ways, such as having a pleasant and satisfying sense of self, feeling competent and adaptable when facing challenges or changes in relationships, especially with family members and significant others like friends and acquaintances, finding reconciliation, being better able to protect oneself and prevent abusive relationships, forming new friendships, being more willing to seek help and try new behaviors, discovering new opportunities, developing strong beliefs, finding meaning in life, and having a new perspective on life (Zebrack et al., 2015). Increased post-traumatic growth in patients leads to better adherence to treatment. Some studies have shown that a negative perception of the disease's status is linked to not following the prescribed treatment, increased future disability, slower recovery, and lower quality of life (Costello et al., 2008).

In recent years, the negative effects of disasters and other unpleasant events have primarily been studied in the context of post-traumatic stress disorder. However, this disorder only explains a portion of how individuals react to life's challenges, and post-traumatic growth can also occur. Post-traumatic growth refers to the positive personal and psychological changes that result from a difficult event and an individual's struggle against the stress it causes, which have adaptive significance (Freire de Medeiros et al., 2017). Post-traumatic growth can occur in various areas, including improvements in relationships

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with others, a greater appreciation for life, a sense of increased personal strength, positive changes in priorities and goals, and spiritual changes. Research in the field of health psychology suggests that the possibility of post-traumatic growth exists for individuals facing stressful events (Tedeschi & Calhoun, 2004).

Numerous treatments have been used for individuals with chronic illnesses, such as multiple sclerosis (MS). This study examines some of these important treatments, one of which is group therapy based on acceptance and commitment. Acceptance and commitment therapy aims to establish mental flexibility, allowing individuals to choose more suitable options rather than simply trying to avoid thoughts, feelings, memories, or disruptive tendencies, or forcing them on themselves (Herbert & Forman, 2013). In acceptance and commitment therapy, efforts are made to increase an individual's acceptance of their mental experiences (thoughts, feelings, etc.) and correspondingly reduce ineffective attempts at control. Patients are taught that any effort to avoid or control these experiences is ineffective and can actually worsen them, and that complete acceptance without any internal or external reaction is necessary. The second step involves increasing the individual's awareness of their current mental state, thoughts, and behaviors. This means being fully present and aware of their thoughts, feelings, and actions in the present moment. In the third stage, the individual is taught to detach themselves from these mental experiences in a way that allows them to function independently from these experiences (cognitive detachment)."

Fourthly, an attempt can be made to decrease excessive self-centeredness or personal narratives that individuals construct in their minds, such as feelings of victimization. Additionally, individuals can be supported in identifying their core personal values, clearly defining them, and transforming them into specific behavioral objectives through a process known as values clarification. Lastly, motivation for committed action can be generated, encouraging individuals to engage in activities that align with their defined goals and specified values, while also accepting their mental experiences (Zettle, 2015). Multiple studies have demonstrated the effectiveness of Acceptance and Commitment Therapy in reducing catastrophic thinking related to pain, improving distress tolerance, and promoting post-traumatic growth in patients with Fibromyalgia Syndrome (EzzatPanah & Latifi, 2020), as well as reducing the fear of cancer recurrence and facilitating post-traumatic growth in breast cancer patients (Sarizadeh et al., 1397).

Another treatment method being investigated in this study is Mindfulness-based Cognitive Therapy, which is based on three key components: avoiding judgment, increasing awareness, and being fully present and focused in the present moment. This therapy assists individuals in processing their cognitive, physiological, and behavioral activities. By cultivating moment-to-moment awareness of thoughts, emotions, and physical sensations, individuals learn to manage their thoughts, gain self-control, and free

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themselves from self-created mental constructs (Sipe & Eisendrath, 2012). Mindfulness therapy has shown significant efficacy in terms of adaptability and has been beneficial as an initial prevention strategy in health and similar settings, particularly for patients experiencing symptoms of stress, anxiety, and depression (Zhao et al., 2020). Mindful individuals tend to make less harmful evaluations of stress and employ fewer avoidance-based coping mechanisms. Mindfulness and well-being are partially or entirely mediated by more adaptive responses to stress and coping strategies (Crowe et al., 2016). Studies have indicated that this therapeutic approach can regulate irregular heart and brain activities, reduce cortisol levels, improve quality of life, enhance immune system function, and promote effective coping (Chiesa & Serretti, 2011). Numerous studies have associated Mindfulness-based Therapy with improvements in anxiety and positive metacognitive beliefs about worrying (Hamedi et al., 2017), increased psychological well-being and hopefulness in patients with multiple sclerosis (King et al., 2013), as well as improved mental health and disease perception in multiple sclerosis patients (Esteki et al., 2020). In light of the aforementioned information, the objective of this current study is to assess the effectiveness and compare group therapy based on Acceptance and Commitment Therapy and Mindfulness-based Cognitive Therapy in promoting post-traumatic growth among individuals with Multiple Sclerosis. This research aims to address two fundamental questions: 1) Is group therapy based on Acceptance and Commitment Therapy and Mindfulness-based Cognitive Therapy effective in promoting post-traumatic growth in individuals with Multiple Sclerosis? 2) Is there a significant difference in the effectiveness of group therapy based on Acceptance and Commitment Therapy and Mindfulness-based Cognitive Therapy in promoting post-traumatic growth in individuals with Multiple Sclerosis? Hence, the aim of this research is to compare the effectiveness of group therapy based on Acceptance and Commitment Therapy and Mindfulness-based Cognitive Therapy in promoting post-traumatic growth among patients with Multiple Sclerosis.

Material and Methods

The current study is categorized as an applied study with an experimental design of pre-test/post-test including a control group. The study utilized two distinct experimental groups and a control group without any intervention throughout the research. The predictor variables (interventions) were group therapy based on Acceptance and Commitment (ACGT) and Mindfulness-based Cognitive Therapy (MBCGT), while the criterion variable was post-traumatic growth. Multivariate analysis of covariance, univariate analysis, and Bonferroni follow-up test methods were employed to analyze the data.

The statistical population for this study consisted of all multiple sclerosis (MS) patients who were members of the Ahvaz MS Patients Support Society in 2019, totaling 327 individuals. The sampling

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method used was purposive, and the inclusion criteria involved written consent for participation, scores below the mean in the post-traumatic growth questionnaire, age between 20 to 55 years, 3 to 7 years of experience with MS symptoms, no addiction or substance abuse, non-participation in other psychological interventions, and literacy. The exclusion criteria included substance dependency, cognitive impairment or dysfunction, inability to speak Farsi fluently, inability to read and write, inability to understand interview and questionnaire questions, lack of willingness to continue participating, or absence from more than two therapy sessions.

A sample of 45 individuals was randomly selected from the population for this study, and they were assigned to the experimental groups: Acceptance and Commitment Group Therapy (15 individuals), Mindfulness-based Cognitive Therapy (15 individuals), and the Control Group (15 individuals).

The Post-Traumatic Growth Inventory, developed by Tedeschi and Calhoun (1996) in the United States, was used to measure post-traumatic growth. It consists of 21 items assessing five domains of psychological changes after facing a stressful event. The items are scored on a 6-point Likert scale, with higher scores indicating less growth. In the Iranian population, the questionnaire was normalized by Seyedmahmoudi et al. (2013), who reported a test-retest correlation coefficient of 0.94 and Cronbach's alpha ranging from 0.66 to 0.90 for the factors. In the present study, the reliability of the scale was determined using Cronbach's alpha, which yielded a coefficient of 0.82.

1. Acceptance and Commitment Group Therapy: The therapy sessions, which followed the principles of Acceptance and Commitment Therapy (ACT) as outlined by (Hayes et al., 2013), were conducted over a span of 8 sessions, with each session lasting 90 minutes. The summarized structure of these therapy sessions can be found in the table presented below:

Table 1. Summary of sessions, guidelines, and techniques used in acceptance and commitment-based therapy

Session	Content
1	Completing the questionnaires, introduction, familiarization with the rules of the group, reviewing the treatment and goals of this program, measuring, conceptualizing and giving the pamphlet
2	Discussing experiences and evaluating them, efficiency as a measure and generating creative frustration
3	Articulating control as the problem, introducing desire as another response, and engaging in purposeful actions
4	Using cognitive fault techniques, interfering with the functioning of problematic language chains, weakening one's alliance with thoughts and emotions
5	Viewing the self as context, undermining the self-concept and expressing the self as observer, demonstrating the separation between the self, internal experiences, and behavior
6	Application of mental techniques, patterning of leaving the mind, training to see inner experiences as a process
7	Introducing value, showing the dangers of focusing on results, discovering the practical values of life
8	Understanding the nature of desire and commitment, determining action patterns in accordance with values, implementing post-test

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2. Mindfulness-Based Cognitive Therapy Sessions: The Mindfulness-Based Cognitive Therapy sessions were developed based on the educational protocol established by Rebecca (Hutton, 2011). These sessions were held for a total of 8 weeks, with each session lasting 90 minutes, specifically for the second experimental group.

Table 2. Summary of mindfulness-based cognitive therapy sessions

Session	Content
1	Communicating, defining and conceptualizing and the need to use mindfulness training. Automatic implementation (teaching to eat a raisin with the awareness of body verification meditation training)
2	Removing obstacles (awareness of thoughts, feelings, emotions, performing meditation practice of checking the body, teaching three minutes of breathing with mindfulness and meditation of the mind)
3	Breathing with mindfulness (doing three minutes of breathing, discovering pleasant daily experiences, learning to practice movements in a conscious way, movement meditations)
4	Staying in the moment (discovering unpleasant experiences, doing 5 minutes of seeing or hearing with mindfulness (awareness of breathing, body parts, sounds, thoughts, and conscious choices) doing three minutes of breathing, taking a walk with mindfulness, teaching relaxation exercises)
5	Accepting and allowing (doing body relaxation exercises, awareness of body thoughts-feelings, three minutes of breathing, reading the poem of the Roman guest house (let what we think is beautiful be what we do), discover the content according to the group's goals)
6	Thoughts do not have a real origin (doing relaxation exercises, awareness of breathing and body, bringing up patients' problems during exercise and discovering its effects on the body and mind, three minutes of breathing, exercise to change mood, thoughts and attitudes and prepare for the end of the course)
7	How to take care of ourselves in the best way (doing relaxation exercises, awareness of breathing, body parts, sounds, thoughts and emotions, three minutes of breathing along with planning a problem during the exercise and discovering its effect on the mind and body, training to identify the connection between activity and mood of people)
8	How to use these items in future decisions (summary of training sessions and application of teachings to deal with mood states in the future). , post-test implementation

Results

Descriptive findings, including the mean and standard deviation of the experimental and control groups, are presented in the following tables.

Table 3. Means and standard deviations of post-traumatic growth in experimental and control groups in pretest and posttest

Variable	Group	Pretest		Posttest	
		Mean	SD	Mean	SD
Post traumatic growth	Experimental 1	39.60	6.10	67.53	5.28
	Experimental 2	39	4.84	66.53	3.97
	Control	39.60	4.45	43.53	3.85

As observed in Table 3, the means and standard deviations for the post-traumatic growth variable in both the experimental and control groups during the pretest and posttest stages are presented.

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The results demonstrated that the relationship between the post-traumatic growth variable and its posttest are significant at the 0.01 level. Hence, the linear assumption between the dependent and covariate variables is maintained. Also, the Levene's test for the post-traumatic growth variable is not significant. Therefore, the variances of both experimental groups 1 and 2, as well as the control group, in the research variable, are not statistically significant. Consequently, the variance homogeneity assumption is confirmed. The assumption of equal variance scores in the research variable between the experimental groups and the control group has been validated. The findings indicated the lack of significance in the assumption of covariance homogeneity using the Box's test ($p < 0.05$, $F = 1.868$, and Box's $M = 43.435$). Hence, the assumption of differences between covariances is established. Likewise, the F-value for the interaction with the post-traumatic growth variable is not significant. Therefore, the assumption of regression homogeneity is confirmed. Finally, the null hypothesis for the normality of score distributions in both experimental groups 1 and 2 and the control group for the post-traumatic growth variable is confirmed. This implies that the assumption of normal distribution of scores in the pretest and in all groups is validated. Since the assumptions of multivariate covariance analysis were confirmed, MANCOVA was used to test the research hypothesis. The result is presented in Table 4.

Table 4. Multivariate analysis of covariance on post-test scores of post-traumatic growth in experimental groups (1 and 2) and control group controlling for pretest

Test	Value	F	Hypothesis DF	Error DF	p	Eta
Pillai's trace	0.975	34.38	3	36	0.001	0.87
Wilks' Lambda	0.041	34.38	3	36	0.001	0.87
Hotelling's trace	22.91	34.38	3	36	0.001	0.87
Roy's largest root	22.89	34.38	3	36	0.001	0.87

As depicted in Table 4, with pretest control, all tests show significant levels, indicating that there is a significant difference ($F = 34.38$, $p < 0.001$) between MS patients in experimental groups (1 and 2) and the control group concerning the dependent variable, post-traumatic growth. The effect size or difference is 0.87, meaning that 87% of individual differences in post-test scores of post-traumatic growth in MS patients are related to the impact of group therapy based on acceptance and commitment and mindfulness-based cognitive therapy.

Table 5. Univariate analysis of covariance on post-test scores of PTG in experimental and control groups

Variable	Source	SS	DF	MS	F	p	Eta	Power
Post-traumatic growth	Group 1	5486.78	1	5486.78	188.69	0.001	0.90	1
	Group 2	5473.02	1	5473.02	173.61	0.001	0.89	1

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As evident in Table 5, with the control of the pretest, the significant levels of all tests indicate that there is a significant difference between MS patients in the experimental group (1) and the control group in terms of post-traumatic growth ($F = 188.69$, $p < 0.001$). In other words, group therapy based on acceptance and commitment has led to an increase in the post-traumatic growth of MS patients in the experimental group (1) compared to the control group. The effect size or difference for post-traumatic growth is 0.90, meaning that 90% of the individual differences in post-assessment scores of post-traumatic growth in MS patients are attributed to the impact of group therapy based on acceptance and commitment. Similarly, with the control of the pretest, the significant levels of all tests indicate a significant difference between MS patients in the experimental group (2) and the control group in terms of post-traumatic growth ($F = 173.61$, $p < 0.001$). In other words, mindfulness-based cognitive therapy has led to an increase in the post-traumatic growth of MS patients in the experimental group (2) compared to the control group. The effect size or difference for post-traumatic growth is 0.89, meaning that 89% of the individual differences in post-assessment scores of post-traumatic growth in MS patients are attributed to the impact of mindfulness-based cognitive therapy. To determine the distinctiveness of effectiveness, a univariate analysis of covariance was conducted, and the Bonferroni post hoc test presented the results in Table 6.

Table 6. Comparison of ACT and MBCT on post-traumatic growth by Bonferroni post hoc test

Variable	Comparison groups	Means Difference	p
Post-traumatic growth	ACT-Control	23.93	0.001
	MBCT-Control	23.25	0.001
	MBCT-ACT	0.67	0.80

As observed in Table 6, the mean differences between acceptance-commitment therapy and mindfulness-based cognitive therapy in the post-traumatic growth variable (MD = 0.672) are not statistically significant at the specified research level (0.05). Therefore, it was evident that there is no difference in the effectiveness of group therapy based on acceptance-commitment and mindfulness-based cognitive therapy in increasing post-traumatic growth in patients with multiple sclerosis. Both treatments are effective interventions for enhancing post-traumatic growth in patients with multiple sclerosis.

Discussion

The purpose of this study was to compare the effectiveness of group therapy based on acceptance-commitment and mindfulness-based cognitive therapy on increasing post-traumatic growth in patients with multiple sclerosis (MS). The results indicated that both group therapies led to increased post-

traumatic growth in MS patients in the experimental groups (1), but there was no significant difference in the effectiveness of acceptance-commitment therapy and mindfulness-based cognitive therapy on increasing post-traumatic growth in patients with multiple sclerosis. Both treatments are effective interventions for enhancing post-traumatic growth in patients with multiple sclerosis. As a comparative study was not conducted, attention was paid to research that had investigated the effectiveness of treatments. It can be noted that the results of Omidi et al. (2018) concluded that acceptance-commitment therapy is an effective intervention. Sarizadeh et al. (1397) showed that acceptance-commitment therapy is effective in improving cognitive dimensions. Amanollahi et al. (2017) concluded that acceptance-commitment therapy is an effective intervention. Hokmabadi et al. (2018) found that acceptance-commitment therapy is an effective approach, consistent with research by Esteki et al. (2020), which concluded that mindfulness-based cognitive therapy is an effective intervention. Rahmani and Mansouri (2020) concluded that mindfulness-based cognitive therapy is an effective approach for the cognitive dimensions of patients. Also, Yang et al. (2015) concluded that mindfulness-based cognitive therapy is an effective approach. This suggests that the diagnosis and treatment of patients with multiple sclerosis can have profound effects on psychological, social, physical, and spiritual health.

Considering that multiple sclerosis affects the psychological and physical dimensions of those affected, the use of psychological therapies alongside medical treatments may help reduce the psychological consequences of the disease. Explaining the findings of this research, it can be said that by participating in group therapy sessions based on acceptance-commitment and mindfulness-based cognitive therapy, patients could collaborate with therapists to find various solutions to their problems. This collaboration in finding solutions to psychological problems led to increased emotional regulation and awareness of the symptoms and treatment of the disease, thereby increasing their post-traumatic growth. In general, group therapy based on acceptance-commitment and mindfulness-based cognitive therapy, through various methods during sessions, improve fear-based thinking and break the flawed cycle of unawareness of the disease's characteristics. Both interventions seemed to help patients form a new relationship with their thoughts and allowed them to be more adaptive with the cognitive and emotional dimensions caused by the disease, enhancing post-traumatic growth. Consequently, it can be said that both group therapies based on acceptance-commitment and mindfulness-based cognitive therapy are effective in enhancing post-traumatic growth in patients with multiple sclerosis, and there is no difference between the two therapies in increasing post-traumatic growth in MS patients. Both interventions are effective in improving post-traumatic growth in MS patients.

The current research has certain limitations that should be acknowledged. Among these limitations, it is important to note that the sample was restricted to individuals with MS and a self-report questionnaire

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was utilized. The role of intervening variables such as the type of medications used, the number of relapses, pain intensity, and overall disability status was not investigated. Therefore, caution should be exercised in generalizing the results to other patients suffering from multiple sclerosis.

Based on our results, it is recommended that in future research, control and experimental subjects should be matched in terms of age conditions, marital status, and pre-test scores. Also, it is suggested that in future research, control and experimental subjects should be examined for psychological disorders. Considering the interaction of multiple sclerosis conditions with psychological issues, it is recommended that psychological treatments be consistently available to these patients.

Conflict of interest: There is no conflict of interest associated with this research.

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