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Comparison of the Effectiveness of Group Acceptance and Commitment Therapy and Emotion Regulation Training on Worry Severity in Female Patients with Multiple Sclerosis

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ABSTRACT

This study aimed to compare the effectiveness of group-based Acceptance and Commitment Therapy (ACT) and Emotion Regulation Training on worry severity among women diagnosed with Multiple Sclerosis (MS) in Ahvaz. The present study employed a quasi-experimental design with a pretest–posttest control group and a three-month follow-up period. The statistical population consisted of all women diagnosed with Multiple Sclerosis in Ahvaz during 2024. Based on the inclusion and exclusion criteria, a sample was selected through purposive sampling and randomly assigned to experimental and control groups. The experimental groups received either group-based Acceptance and Commitment Therapy or Emotion Regulation Training, whereas the control group received no intervention. Data were collected using the standardized Penn State Worry Questionnaire (PSWQ; Meyer et al., 1990). The data obtained during the pretest, posttest, and follow-up stages were analyzed using SPSS version 26 through descriptive statistics (mean and standard deviation) and inferential statistical tests, including multivariate analysis of covariance (MANCOVA), repeated-measures analysis of variance (ANOVA), and the Bonferroni post hoc test. The results indicated that both group-based Acceptance and Commitment Therapy and Emotion Regulation Training significantly reduced worry severity among women with Multiple Sclerosis. Furthermore, the findings revealed no significant difference between the effectiveness of these two therapeutic approaches. Overall, the results of the present study underscore the importance of psychological interventions based on acceptance, commitment, and emotion regulation in improving mental health indicators among women with Multiple Sclerosis and demonstrate that these approaches can be used as effective adjuncts to medical treatments.

Keywords: Acceptance and Commitment Therapy, Emotion Regulation, Worry Severity, Multiple Sclerosis.

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Introduction

Multiple Sclerosis (MS) is a chronic, progressive, immune-mediated neurological disorder characterized by inflammation, demyelination, and neurodegeneration within the central nervous system. The disease affects millions of individuals worldwide and is one of the most common causes of neurological disability among young and middle-aged adults. Advances in pharmacological treatments have substantially improved disease management and reduced relapse rates; however, many patients continue to experience persistent physical, cognitive, and psychological difficulties that adversely affect daily functioning and quality of life

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(1, 2). MS is particularly prevalent among women, who not only exhibit higher incidence rates but also experience unique psychosocial challenges related to family roles, employment, interpersonal relationships, and future uncertainty (3, 4).

The unpredictable nature of MS creates substantial psychological distress. Disease progression, fluctuating symptoms, uncertainty regarding future disability, treatment effectiveness, and social consequences often generate chronic emotional burdens for affected individuals. Research has consistently demonstrated elevated levels of anxiety, depression, stress, sleep disturbances, and reduced psychological well-being among patients with MS (1, 5). In addition to physical symptoms such as fatigue, pain, and motor impairments, psychological concerns frequently become major determinants of overall functioning and quality of life. Contemporary models of chronic illness increasingly emphasize the interaction between physical symptoms and psychological processes, highlighting the need for comprehensive biopsychosocial approaches to disease management (6, 7).

Among the psychological difficulties experienced by individuals with MS, worry represents one of the most prevalent and debilitating concerns. Worry is generally defined as a chain of repetitive, future-oriented thoughts focused on uncertain and potentially negative outcomes. Although moderate worry may facilitate preparation and problem-solving, excessive and uncontrollable worry can contribute to psychological distress, emotional dysfunction, and impaired adjustment. Chronic worry has been associated with anxiety disorders, reduced resilience, impaired coping, and diminished well-being across diverse populations (8, 9). For patients with chronic illnesses such as MS, worry often centers on disease progression, future disability, treatment outcomes, financial burdens, and dependence on others. Persistent worry can consequently intensify emotional distress and interfere with effective disease adaptation (10, 11).

Several disease-related factors contribute to heightened vulnerability to worry among individuals with MS. Neurobiological changes associated with the disease may influence emotional processing and cognitive functioning. Evidence suggests that inflammatory and neurodegenerative processes can affect neural networks involved in emotional regulation, executive functioning, and adaptive coping (12, 13). Difficulties in managing emotional experiences may increase susceptibility to repetitive negative thinking patterns, including worry and rumination. Furthermore, challenges such as fatigue, chronic pain, uncertainty regarding symptom fluctuations, and reduced participation in social activities can create conditions that perpetuate persistent worry and emotional distress (1, 5).

Recent studies have highlighted the central role of emotion regulation in the psychological adjustment of patients with chronic illnesses. Emotion regulation refers to the processes through which individuals monitor, evaluate, and modify emotional reactions to achieve desired goals and maintain psychological functioning. Effective emotion regulation is associated with greater resilience, improved coping abilities, enhanced well-being, and reduced psychological symptoms. Conversely, deficits in emotion regulation are linked to anxiety, depression, worry, and diminished quality of life (8, 13). Research conducted among individuals with MS has demonstrated that difficulties in emotion regulation are significantly associated with poorer psychological outcomes and increased emotional vulnerability (13).

Given the importance of emotional functioning in MS, psychological interventions targeting adaptive emotion regulation have received increasing attention. Emotion Regulation Training aims to enhance awareness, acceptance, understanding, and management of emotional experiences while promoting adaptive

cognitive and behavioral strategies. This approach helps individuals identify maladaptive emotional responses, challenge dysfunctional cognitive patterns, and develop healthier coping mechanisms. Empirical findings suggest that emotion regulation interventions can improve psychological well-being, increase psychological capital, reduce emotional avoidance, and enhance overall adjustment among individuals with MS (14, 15). These findings indicate that strengthening emotional regulation capacities may represent a valuable strategy for reducing worry and improving mental health in this population.

Another intervention that has demonstrated considerable promise in chronic health conditions is Acceptance and Commitment Therapy (ACT). ACT is a third-wave behavioral therapy grounded in functional contextualism and relational frame theory. Rather than attempting to eliminate unpleasant thoughts and emotions, ACT encourages individuals to develop psychological flexibility through acceptance, mindfulness, cognitive defusion, values clarification, and committed action (16). Psychological flexibility enables individuals to engage meaningfully in valued activities despite the presence of distressing internal experiences. Within chronic illness contexts, ACT seeks to reduce experiential avoidance and foster adaptive responses to pain, fatigue, uncertainty, and emotional distress.

A growing body of evidence supports the effectiveness of ACT across various psychological and medical conditions. Systematic reviews and meta-analyses have demonstrated beneficial effects of ACT on chronic pain, fatigue, emotional distress, and quality of life (17-19). In chronic health populations, ACT has been shown to improve psychological functioning by helping individuals alter their relationship with distressing thoughts and emotions rather than attempting to control or suppress them. Such findings suggest that ACT may be particularly suitable for individuals coping with unpredictable and uncontrollable conditions such as MS (16, 17).

Within the field of Multiple Sclerosis, several investigations have reported positive outcomes associated with ACT-based interventions. ACT has been found effective in reducing pain severity, chronic fatigue symptoms, death anxiety, hopelessness, health anxiety, existential anxiety, and emotional difficulties while simultaneously enhancing resilience, well-being, and adaptive functioning (11, 20-24). Moreover, studies indicate that ACT can improve cognitive-emotional regulation and decrease emotional avoidance among patients with MS, thereby addressing key mechanisms associated with psychological distress (15, 21). These findings support the application of ACT as an effective psychological intervention for individuals facing the challenges of chronic neurological disorders.

Similarly, emotion regulation interventions have yielded encouraging outcomes in MS populations. Research has demonstrated that emotion regulation training can improve psychological well-being, strengthen psychological resources, and reduce maladaptive cognitive-emotional patterns among women with MS (14). Comparative studies have further shown that both ACT and emotion regulation approaches contribute to reductions in cognitive failures, emotional avoidance, and other psychological difficulties experienced by individuals with MS (15). Because both interventions target emotional processes through distinct theoretical mechanisms, examining their relative effectiveness may provide valuable insights into optimizing psychological care for this population.

The importance of addressing worry in MS has been emphasized in recent research. Worry is not only associated with heightened anxiety and emotional distress but also contributes to reduced resilience, impaired adjustment, and lower quality of life. Studies investigating ACT have reported significant

reductions in worry severity among clinical populations, including individuals experiencing chronic psychological distress and anxiety-related conditions (10, 25). Furthermore, evidence indicates that emotional dysregulation may contribute directly to the maintenance of worry, suggesting that interventions focused on improving emotional regulation skills may effectively reduce excessive worry and associated psychological symptoms (8, 9).

Despite growing evidence supporting both Acceptance and Commitment Therapy and Emotion Regulation Training, direct comparisons of these approaches among women with Multiple Sclerosis remain limited. Existing studies have generally focused on separate psychological outcomes such as resilience, emotional avoidance, well-being, chronic fatigue, pain perception, cognitive failures, and health anxiety (11, 15, 22, 24). Consequently, there remains insufficient evidence regarding their comparative effectiveness in reducing worry severity, particularly among female patients with MS who may experience heightened psychosocial vulnerability. Given the significant role of worry in psychological adjustment and the potential benefits of both interventions, further comparative investigation appears warranted.

Therefore, the present study aimed to compare the effectiveness of group-based Acceptance and Commitment Therapy and Emotion Regulation Training on worry severity among women with Multiple Sclerosis in Ahvaz.

Methods and Materials

Study Design and Participants

This study employed a quasi-experimental design using a three-group pretest–posttest framework with a three-month follow-up assessment. The research population consisted of all female patients diagnosed with Multiple Sclerosis (MS) who were registered members of the Ahvaz MS Society in 2024. Sample size determination was conducted using Cohen's sample size table, considering a 95% confidence level, an effect size of 0.70, and a statistical power of 0.91, which indicated a minimum of 12 participants per group. To compensate for potential attrition and to enhance the generalizability of the findings, the sample size was increased to 15 participants per group. Accordingly, 45 women with MS who met the inclusion criteria were selected through purposive sampling following a structured clinical interview. Participants were then randomly assigned to one of three groups: the Acceptance and Commitment Therapy (ACT) group (n = 15), the Emotion Regulation Training group (n = 15), and the control group (n = 15). All participants completed the study measures at baseline prior to the intervention. Subsequently, the two experimental groups received their respective interventions, whereas the control group received no psychological treatment during the study period. Posttest assessments were conducted immediately after completion of the interventions, and follow-up assessments were administered three months later. Inclusion criteria included a confirmed diagnosis of Multiple Sclerosis, absence of severe personality disorders or severe psychiatric disorders that could interfere with participation (as assessed through a DSM-based clinical interview), absence of substance or alcohol abuse, no concurrent use of psychiatric medications that could affect participation, willingness to participate voluntarily, the ability to share personal experiences during group sessions, no simultaneous participation in other counseling or psychotherapy programs, a minimum educational attainment equivalent to middle-school completion, and provision of informed consent. Exclusion criteria included participation in other psychotherapeutic interventions during the study period, initiation of

additional pharmacological or psychological treatments outside the study protocol, psychiatric hospitalization during the intervention period, absence from more than three treatment sessions, relocation, incomplete participation in treatment activities, failure to complete therapeutic assignments, or incomplete responses to the study questionnaires.

Data Collection

Worry severity was assessed using the Penn State Worry Questionnaire (PSWQ), originally developed by Meyer, Miller, Metzger, and Borkovec in 1990 as a self-report measure designed to assess the trait of pathological worry. The instrument consists of 16 items that evaluate the generality, intensity, and uncontrollability of worry. Responses are rated on a five-point Likert scale ranging from 1 (not at all typical of me) to 5 (very typical of me), yielding total scores between 16 and 80. Higher scores indicate greater levels of worry. Eleven items are scored directly, whereas five items (Items 1, 3, 8, 10, and 11) are reverse scored. Scores ranging from 16 to 39 indicate low worry, scores between 40 and 59 indicate moderate worry, and scores between 60 and 80 indicate high worry severity. The PSWQ has demonstrated excellent psychometric properties across clinical and non-clinical populations. Previous studies have reported an internal consistency coefficient of .94, test–retest reliability of .90, and strong construct validity, with evidence supporting its ability to discriminate individuals with generalized anxiety disorder from those with depressive disorders. Factor-analytic studies have further confirmed the questionnaire's construct validity.

Intervention

Participants assigned to the Acceptance and Commitment Therapy group received an eight-session intervention delivered in weekly 90-minute group meetings. The intervention was based on the ACT model developed by Hayes et al. (1999) and further informed by protocols designed for chronic health conditions. All six core ACT processes, including acceptance, cognitive defusion, self-as-context, present-moment awareness, values clarification, and committed action, were incorporated through experiential exercises, metaphors, mindfulness practices, group discussions, and structured homework assignments. The first session focused on participant orientation, group formation, psychoeducation regarding Multiple Sclerosis, introduction to mindfulness exercises, and administration of baseline measures. The second session addressed psychological resilience and psychological well-being through brainstorming and mindfulness-based breathing exercises. The third session introduced values clarification using ACT metaphors such as the "Bus," "80th Birthday," and "Tombstone" exercises. The fourth session focused on the concept of acceptance and helping participants create psychological space for difficult emotions and experiences without avoidance or struggle. The fifth session emphasized committed action and the relationship between values-based behavior, resilience, and emotional expression. The sixth session addressed cognitive fusion and cognitive defusion through experiential metaphors and exercises. The seventh session focused on mindfulness, identification of personal values, exploration of barriers to valued living, and development of short- and long-term goals. The final session reviewed the entire intervention, reinforced commitment to values-based action, and administered the posttest assessment.

Participants in the Emotion Regulation Training group received a structured intervention consisting of ten weekly sessions, each lasting 90 minutes. The intervention integrated principles from Linehan's emotion

regulation framework and cognitive-emotional regulation techniques proposed by Leahy and colleagues. The first session included pretest administration and an overview of the program objectives and structure. The second session focused on understanding emotions and increasing emotional awareness. The third session introduced the concept of emotion regulation and cognitive strategies for regulating positive emotions. The fourth session addressed cognitive reappraisal and acceptance-based responses to emotional situations. During the fifth session, participants learned and practiced coping-thought techniques and advanced cognitive reappraisal strategies. The sixth session emphasized behavioral activation and increasing engagement in pleasant and meaningful activities. The seventh session focused on enhancing emotional awareness and recognition of emotional experiences. The eighth session introduced decatastrophizing techniques as well as relaxation and meditation practices. The ninth session emphasized cognitive reframing and structured problem-solving skills. The final session reviewed the intervention content, consolidated acquired skills, and administered the posttest assessment. Throughout the intervention, participants were encouraged to practice learned strategies between sessions and discuss their experiences during subsequent meetings.

Data Analysis

Data analysis was conducted using IBM SPSS Statistics version 28. Descriptive statistics, including means and standard deviations, were calculated to summarize participant characteristics and study variables across assessment points. Inferential analyses were performed to examine intervention effects over time and between groups. Multivariate Analysis of Covariance (MANCOVA) was employed to assess post-intervention differences while controlling for baseline scores. In addition, repeated-measures Analysis of Variance (ANOVA) was used to evaluate changes in worry severity across the pretest, posttest, and three-month follow-up assessments and to examine interaction effects between time and group membership. When significant effects were identified, Bonferroni post hoc comparisons were conducted to determine the specific nature of differences between assessment points. Statistical significance was evaluated at the conventional alpha level of 0.05.

Findings and Results

The study included 45 women diagnosed with Multiple Sclerosis who were equally assigned to the Acceptance and Commitment Therapy (ACT) group (n = 15), the Emotion Regulation Training group (n = 15), and the control group (n = 15). The mean age of participants in the ACT group was 39.73 years (SD = 7.82), compared with 36.33 years (SD = 6.29) in the Emotion Regulation group and 37.40 years (SD = 7.86) in the control group. Participants ranged in age from 25 to 52 years in the ACT group, 28 to 51 years in the Emotion Regulation group, and 25 to 54 years in the control group. Skewness and kurtosis values for age were within the acceptable range of ±2 across all groups, indicating a normal distribution of age. Regarding disease duration, most participants had experienced MS for less than 10 years, with the highest proportion of patients with disease duration below five years observed in the Emotion Regulation group (46.7%). Educational attainment varied across groups; however, bachelor's degree holders represented the largest proportion in the ACT group, whereas associate degree holders were most common in the Emotion Regulation group. The control group demonstrated the greatest educational diversity and included the

highest percentage of participants with postgraduate education. In terms of marital status, married women constituted the majority of participants in all three groups, accounting for 66.7% of the ACT group, 73.3% of the Emotion Regulation group, and 73.3% of the control group, indicating a relatively comparable demographic composition across study conditions.

Table 1. Descriptive Statistics of Worry Severity Across Groups and Measurement Occasions

Group	Variable	Pretest Mean ± SD	Posttest Mean ± SD	Follow-up Mean ± SD
Control	Worry Severity	59.40 ± 7.11	60.20 ± 7.34	58.73 ± 7.25
Acceptance and Commitment Therapy	Worry Severity	60.53 ± 6.82	53.87 ± 6.55	55.20 ± 6.78
Emotion Regulation Training	Worry Severity	61.07 ± 7.26	53.87 ± 6.94	54.33 ± 7.01

As shown in Table 1, the mean scores of worry severity remained relatively stable across the three measurement occasions in the control group. In contrast, both intervention groups demonstrated substantial reductions in worry severity from pretest to posttest. These improvements were largely maintained during the three-month follow-up assessment. The Emotion Regulation Training group exhibited a slightly greater reduction in worry severity than the ACT group; however, the observed differences between the two treatment conditions appeared small. Overall, the descriptive findings suggest that participation in either psychological intervention was associated with meaningful decreases in worry severity among women with Multiple Sclerosis.

Prior to conducting the primary analyses, the assumptions underlying repeated-measures analysis of variance were examined. Inspection of skewness and kurtosis indices indicated that the distribution of worry severity scores approximated normality across all groups and measurement occasions. Levene's test supported the homogeneity of variance assumption, and Box's M test indicated equality of covariance matrices across groups. Mauchly's test of sphericity was not significant; therefore, the assumption of sphericity was considered satisfied. In addition, no problematic outliers were identified, and the data met the statistical requirements for conducting repeated-measures ANOVA and subsequent post hoc analyses.

Table 2. Between-Subjects Effects for Comparison of Worry Severity Across Groups

Source	Sum of Squares	df	Mean Square	F	p	Partial η²
Group	598.178	2	299.089	19.459	< .001	.481
Error	645.556	42	15.370			

The results presented in Table 2 revealed a statistically significant between-group effect for worry severity, $F(2, 42) = 19.459$, $p < .001$, $\eta^2 = .481$. The effect size indicates that approximately 48.1% of the variance in worry severity was attributable to group membership, representing a large effect according to conventional criteria. These findings demonstrate that the three groups differed significantly in their levels of worry severity across the study period, thereby supporting the effectiveness of the psychological interventions relative to the control condition.

Table 3. Bonferroni Post Hoc Comparisons for Worry Severity Between Groups

Dependent Variable	Group 1	Group 2	Mean Difference	Standard Error	p
Worry Severity	Control	Acceptance and Commitment Therapy	3.711	0.827	< .001

Worry Severity	Control	Emotion Regulation Training	4.956	0.827	< .001
Worry Severity	Acceptance and Commitment Therapy	Emotion Regulation Training	1.244	0.827	.419

Bonferroni post hoc comparisons indicated that participants in both intervention groups reported significantly lower worry severity scores than those in the control group. Specifically, significant differences were observed between the control group and the ACT group ($p < .001$), as well as between the control group and the Emotion Regulation Training group ($p < .001$). However, no statistically significant difference was found between the ACT and Emotion Regulation Training groups ($p = .419$). These findings suggest that both interventions were effective in reducing worry severity among women with Multiple Sclerosis, but neither intervention demonstrated superiority over the other in terms of treatment effectiveness.

Discussion and Conclusion

The present study aimed to compare the effectiveness of group-based Acceptance and Commitment Therapy (ACT) and Emotion Regulation Training on worry severity among women with Multiple Sclerosis (MS) in Ahvaz. The findings demonstrated that both interventions significantly reduced worry severity compared with the control group. Furthermore, the reductions observed in the two intervention groups were maintained at the follow-up assessment, indicating the relative stability of treatment effects over time. However, no statistically significant difference was found between the ACT and Emotion Regulation Training groups, suggesting that both approaches were similarly effective in reducing worry among women with MS.

The finding that Acceptance and Commitment Therapy significantly reduced worry severity is consistent with a growing body of literature highlighting the effectiveness of ACT in improving psychological functioning among individuals with chronic illnesses and anxiety-related conditions. Previous studies have shown that ACT reduces psychological distress by increasing psychological flexibility and helping individuals change their relationship with distressing thoughts and emotions rather than attempting to eliminate them (16, 17). From the ACT perspective, excessive worry is maintained through experiential avoidance, cognitive fusion, and attempts to control internal experiences. Individuals become entangled with distressing thoughts about future events and perceive these thoughts as literal truths. Consequently, worry becomes a dominant coping strategy that paradoxically increases emotional suffering. ACT seeks to weaken these maladaptive processes through acceptance, mindfulness, and cognitive defusion techniques, thereby enabling individuals to respond more flexibly to uncertainty and distress (16).

The present findings are consistent with research conducted among individuals with MS. For example, ACT has been shown to reduce chronic fatigue symptoms and pain perception in patients with MS (22). Similarly, ACT interventions have been associated with reductions in death anxiety and hopelessness among patients with MS (23). Other investigations have reported improvements in resilience, psychological well-being, health anxiety, and symptom management following ACT-based interventions (11, 24). Because worry frequently emerges from concerns regarding disease progression, disability, and uncertainty about the future, reductions in anxiety, hopelessness, and maladaptive emotional responses are likely to contribute directly to lower levels of pathological worry. The findings of the current study therefore align closely with prior evidence supporting the usefulness of ACT in addressing psychological challenges associated with MS.

The effectiveness of ACT observed in the present study can also be understood in light of the unique psychological demands imposed by Multiple Sclerosis. MS is characterized by unpredictability, fluctuating symptoms, and uncertainty regarding future health outcomes (1, 2). These factors create fertile conditions for chronic worry because individuals often have limited control over disease-related events. Traditional coping strategies that emphasize control and avoidance may become ineffective in such contexts. ACT encourages patients to accept unavoidable uncertainty while maintaining engagement in meaningful activities and valued life domains. This shift from control-based coping to acceptance-based coping may explain the significant reductions in worry severity observed among participants who received ACT.

The findings also revealed that Emotion Regulation Training significantly reduced worry severity among women with MS. This result is theoretically meaningful because worry is closely linked to emotional dysregulation. Individuals who struggle to identify, understand, and manage emotional experiences often rely on repetitive negative thinking as a means of coping with uncertainty and distress. Contemporary psychological models suggest that deficits in emotion regulation increase vulnerability to anxiety, rumination, and worry (8, 9). By improving emotional awareness and teaching adaptive cognitive and behavioral strategies, emotion regulation interventions help individuals process emotional experiences more effectively and reduce dependence on maladaptive coping mechanisms.

The current findings support previous studies indicating the effectiveness of emotion regulation interventions among individuals with MS. Dehkordi demonstrated that emotion regulation training improved psychological well-being and psychological capital in women with MS (14). Likewise, Dehghani and colleagues reported that emotion regulation training significantly reduced emotional avoidance and cognitive failures among patients with MS (15). These outcomes suggest that strengthening emotional competencies enables individuals to respond more adaptively to stressors associated with chronic illness. Because worry often emerges from difficulties managing uncertainty and emotional discomfort, improvements in emotion regulation are likely to reduce the frequency and intensity of worry-related cognitions.

Another explanation for the effectiveness of emotion regulation training concerns the relationship between emotional awareness and cognitive appraisal processes. Many individuals with MS experience repeated physical symptoms that may be interpreted catastrophically, resulting in heightened anxiety and worry. Emotion regulation interventions teach participants to identify emotional triggers, challenge maladaptive interpretations, and replace dysfunctional thinking patterns with more balanced appraisals. Cognitive reappraisal, one of the central components of emotion regulation training, has been consistently associated with reduced anxiety and improved psychological adjustment. Consequently, participants may have become less likely to engage in catastrophic future-oriented thinking, thereby reducing worry severity.

An important finding of the present study was the absence of a statistically significant difference between the effectiveness of ACT and Emotion Regulation Training. This result suggests that although the two interventions are grounded in different theoretical traditions, they may influence common psychological mechanisms associated with worry. Both approaches seek to alter individuals' responses to distressing emotions and thoughts, enhance adaptive coping, and reduce maladaptive patterns of emotional processing. ACT accomplishes this through acceptance, mindfulness, and psychological flexibility, whereas Emotion Regulation Training focuses on emotional awareness, cognitive reappraisal, and adaptive emotional

management. Despite these differences, both interventions ultimately promote healthier relationships with internal experiences and reduce the impact of distressing cognitions on behavior.

This finding is consistent with previous comparative investigations. Dehghani and colleagues reported that both ACT and emotion regulation training were effective in improving cognitive and emotional functioning among patients with MS (15). Similarly, studies comparing ACT with other therapeutic approaches have often found comparable improvements across psychological outcomes, suggesting that multiple intervention pathways may lead to meaningful clinical benefits (10, 25). Such findings highlight the possibility that common therapeutic factors—including increased self-awareness, enhanced coping skills, improved emotional processing, and supportive group interactions—may play important roles in treatment effectiveness.

The maintenance of treatment gains at follow-up further strengthens the significance of the present findings. Chronic illnesses often require long-term psychological adaptation, and interventions that produce only short-lived improvements may have limited clinical value. The sustained reductions in worry severity observed in both intervention groups suggest that participants successfully integrated therapeutic skills into their daily lives. In ACT, continued use of mindfulness, acceptance, and values-based action may have contributed to lasting improvements. In Emotion Regulation Training, ongoing application of cognitive reappraisal, emotional awareness, and adaptive coping strategies likely helped participants maintain emotional stability over time. These findings support the long-term utility of both interventions in promoting psychological adjustment among women with MS.

The present results should also be interpreted within the broader context of psychosocial adaptation to chronic illness. Previous studies have emphasized the importance of resilience, self-esteem, psychological well-being, and adaptive coping in determining quality of life among individuals with MS (4, 5). Worry can undermine these protective factors by increasing emotional distress and limiting engagement in meaningful activities. Therefore, interventions that successfully reduce worry may generate broader benefits extending beyond symptom reduction alone. Improvements in emotional functioning may facilitate better social relationships, enhanced treatment adherence, greater participation in valued activities, and improved overall well-being.

Furthermore, the findings align with emerging evidence emphasizing the role of psychological interventions alongside medical treatment in chronic neurological disorders. Although advances in disease-modifying therapies have improved the medical management of MS (2, 26), psychological symptoms continue to represent a substantial burden for many patients. Effective psychosocial interventions can complement pharmacological treatment by addressing emotional and cognitive challenges that medical therapies alone may not adequately resolve. The current findings therefore support the integration of structured psychological programs into comprehensive MS care.

Overall, the present study provides evidence that both Acceptance and Commitment Therapy and Emotion Regulation Training are effective interventions for reducing worry severity among women with Multiple Sclerosis. Given the chronic and unpredictable nature of the disease, interventions that enhance psychological flexibility, emotional competence, and adaptive coping may play a critical role in improving long-term psychological adjustment and quality of life.

Several limitations should be considered when interpreting the findings of this study. First, the sample consisted exclusively of women with Multiple Sclerosis from a single city, which may limit the generalizability of the findings to men, other geographical regions, or different cultural contexts. Second, the relatively small sample size may have reduced statistical power for detecting subtle differences between the two intervention approaches. Third, the study relied on self-report measures, which may be influenced by response biases and subjective perceptions. Fourth, the follow-up period was limited to three months and therefore does not provide information regarding the long-term maintenance of treatment effects. Finally, factors such as disease severity, medication adherence, social support, and comorbid psychological conditions were not controlled and may have influenced participants' responses to treatment.

Future studies should examine the effectiveness of Acceptance and Commitment Therapy and Emotion Regulation Training in larger and more diverse samples, including male patients and individuals from different cultural backgrounds. Researchers are encouraged to conduct longer-term follow-up assessments to evaluate the durability of treatment gains over extended periods. Comparative investigations involving additional psychological interventions may further clarify the relative effectiveness of different therapeutic approaches for individuals with Multiple Sclerosis. Future studies may also explore potential mediating variables such as psychological flexibility, emotional awareness, resilience, and coping strategies to better understand the mechanisms through which these interventions reduce worry. Incorporating objective clinical indicators and multidimensional assessments of psychological functioning would further strengthen future research in this area.

The findings suggest that both Acceptance and Commitment Therapy and Emotion Regulation Training can be incorporated into multidisciplinary rehabilitation and support programs for individuals with Multiple Sclerosis. Mental health professionals working with this population may benefit from integrating structured interventions focused on acceptance, mindfulness, emotional awareness, and adaptive coping skills into routine clinical practice. Healthcare centers, MS associations, and rehabilitation clinics may consider offering group-based psychological programs to complement medical treatment and improve patients' psychological well-being. Educational workshops designed to enhance emotional management and coping with uncertainty may also help patients adapt more effectively to the challenges associated with living with Multiple Sclerosis. Finally, collaboration among neurologists, psychologists, counselors, and rehabilitation specialists may contribute to more comprehensive and patient-centered care.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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