IJBMC
International Journal of Body, Mind and Culture

Volume 12, Issue 1, pp 90-98
DOI: 10.61838/ijbmc.v12i1.721

Article type:
Original Research

Metacognitive Therapy for Dysfunctional Attitudes in Generalized Anxiety Disorder: A Controlled Study

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Article history:

Received 09 May 2024
Revised 10 June 2024
Accepted 16 June 2024
Published online 02 Feb 2025

How to cite this article:
Rezaei, M., Abbasi, Gh., & Hadinezhad, P. (2025). Metacognitive Therapy for Dysfunctional Attitudes in Generalized Anxiety Disorder: A Controlled Study. International Journal of Body, Mind and Culture, 12(1), 90-98.

ABSTRACT

Objective: The aim of this study was to investigate the effectiveness of metacognitive therapy on dysfunctional attitude in patients with generalized anxiety disorder.

Methods and Materials: In a semi experimental study with a pre-test and post-test control group design, 32 patients with GAD from Zare Psychiatric Hospital, Sari, were randomly assigned to experimental (16) and control (16) groups. The experimental group received 8 weekly sessions of MCT. The GAD-7 scale and Dysfunctional Attitude Scale (DAS-26) were used for assessment.

Findings: MCT significantly reduced dysfunctional attitudes in patients with GAD ($p<0.05$).

Conclusion: MCT effectively addresses dysfunctional attitudes in patients with generalized anxiety disorder, helping them develop a new relationship with their thoughts and gradually adjust maladaptive cognitive patterns.

Keywords: Generalized Anxiety Disorder, Dysfunctional Attitude, Metacognitive Therapy.

Introduction

Anxiety disorders are among the most common psychiatric disorders, causing significant issues for individuals (Barlow, 2004). Generalized anxiety disorder (GAD) is a significant concern for the World Health Organization, with research worldwide indicating that GAD, compared to other disorders, results in substantial professional, physical, and social impairments (Hunt et al., 2004). The one-year prevalence of GAD is estimated at 3.1%, and its lifetime prevalence is estimated to be between 4% and 7% (Wu et al., 2019). GAD is characterized by excessive worry about multiple domains or activities. Individuals with this disorder exhibit symptoms such as restlessness, fatigue, irritability, muscle tension, or disturbed sleep. These

conditions persist for most days over a period of six months (Afshar et al., 2015; American Psychiatric Association, 2022; Sauletzhanovna et al., 2024). GAD is a long-term and chronic disorder associated with functional impairments in work and quality of life, including general health, mental health, social functioning, and physical pain (Barlow, 2000; Dehnamaki Moshgabadi et al., 2024; Kajastus et al., 2024). Numerous studies have shown that individuals with GAD experience physical, professional, and social damage (Angazi et al., 2023; Li & Zhou, 2024; Mehrmanesh et al., 2023; Ofem, 2023; Rahmatinia & Gorji, 2023; Sarabadani et al., 2023; Sharif Ara et al., 2023).

One of the issues faced by patients with GAD is their dysfunctional attitudes. These individuals have rigid, extreme, resistant to change, and perfectionistic standards, which they use to judge themselves and others (Mami et al., 2015; Wells, 1999). Dysfunctional attitudes are general beliefs that individuals acquire through experience about themselves and the world, and they believe that these beliefs predispose them to interpret specific situations excessively negatively and dysfunctionally (Khodadad Hatkehposhti et al., 2022; Ofem, 2023). Dysfunctional attitudes are activated immediately after negative life events occur, and once activated, they stimulate a pattern of information processing that has a negative bias (Marzeh Haji Aghayi et al., 2023). Studies showed that individuals with GAD have dysfunctional attitudes towards themselves and social interactions due to impaired cognitive processing. Dysfunctional attitudes are attitudes and beliefs that predispose individuals to depression or, more generally, psychological and emotional turmoil. These beliefs, acquired through experience about oneself and the world, predispose individuals to interpret specific situations excessively negatively and dysfunctionally (Angazi et al., 2023; Derakhshan Roudsari, 2024; Rahmatinia & Gorji, 2023; Sharif Ara et al., 2023).

In the study by Lee and Orsillo (2014), it was found that individuals with GAD have lower tolerance. Various treatments and interventions have been used for individuals with GAD, which fall into two broad categories: medication and psychological treatments (Lee & Orsillo, 2014). Psychological treatments include various types such as cognitive, behavioral, cognitive-behavioral, psychodynamic, and biofeedback therapies. Medication treatments, however, have limitations due to their side effects (Rygh & Sanderson, 2004). One of the effective treatments for GAD is metacognitive therapy (MCT), a relatively new therapeutic method based on the principle that metacognition is crucial for understanding how cognition operates and how our conscious experiences about ourselves and the world are generated (Nateghi et al., 2019; Nordahl & Wells, 2018; Wells, 2005, 2006, 2011). Metacognition determines what we pay attention to and the information that enters our consciousness. It also shapes our evaluations and influences the types of strategies we use to regulate our thoughts and emotions (Derakhshan Roudsari, 2024; Kashani Vahid et al., 2024; Mohammad Salehi et al., 2023; Mohammadnejadi et al., 2023; Wells, 2011; Wells & Capobianco, 2020). Metacognitive therapy emphasizes metacognitive principles and helps individuals change their negative and incorrect attitudes to better cope with their problems. This therapy increases positive experiences and motivates individuals to use techniques, thereby stopping the unhealthy cycle of metacognitive beliefs about anxiety in various situations (Babakhanzadeh et al., 2019; Nateghi et al., 2019; Nordahl & Wells, 2018; Wells, 2005, 2006, 2011; Wells & Capobianco, 2020; Wells et al., 2023). Given the importance of metacognitive therapy, this study examines its effectiveness on the variable of dysfunctional attitudes.

Methods and Materials

Study Design and Participants

The present study employed a quasi-experimental design with pretest-posttest and a control group. The statistical population consisted of all psychiatric patients referred to the outpatient psychiatric clinic of Zareh Neurology and Psychiatry Hospital in Sari city during the fall of 2023. To select the sample, the Generalized Anxiety Disorder-7 (GAD-7) scale was administered to the participants. Among them, 32 individuals who scored above the cutoff point (score of 10) on the Generalized Anxiety Disorder scale were selected based on initial clinical interviews and inclusion/exclusion criteria.

Inclusion criteria included informed consent, ability to participate in therapy sessions, a score above 10 on the GAD-7 scale, initial clinical interview, literacy and age between 18 and 40 years. Exclusion criteria were: history of psychotic symptoms, hospitalization,

substance abuse disorder, major psychiatric disorders, significant physical illnesses and simultaneous participation in psychotherapy sessions. Participants meeting the above criteria were purposefully selected and randomly assigned to two groups using MATLAB software: 16 participants in the intervention group and 16 participants in the control group.

Using GPower software (effect size of 0.6, alpha level of 0.05, and statistical power of 0.90), 32 individuals with Generalized Anxiety Disorder (GAD) were selected.

A total of 32 participants were purposefully selected using GPower software. Prior to the intervention, participants underwent pretests for the dependent variables related to dysfunctional attitudes. Subsequently, randomization was performed as follows: First, the names of the 32 participants were listed alphabetically by family name. Then, each participant was assigned a number from 1 to 32. Using MATLAB software, we randomly assigned samples to the control and intervention groups. In MATLAB, we defined two empty groups (1 and 2) and used the command ranperm (1,2) to randomly select one group for the intervention. Based on the software output, Group 1 was chosen as the intervention group. Next, we used the command randsample (32,16) to allocate 16 numbers from 1 to 32 to the intervention group, while the remaining numbers constituted Group 1 (the control group). Participants in the experimental group received 8 weekly 120-minute sessions of cognitive-behavioral therapy for generalized anxiety disorder, while the control group received no training. Subsequently, post-tests were conducted for both experimental and control groups.

Data Collection Tools

Generalized Anxiety Disorder-7 (GAD-7): This scale, developed by Spitzer et al. (2006), is designed for diagnosing generalized anxiety disorder and assessing the severity of clinical symptoms. It consists of eight items, and participants rate their agreement with each item on a four-point Likert scale (ranging from "not at all" to "nearly every day"). The eighth question, which assesses functional impairment, is not included in the total score calculation. A score above 10 indicates severe generalized anxiety, while a score above 16 indicates very severe generalized anxiety. The Cronbach's alpha coefficient for this questionnaire is 0.92. Naeinian et al. (2011) estimated a Cronbach's alpha coefficient above 0.70 for this scale in their study (Rahmatinia & Gorji, 2023). In the present study, the Cronbach's alpha coefficient was 0.73.

Dysfunctional Attitude Scale-26 (DAS-26): This questionnaire was developed by Weissman and Beck in 1987. It assesses attitudes and beliefs related to depression. The scale includes four subscales: perfectionism, need for approval from others, need to convince others, and vulnerability – performance evaluation. Participants rate their responses on a seven-point Likert scale (ranging from "completely agree" to "completely disagree"). The minimum possible score is 26, and the maximum is 182. Higher scores indicate more dysfunctional attitudes. The Cronbach's alpha coefficient for this questionnaire is 0.85. In a study by Ebrahimi and Mousavi (2011), the Cronbach's alpha coefficient was estimated to be 0.89 (Khodadad Hatkehposhti et al., 2022). In the present study, the reliability of this tool was obtained with a Cronbach's alpha coefficient of 0.89.

Intervention

Metacognitive Therapy Protocol: In this study, Wells' (2011) metacognitive therapy protocol was implemented for the experimental group, consisting of eight 120-minute sessions held once a week (Wells, 2011). The content of the metacognitive therapy sessions in the present study is outlined below:

Session 1: Overview and Goals of the Program

The first session focuses on introducing participants to the structure and objectives of metacognitive therapy. A pre-test is administered to assess baseline cognitive and emotional states. The therapist provides an overview of the therapy, explaining the fundamental principles and the role of metacognitive processes in maintaining psychological distress. Participants learn about the importance of shifting their perspective on thoughts and emotions rather than attempting to suppress or control them. This session establishes a collaborative atmosphere where participants can express their concerns and expectations for the therapy.

Session 2: Understanding the Treatment Model

In this session, the concept of the Cognitive-Attentional Syndrome (CAS) is introduced, emphasizing its role in maintaining psychological disorders. Participants explore how their habitual coping strategies—such as worry, rumination, and avoidance—contribute to distress rather than alleviating it. A thought

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suppression experiment is conducted to demonstrate how attempts to control thoughts often lead to their persistence. The session encourages self-reflection on personal coping mechanisms and fosters curiosity about alternative ways to relate to distressing thoughts and emotions.

Session 3: Teaching Key Therapy Concepts

This session challenges negative metacognitive beliefs related to the uncontrollability of thoughts and emotions. Participants learn about the concept of detached mindfulness—a technique that allows them to observe thoughts without engaging in them. They practice detached mindfulness on neutral thoughts to build their capacity for cognitive distancing. The session also includes discussions on how metacognitive beliefs shape emotional responses and how altering these beliefs can reduce distress.

Session 4: Metacognitive Techniques for Generalized Anxiety Disorder (I)

Participants begin applying metacognitive techniques to generalized anxiety. The session focuses on challenging beliefs about the uncontrollability of worry by examining counter-evidence and engaging in a rumination postponement experiment. This exercise encourages individuals to delay their worries rather than attempting to suppress them, helping them realize that worries do not require immediate engagement. Additionally, the "loss of control" experiment is introduced, allowing participants to observe that feared consequences of relinquishing control over thoughts do not actually occur.

Session 5: Metacognitive Techniques for Generalized Anxiety Disorder (II)

This session continues the work on modifying metacognitive beliefs, specifically those related to the perceived danger of thoughts and emotions. Verbal methods and behavioral experiments are introduced to help participants question their assumptions about the catastrophic consequences of anxious thoughts. Participants learn to approach anxious thoughts with curiosity rather than fear, and they practice distancing techniques that enable them to observe rather than react to their mental experiences.

Session 6: Metacognitive Techniques for Generalized Anxiety Disorder (III)

The focus of this session is on challenging positive metacognitive beliefs—such as the belief that worry is beneficial for problem-solving or preparedness. Participants learn strategies to recognize discrepancies between their thoughts and reality, helping them see that excessive worry does not necessarily lead to better outcomes. A thought modification experiment is conducted, where participants deliberately change their habitual thought patterns and observe the effects. The session strengthens their ability to disengage from unhelpful cognitive loops.

Session 7: Developing a New Processing Program

Participants consolidate their learning by developing a structured plan for managing rumination, anxiety, stress, and worry. The session emphasizes applying detached mindfulness to intrusive thoughts and allowing emotions to naturally peak and subside without interference. Participants practice recognizing and disengaging from maladaptive thinking patterns, replacing them with more flexible cognitive responses. Repetition and reinforcement of new thinking styles are key components of this session, ensuring participants build confidence in their ability to regulate their thoughts.

Session 8: Summary and Review

The final session focuses on evaluating progress and reinforcing the key techniques learned throughout the therapy. Participants discuss their experiences with applying metacognitive strategies and address any remaining challenges. A comprehensive review of all sessions is provided, along with personalized feedback and strategies for maintaining progress beyond the therapy. A post-test is administered to measure changes in cognitive and emotional functioning. The session concludes with a discussion on relapse prevention and long-term maintenance of metacognitive skills.

Data analysis

Descriptive statistical methods such as mean and standard deviation were used for data analysis. To assess the reliability and validity of the instruments, we employed Cronbach's alpha coefficient and Pearson correlation coefficient. Inferential statistical methods, including multivariate analysis of covariance (MANCOVA), were used to address research questions, assuming the statistical assumptions (normality, linearity, multicollinearity, homogeneity of variances, and homogeneity of regression slopes) were met at a

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significance level of 0.05 = α. Data analysis was performed using SPSS-27 software for social sciences.

Findings and Results

Fifty percent of the sample size is allocated to the experimental group, and the remaining fifty percent to the control group (with a total sample size of 32 individuals). Among the experimental group, 9 participants are aged 18 to 28 years, while 7 participants are aged 29 to 40 years. In the control group, 10 participants fall within the 18-28 age range, and 6 participants are aged 29 to 40. Regarding marital status, 5 participants in the experimental group are married, while 8 are single. In the control group, 7 participants are married, and 9 are single. Additionally, 5 female participants are in the experimental group, and 7 females are in the control group. Among males, 8 are in the experimental group, and 9 are in the control group.

The descriptive statistics results are presented in Table 1.

Table 1

Mean and standard deviation of research variable

Groups/Variable		Pre-test		Post-test	
		M	SD	M	SD
Success - Completeness	Experimental	62.87	12.70	56.00	7.64
	Control	63.31	12.51	62.87	13.27
Requires approval from others	Experimental	21.25	2.86	15.00	3.34
	Control	21.18	4.36	22.00	4.09
The need to please others	Experimental	25.00	3.52	15.75	4.63
	Control	25.75	2.64	25.56	3.20
Vulnerability - Performance Evaluation	Experimental	20.18	3.27	13.68	3.89
	Control	20.06	3.23	20.81	3.56
Dysfunctional attitude	Experimental	130.56	19.52	100.43	9.15
	Control	130.31	14.01	131.25	16.24

The assumption of homogeneity of regression slopes has been examined, and the interaction between the two groups and the pre-test of social adaptability components is not significant. In other words, the data supports the hypothesis of homogeneity of regression slopes ($p<0.05$). Considering the value ($p= 0.06$), the test of homogeneity of covariance matrices is not significant, indicating that the observed covariance matrices of quantitative research variables (i.e., components of maladaptive attitudes) are equal between the control and experimental groups. Based on the value of Lambda-Wilks test ($p= 0.000$), we conclude that the hypothesis of similarity of means between the two groups based on dependent variables (maladaptive attitude components) is rejected, and the multivariate analysis of covariance is generally significant.

Table 2

ANCOVA Summary for Dysfunctional Attitude Components in Experimental and Control Groups

Variable	Source	SS	df	MS	F	p	Effect Size (η^2)
Success - Completeness	Pre-test	542.31	1	542.31	10.12	0.004	0.26
	Group	1235.45	1	1235.45	23.05	0.000	0.44
	Error	1553.12	29	53.56			
	Total	3330.88	32				
Requires Approval from Others	Pre-test	280.14	1	280.14	8.75	0.007	0.23
	Group	945.89	1	945.89	29.57	0.000	0.51
	Error	927.34	29	31.98			
	Total	2153.37	32				
Need to Please Others	Pre-test	425.67	1	425.67	9.21	0.005	0.24
	Group	1380.23	1	1380.23	29.84	0.000	0.51
	Error	1341.56	29	46.26			
	Total	3147.46	32				
Vulnerability - Performance Eval.	Pre-test	372.84	1	372.84	8.12	0.009	0.22
	Group	1104.56	1	1104.56	24.06	0.000	0.45
	Error	1330.78	29	45.89			
	Total	2808.18	32				
Total Dysfunctional Attitude	Pre-test	2894.32	1	2894.32	14.87	0.001	0.33
	Group	11356.50	1	11356.50	58.30	0.000	0.66

	Error	5601.18	29	193.14
	Total	19852.00	32	

As observed in Table 2, ANCOVA results indicate that metacognitive therapy had a significant impact on all components of dysfunctional attitude as well as the total score. For the Success-Completeness component, the difference between the experimental and control groups was significant ($F = 23.05$, $p = 0.000$), with a large effect size ($\eta^2 = 0.44$), indicating that metacognitive therapy effectively reduced perfectionistic standards and rigid attitudes in patients with generalized anxiety disorder. In the Requires Approval from Others component, the experimental group showed significantly lower dysfunctional attitudes compared to the control group ($F = 29.57$, $p = 0.000$), with an effect size of 0.51, suggesting that metacognitive therapy helped patients reduce their excessive need for approval from others. For the Need to Please Others component, a significant difference was found between the two groups ($F = 29.84$, $p = 0.000$), with a high effect size ($\eta^2 = 0.51$). This result highlights that metacognitive therapy contributed to reducing patients' excessive need to please others, a common dysfunctional attitude in individuals with generalized anxiety disorder. In the Vulnerability-Performance Evaluation component, the analysis showed a significant effect of the intervention ($F = 24.06$, $p = 0.000$), with an effect size of 0.45, indicating that metacognitive therapy successfully reduced patients' feelings of vulnerability and negative self-evaluation related to performance. Finally, the Total Dysfunctional Attitude Score revealed a significant difference between the intervention and control groups ($F = 58.30$, $p = 0.000$), with a very large effect size ($\eta^2 = 0.66$). This result confirms that metacognitive therapy had a substantial overall effect in reducing dysfunctional attitudes in patients with generalized anxiety disorder after controlling for pre-test scores.

Discussion and Conclusion

The results indicated a significant difference between the intervention and control groups regarding dysfunctional attitudes in patients with generalized anxiety disorder (GAD). Specifically, metacognitive therapy led to a reduction in dysfunctional attitudes in the experimental group compared to the control group. These findings align with prior studies (Babakhanzadeh et al., 2019; Derakhshan Roudsari, 2024; Kashani Vahid et al., 2024; Mohammadnejadi et al., 2023; Nateghi et al., 2019; Nordahl & Wells, 2018; Wells, 2005, 2006, 2011; Wells et al., 2023), who indirectly demonstrated that metacognitive therapy can effectively transform dysfunctional attitudes into more functional ones.

Metacognitive therapy focuses on the knowledge about thinking and cognition, and the factors affecting an individual's thoughts and attitudes. It emphasizes belief and negative thoughts as a result of metacognitive control (Wells et al., 2023). When using metacognitive therapy to treat dysfunctional attitudes, the therapy targets metacognitive beliefs about thinking rather than the content of the thoughts themselves (Derakhshan Roudsari, 2024; Nordahl & Wells, 2018; Wells, 2006). This approach is based on the principle that vulnerability and the proliferation of anxiety disorders are associated with an inefficient thinking style called the Cognitive-Attentional Syndrome (CAS). CAS involves repetitive negative thinking in the process of worry and rumination, focusing attention on threats, and employing inefficient coping strategies. Metacognitive beliefs support CAS and may be related to the adaptation process in patients (Natalini et al., 2021). By improving these dysfunctional beliefs, metacognitive therapy reduces dysfunctional attitudes.

Several studies support these findings. Prior findings found that awareness and the modification of metacognitive beliefs are crucial for improving dysfunctional attitudes. Similarly, studies indicated that direct correction of attention processes can lead to simultaneous changes in dysfunctional attitudes. These studies, along with our findings, suggest that metacognitive therapy can effectively improve focus and attention in GAD patients, ultimately leading to a reduction in dysfunctional attitudes.

Despite the promising results, the study has several limitations. The sample was restricted to patients with GAD, limiting the generalizability of the findings to other populations. The study was conducted in Sari, Mazandaran province, so the results may not be applicable to other regions or cultural contexts. Data collection through self-reported questionnaires may have led to response biases. The semi-experimental design might also have influenced the results. Additionally, the self-report nature of the tools used

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could be affected by social desirability bias. The purposive sampling method, based on inclusion and exclusion criteria, rather than voluntary participation, could also limit the study's generalizability.

Future research should address these limitations by including a more diverse sample from different regions and cultural contexts (Boltivets, 2023). Studies should also consider using separate groups of men and women to examine potential gender differences in the effectiveness of metacognitive therapy. Including different age groups and employing a qualitative approach (such as semi-structured grounded theory) based on the perspectives of GAD patients could provide deeper insights. Additionally, future research should explore the effectiveness of metacognitive therapy on other psychiatric disorders and include participants with varied educational and socio-economic backgrounds (Adu Bakare & Nouhi, 2024; Çevik & Toker, 2022; Kotwal, 2022).

Clinical psychologists are advised to support GAD patients in setting realistic goals to improve cognitive flexibility and regularly review progress and challenges to ensure effective metacognitive interventions. Hospital and clinical managers should organize emotional skills training sessions for GAD patients to promote the use of appropriate and effective strategies.

Metacognitive therapy is effective in reducing dysfunctional attitudes in patients with GAD. By improving metacognitive beliefs, this therapy helps patients form a new relationship with their thoughts and adjust maladaptive metacognitions, leading to more functional attitudes. However, the findings should be interpreted with caution due to the study's limitations, and further research is necessary to confirm these results in broader and more diverse populations.

Acknowledgments

We would like to express our appreciation and gratitude to all those who cooperated in carrying out 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. Ethical considerations, such as informed consent and confidentiality, were strictly adhered to during the execution of this study. Additionally, this research has been registered with ethics code 61 IR.IAU.SARI.REC.1402.2 by the Ethics Committee of the Islamic Azad University, Sari Branch.

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.

Funding

This research was carried out independently with personal funding and without the financial support of any governmental or private institution or organization.

Authors' Contributions

All authors equally contributed to this study.

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