Research Paper

Comparing the Effectiveness of Acceptance and Commitment Therapy and Metacognitive Therapy on Psychological Well-being in Women With Generalized Anxiety Disorder

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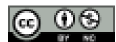

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ABSTRACT

Objective: This study compares the effectiveness of acceptance and commitment therapy and metacognitive therapy on psychological well-being in women with generalized anxiety disorder.

Methods: The current study has an applied purpose and utilizes a semi-experimental research method. It follows a pre-test-post-test design with a control group and includes a two-month follow-up phase. The target population for this research consists of women with generalized anxiety disorder, who were selected using the purposeful sampling method. The study was conducted in Tehran, Iran, during the summer and autumn of 2022. Following the research design, the participants were randomly divided into a control group (n=17) and an experimental group (n=17). A 10-session therapy protocol based on acceptance and commitment was implemented for the members of the first experimental group, and a 10-session protocol of metacognitive therapy was implemented for the second experimental group individually and in person. The Ryff scales of psychological well-being were conducted in three phases: before, after intervention, and follow-up. The obtained data were statistically analyzed using the analysis of variance with repeated measurements with the SPSS software, version 25, at the significance level of 0.05.

Results: The research identified a significant difference in the initial assessment results compared to the assessments conducted after the therapy in both groups ($P<0.01$). In other words, the findings indicated that acceptance and commitment therapy was more successful and consistent than metacognitive therapy. The disparity between the scores obtained after treatment and during the follow-up period was notable, indicating that acceptance and commitment therapy had a more powerful impact on treatment ($P<0.05$).

Conclusion: The results suggested that women with general anxiety disorders benefited from therapy courses in terms of psychological well-being. Thus, unlike the meta-cognitive therapy, the results suggest that acceptance and commitment therapy-based exercises would be of additional value for improving psychological well-being. As this is the first study on the topic, more research is needed to determine the effectiveness of these two therapies for general anxiety in individuals.

Keywords:
Acceptance and commitment therapy, Metacognitive therapy, Psychological well-being, Women, Generalized anxiety disorder

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Highlights

- Generalized anxiety disorder is when someone constantly worries considerably and finds it hard to stop or control their worrying. This sense can be about various matters and comes with physical and mental symptoms.

- The acceptance and commitment therapy was better and more consistent than metacognitive therapy.

- The scores were significantly different after the treatment compared to during the follow-up period, showing that acceptance and commitment therapy had a stronger effect on treatment.

Plain Language Summary

This research examined the impact of two treatment methods: acceptance and commitment therapy and metacognitive therapy. They were compared on the mental well-being of women diagnosed with generalized anxiety disorder. Generalized anxiety disorder is characterized by excessive worry about daily life matters and persists for over six months. Along with experiencing constant worry, individuals may also feel agitated and exhausted, have difficulty focusing, become easily annoyed, experience muscle tension, and struggle with sleep. Psychological therapies may be beneficial for individuals with such symptoms.

Introduction

Generalized anxiety disorder (GAD) is a common disorder associated with a chronic course and significantly reduced quality of life (Haseth et al., 2019). This disorder, as outlined in The diagnostic and statistical manual of mental disorders, fifth edition, refers to an excessive and prolonged state of anxiety regarding various events and activities that persists for a minimum of six months and significantly hampers the individual's ability to function properly. Managing and controlling anxiety is particularly challenging in this disorder (LeardMann et al., 2021; Luo et al., 2019). Anxiety is a fear of uncertainty that a person cannot interpret but experiences unpleasant sensations related to physical stimulation (Wroblewski et al., 2023). Accordingly, the person experiencing this feeling does not know the cause of the anxiety (Li et al., 2020). GAD is a common type of anxiety disorder with a prevalence rate of 5.2% in individuals aged 18–64 years (Chaturvedi et al., 2019). Regardless of likelihood, GAD continuously predicts future irrational or exaggerated negative events (LaFreniere et al., 2020)

Previous research showed each indicator of psychological well-being had strong associations with generalized anxiety (Faraci et al., 2022). In addition, research findings indicated that concern was inversely correlated with psychological well-being (PWB) and tended to be positively linked with symptoms of anxiety, even after accounting for other variables (Iani et al., 2019). The results suggested that fostering a sense of purpose in life and the autonomy dimension of PWB could potentially prevent GAD while strengthening the positive relationship with others dimension of PWB that might contribute to generalized anxiety based on the fear of anxiety. Hence, the dimensions of PWB may be beneficial in a primary prevention setting (Takebayashi et al., 2018). A prior study demonstrated that individuals with GAD who paid less attention to their emotions and moods showed higher levels of PWB, aligning with previous research that found reduced attention to feelings predicted better mental health and positive mood (Iani et al., 2019). Furthermore, it was found that PWB acted as a protective factor in the connection between cognitive vulnerabilities and symptoms of generalized anxiety; thus, anxiety symptoms would not escalate in individuals with high cognitive vulnerability if PWB was high (Takebayashi et al., 2018).

Although researchers have shown that various therapeutic approaches can be effective in the treatment of GAD, the discussion of having empirical support and different types of psychotherapies in the treatment of this disorder have always faced challenges. Acceptance and commitment therapy (ACT) help these individuals develop personal strengths, optimal functioning, and well-being (Mani et al., 2019). A recent study conducted by Hossein Nazari et al (2022) suggests that well-being therapy and ACT have the potential to alleviate death anxiety in older adults. Implementing ACT involves encouraging participants to enhance their dedication to leading healthier and more fulfilling lives. This ap-

proach also uses behavioral strategies to cope with negative thoughts and emotions. Consequently, ACT can improve psychological well-being and reduce rumination (Mikaeili, 2022). The outcomes of a prior investigation further support the effectiveness of ACT in diminishing behavioral inhibition and cognitive behavioral avoidance in women afflicted with GAD. Moreover, the use of this cost-effective and straightforward therapeutic approach can serve as a foundation for promoting psychological well-being, managing excitement, and establishing healthy interpersonal relationships (Eqharari et al., 2019; Sharif Ara et al., 2023).

The treatment approach discussed here is a psychological intervention incorporating behavioral and modern evolutionary principles. It employs techniques like mindfulness, acceptance, and commitment to enhance psychological flexibility. The fundamental principles of this approach are as follows: 1) Acknowledging and embracing pain or other unpleasant events and thoughts without attempting to control them; 2) Engaging in actions that align with one's values and committing to them as meaningful objectives while not disregarding unfamiliar experiences (Montazernia et al., 2021). The integration of verbal and cognitive processes with non-verbal elements contributes to the effectiveness of this treatment. It involves exercises that expose individuals to their fears, linguistic metaphors, and mindfulness practices (Abdollahi et al., 2020). ACT, which is a form of a mindfulness intervention, employs metaphors and proverbs to assist clients in enhancing their lives through increased awareness, acceptance, and present-moment focus instead of engaging in internal conflicts and avoiding internal experiences, such as thoughts, memories, and emotions (Azkhosh et al., 2016).

There have been various studies indicating that exposure techniques lead to significant reductions in GAD symptoms (Weisman & Rodebaugh, 2018). The existing evidence suggests that metacognitive therapy (MCT) is effective in treating anxiety and related disorders (McEvoy, 2019; Normann & Morina, 2018). As an alternative to CBT, MCT specifically focuses on modifying cognitive processes rather than the content of thoughts (Wells, 1995). The foundation of MCT lies in the self-regulatory executive function (S-REF) model (Wells & Matthews, 1996), which suggests that psychological disorders arise from a common set of processes referred to as the cognitive attentional syndrome (CAS). CAS entails persistent negative thinking patterns (rumination and worry), inflexible attention and threat monitoring, and maladaptive behavioral strategies that perpetuate negative thought patterns (Strand et al., 2023). According to the metacognitive model of GAD, individuals' thoughts and beliefs about worry (known as metacognitive beliefs) play a significant role in developing and maintaining the disorder (Haseth et al., 2019).

From a metacognitive perspective, meta-worry can result in avoidance behaviors, such as situational avoidance, seeking reassurance, distraction, and efforts to control anxious thoughts. When these attempts fail, it further reinforces the individual's belief in the uncontrollability of worry (Köcher et al., 2021). A recent systematic review and meta-analysis conducted by Normann and Morina (2018) focused on MCT for anxiety and depression. Their findings significantly improved the pre- to post-treatment effect size when comparing MCT to waitlist controls. Previous research has also explored the effectiveness of group MCT for individuals with GAD. The results demonstrated large effect sizes in the reduction of anxiety, depression, and comorbid measures, as well as improvements in metacognitive beliefs and maladaptive coping strategies (Callesen et al., 2019; Haseth et al., 2019).

According to the mentioned studies, there is a shortage of research regarding the lack of comparison between these treatments. Therefore, this research can be considered innovative from this perspective. Additionally, given the significance of anxiety and its profound impact on various aspects of life and mental well-being, there is a necessity for such studies. However, to establish definitive conclusions, further trials with a larger number of participants are required. The current findings indicate that MCT may be more effective than other psychotherapy forms, including ACT. To comprehend the characteristics, rationale, and underlying concepts of these two approaches, an examination of their impact on individuals can be undertaken. Individuals with anxiety who do not respond well to conventional treatments and exhibit low mental and social well-being along with a poor quality of life might benefit from these therapies. This study assesses and compares the impact of ACT and MCT on women diagnosed with GAD. The researchers evaluate how these therapies influence the psychological well-being of women.

Materials and Methods

Study design and participants

The current study has an applied purpose, utilizes a semi-experimental research method, and follows a pre-test-post-test design with a control group and a two-month follow-up phase. The statistical population for

this study comprises women living in Tehran City, Iran, who have GAD. The research was conducted in Tehran, Iran, during the summer and autumn of 2022. Due to the unavailability of statistics and information on all individuals with GAD syndrome in Tehran, a non-random and purposeful sampling process was employed. Only individuals who met the criteria for GAD based on the questionnaire and diagnostic interview were included. The sample size consisted of 36 patients with GAD who agreed to participate in the research (n=12 women in each group). The sample size was determined using G*Power software, with a significance level of 0.05, test power of 0.90, and effect size of 1.42 (Mohammadi et al., 2021). Meanwhile, 60 individuals were initially selected as the sample to account for potential dropouts. Following the sample selection, the participants were randomly divided into three groups, with two experimental groups assigned to each intervention and one control group (n=17 for each group). All treatment and control groups were matched in terms of all the criteria for participating in the sessions.

To participate in the research, the individuals had to meet certain requirements. These requirements included not taking any psychiatric medications, not having specific physical issues or personality disorders, not having a history of hospitalization or psychological treatment, having between 18 to 60 years of age, not having a clinical diagnosis of GAD, having a basic level of education in reading and writing, and providing informed consent. On the other hand, there are also criteria for exclusion from the research. These include having the co-occurring disorders mentioned in the entry criteria, participating in simultaneous counseling or other forms of psychotherapy, having a severe physical or mental disorder (such as a substance use disorder, personality disorders, psychosis, or symptoms like delusions, hallucinations, or lack of awareness of time and place) that would prevent intervention, receiving drug therapy, or having three consecutive sessions without attendance.

Study procedure

Once the necessary permissions were obtained to carry out the research, communication was initiated through social media platforms and with cultural and artistic centers in Tehran municipality (specifically the library) and three psychological clinics in the city, covering regions 2, 3, and 4. Subsequently, negotiations were held with the management and officials of these centers, and permission was secured to collaborate and conduct sampling within the target community of women suffering from GAD syndrome. The individuals who scored below the cut-off line on the questionnaire were contacted individually for further evaluation and to determine their eligibility for participation in the research. A clinical interview for GAD was conducted during a telephone meeting, where individuals were assessed based on specific entry and exit criteria. Those who met the criteria and expressed their willingness were invited to take part in the research.

In addition, these individuals received the necessary information regarding the study's overall goals, advantages, disadvantages, research process, and duration. This ensured that they could make an informed decision about their participation. A total of 60 individuals were chosen for the investigation. Following the research design and using random assignment, the participants were divided into two groups: The control group (n=17) and the experimental group (n=17). Subsequently, a pre-test was administered, and all participants completed a series of questionnaires. The participants also completed a written consent form to indicate their willingness to participate in the research alongside the pre-test.

In the next step, individuals from the first experimental group (Table 1) underwent a 10-session therapy program based on ACT, as outlined by Hayes et al. (2012). For the second experimental group, a 10-session program of MCT (developed by Wells in 2010) was implemented individually (Table 2). The control group had regular contact with the tester but received no specific active treatment. These therapy sessions took place at the Taliee Clinical Psychology Center and were administered by a PhD candidate in psychology. After the final counseling session, a post-test was conducted for all experimental and control group participants. Additionally, a follow-up phase occurred two months later. To uphold ethical principles, individuals in the control group who desired professional assistance received GAD treatment after completing the study. Figure 1 displays the consolidated standards of reporting trials flow diagram. Research instruments were used to evaluate all participants during the pre-test and post-test stages.

Research instruments

Research-made demographic questionnaire

A researcher-made demographic was used to determine the participant's age, education, occupation, and marital status.

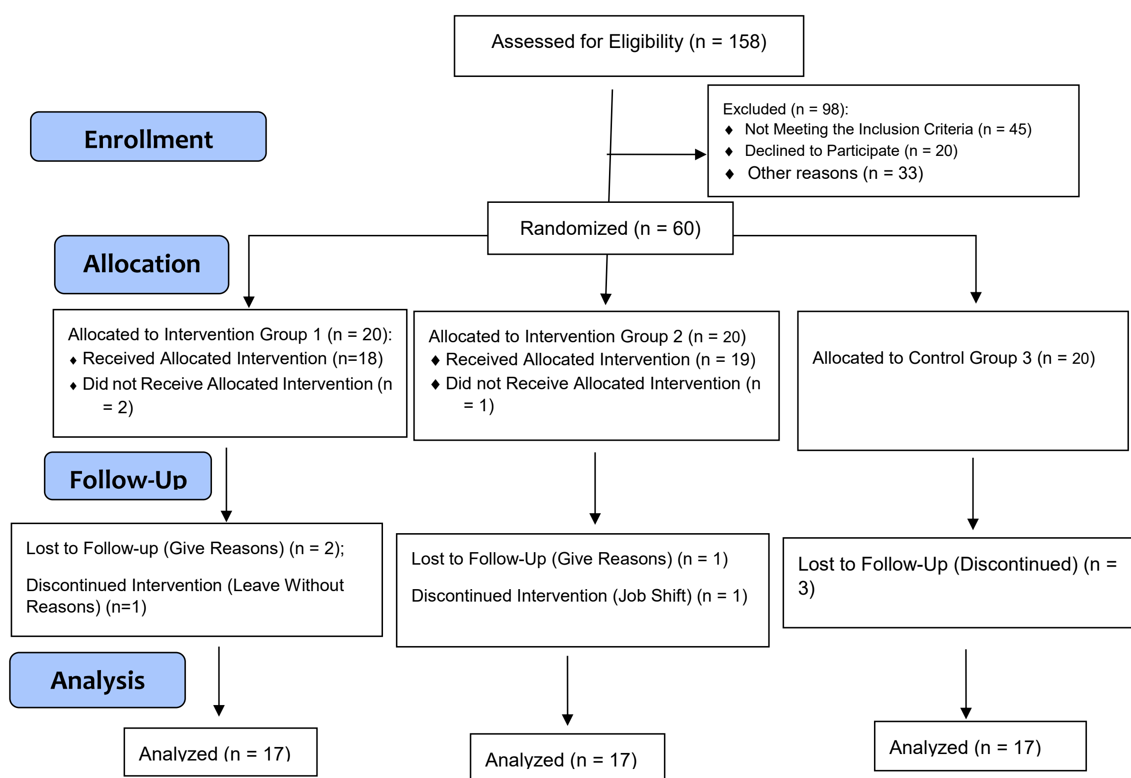

Figure 1. CONSORT flow diagram

Generalized anxiety disorder short scale

The scale developed by Spitzer et al. (2006) consists of 7 primary questions and 1 additional question to assess the level of impairment in various aspects of the individual's life, including social, family, and occupational functioning. Each item was scored using a Likert scale with 4 options ranging from never to almost every day. The seven main questions of the generalized anxiety scale evaluate the mental state and difficulties experienced by the respondent over the past two weeks. Each question is assigned a score from 0 to 3, resulting in a total score range of 0 to 21. Regarding internal consistency, the Iranian scale version demonstrated good reliability with a Cronbach α value of 0.876 (Omani-Samani et al., 2018).

Ryff scales of psychological well-being

The researchers utilized the 42-item version of the Ryff scales of psychological well-being to measure psychological well-being. This index is widely used and focuses on eudaimonic well-being, encompassing various aspects, such as autonomy, environmental mastery, personal growth, positive relationships, purpose in life, and self-acceptance. An example item from this scale is as follows: "I feel a sense of purpose and direction in my life." Ryff's measure possesses factorial validity, high internal consistency, and high criterion-related validity. In a previous study, the Persian version of this measure achieved a Cronbach α of 0.89 (Aghababaei et al., 2016), while the short 18-item version obtained the same α value (Varaee et al., 2018). In the present study, the Persian versions of these scales exhibited Cronbach α values that ranged from 0.57 to 0.81. The survey packages used for data collection contained the Persian adaptations of the measures above and were administered to various classroom groups. The participants provided informed consent before answering demographic questions and completing the measures described earlier.

All procedures adhered to the ethical guidelines of the respective institution for research involving human subjects.

Statistical analyses

An analysis of variance of the repeated measure with a within-group effect was utilized to examine the impact of acceptance and commitment treatments and MCT on the scores of psychological well-being components in the pre-test, post-test, and follow-up periods. Initially, the hypothesis of the homogeneity of the variables was assessed to investigate the mean difference between the mean components of psychological well-being in the

Table 1. Summary of therapy sessions based on acceptance and commitment

Session	Content
1st	Providing a concise description of the issue to the therapist; utilizing anxiety in different situations; instruction in techniques for achieving a state of relaxation.
2nd	Learning how to manage matters beyond our control can be compared to dealing with wrinkled socks; being stuck in a pit, or being trapped inside a gas tank.
3rd	Learning how to manage matters beyond our control can be compared to dealing with wrinkled socks stuck in a pit or trapped inside a gas tank.
4th	Categorizing disturbing thoughts; observing thoughts; engaging in thought observation
5th	Facing, embracing, and eradicating fear; comprehensive practice of loosening muscles; cease exercise aimed at reducing anxiety and fretting.
6th	Acknowledging and paying attention to anxious thoughts; detaching one from personal experiences; analogy between art and ant; analogy between a chess board and a situation; engaging in practicing for a superb performance. Exercising involves evaluating and creating space for oneself.
7th	Being fully aware of the current moment; engaging in exercises that involve listening, observing, and smelling. Trying to consume food that is not preferred; carrying out a routine of cold baths.
8th	Progressing in the correct direction; focus on nurturing instead of being concerned with one's life; engaging in meaningful encounters; evolving by exploring the realm of virtues; practice detecting hindrances and challenges.
9th	Describing the extent of vulnerability; addressing moments of concern; assessing stress factors. Employing abilities; progressing further.
10th	Developing abilities and resolving issues; training in problem-solving; engaging in courageous activities to enhance skills.

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Table 2. Summary of therapy sessions based on metacognitive therapy

Session	Content
1st	Creating a case formulation; presenting the metacognitive model; overview of delaying anxiety; assignment: Practicing dissociative awareness and postponing worry.
2nd	Examining the assignment and finishing the GADS-R, particularly the convictions connected to the inability to control anxiety; homework: Persist in delaying concern and implement the trial to verify lack of authority.
3rd	Evaluating the task and filling out the GADS-R form; paying particular attention to beliefs regarding the uncontrollability of anxiety. As for the homework; practicing the habit of delaying worry; refraining from avoiding worries; and embracing the sensation of losing control.
4th	Examining the assignment and fulfilling the GADS-R, particularly the convictions connected to the inability to control anxiety and actions; homework: Engaging in a purposeful test to assess if the worry poses any harm.
5th	Examining the assigned homework and filling out the GADS-R questionnaire, mainly focusing on beliefs associated with the potential harm caused by worrying; homework: Engaging in behavioral experiments aimed at challenging beliefs regarding the potential harm caused by worrying.
6th	Examining the assignment and filling out the GADS-R form; paying particular attention to the notions concerning the level of concern about worry and the rest of the strategies that prove to be ineffective; additional assignment: Conducting a behavioral experiment that challenges one's beliefs regarding the harmfulness of worrying.
7th	Assessing the homework and completing the GADS-R by giving attention to the potential negative effects of excessive anxiety. The homework task includes either using contradictory approaches or a separate experiment to validate positive metacognitive beliefs.
8th	Looking over assignments and finishing the GADS-R, particularly emphasizing optimistic metacognitive beliefs; homework tasks may involve conducting behavioral experiments, such as those to reduce or increase anxiety.
9th	Assessing the completed assignments and conducting the GADS-R questionnaire to analyze maladaptive coping and avoidance patterns; substituting the current processing system; asking the patient to create an initial treatment summary.
10th	Analyzing a summary of the treatment and assessment of GADS-R; improving recently developed processing techniques and demonstrating them with illustrations; organizing additional sessions to reinforce assigned homework; providing comprehensive explanations of the ongoing implementation.

GADS-R: General anxiety disorder scale-revised.

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three groups at the three treatment stages. The normality of the data was tested using the Shapiro-Wilk test, and the significance threshold for each research variable was found to be above 0.05, indicating that parametric tests can be employed. Additionally, the Levene test was conducted to verify the equality of variance in groups, assuming all variables' variances are equal (P>0.05). The obtained data were subjected to statistical analysis using the SPSS software, version 25, at a 0.05 significance level.

Results

The Mean±SD of the age of women with GAD was 44.23±5.32. Demographic variables of women with this disorder are presented in Table 3. The results of the Kruskal–Wallis showed no significant difference in the age (P=0.78) and education level (P=0.57) of the three groups.

The test of sphericity to check the homogeneity of covariance was not established (P>0.05). Accordingly, the greenhouse–Geisser test is used in the hypothesis test to obtain a more accurate approximation, and the results of the within-group analysis of variance are calculated using the lack of the sphericity assumption (Table 4).

According to the results of Table 5, the difference between the scores of the psychological well-being components in the three study periods is significant (P<0.01). Furthermore, the mean autonomy scores and psychological well-being exhibited considerable discrepancies within the two analyzed groups (P<0.01). In addition, the interaction between research stages and group membership was also significant in the vari-

Table 3. Mean±SD of worry and quality of life by measurement stage in groups

Variables	Groups	Mean±SD		
		Pre-test	Post-test	Follow-up
Self-acceptance	Acceptance and commitment	31.00±6.68	45.40±7.68	43.60±7.84
	Metacognitive therapy	34.20±8.55	41.00±5.74	40.20±7.06
	Control	32.60±7.51	32.00±11.09	34.60±11.27
Positive relationships with others	Acceptance and commitment	35.60±7.16	41.40±6.33	41.40±7.71
	Metacognitive therapy	30.00±6.61	35.40±5.69	37.60±7.16
	Control	33.00±6.71	30.80±10.54	31.40±8.48
Autonomy	Acceptance and commitment	31.00±7.32	44.00±6.58	43.20±5.05
	Metacognitive therapy	27.20±4.60	38.40±6.02	39.80±5.49
	Control	27.60±4.70	24.20±7.48	26.60±8.32
Purpose in life	Acceptance and commitment	37.00±8.07	44.40±5.46	44.80±4.74
	Metacognitive therapy	33.20±4.16	41.40±5.34	43.40±5.30
	Control	34.60±6.09	32.40±9.16	35.20±11.08
Personal growth	Acceptance and commitment	34.00±7.58	41.40±6.02	41.40±6.63
	Metacognitive therapy	36.20±5.72	40.80±5.76	40.60±7.34
	Control	33.40±6.50	31.60±8.85	33.00 ±9.00
Environmental mastery	Acceptance and commitment	34.27±6.61	42.60±6.33	42.20±7.50
	Metacognitive therapy	32.80±6.69	37.20±4.78	38.80±7.24
	Control	33.00±6.71	32.00±8.36	32.33±8.72

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Note: Mean values in the ACT and MCT groups saw a change in the post-test phase when compared to the pre-test phase.

Table 4. Mauchly sphericity test to check the homogeneity of covariance

Variables/ Indicators	Self-acceptance	Personal Growth	Positive Relationships	Purpose In Life	Environmental Mastery	Autonomy
df	2	2	2	2	2	2
Mauchly W	0.36	0.47	0.34	0.47	0.46	0.56
Sig.	0.001	0.001	0.001	0.001	0.001	0.001

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ables of autonomy and psychological well-being (P<0.01). In other words, the difference between autonomy scores and psychological well-being in the three study periods in the two experimental groups was significant. Therefore, it can be concluded that metacognitive therapy and acceptance and commitment therapy have different effects on improving autonomy and psychological well-being. The results show a significant difference in autonomy and psychological well-being levels in the pre-test, post-test, and follow-up periods.

The results of Table 6 show that the difference between the pre-test and the two post-test and follow-up stages in the two experimental groups is significant (P<0.01). 0.55 Also, the difference between the post-test and follow-up scores in the two groups of MCT and therapy based on ACT is significant, showing the treatment effect's greater effectiveness and stability in the therapy group based on ACT (P<0.05).

Table 5. Mixed variance analysis test of psychological well-being component scores with greenhouse–Geisser correction

Variables	Indicator	SS	df	MS	F	Sig.	η^2
Self-acceptance	Within-group	2005.40	1.29	1549.92	25.91	0.001	0.48
	Interaction	255.80	1.29	197.70	3.31	0.07	0.11
	Between-group	52.90	1.00	52.90	0.64	0.43	0.02
Positive relationships with others	Within-group	774.60	1.26	614.03	12.94	0.001	0.32
	Interaction	20.60	1.26	16.33	0.34	0.61	0.01
	Between-group	592.90	1.00	592.90	2.49	0.11	0.07
Autonomy	Within-group	3002.60	1.30	2318.56	47.64	0.001	0.63
	Interaction	20.60	1.30	15.91	4.33	0.01	0.14
	Between-group	409.60	1.00	409.60	9.77	0.001	0.26
Purpose in life	Within-group	1432.80	1.36	1050.86	30.06	0.001	0.52
	Interaction	22.40	1.36	16.43	0.47	0.56	0.02
	Between-group	168.10	1.00	168.10	3.50	0.07	0.11
Personal growth	Within-group	708.20	1.71	413.17	12.07	0.001	0.30
	Interaction	42.20	1.71	24.62	0.72	0.47	0.03
	Between-group	1.60	1.00	1.60	0.02	0.88	0.00
Environmental mastery	Within-group	894.29	1.19	750.28	16.32	0.001	0.37
	Interaction	58.02	1.19	48.68	1.06	0.32	0.04
	Between-group	2005.40	1.00	263.51	3.50	0.07	0.11

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Table 6. The results of the pairwise comparisons of the means of the three stages

Groups	Within Group	Mean±SD	Sig.	Between Group (Post-test)	Between Group (Follow-up)
Acceptance and commitment (autonomy)	Pre-test-post-test	-13.00±2.83	0.001	0.013	0.025
	Pre-test-follow-up	-12.20±2.54	0.001		
	Post-test-follow-up	0.80±1.26	0.99		
Metacognitive therapy (autonomy)	Pre-test-post-test	-11.20±2.04	0.001		
	Pre-test-follow-up	-12.60±2.07	0.001		
	Post-test-follow-up	-1.40±0.82	0.33		
Acceptance and commitment (psychological well-being)	Pre-test-post-test	-5.93±0.90	0.001	0.001	0.001
	Pre-test-follow-up	-6.93±0.90	0.001		
	Post-test-follow-up	-1.00±0.87	0.99		
Metacognitive therapy (psychological well-being)	Pre-test-post-test	-2.80±0.55	0.001		
	Pre-test-follow-up	-2.33±0.74	0.02		
	Post-test-follow-up	0.47±0.38	0.71		

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Discussion

This study determined whether ACT or MCT could improve the psychological well-being of women diagnosed with GAD. In contrast to MCT, ACT demonstrated notable superiority, and its positive outcomes endured for an extended period in the follow-up phase.

Consistent with the findings of this study, Eqharari et al. 2019; Sharif Araet al. 2023; Demehri et al. 2019, and Mani et al. 2019 confirmed the effectiveness of ACT.

According to the results of multivariate analysis of covariance, ACT treatment has a positive effect on self-acceptance, positive relationships with others, autonomy, purposeful life, and overall psychological well-being and sexual function scores. The results also showed that ACT treatment had no significant effect on the components of environmental dominance and individual growth. According to repeated measures analysis of variance, the effect of ACT treatment has been effective on psychological well-being, including total psychological well-being and sexual performance, as well as on self-acceptance, positive relationships with others, and purposeful life (Hasanzadeh et al., 2019). ACT is a distinct form of behavioral and cognitive therapy that places significant emphasis on the context of behavior (Hayes et al., 2013; Whiting et al., 2017). It builds upon a relational frame model that connects behavioral principles to psychological issues and positive behavior (Hayes et al., 2013; Whiting et al., 2017). The primary goal of ACT is to optimize human potential and enable individuals to lead a fulfilling and meaningful life (White et al., 2021). Within ACT, experiential acceptance or mindfulness is a fundamental process closely linked to well-being (Eadeh et al., 2023). Furthermore, ACT places great importance on fostering valued or engaged living. Making committed choices and pursuing goals that align with intrinsic values and motivations has been identified as a predictor of well-being (Assor et al., 2020). The ability to live mindfully, accept current experiences, and act under one's core values is psychological flexibility (Katajavuori et al., 2023).

In contrast to prior research, this study revealed varying outcomes regarding how much MCT enhances psychological well-being. Research has consistently shown that MCT is a highly effective approach (Wells, 2010; Normann & Morina, 2018; Haseth et al., 2019; Callesen et al., 2019; Mikaeili, 2022; Strand et al., 2023).

Wells and Matthews (1996) introduced an earlier transdiagnostic approach known as the self-regulatory executive function model, which proposes universal psychological factors across various pathologies. They argued that psychological disorders are sustained by a common

maladaptive cognitive attentional syndrome that should be the focus of treatment (Callesen et al., 2019). An increased focus on oneself characterizes the CAS, repetitive negative thinking involving worry and rumination, and unhelpful coping strategies and behaviors such as monitoring threats, suppressing thoughts, and avoiding situations (Strand et al., 2023). This syndrome results from an individual's metacognitive beliefs, which result in prolonged negative processing and subsequent distress. There are two types of metacognitive beliefs as follows: Negative metacognitive beliefs and positive metacognitive beliefs. Negative metacognitive beliefs revolve around the idea that worry is uncontrollable and dangerous (for example, "I have no control over my worries" or "My worries can harm me"). On the other hand, positive metacognitive beliefs emphasize the usefulness of worry (for instance, "Worrying helps me cope," or "If I worry, I'll be prepared"). These underlying metacognitive beliefs play a significant role in driving the CAS. MCT, developed based on this model, eliminates the CAS and modifies positive and negative metacognitive beliefs (Wells, 2010).

While these two approaches were first applied to the psychological well-being of women with generalized anxiety, in contrast to the strong background in favor of MCT treatment, most previous studies compared ACT treatment with other treatments, and both showed results in favor of the ACT. For example, a study comparing the effect of commitment-based acceptance and treatment and a mindfulness-based stress reduction program on work attitudes, health-related anxiety, psychological well-being, and body image showed that ACT is more effective than a mindfulness-based stress reduction program (Pasyar et al., 2023). In addition, the study was conducted to compare the effect of acceptance and commitment therapy and metacognition therapy on the recovery of women on dialysis. Both treatments improve the endurance of patients on hemodialysis (Tajbakhsh et al., 2023). Ahmadi et al. (2022) have shown that ACT and MCT are effective in increasing adaptive cognitive emotion regulation strategies and decreasing cognitive emotional regulation strategies. Furthermore, the results suggest that ACT is more effective than MCT in modulating cognitive-emotional regulation strategies (Ahmadi et al., 2022). Instead of teaching better and better strategies to change or reduce unwanted thoughts and emotions, ACT teaches patients skills to perceive and observe unpleasant thoughts and emotions as they are (Yasaie Sokeh et al., 2017).

Conclusion

Women with GAD benefited from therapy courses in terms of psychological well-being. Thus, unlike the MCT, the results suggest that ACT-based exercises would be of additional value for improving psychological well-being. As this is the first study on the topic, more research is needed to determine the effectiveness of these two therapies for general anxiety in individuals.

Study limitations

There are limitations to the study. Initially, a small sample size and nonrandom sampling put the validity of our findings at risk. Our results may have been influenced by recall bias and answer accuracy due to the use of self-report instruments. Despite our efforts to control extraneous variables statistically, there may have been additional effects of subject variables that we overlooked, such as comorbid physical conditions that could contribute to anxiety symptoms. Therefore, we recommend that future studies consider these variables as exclusion criteria.

Furthermore, since our sample consisted of individuals with mild anxiety symptoms, it is possible that different results would be observed at different severity stages of anxiety disorders. Additionally, the cross-sectional design of this study cannot determine a cause-and-effect relationship for the observed associations. Future studies should employ longitudinal designs to examine changes in mindfulness and metacognitions over time and identify causal predictors of anxiety disorder symptom severity. Finally, it would have been preferable to assess mindfulness and metacognition in individuals with anxiety disorders who are not undergoing pharmacological or non-pharmacological treatment to avoid the potential effects of these treatments on symptom severity.

Ethical Considerations

Compliance with ethical guidelines

The study was approved by the Ethics Committee of Islamic Azad University, Semnan Branch (Code: IR.IAU.SHAHROOD.REC.1401.058).

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Authors' contributions

All authors equally contributed to preparing this article.

Conflict of interest

The authors declared no conflict of interest

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