

# A Comparative Analysis of the Efficacy of Acceptance and Commitment Therapy (ACT) and Metacognitive Therapy (MCT) on Worry and Quality of Life in Women Diagnosed with Generalized Anxiety Disorder

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## Abstract

**Background:** Generalized Anxiety Disorder (GAD) is characterized by an excessive preoccupation with daily life occurrences and situations. This study aimed to compare the effectiveness of Metacognitive Therapy (MCT) and Acceptance and Commitment Therapy (ACT) in reducing worry and improving the quality of life among women diagnosed with GAD.

**Methods:** A quasi-experimental study was conducted using a pretest and a 3-month follow-up design. The study participants were women with GAD selected through convenient sampling in Tehran, Iran, from September to November 2022. According to the research design, the participants were divided into experimental and control groups (n=17 in each group). The experimental group underwent a 10-session treatment protocol based on ACT, while the control group did not receive any specific treatment. Data collection was accomplished using the Pennsylvania State Worry Questionnaire (PSWQ) to assess worry, the Brief Generalized Anxiety Disorder Scale (GAD-7) to measure generalized anxiety, and the Quality of Life Questionnaire (QOL) to assess the quality of life. Data analysis was performed using SPSS version 25, utilizing analysis of variance and repeated measures at a significance level of 0.05.

**Results:** Significant differences were observed between the experimental and follow-up phases among the ACT, MCT, and Control groups concerning environmental health variables (P=0.04). The study's results indicated significant differences in anxiety variables between the three groups (ACT, MCT, and Control) during the experimental and follow-up phases (P=0.001). No significant differences were noted between the ACT, MCT, and control groups regarding changes in physical health at the post-test (P=0.2) and follow-up (P=0.1) phases. In addition, significant differences were found among the three groups (ACT, MCT, and Control) regarding changes in mental health during the pretest and follow-up (P=0.001). This study also revealed significant disparities in social health variables among the three groups (ACT, MCT, and Control) (P=0.001).

**Conclusion:** In summary, this study suggested that fostering positive thoughts about worrying may contribute to reducing the severity of anxiety disorders in adults. Intriguingly, mindfulness and a focus on the present moment did not appear to be significantly correlated with mild anxiety experiences.

**Keywords:** Acceptance and commitment therapy, Metacognitive, Worry, Quality of life, Women, Generalized anxiety disorder

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## 1. Introduction

Anxiety ranks as one of the most prevalent causes of diminished quality of life, whereas an excessive inclination towards experiential pursuits is frequently overlooked as a concern in need of resolution. Among the various types of anxiety disorders, such as social phobia, obsessive-compulsive spectrum disorder, and panic attacks, Generalized Anxiety Disorder (GAD) stands out as one of the most formidable anxiety disorders (1). Anxiety is a common condition that impacts an individual's mental health and can exert both short-term and long-term physical repercussions

on the body. Given its clinical significance, early detection of anxiety is imperative (2). Anxiety is characterized by a fear of uncertainty that elicits unpleasant physical sensations, which individuals find challenging to interpret (3, 4). Individuals experiencing this sensation often cannot identify its root cause (5). GAD is a prevalent form of anxiety disorder, afflicting 5.2% of individuals aged 18 to 64 (6). It is widely believed that GAD perpetually predicts or escalates negative behaviors, irrespective of risk factors (7). Consequently, Cognitive Therapy (CT) for GAD instructs clients to recognize apprehensions as mere suspicions and encourages them to test their validity when anxiety-related

predictions prove to be erroneous (6, 7).

Traditional Cognitive-Behavioral Therapy (CBT) focuses on cognitive restructuring and altering thought content. In this therapeutic model, rectifying flawed assumptions and core beliefs follows a logical framework, and once these adjustments occur, symptoms subside. While this approach is reasonably practical in alleviating anxiety symptoms, it does not target overall quality of life or coexisting disorders, leading to symptom recurrence (8). These conventional treatments are favored because they reduce the severity and frequency of disease symptoms (9). In terms of treatment efficacy, both traditional CBT and Acceptance and Commitment-Based Therapy (ACT) have made strides in reducing anxiety symptoms. However, it is worth noting that this progress may not be sustained upon follow-up (10). Acceptance and Commitment treatments demonstrate significantly greater effectiveness and maintain their impact on patients' quality of life over an extended period (11). Consequently, a treatment approach based on Acceptance and Commitment is a more robust predictor of long-term improvement in patients' quality of life (12).

In contrast to cognitive behavioral therapy, MCT emphasizes information processing rather than the content of thoughts. It posits that attention and errors are intricately linked to cognitive and metacognitive processes, with metacognitive beliefs serving as the root cause of distress, anxiety, and worry (12). According to the metacognitive theory, many GAD-related behaviors have a psychological origin (13). The metacognitive model contends that effective treatment for metacognitive anxiety disorder should concentrate on managing various metacognitive factors (14). This encompasses correcting misconceptions related to excessive concern, recognizing the belief that excessive worry leads to unfavorable outcomes, and acknowledging that excessive worry can assist in coping with difficulties. Recent scientific investigations explored this therapy as a potential solution for individuals grappling with specific mental health challenges (11-13).

MCT has been proven to be effective for an array of mental health conditions (13-19). The efficacy of Acceptance and Commitment Therapy (ACT) and MCT can be elucidated by examining their distinctive features, underlying rationales, and core

principles. Individuals suffering from anxiety, who exhibit poor responses to traditional treatments and endure diminished mental and social well-being alongside a compromised quality of life, may find potential benefits in these innovative approaches. This research's principal objective is to juxtapose ACT with MCT in the context of anxious women. The study aimed to evaluate the impact of these therapies on women's anxiety levels, psychological flexibility, quality of life, and overall psychological well-being.

## 2. Methods

### 2.1. Design and Participants

The present research serves an applied purpose, employing a semi-experimental research method with a pre-test-post-test design featuring a control group and a two-month follow-up phase. The statistical population under examination comprises women residing in Tehran, Iran diagnosed with GAD. The research activities occurred during the summer and autumn of 2022 in Tehran, Iran. Given the unavailability of comprehensive statistics and information regarding all individuals with generalized anxiety syndrome in Tehran, a non-random convenient sampling approach was employed. This approach aimed to selectively include individuals diagnosed with GAD following the completion of a questionnaire and a diagnostic interview. The resulting sample consisted of 36 patients with GAD, 12 women in each group, all of whom willingly participated in the study.

The researchers established the sample size by utilizing G\*Power software with a significance level of 0.05, a power of 0.90, and an effect size of 1.42 (18). The participants were randomly allocated to groups using a coin toss method, where a coin was flipped in the air to determine group assignments. Each participant in the test groups underwent this coin toss procedure once to determine their selection. Subsequently, the remaining individuals constituted the control group.

To account for potential dropouts, 60 individuals were selected as the sample. After the sample selection, participants were randomly distributed into three groups including two experimental groups, each receiving a different intervention, and one control group (n=17 for each group). All groups, including the treatment and control

groups, were homogenized based on specified criteria for admission to the sessions.

Inclusion criteria for participation in the research were as follows: not concurrently taking psychiatric medications; absence of specific physical ailments and personality disorders; no history of hospitalization or receipt of psychological treatment; age range of 18 to 60 years; absence of a clinical diagnosis of GAD; minimum literacy in reading and writing; and provision of informed consent prior to participation.

Exclusion criteria from the research encompassed the following: the presence of co-occurring disorders as mentioned in the inclusion criteria; simultaneous engagement in counseling or other psychotherapy sessions; the existence of a severe physical or mental disorder (e.g., substance use disorder, personality disorder, or impaired temporal and spatial perception) rendering intervention unfeasible; ongoing medication treatment; and missing three consecutive sessions.

## 2.2. Procedure

After obtaining the necessary research approvals, including approval from the university's ethics committee (IR.IAU.SHAHROOD.REC.1401.058), correspondence was initiated with various entities. This included reaching out to cultural and artistic centers within the Tehran municipality's library and three psychological clinics in Tehran regions 2, 3, and 4. Subsequently, negotiations were carried out with the management of these centers and officials from the cultural and artistic centers of Tehran municipality to secure permission for cooperation and sampling within the target community, specifically focusing on women suffering from general anxiety syndrome.

Individuals who scored below the predetermined threshold in the questionnaire were contacted individually to assess their eligibility for participation in the research. During these telephone meetings, a clinical interview was conducted to evaluate their general anxiety levels, and participants were assessed against established entry and exit criteria. Those meeting the criteria and expressing willingness were invited to participate in the research.

The researcher carried out the identification

of general anxiety syndrome during the initial telephone call with the research samples. The researcher employed the 7-item scale (GAD-7) of Spitzer and colleagues (20) as the identification tool. Following the initial calculations, the researcher administered the questionnaire over the phone and calculated the scores for all participants. Individuals diagnosed with general anxiety syndrome based on the established threshold in this questionnaire were included in the study.

Furthermore, these selected participants were provided comprehensive information about the study's overarching objectives, potential benefits and drawbacks, the research process, and its anticipated duration. This ensured that they could make an informed decision regarding their participation. Ultimately, a total of 60 individuals were chosen for the study.

Following the research design, participants were initially divided into a control group (n=17) and an experimental group (n=17). A pretest was conducted for all participants, and each individual completed the questionnaire. Simultaneously, participants provided written consent to participate in the study.

The subsequent phase involved the implementation of a 10-step treatment protocol centered around agreement and commitment (Table 1) for members of the first experimental group (Table 2). The second experimental group (Table 2) underwent the 10-step treatment protocol (14) associated with MCT. The control group maintained contact with the supervisor but underwent no specific intensive treatment. Treatment was conducted at the Taliee Center for Clinical Psychology.

Upon completing the treatment phase, a post-test was administered to all participants in the experimental and control groups. Follow-up observations were conducted at two-month intervals. Furthermore, to meet the ethical requirements of the study, individuals in the control group who expressed a desire for professional help after the study received a general anxiety treatment.

The CONSORT flowchart illustrating the study's progression is depicted in Figure 1. The designated assessment tool assessed all participants in the pretest and post-test phases.

**Table 1:** Acceptance and commitment therapy

Session	
One	Brief explanation to the therapist about the problem; Applications of worry; Relaxation training
Two	Learning to control uncontrollable things, Allegory of wrinkled socks; Allegory of the person in the pit; Allegory of the man in the gas tank
Three	Training of desire and external and internal principles; Allegory of passengers on the bus; Desire vs. wanting Acceptance vs. submission; Training what to do when the worry starts; Exercise of giving up
Four	Labeling Worrying Thoughts; Monitoring Thoughts; Practicing Watching Thoughts
Five	Confronting, accepting, and eliminating fear; Extensive muscle relaxation exercise; Stop anxiety and worry exercise
Six	Accepting and observing anxious thoughts; Separating yourself from your experiences; Parable of art vs. ant; Parable of chess board; Practice Let's have a great performance; Space evaluation exercise
Seven	Mindfulness in the present time; listening practice; looking practice; smelling practice
Eighth	Moving in the right direction; Practice of caring instead of worrying about your life; Practice of valuable experiences; Practice of shopping in the store of values; Practice of the identification of obstacles
Nine	Explaining the exposure; Dealing with the time of worry; Grading anxiety areas; Using skills; Moving forward
Ten	Creating skills and solving problems; Problem-solving training; Courageous exercise

**Table 2:** Summary of therapy sessions based on metacognitive therapy

<b>First session:</b>	* Designing a case formulation, * Introduction to the metacognitive model, * Introduction to postponing worry, * Homework: Dissociative awareness attention and postponing worry.
<b>Second session:</b>	* Reviewing the task and completing the GADS-R, especially the beliefs related to the uncontrollability of worry, * Homework: Continue to postpone worrying and introduce the test of loss of control.
<b>Third session:</b>	* Reviewing the assignment and completing the GADS-R, especially beliefs related to the uncontrollability of worry, * Homework: continue to postpone worry, stop worry-avoidance behaviors, and experiment with loss of control.
<b>Fourth session:</b>	* Reviewing the task and completing the GADS-R, especially the beliefs related to the uncontrollability of worry and behaviors, * Homework: Deliberate worry test to check whether the worry is dangerous.
<b>Fifth session:</b>	* Reviewing homework and complete the GADS-R, especially believes related to the dangerousness of worry, * Homework: behavioral experiments to challenge beliefs related to the dangerousness of worry.
<b>Sixth session:</b>	* Reviewing the task and complete the GADS-R, especially the beliefs related to the dangerousness of worry and the remaining ineffective strategies, * Homework: a behavioral experiment to challenge beliefs about the dangerousness of worry.
<b>Seventh session:</b>	* Reviewing homework and completing the GADS-R, especially related to the dangerousness of worry, * Homework: a dissonant strategy or another experiment to challenge positive metacognitive believes.
<b>Eighth session:</b>	* Reviewing homework and completing GADS-R, especially positive metacognitive beliefs Homework: behavioral experiments (for example, anxiety-reduction and anxiety-increasing experiments).
<b>Ninth session:</b>	* Reviewing homework and completing the GADS-R, examining residual maladaptive and avoidant coping, * Replacing the new processing program, * Requesting the patient to prepare the initial treatment summary.
<b>Ten session</b>	* Reviewing treatment summary and reviewing GADS-R, * Completing general treatment plan (relapse prevention), * Strengthen new processing programs and explain them with examples, * Planning homework reinforcement sessions: Specifying the continuation of the application.

### 2.3. Research Instruments

**2.3.1. Demographic Information Questionnaire:** This researcher-designed questionnaire comprised inquiries regarding age, education, occupation, and marital status.

**2.3.2. Generalized Anxiety Disorder Short Scale (GAD-7) :** Developed by Spitzer and colleagues (20), this scale encompasses seven core questions and assesses impairment levels in the patient's activities, social interactions, family life, and occupational functioning. The rating method employed a Likert scale with four response options, making it amenable to daily use. Each of the seven

pivotal questions within the Generalized Anxiety Scale evaluates the respondent's psychological state and distress experienced over the preceding two weeks. Scores for each question on the scale range from 0 to 3, yielding a total score between 0 and 21. The GAD-7 exhibited robust content validity (CVI value=0.85 and CVR value=0.95), internal consistency ( $\alpha=0.80$ ), and test-retest reliability (ICC=0.85) (21). In Iran, the scale demonstrated sound internal consistency with a Cronbach's alpha of 0.876.

**2.3.3. Pennsylvania State Worry Questionnaire (PSWQ):** Crafted by Meyer and colleagues (22), this questionnaire comprises 16 items, with responses

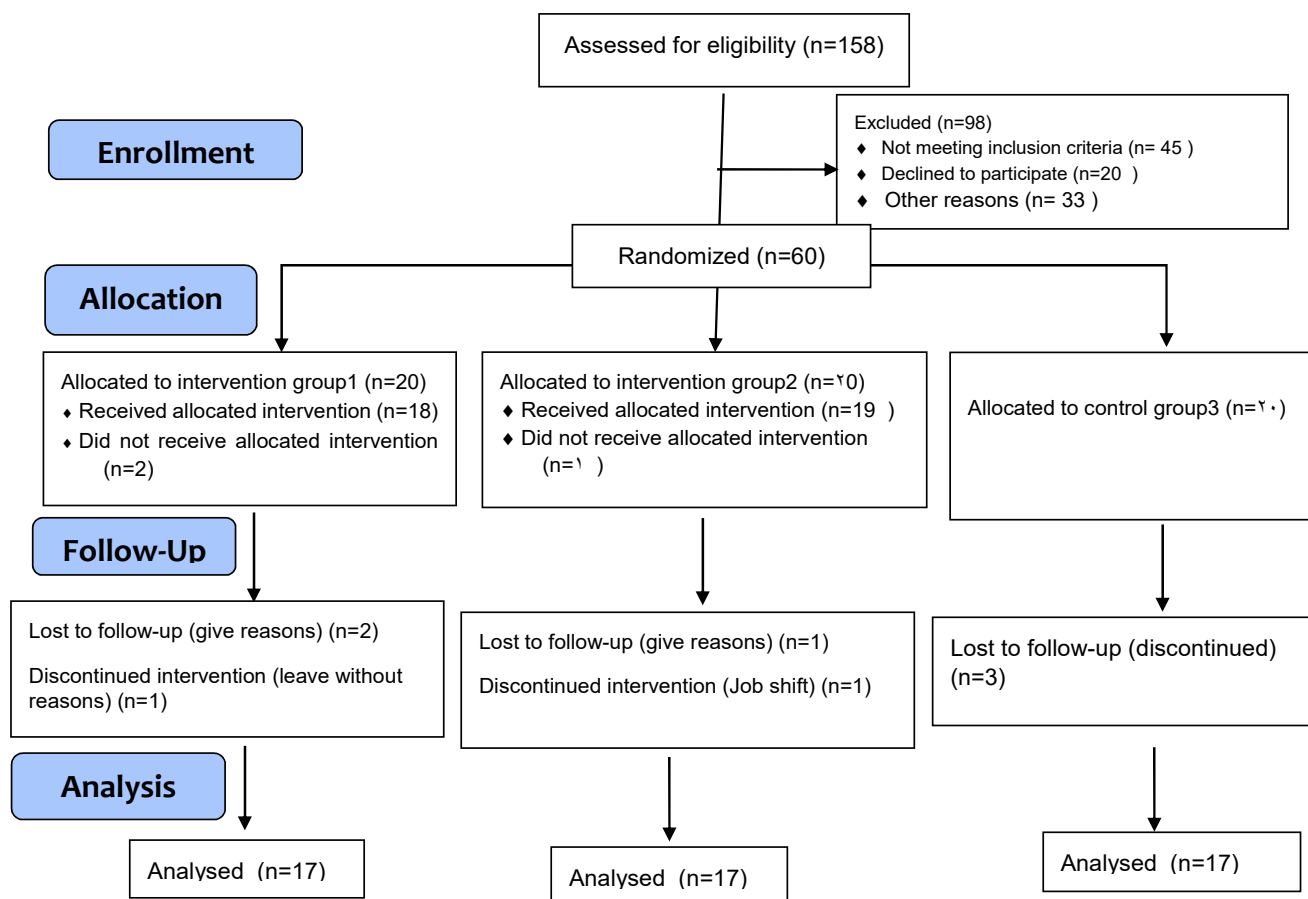


Figure 1: The figure shows the CONSORT flow diagram.

rated on a 5-point Likert scale ranging from 1 (not at all true) to 5 (very true). The PSWQ also exhibited sound content validity (CVI value=0.75 and CVR value=0.85), internal consistency ( $\alpha=0.79$ ), and test-retest reliability (ICC=0.76) (23). Dehshiri and colleagues (23) reported Cronbach's alpha and questionnaire retest coefficients of 0.88 and 0.79, respectively.

**2.3.4. Quality of Life Questionnaire (QOL):** Developed in 1989 by the World Health Organization (WHO) in collaboration with 15 international centers, this survey assessed individuals' quality of life during the preceding two weeks. It comprises 100 questions (24). Nejat and co-workers adapted the Iranian format based on the translation of the original version, an adapted format, a standard format, and a concise version comprising 26 questions. Among these questions, 24 are allocated to four domains, while the first two are not assigned to any specific domain (25). The four subcategories encompass a) the physical health domain, b) the psychological domain, c) the social relations domain, and d) the life domain. The raw score for each subscale is determined by

summing the individual scores, resulting in a score range of 26 to 130. Higher scores indicate a superior quality of life.

Results from the 15 international centers of the World Health Organization (WHO) and the Quality of Life Scale Group exhibited Cronbach's alpha coefficients for the four subscales and the overall scale, ranging from 0.73 to 0.89. The quality of life questionnaire demonstrated robust content validity (CVI value=0.95, CVR value=1), internal consistency ( $\alpha=0.79$ ), and test-retest reliability (ICC=0.86) (25). Furthermore, it was observed that all questionnaires had strong internal consistency, except for question 8 and the total questionnaire. The validity of the two questionnaires, the Short Patient Quality of Life Questionnaire and the Quality of Life Questionnaire was 0.58 for the overall scale and 0.63, 0.60, 0.39, and 0.50 for the subscales. Cronbach's alpha for this question in this study was 0.85.

#### 2.4. Statistical Analyses

In this study, descriptive statistics relied on mean

and standard deviation, while inferential statistics employed covariance analysis. The sphericity test was utilized to assess the homogeneity of covariances. SPSS version 25 was used for data analysis, employing the f test and repeated measures analysis of variance with a significance level set at 0.05.

### 3. Results

In the intervention and control groups, the mean±SD age of women with GAD was 44.23±5.32 years. Demographic variables of the women with GAD are presented in Table 3. The results of the Chi-square test also indicated that there were no significant differences among the three groups in terms of age and knowledge level (P>0.05) (Table 3).

Based on the data in Table 3, the researcher compared the groups concerning demographic

variables. In the 20-30 age group, the proportions of participants in the ACT, MCT, and control groups were 46.6%, 53.3%, and 53.3%, respectively. In the 31-40 age group, proportions were 33.3%, 37.0%, and 29.6%, respectively. In the 41-50 age group, proportions were 26.6%, 13.3%, and 20%, respectively. The percentages of participants in the Masters group in the ACT, MCT, and Control groups were 20%, 13.3%, and 20%, respectively. The percentages of participants in the Senior group in the ACT, MCT, and Control groups were 53.3%, 66.6%, and 60%, respectively. The percentages of people participating in the PhD group in the ACT, MCT, and Control groups were 26.6%, 20%, and 20%, respectively.

Table 4 demonstrates a significant difference in anxiety levels between the ACT, MCT, and control groups in both the pretest and follow-up phases (P=0.001). Furthermore, the analysis results

**Table 3:** Demographic characteristics in the experimental and control groups

Demographic information	ACT	Percent	MCT	Percent	Control	Percent	Chi-square	P value	
Age	20 to 30 years	4	26.6%	5	33.3%	4	26.6%	0.37	0.91
	31 to 40 years	7	46.6%	8	53.3%	8	53.3%		
	41 to 50 years	4	26.6%	2	13.3%	3	20%		
Grade	Masters	3	20%	2	13.3%	3	20%	0.78	0.74
	Senior	8	53.3%	10	66.6%	9	60%		
	PhD	4	26.6%	3	20%	3	20%		

ACT: Acceptance and Commitment Therapy; MCT: Metacognitive Therapy

**Table 4:** Mean±SD of the research variables in experimental and control groups

Variables	Groups	Mean±SD			Within group P-value
		Pre-test	Post-test	Follow up	
Worry	Acceptance and commitment	58.33±9.40	50.33±9.15	53.00±6.59	0.001
	Metacognitive therapy	59.13±8.67	54.87±10.13	56.20±9.82	0.019
	Control	59.40±7.53	58.33±7.81	58.87±9.30	0.676
	Between group test P-value	0.939	0.001	0.027	-
Physical health	Acceptance and commitment	15.93±5.52	17.53±4.52	18.47±4.17	0.188
	Metacognitive therapy	16.27±5.34	16.87±4.32	17.60±3.83	0.153
	Control	15.80±4.65	15.40±4.56	15.33±4.57	0.719
	Between group test P-value	0.916	0.417	0.120	-
Psychological health	Acceptance and commitment	13.53±4.85	19.47±3.27	20.47±3.27	0.001
	Metacognitive therapy	14.67±2.94	17.47±2.36	17.00±2.14	0.002
	Control	13.87±3.02	13.20±2.78	12.93±2.02	0.182
	Between group test P-value	0.693	0.001	0.001	-
Social health	Acceptance and commitment	16.73±3.37	22.33±1.88	23.07±1.83	0.001
	Metacognitive therapy	16.73±4.53	19.87±4.00	21.87±4.31	0.001
	Control	17.27±4.45	16.53±4.29	17.53±4.12	0.354
	Between group test P-value	0.921	0.001	0.001	-
Environmental health	Acceptance and commitment	7.13±5.18	10.40±3.11	11.67±3.90	0.005
	Metacognitive therapy	8.60±3.94	10.13±4.03	11.13±4.03	0.011
	Control	8.47±3.68	7.67±3.74	6.93±3.26	0.082
	Between group test P-value	0.593	0.021	0.002	-

indicated a significant difference between the pretest and post-test periods in the ACT and MCT groups ( $P=0.01$ ). However, no differences were observed in the control group at different stages of the study ( $P=0.37$ ).

The test and control groups exhibited distinct differences in mean scores for psychological health, social relationships, and environmental health components ( $P<0.05$ ). The research revealed substantial disparities in the changes in the quality of life among the three groups (ACT, MCT, and Control) ( $P<0.05$ ).

At the Post-test and Follow-up stages, the ACT, MCT, and Control groups showed similar levels of physical health, as indicated by the results ( $P=0.1$ ). According to the results, there was significant variation between the assessments before and after for both the ACT and MCT groups,  $a=0.28$  and  $P=0.26$ ). The results demonstrated significant differences in the mental health outcomes of the ACT, MCT, and control groups at the Post-test and Follow-up stages ( $P=0.001$ ).

Overall, there were considerable differences between the pretest scores and both the post-test and follow-up scores in the ACT group. A significant distinction was also found between the MCT group's pretest scores and the post-test and follow-up scores ( $P=0.04$ ). However, in the control group, no differences were discovered between the measurement points ( $P=0.26$ ). The research concluded that the ACT, MCT, and control groups displayed significant variances in their social health ( $P=0.001$ ). The study ultimately revealed a significant contrast in scores between the pre- and post-tests for both the ACT and MCT groups ( $P<0.001$ ).

As a result, there was a significant variation in the health conditions among the ACT, MCT, and Control groups before and after the test ( $P=0.04$ ). The test scores and follow-up scores for the ACT and MCT groups held great significance, as the differences between the groups were found to be statistically significant ( $P<0.01$ ). However, in the group that did not receive any special treatment, no differences were found during the different stages of the research ( $P=0.32$ ). Overall, the treatment based on acceptance and commitment helped improve the quality of life and reduce worry in women with pervasive anxiety disorders, proving

to be more effective than other treatments.

#### 4. Discussion

The study investigated the impact of ACT and MCT on women suffering from GAD to reduce anxiety levels and enhance their quality of life. It was observed that ACT demonstrated long-lasting effects at follow-up, unlike MCT, which proved to be significantly less effective.

Supporting evidence for these findings is provided by studies conducted by Mohagheghi and colleagues (26), Petersen and colleagues (27), Kelson and colleagues (28), and Barreto and Gaynor (29). In 2016, Mohagheghi and colleagues (26) found that ACT effectively reduced general and social anxiety but did not have a substantial impact on health-related anxiety (26). Similarly, Mansouri and colleagues reported a reduction in anxiety among mothers with GAD who underwent ACT, especially among mothers of children with autism spectrum disorder (30). Petersen and colleagues (27) also reported favorable treatment outcomes with high acceptability rates, supporting the idea that ACT can be a valuable intervention in educational and clinical settings serving anxious youth (27).

Research conducted by Fledderus and colleagues in 2012 under experimental conditions demonstrated significant improvements in depression, anxiety, fatigue, experiential avoidance, and mental well-being, as well as positive thinking, compared to the control group (31). In the study, participants were assigned randomly to different groups in 11 tests, while in 9 experiments, participants were not subjected to random assignment. It is worth noting that all participants in these studies were adults. Across 18 studies, iACT (individualized ACT) treatment was found to have a significant impact on reducing anxiety, with participants in 13 of these studies expressing moderate to high satisfaction with the treatment overall (29).

Furthermore, the effectiveness of the metacognitive approach is corroborated by the research of Wells (14), Nordahl and colleagues (32), Van der Heiden and co-workers (33), Javandel Someesaraee and colleagues (34), Naderi Lordegani and Chorami (35), and Sandin and colleagues (36). Findings of Javandel Someesaraee

and colleagues (34) suggested that metacognitive strategies training can be beneficial in improving emotional suppression, poor emotional experience, unprocessed emotions, and emotional avoidance in patients with GAD (34). Study of Naderi Lordegani and Chorami (35) demonstrated that metacognitive training improved the quality of life and psychological resilience of Red Crescent rescuers in their experimental group, and these effects were sustained for two months (35). Main finding of Aydın and co-workers (17) was that positive beliefs about anxiety were associated with reduced symptom severity in individuals with GAD. Additionally, individuals with high levels of health consciousness held more positive beliefs about anxiety. They were more concerned about the internal experiences of GAD patients, who, in turn, held negative beliefs about the uncontrollability, danger, and the need to control their thoughts.

Nordahl and colleagues, investigated the effectiveness of MCT in assisting individuals with GAD. The objective was to determine if this therapy could reduce anxiety and worry while enhancing overall quality of life. The findings indicated that individuals with GAD experienced reduced anxiety and worry, ultimately leading to an improvement in their overall quality of life (32). Similarly, in a study conducted by Van der Heiden and colleagues, significant improvements were observed in the participants' condition following the completion of both MCT and ACT treatments (33).

Research of Wells in 2010 revealed that 31 patients underwent individualized treatment over 8 to 13 weekly sessions. The recovery rate for MCT was 81% for trait worry and 11% for applied relaxation. At the six-month follow-up, the recovery rate for MCT remained high at 71% for both worry and trait-anxiety variables, while for relaxation therapy, it was only 11% and 31% for the respective variables. The twelve-month recovery rate for MCT was 81% for worry and 61% for trait anxiety, whereas for applied relaxation therapy, it was 11% and 31%, respectively. In conclusion, based on recovery rates and effect size in this research, it can be concluded that MCT is more practical than applied relaxation therapy (14).

To further elucidate these findings, it is essential to understand that individuals with GAD tend to avoid their emotions and thoughts due to their behavioral limitations. According to the model

developed by the researchers, individuals with GAD react negatively to their emotions and attempt to evade them in their actions and thoughts. Occasionally, individuals may encounter situations that induce fear or distress, prompting them to distance themselves from these experiences. While this avoidance may provide short-term relief from the distress associated with internal experiences, it ultimately reinforces behavioral restrictions and diminishes activities that individuals value (14, 37).

On the other hand, the model of avoiding worry and GAD posits that increased emotional and physical experiences can lead to the effective processing of emotional signals. Habituation and desensitization eliminate the potential for confronting fear-inducing signals entirely, rendering worry an ineffective cognitive effort to address perceived threats while avoiding distressing emotional and physical experiences. According to this model, catastrophic mental images are replaced by verbal activities that result in reduced distress and physical activity. Therefore, anxiety is negatively reinforced through the elimination of distressing and fear-inducing mental images (38).

#### *4.1. Limitation*

However, it is essential to acknowledge certain limitations in this study. The small sample size and non-random sampling method pose a risk of potential flaws in the results. Additionally, self-report instruments may introduce recall bias and response imprecision, potentially influencing the findings. Despite efforts to statistically control extraneous variables, some subject-related factors, such as comorbid physical conditions that may manifest similar symptoms, could have been overlooked. Therefore, future studies should consider these factors as exclusion criteria. Subsequent research should also adopt longitudinal designs to examine changes in mindfulness and metacognition over time and identify causal predictors of symptom severity in individuals with GAD. Finally, it is advisable to assess mindfulness and metacognition in AD patients who are not undergoing pharmacological or non-pharmacological treatments to prevent potential interference with symptom severity assessments.

## **5. Conclusion**

In summary, this study posits that cultivating



affirmative cognitions regarding apprehension could potentially ameliorate the gravity of anxiety disorders in adult individuals. Intriguingly, the conscious awareness and concentration on the current moment did not appear to exhibit a discernible correlation with the manifestation of mild anxiety. Consequently, the proposal suggested that, rather than emphasizing mindfulness, it may be more advantageous to concentrate on enhancing pessimistic cognitive constructs concerning ruminative processes and knowledge acquisition among adults diagnosed with anxiety disorders. Given the pioneering nature of this investigation, further research is imperative to elucidate the impact of metacognitive beliefs on the anxiety levels of adults.

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### Authors' Contribution

Parvin Mostafazadeh: Substantial contributions to the conception and design of the work; acquisition, analysis, and interpretation of data for the work; drafting the work. Nemat Sotoudehasl: Substantial contributions to the conception of the work, drafting the work and reviewing it critically for important intellectual content; Raheb Ghornabni: Acquisition, analysis, and interpretation of data for the work, drafting the work. All authors approved of the final version to be published, and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

### Ethical Approval

The study was approved by the Ethical Committee of Islamic Azad University- Semnan Branch with the code of IR.IAU.SHAHROOD.REC.1401.058. Also, written informed consent was obtained from the participants.

**Conflict of Interest:** None declared.

### References

1. Crocq MA. A history of anxiety: from Hippocrates to DSM. *Dialogues Clin Neurosci.* 2015;17(3):319-25. doi: 10.31887/DCNS.2015.17.3/macrocq. PubMed PMID: 26487812; PubMed Central PMCID: PMC4610616.
2. Aquin JP, El-Gabalawy R, Sala T, Sareen J. Anxiety Disorders and General Medical Conditions: Current Research and Future Directions. *Focus (Am Psychiatr Publ).* 2017;15(2):173-181. doi: 10.1176/appi.focus.20160044. PubMed PMID: 31975849; PubMed Central PMCID: PMC6526963.
3. Cohen M, Quintner J, van Rysewyk S. Reconsidering the International Association for the Study of Pain definition of pain. *Pain Rep.* 2018;3(2):e634. doi: 10.1097/PR9.0000000000000634. PubMed PMID: 29756084; PubMed Central PMCID: PMC5902253.
4. Darley A, Coughlan B, Maguire R, McCann L, Furlong E. A bridge from uncertainty to understanding: The meaning of symptom management digital health technology during cancer treatment. *Digit Health.* 2023;9:20552076231152163. doi: 10.1177/20552076231152163. PubMed PMID: 36714543; PubMed Central PMCID: PMC9880573.
5. Ots T. The angry liver, the anxious heart and the melancholy spleen. The phenomenology of perceptions in Chinese culture. *Cult Med Psychiatry.* 1990;14(1):21-58. doi: 10.1007/BF00046703. PubMed PMID: 2340732.
6. Junge A, Wellmann K, Zech A. Prevalence of symptoms of depression and generalized anxiety disorder in field hockey players of German first and lower leagues. *Scand J Med Sci Sports.* 2023;33(9):1866-1873. doi: 10.1111/sms.14426. PubMed PMID: 37309991.
7. LaFreniere LS, Newman MG. Exposing Worry's Deceit: Percentage of Untrue Worries in Generalized Anxiety Disorder Treatment. *Behav Ther.* 2020;51(3):413-423. doi: 10.1016/j.beth.2019.07.003. PubMed PMID: 32402257; PubMed Central PMCID: PMC7233480.
8. Preacher KJ, Hayes AF. Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behav Res Methods.* 2008;40(3):879-

91. doi: 10.3758/brm.40.3.879. PubMed PMID: 18697684.
9. Zimmerman M, Morgan TA, Stanton K. The severity of psychiatric disorders. *World Psychiatry*. 2018;17(3):258-275. doi: 10.1002/wps.20569. PubMed PMID: 30192110; PubMed Central PMCID: PMC6127765.
  10. Chapoutot M, Peter-Derex L, Bastuji H, Leslie W, Schoendorff B, Heinzer R, et al. Cognitive Behavioral Therapy and Acceptance and Commitment Therapy for the Discontinuation of Long-Term Benzodiazepine Use in Insomnia and Anxiety Disorders. *Int J Environ Res Public Health*. 2021;18(19):10222. doi: 10.3390/ijerph181910222. PubMed PMID: 34639523; PubMed Central PMCID: PMC8508349.
  11. Ahmadi Ghahnaviyeh L, Bagherian B, Feizi A, Afshari A, Mostafavi Darani F. The Effectiveness of Acceptance and Commitment Therapy on Quality of Life in a Patient with Myocardial Infarction: A Randomized Control Trial. *Iran J Psychiatry*. 2020;15(1):1-9. PubMed PMID: 32377209; PubMed Central PMCID: PMC7193234.
  12. Zhang Z, Leong Bin Abdullah MF, Shari NI, Lu P. Acceptance and commitment therapy versus mindfulness-based stress reduction for newly diagnosed head and neck cancer patients: a randomized controlled trial assessing efficacy for positive psychology, depression, anxiety, and quality of life. *Plos One*. 2022;17(5):e0267887. doi: 10.1371/journal.pone.0267887. PubMed PMID: 35536828; PubMed Central PMCID: PMC9089868.
  13. Moritz S, Klein JP, Lysaker PH, Mehl S. Metacognitive and cognitive-behavioral interventions for psychosis: new developments. *Dialogues Clin Neurosci*. 2019;21(3):309-317. doi: 10.31887/DCNS.2019.21.3/smoritz. PubMed PMID: 31749655; PubMed Central PMCID: PMC6829173.
  14. Wells A. Metacognitive theory and therapy for worry and generalized anxiety disorder: Review and status. *Journal of Experimental Psychopathology*. 2010;1(1):jep-007910. doi: 10.5127/jep.007910.
  15. Thorslund J, McEvoy PM, Anderson RA. Group metacognitive therapy for adolescents with anxiety and depressive disorders: A pilot study. *J Clin Psychol*. 2020;76(4):625-645. doi: 10.1002/jclp.22914. PubMed PMID: 31916590.
  16. Capobianco L, Faija C, Husain Z, Wells A. Metacognitive beliefs and their relationship with anxiety and depression in physical illnesses: A systematic review. *PLoS One*. 2020;15(9):e0238457. doi: 10.1371/journal.pone.0238457. PubMed PMID: 32911486; PubMed Central PMCID: PMC7500039.
  17. Aydın O, Obuca F, Çakıroğlu E, Ünal-Aydın P, Esen-Danacı A. The evaluation of the effect of mindfulness and metacognition on anxiety symptoms: A case-control study. *Eur Psychiatry*. 2022;65(Suppl 1):S394-395. doi: 10.1192/j.eurpsy.2022.998. PubMed Central PMCID: PMC9566926.
  18. Mohammadi H, Khalatbari J, Abolmaali K. The Effect of Integrating Cognitive-Behavioral Therapy and Mindfulness Therapy on Lifestyle of Women with Irritable Bowel Syndrome. *Women Health Bull*. 2021;8(4):220-227. doi: 10.30476/whb.2021.91397.1124.
  19. Hayes SC, Pistorello J, Levin ME. Acceptance and commitment therapy as a unified model of behavior change. *The Counseling Psychologist*. 2012;40(7):976-1002. doi: 10.1177/0011000012460836.
  20. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Intern Med*. 2006;166(10):1092-7. doi: 10.1001/archinte.166.10.1092. PubMed PMID: 16717171.
  21. Omani-Samani R, Ghaheri A, Navid B, Sepidarkish M, Maroufizadeh S. Prevalence of generalized anxiety disorder and its related factors among infertile patients in Iran: a cross-sectional study. *Health Qual Life Outcomes*. 2018;16(1):129. doi: 10.1186/s12955-018-0956-1. PubMed PMID: 29914527; PubMed Central PMCID: PMC6006936.
  22. Meyer TJ, Miller ML, Metzger RL, Borkovec TD. Development and validation of the Penn State Worry Questionnaire. *Behav Res Ther*. 1990;28(6):487-95. doi: 10.1016/0005-7967(90)90135-6. PubMed PMID: 2076086.
  23. Dehshiri GR, Golzari M, Borjali A, Sohrabi F. Psychometrics particularity of farsi version of Pennsylvania state worry questionnaire for college students. *Journal of Clinical Psychology*. 2010;1:67-75. doi: 10.22075/JCP.2017.1988. Persian.
  24. World Health Organization. WHOQOL-BREF: introduction, administration, scoring and generic version of the assessment: field trial version; 1996. Available from: <https://apps.who>

- int/iris/handle/10665/63529.
25. Nejat S, Montazeri A, Holakouie Naieni K, Mohammad K, Majdzadeh S. The World Health Organization quality of Life (WHOQOL-BREF) questionnaire: Translation and validation study of the Iranian version. *sjsph*. 2006;4(4):1-12. Persian.
  26. Mohagheghi H, Dousti P, Jafari D. The effectiveness of acceptance and commitment therapy on reduction, generalized anxiety disorder, social phobia and health anxiety in students. *Clinical Psychology Studies*. 2016;6(23):81-94. doi: 10.22054/jcps.2016.4559.
  27. Petersen JM, Davis CH, Renshaw TL, Levin ME, Twohig MP. School-based acceptance and commitment therapy for adolescents with anxiety: A pilot trial. *Cognitive and Behavioral Practice*. 2023;30(3):436-452. doi: 10.1016/j.cbpra.2022.02.021.
  28. Kelson J, Rollin A, Ridout B, Campbell A. Internet-Delivered Acceptance and Commitment Therapy for Anxiety Treatment: Systematic Review. *J Med Internet Res*. 2019;21(1):e12530. doi: 10.2196/12530. PubMed PMID: 30694201; PubMed Central PMCID: PMC6371070.
  29. Barreto M, Gaynor ST. A single-session of acceptance and commitment therapy for health-related behavior change: Protocol description and initial case examples. *Behavior Analysis: Research and Practice*. 2019;19(1):47-59. doi: 10.1037/bar0000093.
  30. Mansouri A, Korozhde N, Miri S. The Effectiveness of Acceptance and Commitment Therapy (ACT) on the Symptoms of Generalized Anxiety Disorder (GAD) in Mothers of Children with Autism Spectrum Disorder. *Clinical Psychology Achievements*. 2017;2(4):1-20. doi: 10.22055/jacp.2018.23820.1055. Persian.
  31. Fledderus M, Bohlmeijer ET, Pieterse ME, Schreurs KM. Acceptance and commitment therapy as guided self-help for psychological distress and positive mental health: a randomized controlled trial. *Psychol Med*. 2012;42(3):485-95. doi: 10.1017/S0033291711001206. PubMed PMID: 21740624.
  32. Nordahl HM, Borkovec TD, Hagen R, Kennair LEO, Hjemdal O, Solem S, et al. Metacognitive therapy versus cognitive-behavioural therapy in adults with generalised anxiety disorder. *BJPsych Open*. 2018;4(5):393-400. doi: 10.1192/bjo.2018.54. PubMed PMID: 30294448; PubMed Central PMCID: PMC6171331.
  33. van der Heiden C, Muris P, van der Molen HT. Randomized controlled trial on the effectiveness of metacognitive therapy and intolerance-of-uncertainty therapy for generalized anxiety disorder. *Behav Res Ther*. 2012;50(2):100-9. doi: 10.1016/j.brat.2011.12.005. PubMed PMID: 22222208.
  34. Javandel Someesaraee R, Zare S, Zare S. The Effectiveness of Teaching Metacognitive Strategies on the Emotional Processing in Patients with Generalized Anxiety Disorder. *Iranian Journal of Learning and Memory*. 2019;2(6):19-25. doi: 10.22034/iepa.2019.198119.1121. Persian.
  35. Naderi Lordegani M, Chorami M. The Effectiveness of Meta-Cognitive Training on Quality of Life and Psychological Hardiness of Red Crescent Relief Rescuer Workers. *Positive Psychology Research*. 2021;6(4):81-92. doi: 10.22108/ppls.2021.117405.1754.
  36. Sandin K, Gjengedal RGH, Osnes K, Hannisdal M, Berge T, Leversen JSR, et al. Metacognitive therapy and work-focused interventions for patients on sick leave due to anxiety and depression: study protocol for a randomised controlled wait-list trial. *Trials*. 2021;22(1):854. doi: 10.1186/s13063-021-05822-4. PubMed PMID: 34838125; PubMed Central PMCID: PMC8626756.
  37. Bandelow B, Michaelis S, Wedekind D. Treatment of anxiety disorders. *Dialogues Clin Neurosci*. 2017;19(2):93-107. doi: 10.31887/DCNS.2017.19.2/bbandelow. PubMed PMID: 28867934; PubMed Central PMCID: PMC5573566.
  38. Nayinian MR, Shairi M, Sharifi M, Hadian M. To Study Reliability and Validity for a Brief Measure for Assessing Generalized Anxiety Disorder (GAD-7). *Clinical Psy & Personality*. 2011;3(4):41-50. Persian.