

# Comparing the Effectiveness of Metacognitive Therapy and Compassion-Focused Therapy on Repetitive Thinking in Female Students with Non-Clinical Depression

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## ABSTRACT

**Objective:** The present study aimed to compare the effectiveness of Metacognitive Therapy (MCT) and Compassion-Focused Therapy (CFT) in reducing repetitive thinking among female university students with non-clinical depression and to identify the more effective intervention.

**Methods and Materials:** This quasi-experimental study employed a pretest–posttest control group design with a three-month follow-up assessment. The statistical population consisted of female students with non-clinical depression at Islamic Azad University, Sari Branch, during the 2025 academic year. Forty-five participants were selected through purposive sampling and assigned to three groups: Metacognitive Therapy (n=15), Compassion-Focused Therapy (n=15), and a control group (n=15). Participants in the intervention groups received eight 90-minute sessions based on Wells' Metacognitive Therapy protocol and Gilbert's Compassion-Focused Therapy protocol, respectively. Data were collected using the Repetitive Negative Thinking Scale and analyzed through repeated-measures ANOVA, Bonferroni post hoc tests, and Tukey comparisons.

**Findings:** Repeated-measures ANOVA demonstrated significant main effects for group ( $F=25.519$ ,  $p<0.01$ ,  $\eta^2=0.549$ ) and time ( $F=50.583$ ,  $p<0.01$ ,  $\eta^2=0.546$ ), as well as a significant group-by-time interaction effect ( $F=14.483$ ,  $p<0.01$ ,  $\eta^2=0.408$ ). Bonferroni analyses revealed significant reductions in repetitive thinking from pretest to posttest and follow-up ( $p<0.001$ ), whereas the difference between posttest and follow-up was not significant, indicating maintenance of treatment gains. Tukey comparisons further showed that Metacognitive Therapy produced significantly greater reductions in repetitive thinking than Compassion-Focused Therapy ( $p<0.01$ ).

**Conclusion:** Both therapeutic approaches effectively reduced repetitive thinking among female students with non-clinical depression; however, Metacognitive Therapy demonstrated superior effectiveness. The findings suggest that directly modifying maladaptive metacognitive beliefs and cognitive processing styles may be more beneficial than compassion-based interventions for reducing repetitive thinking and preventing progression toward clinical depression.

**Keywords:** Repetitive Thinking; Metacognitive Therapy; Compassion-Focused Therapy; Non-Clinical Depression; Female University Students.

## 1. Introduction

Depression is among the most prevalent psychological disorders worldwide and represents a major contributor to emotional distress, functional impairment, and reduced quality of life. In addition to clinically diagnosed depressive disorders, increasing attention has been directed toward non-clinical depression, a subthreshold condition characterized by the presence of depressive symptoms that do not fully meet diagnostic criteria for major depressive disorder but nevertheless exert meaningful negative effects on psychological functioning, academic performance, and interpersonal relationships (Lim & Park, 2024; O'Toole et al., 2022; Yasin et al., 2023). Research has shown that individuals experiencing non-clinical depression often demonstrate cognitive, emotional, and neuropsychological vulnerabilities similar to those observed in clinical populations, suggesting that this condition should be considered an important target for early intervention and prevention efforts (Bar-Sella et al., 2022; Lim & Park, 2024). Among university students, particularly female students, non-clinical depressive symptoms are especially concerning because they emerge during a developmental period characterized by academic pressures, identity formation, social challenges, and increased emotional sensitivity.

One of the most prominent cognitive characteristics associated with depressive symptoms is repetitive negative thinking. Repetitive negative thinking refers to a pattern of persistent, recurrent, and difficult-to-control thoughts that revolve around personal concerns, failures, threats, or negative emotional experiences. Unlike ordinary problem-solving processes, repetitive negative thinking is often unproductive and contributes to the maintenance and exacerbation of psychological distress (Constantin et al., 2021; Palmieri et al., 2021). Contemporary theoretical models suggest that repetitive negative thinking represents a transdiagnostic process underlying numerous psychological disorders, including depression, anxiety disorders, obsessive-compulsive disorder, eating disorders, substance-use problems, and suicidal ideation (Forthman et al., 2023; Palmieri et al., 2021; Zagaria et al., 2023). Network analyses have identified repetitive negative thinking as a central node connecting multiple psychopathological domains, indicating that reductions in this cognitive process may yield broad therapeutic benefits across various forms of emotional disturbance (Zagaria et al., 2023).

Recent investigations have further demonstrated the importance of repetitive negative thinking in the development and maintenance of depressive symptoms. Neurocognitive studies indicate that repetitive negative thinking influences attentional control, working memory performance, emotional regulation, and neural error-processing systems, thereby contributing to vulnerability for depression and anxiety (Ren et al., 2025; van Oort et al., 2022). Machine-learning approaches have identified repetitive negative thinking as one of the strongest behavioral predictors of emotional dysfunction across diagnostic categories (Forthman et al., 2023). Furthermore, ecological momentary assessment studies among university students have revealed that elevated stress levels are consistently associated with increases in repetitive negative thinking and subsequent declines in mental health and well-being (Inostroza et al., 2024). Longitudinal evidence has also shown that repetitive negative thinking mediates the relationship between problematic social media use and suicide-related outcomes, highlighting its role as a critical cognitive vulnerability factor (Brailovskaia et al., 2023).

Female university students may be particularly susceptible to repetitive negative thinking because of their heightened exposure to interpersonal stressors and emotional reactivity. Studies examining social interactions among young women have found that negative interpersonal experiences and peer-related stress contribute significantly to sustained negative affect and cognitive preoccupation (Hamilton et al., 2021). Moreover, non-clinical depression has been associated with maladaptive interpretation biases and increased sensitivity to social exclusion, both of which may intensify cycles of repetitive thinking and emotional distress (Bar-Sella et al., 2022). Consequently, identifying effective interventions capable of reducing repetitive negative thinking among female students with non-clinical depression represents an important clinical and preventive priority.

Among contemporary psychological interventions, Metacognitive Therapy (MCT) has emerged as a highly influential approach for addressing repetitive negative thinking. Developed by Wells, metacognitive therapy is grounded in the Self-Regulatory Executive Function model and proposes that psychological disorders are maintained by maladaptive metacognitive beliefs and the Cognitive Attentional Syndrome, a pattern characterized by persistent worry, rumination, threat monitoring, and ineffective coping behaviors (Wells, 2011). According to this framework, it is not merely the content of thoughts that causes emotional

distress but rather individuals' beliefs about their thinking processes and their tendency to engage in prolonged cognitive processing (Batmaz et al., 2021; Brown et al., 2022). Metacognitive therapy therefore seeks to modify dysfunctional metacognitive beliefs, reduce rumination and worry, strengthen attentional flexibility, and promote adaptive self-regulation.

An expanding body of evidence supports the effectiveness of metacognitive therapy across a wide range of psychological conditions. Long-term follow-up studies have demonstrated that metacognitive therapy can produce enduring improvements in generalized anxiety disorder that extend for many years after treatment completion (Solem et al., 2021). Randomized controlled trials have reported substantial reductions in anxiety and depressive symptoms among patients receiving metacognitive interventions (Wells et al., 2021; Wells et al., 2023). Additional studies have shown beneficial outcomes in obsessive-compulsive disorder, substance-use disorders, major depression, and mixed emotional disorders (Kroener et al., 2024; Melchior et al., 2023; Strand et al., 2023). Reviews examining the broader applicability of metacognitive therapy have concluded that targeting maladaptive metacognitive processes offers a powerful mechanism for reducing psychological distress across diagnostic categories (Brown et al., 2022; Sharma et al., 2022). Furthermore, preliminary findings suggest that metacognitive therapy is effective in reducing repetitive negative thinking among children, adolescents, and adults, emphasizing its relevance for preventive mental health interventions (McEvoy et al., 2015; Thingbak et al., 2024).

Another intervention that has gained increasing empirical support is Compassion-Focused Therapy (CFT). Compassion-focused therapy was developed to address excessive self-criticism, shame, and difficulties in emotional regulation through the cultivation of compassion toward oneself and others (Gilbert et al., 2024). Drawing upon evolutionary psychology, attachment theory, and affective neuroscience, compassion-focused therapy proposes that many psychological problems arise from an overactivation of threat-protection systems and an underdevelopment of affiliative and soothing systems (Bell et al., 2021; Gilbert et al., 2024). By strengthening self-compassion, emotional acceptance, and feelings of connectedness, compassion-focused therapy aims to reduce distress and promote psychological resilience.

Empirical evidence indicates that compassion-focused therapy can improve emotional well-being and reduce

symptoms across various clinical populations. Studies have reported positive outcomes among individuals with treatment-resistant depression, intellectual disabilities, body-image concerns, and diverse psychological difficulties treated within university counseling settings (Asano et al., 2022; Carter et al., 2021; Fox et al., 2021; Goad & Parker, 2021). Research has further shown that compassion-focused interventions enhance self-compassion, reduce self-criticism, and improve emotional functioning among both clinical and non-clinical populations (Beaumont et al., 2021; Matos et al., 2023). Qualitative investigations have highlighted the importance of compassionate imagery and nurturing representations in fostering emotional safety and psychological growth (Crone et al., 2024). Because repetitive negative thinking is often accompanied by harsh self-evaluation, shame, and emotional avoidance, compassion-focused therapy may provide an alternative pathway for reducing cognitive distress through enhanced emotional regulation and self-kindness (Gilbert et al., 2024; Jansen, 2021).

Several studies have explored the effects of compassion-focused therapy and related interventions on repetitive thinking and depressive symptoms. Frostadottir and Dorjee found that compassion-focused therapy contributed to reductions in rumination and psychological symptoms among individuals experiencing depression, anxiety, and stress (Frostadottir & Dorjee, 2019). Similarly, Alijani and Ranjbar Kohan demonstrated that compassion-focused therapy significantly reduced negative automatic thoughts and dysfunctional attitudes among patients with major depression (Alijani & Ranjbar Kohan, 2022). These findings suggest that compassion-based approaches may influence repetitive negative thinking indirectly by fostering acceptance, emotional warmth, and self-compassion.

Despite the growing evidence supporting both metacognitive therapy and compassion-focused therapy, important questions remain unanswered. Existing research has generally examined these interventions independently, and relatively few studies have directly compared their effectiveness on repetitive negative thinking. Moreover, the majority of previous investigations have focused on clinical populations diagnosed with major depressive disorder, anxiety disorders, obsessive-compulsive disorder, or other psychiatric conditions (Asano et al., 2022; Melchior et al., 2023; Wells et al., 2021). Comparatively little attention has been devoted to individuals experiencing non-clinical depression, despite evidence suggesting that early intervention at this stage may prevent progression to more

severe psychopathology (Lim & Park, 2024; Yasin et al., 2023). Furthermore, research comparing metacognitive and compassion-focused approaches within university populations remains limited.

A notable gap in the literature concerns female university students with non-clinical depression. This population is vulnerable to persistent repetitive negative thinking due to academic demands, social pressures, developmental transitions, and heightened emotional sensitivity. Although both metacognitive therapy and compassion-focused therapy appear promising for addressing cognitive and emotional difficulties, they operate through distinct mechanisms. Metacognitive therapy directly targets dysfunctional thinking processes and metacognitive beliefs, whereas compassion-focused therapy primarily aims to strengthen emotional regulation systems and cultivate self-compassion (Gilbert et al., 2024; Wells, 2011). Determining which of these approaches produces greater reductions in repetitive negative thinking may provide valuable guidance for clinicians, counselors, and university mental health services seeking effective interventions for at-risk students. Recent evidence supporting the effectiveness of metacognitive therapy for repetitive thoughts (Esmailzadeh et al., 2023) and the benefits of compassion-focused interventions for depressive cognitions (Alijani & Ranjbar Kohan, 2022) further underscores the need for direct comparison.

Therefore, the present study aimed to compare the effectiveness of Metacognitive Therapy and Compassion-Focused Therapy on repetitive thinking among female university students with non-clinical depression.

## 2. Methods and Materials

### 2.1. Study Design and Participants

This study was conducted using a quasi-experimental design with a pretest–posttest control group structure and a three-month follow-up phase. The statistical population consisted of all female students with non-clinical depression at Islamic Azad University, Sari Branch, during the 2024–2025 academic year. Based on estimation using G\*Power software, 45 participants were selected through non-random purposive sampling and assigned to three groups: 15 participants in the control group, 15 participants in the first experimental group receiving metacognitive therapy, and 15 participants in the second experimental group receiving compassion-focused therapy. The inclusion criteria were having non-clinical depression, being 20 to 40 years old, obtaining a score between 14 and 19 on the Beck Depression

Inventory-II indicating mild depression, residing in Sari, having received no previous psychological treatment, at least one month having passed since identification of the condition, absence of severe physical illness, not using psychiatric medication, willingness to participate in the study, and absence of comorbid psychological or physical disorders that could interfere with participation in the intervention sessions. The exclusion criteria included the emergence of psychological or physical disorders that disrupted the intervention process, withdrawal of consent at any stage of the study, uncertainty regarding any of the inclusion criteria, incomplete questionnaire responses, and absence from more than two consecutive sessions.

### 2.2. Measures

The Repetitive Negative Thinking Scale developed by McEvoy et al. (2014) was used to assess repetitive negative thinking. This instrument consists of 10 items rated on a five-point Likert scale ranging from 1, indicating “completely false,” to 5, indicating “completely true.” The scale yields a total score, with higher scores indicating a more unfavorable condition and a greater level of repetitive negative thinking. The original developers confirmed its construct and concurrent validity and reported a Cronbach’s alpha reliability coefficient of 0.89. In Iran, Akbari (2017) confirmed the construct and concurrent validity of the scale, and its reliability was reported as 0.76 using Cronbach’s alpha.

The Beck Depression Inventory-II (1996) was used to assess depressive symptoms and screen participants for non-clinical depression. This questionnaire is one of the most widely used instruments for evaluating depressive states and includes 21 four-choice items scored from 0 to 3. The total score classifies depression severity as follows: 0 to 13 indicating no or minimal depression, 14 to 19 indicating mild depression, 20 to 28 indicating moderate depression, and 29 to 63 indicating severe depression. The developers confirmed the construct and content validity of the instrument and reported a Cronbach’s alpha coefficient of 0.88. In Iran, its validity has been confirmed in several studies, and its reliability has been reported as 0.84 using Cronbach’s alpha.

### 2.3. Intervention

The metacognitive therapy intervention was implemented for the first experimental group based on Wells’ model in eight 90-minute sessions. The intervention began with

introduction, pretest administration, familiarization with the metacognitive model, case formulation, identification and labeling of rumination episodes, enhancement of metacognitive awareness, and practice of the attention training technique. Subsequent sessions focused on reviewing homework, examining rumination duration, identifying negative metacognitive beliefs related to uncontrollability of rumination, introducing detached mindfulness, postponing rumination, identifying rumination triggers, challenging negative and positive metacognitive beliefs, reducing avoidant coping strategies, expanding adaptive activity levels, identifying and stopping maladaptive coping behaviors such as excessive sleep, challenging negative beliefs related to emotion and depression, designing a new processing plan, addressing fear of depressive relapse, strengthening attention training, completing the treatment plan, working on residual metacognitive beliefs, predicting possible triggers, planning the application of the new processing program, relapse prevention, summarizing the sessions, and administering the posttest.

The compassion-focused therapy intervention was implemented for the second experimental group based on Gilbert’s model in eight 90-minute sessions. The intervention began with establishing an initial therapeutic relationship, group formation, reviewing the structure of sessions, introducing the general principles of compassion-focused therapy, distinguishing compassion from self-pity, assessing emotional distress, explaining emotional suffering and its related factors, and conceptualizing self-compassion training. The following sessions included mindfulness training through body scanning and breathing exercises, familiarization with compassion-based brain systems, empathy training, recognition of the characteristics of compassionate individuals, cultivation of compassion toward others, development of warmth and kindness toward oneself, strengthening awareness of common humanity, reducing shame and self-destructive emotions, cultivating a

compassionate mind, forgiveness training, acceptance without judgment, tolerance training, compassionate imagery practice, teaching verbal, practical, situational, and continuous forms of compassion, applying compassion in daily life, writing compassionate letters to oneself and others, recording real-life compassion-based situations and personal responses, reviewing learned skills, summarizing therapeutic content, presenting strategies for maintaining and applying the therapeutic method in daily life, and administering the posttest.

*2.4. Data Analysis*

After obtaining organizational permissions from the university research administration, informed consent was obtained from all participants before the interventions began. Pretests were administered to both experimental groups and the control group before the sessions. The two intervention programs were then delivered only to the experimental groups, with two sessions held weekly, while the control group received no intervention. At the end of the intervention period, posttests were administered to all groups, and a three-month follow-up assessment was conducted to examine the stability of the intervention effects. Data were analyzed using mixed repeated-measures analysis of variance to evaluate within-group changes over time, between-group differences, and the interaction between time and group. Bonferroni and Tukey post hoc tests were used for pairwise comparisons. All statistical analyses were conducted using SPSS version 18.

**3. Findings and Results**

Before examining the inferential findings, the descriptive statistics of repetitive thinking were calculated for the metacognitive therapy, compassion-focused therapy, and control groups across the three measurement stages, including pretest, posttest, and follow-up

**Table 1**

*Descriptive statistics of repetitive thinking scores across groups and measurement stages*

| Dependent Variable  | Group                      | Pretest Mean | Pretest SD | Posttest Mean | Posttest SD | Follow-up Mean | Follow-up SD |
|---------------------|----------------------------|--------------|------------|---------------|-------------|----------------|--------------|
| Repetitive Thinking | Metacognitive Therapy      | 30.42        | 3.13       | 21.52         | 2.26        | 21.45          | 2.10         |
| Repetitive Thinking | Compassion-Focused Therapy | 30.54        | 3.18       | 25.48         | 2.35        | 25.39          | 2.22         |
| Repetitive Thinking | Control                    | 30.53        | 3.61       | 30.44         | 3.58        | 30.36          | 3.49         |

As shown in Table 1, the mean score of repetitive thinking in the metacognitive therapy group decreased from 30.42 at pretest to 21.52 at posttest and remained almost stable at 21.45 during the follow-up stage. In the compassion-focused therapy group, the mean score decreased from 30.54 at pretest to 25.48 at posttest and 25.39 at follow-up. In contrast, the control group showed almost no meaningful change, with mean scores of 30.53, 30.44, and 30.36 at pretest, posttest, and follow-up, respectively. These descriptive findings suggest that both interventions reduced repetitive thinking, although the reduction was greater in the metacognitive therapy group than in the compassion-focused therapy group, and the therapeutic effects were maintained at follow-up.

Before conducting the repeated-measures analysis of variance, the statistical assumptions were examined. The results of the Shapiro–Wilk test for repetitive thinking scores at the pretest, posttest, and follow-up stages were not statistically significant, indicating that the distribution of scores did not significantly deviate from normality. In addition, the results of Levene’s test showed that the assumption of homogeneity of variances across groups was met. Mauchly’s test of sphericity also indicated that the assumption of sphericity was not violated. Therefore, the required assumptions for conducting mixed repeated-measures analysis of variance were confirmed.

**Table 2**

*Summary of mixed repeated-measures analysis of variance for repetitive thinking*

| Variable            | Source of Variation      | Sum of Squares | df | Mean Square | F      | p    | Effect Size | Power |
|---------------------|--------------------------|----------------|----|-------------|--------|------|-------------|-------|
| Repetitive Thinking | Group                    | 807.248        | 2  | 403.624     | 25.519 | 0.01 | 0.549       | 1.000 |
| Repetitive Thinking | Treatment Stages         | 510.357        | 1  | 510.357     | 50.583 | 0.01 | 0.546       | 1.000 |
| Repetitive Thinking | Group × Treatment Stages | 292.259        | 2  | 146.130     | 14.483 | 0.01 | 0.408       | 0.998 |

As presented in Table 2, the results of the mixed repeated-measures analysis of variance showed that the main effect of group was statistically significant for repetitive thinking,  $F=25.519$ ,  $p=0.01$ , with an effect size of 0.549 and statistical power of 1.000. The main effect of treatment stages was also significant,  $F=50.583$ ,  $p=0.01$ , with an effect size of 0.546 and statistical power of 1.000. Moreover, the interaction

effect between group and treatment stages was significant,  $F=14.483$ ,  $p=0.01$ , with an effect size of 0.408 and statistical power of 0.998. These findings indicate that repetitive thinking scores changed significantly across the measurement stages and that the pattern of change differed significantly between the metacognitive therapy, compassion-focused therapy, and control groups.

**Table 3**

*Summary of post-hoc comparisons for repetitive thinking*

| Post-hoc Test | Variable            | Comparison                                       | Mean Difference | Standard Error | p     |
|---------------|---------------------|--|-----------------|----------------|-------|
| Bonferroni    | Repetitive Thinking | Pretest–Posttest                                 | 4.684           | 0.666          | 0.001 |
| Bonferroni    | Repetitive Thinking | Pretest–Follow-up                                | 4.763           | 0.670          | 0.001 |
| Bonferroni    | Repetitive Thinking | Posttest–Follow-up                               | 0.078           | 0.035          | 0.086 |
| Tukey         | Repetitive Thinking | Compassion-Focused Therapy–Metacognitive Therapy | 2.675           | 0.838          | 0.01  |

As shown in Table 3, the Bonferroni post-hoc test indicated that the difference in repetitive thinking scores between pretest and posttest was statistically significant, with a mean difference of 4.684 and  $p=0.001$ . The difference between pretest and follow-up was also significant, with a mean difference of 4.763 and  $p=0.001$ . However, the difference between posttest and follow-up was not statistically significant, with a mean difference of 0.078 and  $p=0.086$ , indicating that the reduction in repetitive thinking

remained stable during the follow-up period. In addition, the Tukey post-hoc comparison between the two experimental groups showed a significant difference between compassion-focused therapy and metacognitive therapy, with a mean difference of 2.675, standard error of 0.838, and  $p=0.01$ . This finding indicates that metacognitive therapy was significantly more effective than compassion-focused therapy in reducing repetitive thinking among female students with non-clinical depression.

#### 4. Discussion

The present study aimed to compare the effectiveness of Metacognitive Therapy (MCT) and Compassion-Focused Therapy (CFT) on repetitive thinking among female university students with non-clinical depression. The findings demonstrated that both interventions significantly reduced repetitive thinking compared with the control group. The results of the mixed repeated-measures analysis of variance indicated significant effects for treatment group, treatment stage, and the interaction between group and treatment stage. Furthermore, post-hoc analyses revealed that reductions in repetitive thinking observed at posttest were maintained during the three-month follow-up period. Most importantly, the comparison between the two intervention groups showed that metacognitive therapy produced significantly greater reductions in repetitive thinking than compassion-focused therapy. These findings suggest that while both approaches are beneficial for addressing maladaptive cognitive processes associated with non-clinical depression, metacognitive therapy may be particularly effective in targeting the mechanisms responsible for the maintenance of repetitive thinking.

The finding that both interventions significantly reduced repetitive thinking is consistent with a growing body of literature demonstrating that cognitive and emotion-focused therapeutic approaches can alleviate maladaptive repetitive thought processes. Repetitive negative thinking has been identified as a transdiagnostic process that contributes to the persistence of depression, anxiety, and other forms of psychological distress (Forthman et al., 2023; Zagaria et al., 2023). Because repetitive thinking operates as a maintaining factor across multiple disorders, interventions that either directly modify dysfunctional thinking processes or indirectly enhance emotional regulation capacities are expected to produce therapeutic benefits. The significant reductions observed in both treatment groups support this theoretical assumption and suggest that repetitive thinking is amenable to change through psychological intervention even among individuals experiencing non-clinical levels of depressive symptoms.

The effectiveness of metacognitive therapy observed in the present study aligns closely with the theoretical foundations proposed by Wells. According to the metacognitive model, psychological distress is maintained not by the content of thoughts themselves but by dysfunctional beliefs about thinking and the activation of the Cognitive Attentional Syndrome, which includes

rumination, worry, threat monitoring, and ineffective coping strategies (Wells, 2011). Female students with non-clinical depression often engage in repetitive thinking because they believe that analyzing their problems repeatedly will help them understand or solve them. However, metacognitive therapy challenges these beliefs and teaches individuals to disengage from prolonged cognitive processing. By reducing the tendency to monitor, evaluate, and react to negative thoughts, the intervention weakens the processes that sustain repetitive thinking. The significant decline in repetitive thinking scores following metacognitive therapy therefore supports the central assumptions of the metacognitive model.

The current findings are consistent with previous empirical studies reporting the effectiveness of metacognitive therapy across various psychological conditions. McEvoy and colleagues demonstrated that group-based metacognitive therapy significantly reduced repetitive negative thinking among individuals with generalized anxiety disorder (McEvoy et al., 2015). Similarly, Strand and colleagues found substantial improvements among patients with major depressive disorder who received generic group metacognitive therapy (Strand et al., 2023). Evidence from randomized controlled trials has also shown that metacognitive therapy is effective in reducing symptoms of depression and anxiety among patients with cardiovascular disease (Wells et al., 2021; Wells et al., 2023). Furthermore, metacognitive interventions have demonstrated effectiveness in obsessive-compulsive disorder, alcohol use disorder, and emotional disorders among children and adolescents (Kroener et al., 2024; Melchior et al., 2023; Thingbak et al., 2024). The convergence of findings across different populations supports the robustness of metacognitive therapy as a treatment approach and strengthens confidence in the present results.

Another explanation for the effectiveness of metacognitive therapy involves its influence on attentional control and self-regulation. Research suggests that repetitive thinking is associated with disruptions in executive functioning, attentional flexibility, and neural mechanisms involved in cognitive control (Ren et al., 2025; van Oort et al., 2022). Metacognitive therapy specifically trains individuals to develop detached mindfulness and flexible attention allocation, enabling them to observe thoughts without becoming immersed in them. As attentional control improves, individuals become less likely to engage in prolonged rumination and more capable of redirecting

cognitive resources toward adaptive activities. Such mechanisms may explain why participants in the metacognitive therapy group exhibited substantial and sustained reductions in repetitive thinking.

The findings also indicated that compassion-focused therapy significantly reduced repetitive thinking. This result is theoretically meaningful because repetitive negative thinking is often accompanied by self-criticism, shame, self-blame, and emotional avoidance. Compassion-focused therapy seeks to cultivate warmth, kindness, acceptance, and emotional safeness, thereby reducing the emotional conditions that promote repetitive thinking (Bell et al., 2021; Gilbert et al., 2024). When individuals develop a more compassionate relationship with themselves, they become less inclined to engage in harsh self-evaluation and repetitive self-focused rumination. Consequently, emotional distress decreases, and the intensity of repetitive thinking may be reduced.

The effectiveness of compassion-focused therapy found in this study is consistent with previous research. Frostadottir and Dorjee reported that compassion-focused therapy reduced rumination and psychological symptoms among individuals experiencing depression, anxiety, and stress (Frostadottir & Dorjee, 2019). Alijani and Ranjbar Kohan found that compassion-focused therapy significantly improved dysfunctional attitudes and negative automatic thoughts among patients with major depression (Alijani & Ranjbar Kohan, 2022). Similarly, Asano and colleagues observed positive therapeutic outcomes among individuals with treatment-resistant depression who participated in group compassion-focused therapy (Asano et al., 2022). Other investigations have reported improvements in emotional functioning, self-compassion, and psychological well-being among diverse populations receiving compassion-based interventions (Beaumont et al., 2021; Carter et al., 2021; Fox et al., 2021; Goad & Parker, 2021). Collectively, these findings support the conclusion that compassion-focused therapy is an effective intervention for reducing cognitive and emotional vulnerabilities associated with depression.

Although both interventions were effective, metacognitive therapy produced significantly greater reductions in repetitive thinking than compassion-focused therapy. This finding may be explained by differences in the primary therapeutic targets of the two approaches. Metacognitive therapy directly addresses repetitive thinking as its central mechanism of change. It teaches participants to identify maladaptive metacognitive beliefs, challenge

assumptions about the usefulness of rumination, and disengage from repetitive cognitive processing. In contrast, compassion-focused therapy targets broader emotional regulation systems and promotes self-compassion, acceptance, and emotional soothing. While these changes may indirectly reduce repetitive thinking, they do not necessarily target the cognitive process itself with the same degree of specificity (Gilbert et al., 2024; Wells, 2011).

The superiority of metacognitive therapy may also reflect the particular characteristics of non-clinical depression. Individuals experiencing non-clinical depression frequently remain cognitively active and highly engaged with their internal thought processes. They often attempt to understand or control their emotional experiences through excessive rumination. Because metacognitive therapy directly challenges these cognitive strategies, it may produce more immediate reductions in repetitive thinking than interventions focused primarily on emotional regulation. Previous research has shown that maladaptive metacognitive beliefs play a critical role in maintaining psychological distress across disorders (Batmaz et al., 2021; Brown et al., 2022; Solem et al., 2021). Therefore, directly modifying these beliefs may yield stronger effects on repetitive thinking than indirectly influencing them through enhanced self-compassion.

Another possible explanation relates to the mechanisms underlying repetitive negative thinking. Contemporary evidence suggests that repetitive thinking is associated with maladaptive reinforcement processes, attentional biases, interpretation biases, and heightened sensitivity to stress (Bar-Sella et al., 2022; Bedder et al., 2024; Inostroza et al., 2024). Metacognitive therapy explicitly targets these maintaining mechanisms by encouraging attentional flexibility and reducing engagement with repetitive thoughts. Compassion-focused therapy may alleviate the emotional consequences of repetitive thinking but may not interrupt the cognitive cycle as directly. Consequently, individuals receiving metacognitive therapy may experience greater reductions because the intervention directly disrupts the processes responsible for maintaining rumination.

The maintenance of treatment gains during follow-up is another important finding. The absence of significant differences between posttest and follow-up assessments suggests that participants retained the skills acquired during treatment and continued applying them after the intervention ended. This stability is particularly encouraging because repetitive thinking is often considered a chronic and self-perpetuating cognitive habit. The durability of treatment

effects observed in the present study is consistent with previous investigations demonstrating long-term benefits of metacognitive therapy and compassion-focused therapy (Matos et al., 2023; Solem et al., 2021). The maintenance of gains indicates that both interventions may produce lasting changes in cognitive and emotional functioning rather than temporary symptom reduction.

The present findings also contribute to the literature on non-clinical depression. Previous studies have highlighted the importance of identifying and treating subthreshold depressive symptoms before they progress into more severe clinical conditions (Lim & Park, 2024; O'Toole et al., 2022; Yasin et al., 2023). Because repetitive thinking is a known risk factor for the development and recurrence of depressive disorders, reducing this process among individuals with non-clinical depression may have preventive value. The current results suggest that psychological interventions targeting repetitive thinking can be effectively implemented within university populations and may help reduce vulnerability to future emotional disorders.

## 5. Conclusion

Overall, the findings indicate that both metacognitive therapy and compassion-focused therapy are effective interventions for reducing repetitive thinking among female university students with non-clinical depression. However, metacognitive therapy appears to offer greater benefits, likely because it directly targets the cognitive mechanisms responsible for maintaining repetitive thinking. These results support theoretical models emphasizing the role of metacognitive processes in psychological distress and provide further evidence for the clinical utility of metacognitive interventions within preventive mental health contexts.

## 6. Limitations & Suggestions

Several limitations should be considered when interpreting the findings of this study. First, the sample consisted exclusively of female university students with non-clinical depression, which may limit the generalizability of the results to males, older adults, clinical populations, or individuals from different cultural backgrounds. Second, the relatively small sample size reduced the ability to examine potential moderating variables such as age, academic major, socioeconomic status, or severity of depressive symptoms. Third, all data were collected through self-report measures, making the results vulnerable to social desirability bias,

response style effects, and subjective interpretation of questionnaire items. Fourth, the follow-up period was limited to three months, preventing conclusions regarding the long-term durability of treatment effects. Finally, the study did not directly assess potential mediators of change, such as metacognitive beliefs, self-compassion, attentional control, or emotional regulation processes.

Future studies should examine the comparative effectiveness of metacognitive therapy and compassion-focused therapy using larger and more diverse samples, including male students, clinical populations, and participants from different cultural settings. Researchers may also investigate longer follow-up periods to determine whether treatment gains remain stable over time. Additional studies could explore the mechanisms through which these interventions reduce repetitive thinking by assessing changes in metacognitive beliefs, self-compassion, attentional flexibility, emotional regulation, and cognitive control. Comparative research involving other evidence-based interventions, such as mindfulness-based cognitive therapy and cognitive-behavioral therapy, would further clarify the relative strengths of different treatment approaches. Finally, mixed-method and qualitative studies may provide valuable insights into participants' experiences of therapeutic change and the factors that facilitate successful outcomes.

Mental health professionals working in university counseling centers should consider incorporating interventions specifically designed to reduce repetitive thinking among students experiencing depressive symptoms. Metacognitive therapy may be particularly useful when repetitive thinking and rumination constitute primary maintaining factors of emotional distress. Compassion-focused therapy can also be valuable for students who experience elevated self-criticism, shame, and difficulties with self-acceptance. University mental health programs may benefit from offering group-based interventions that teach cognitive and emotional self-regulation skills before depressive symptoms reach clinical levels. Integrating preventive psychological services within higher education settings may contribute to improved academic functioning, emotional well-being, and overall quality of life among students.

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## Declaration of Interest

The authors of this article declared no conflict of interest.

## Ethical Considerations

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

## Transparency of Data

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

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## Authors' Contributions

All authors equally contributed to this article.

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