






Comparison of the Effectiveness of Cognitive Emotion Regulation Training and Metacognitive Therapy on Guilt and Depression in Mothers Experiencing Miscarriage

Zeinab. Bandani¹, Maryam Sadat. Mirazim^{2*}, Zahra. Khoshbakht³, Malihe. Nosratabadi⁴, Hoda. Zamani rad⁵, Farshad. Samadi^{6*}

¹ Master's degree in Educational Psychology, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran

² Master's degree in General Psychology, Varamin Pishva Branch, Islamic Azad University, Varamin Pishva, Iran

³ Master of Educational Sciences majoring in educational management, Shiraz University, Shiraz, Iran

⁴ Master of Clinical Psychology, Shiraz University, Shiraz, Iran

⁵ Master of Family Counseling, Khatam University, Tehran, Iran

⁶ PhD in Health Psychology, Roudehen Branch, Islamic Azad University, Roudehen, Iran

* Corresponding author email address: farshadsamdi.com@gmail.com

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ABSTRACT

Objective: Pregnancy loss has significant psychological effects on parents and some relatives, including feelings of guilt and depression, anxiety, sleep disorders, and more. Therefore, the aim of this study was to compare the effectiveness of cognitive emotion regulation training and metacognitive therapy on guilt and depression in mothers experiencing miscarriage.

Methods and Materials: This study is applied in nature and employs a quasi-experimental design with pre-test and post-test control groups. The statistical population included pregnant women in Tehran who experienced either voluntary or involuntary miscarriage, whether intentional or unintentional. A total of 60 women were selected through purposive sampling and divided into two groups: cognitive emotion regulation training (15 participants in the experimental group, 15 in the control group) and metacognitive therapy (15 participants in the experimental group, 15 in the control group). The data collection tools included the Granefski Cognitive Emotion Regulation Questionnaire, the Kugler Guilt Questionnaire, and the Beck Depression Inventory. Data analysis was performed using SPSS-24 software and multivariate analysis of covariance (MANCOVA).

Findings: The results indicated that cognitive emotion regulation training and metacognitive therapy had a significant impact on reducing guilt and depression in mothers who experienced miscarriage.

Conclusion: Based on the results of this study, it is recommended that policymakers and mental health practitioners design operational policies to enhance the mental health of mothers experiencing miscarriage.

Keywords: Cognitive Emotion Regulation Training, Metacognitive Therapy, Guilt, Depression.

1. Introduction

Miscarriage is a common medical procedure, with an estimated 1 in 4 women in the United States experiencing it (Bottomley & Bourne, 2009; Castellini et al., 2019). According to the World Health Organization, approximately 210 million women become pregnant worldwide each year, and 22% resort to abortion. Based on a population study in Iran in 2000, about 26.7% of women had undergone intentional and illegal abortions (Okoth et al., 2020; Tavoli et al., 2018). Miscarriage can be categorized into three major types: spontaneous miscarriage, illegal abortion, and therapeutic abortion. Recent evidence suggests that more than half of women experience various psychological complications in the weeks and years following a miscarriage. Ten percent of women exhibit high levels of anxiety up to six months post-miscarriage and are at a higher risk for post-traumatic stress disorder and obsessive-compulsive disorder. Within 12 weeks after a miscarriage, anxiety is more common and severe than depression. Generalized anxiety is a pervasive, unpleasant, and vague feeling often accompanied by autonomic symptoms such as headaches, sweating, palpitations, chest tightness, and mild stomach discomfort (Bailey et al., 2015; Bellhouse et al., 2018; Bottomley & Bourne, 2009; Huffman et al., 2015). For many women, miscarriage is a stressful event that involves psychological distress both before and after the procedure (Hiefner, 2021).

One of the psychological damages observable and prevalent among women who have experienced miscarriage is guilt. Guilt and shame are often considered synonymous but are fundamentally different. Researchers do not agree on the basis of this difference. Currently, there are two models concerning the difference between guilt and shame: the self-behavior distinction model and the public-private distinction model (Huffman et al., 2015; Iwanowicz-Palus et al., 2020). Personal and private mistakes can trigger guilt, while public failures are likely to evoke shame (Arian et al., 2021; Ollivier et al., 2022). Empirical evidence assessing the behavioral tendencies of individuals experiencing guilt or shame suggests that guilt promotes constructive and innovative activities, whereas shame leads to defensiveness, interpersonal avoidance, and relational coldness. Research indicates that shame is associated with denial, concealment, or fleeing from the situation causing shame, while guilt corresponds with compensatory behaviors such as confession, apology, and undoing the consequences (Glad et

al., 2024; Levinson et al., 2016; Ollivier et al., 2022; Pourjaberi et al., 2023; Vermetten et al., 2023).

Another psychological harm among women who have experienced miscarriage is depression, with an estimated prevalence of 53.5% post-miscarriage (Campillo et al., 2017; deMontigny et al., 2017; Sugiura-Ogasawara et al., 2013). About 20% of women exhibit major or minor depressive symptoms within three months postpartum according to review studies. Depression, a common illness worldwide, differs from normal mood fluctuations and short-term emotional responses to life's challenges (Sugiura-Ogasawara et al., 2013). It encompasses a wide range of clinical symptoms characterized by feelings of sadness, emptiness, or irritability, along with physical and cognitive changes that significantly impair an individual's ability to function (American Psychiatric Association, 2022). Depression imposes substantial individual, social, and economic costs on individuals and society. Depressed individuals often find concentration and attention to be a formidable task, struggle to understand what they read or hear from others, and prefer to sit alone. When faced with a problem, they lack strategies for problem-solving, neglect personal hygiene, have multiple somatic complaints without a physical origin, and generally feel worried and sorrowful most of the time (Kashani Vahid et al., 2024).

Psychotherapeutic interventions can effectively reduce and improve the common psychological harms in women who have experienced miscarriage. One such intervention is cognitive emotion regulation training, which has been shown to reduce psychological harms in women who have had miscarriages. Emotion regulation refers to how an individual processes challenges, distressing events, and stressful life incidents. Research findings indicate that emotion regulation is associated with success or failure in various life domains (Abedi Shargh et al., 2017; Ghasemi et al., 2019; Saeedi et al., 2012; Zeman et al., 2006). Findings suggest that emotion regulation is one of the most influential variables on health levels (Ajele et al., 2021; Aldao & Nolen-Hoeksema, 2010; Aldao et al., 2010; Bagheri Sheykhgafshe et al., 2022).

Metacognition is one of the effective approaches to emotion regulation. Metacognition involves any knowledge or cognitive activity that focuses on or regulates emotion. In other words, metacognition can be defined as any knowledge or cognitive process that includes evaluating, monitoring, or controlling cognition. Therefore, it is a multifaceted concept that includes knowledge, beliefs, processes, and strategies that control or evaluate cognition (Batmaz et al., 2014). A

metacognitive approach provides strategies for individuals to free themselves from mechanisms that cause difficulties in emotion regulation and offers flexible emotional processing training to guide future thinking and behavior in the face of threat and harm. Additionally, metacognitive knowledge plays a crucial role in controlling anxiety sensitivity, with metacognitive strategies diminishing worry, stress, threat, and maladaptive self-control (Capobianco et al., 2020; Davoodi et al., 2023; Hagen et al., 2017; Holdhus, 2021; Spada et al., 2008; Wells, 2009; Wells et al., 2023).

The rationale for selecting these two protocols or training methods—cognitive emotion regulation training and metacognitive training—is that both are necessary to reduce the negative psychological factors affecting women who have experienced miscarriage. Although separate studies have explored the relationship between each method and the variables, no study has simultaneously compared the two methods in a single research. However, existing studies have examined the relationship between these variables and miscarriage individually, showing that both cognitive emotion regulation training and metacognitive training are effective in reducing guilt and depression in women who have had miscarriages. Therefore, the primary research question is how effective cognitive emotion regulation training and metacognitive training are in reducing guilt and depression in women who have experienced miscarriage.

2. Methods and Materials

2.1. Study design and Participant

This study is applied in nature and employs a quasi-experimental design with pre-test and post-test control groups. The statistical population included pregnant women in Tehran who experienced either voluntary or involuntary miscarriage, whether intentional or unintentional. A total of 60 women were selected through purposive sampling and divided into two groups: cognitive emotion regulation training (15 participants in the experimental group, 15 in the control group) and metacognitive therapy (15 participants in the experimental group, 15 in the control group).

Inclusion criteria for the study population were:

- Being a woman
- Age between 18 and 40 years
- Having a history of miscarriage

Exclusion criteria included:

- Absence from more than three sessions
- Failure to complete session assignments

- Lack of cooperation and willingness to continue the educational sessions

2.2. Measures

2.2.1. Guilt

Guilt Questionnaire: To assess guilt, we used the Kugler and Jones Guilt Questionnaire, developed and refined between 1988 and 1992, which includes 45 items and 2 subscales. In Iran, the content and face validity of the questionnaire were confirmed by Naziri (1995), with reliability scores for the subscales of moral standard (81%), guilt trait (72%), and guilt state (56%) obtained through test-retest over a ten-week interval (Arian et al., 2021).

2.2.2. Depression

The Beck Depression Inventory, designed and validated by Beck in 1961, measures the severity of depression for diagnosing depressive disorders in adults. The inventory comprises 21 questions, with responses scored from 0 to 3 based on the severity of depression: mild depression (11-16), borderline clinical depression (17-20), moderate depression (21-30), severe depression (31-40), and extreme depression (41-63). Beck and colleagues reported a one-week test-retest reliability coefficient of 0.93. In Iran, Rajabi confirmed the inventory's reliability with a Cronbach's alpha coefficient of 0.87 for the entire questionnaire and a split-half reliability coefficient of 0.83. Taheri Tanjani et al. (2014) assessed the content, face, and criterion validity of the questionnaire, reporting a Cronbach's alpha coefficient of 0.93, split-half reliability of 0.64, and test-retest reliability of 0.81. Rajabi et al.'s study indicated the Beck Depression Inventory's validity in the Iranian population with a Cronbach's alpha coefficient of 0.87 and a split-half reliability coefficient of 0.83 (Karimi Dastaki & Mahmudi, 2024; Kashani Vahid et al., 2024).

2.3. Intervention

2.3.1. Metacognitive Training

This educational intervention, based on Wells' metacognitive therapy model, targeting cognitive deficits (2023), was delivered in eight 90-minute sessions over eight weeks as outlined below (Wells et al., 2023):

Session 1: Introduction and Problem Formulation

The first session outlines the rules and goals of the group sessions. It includes problem formulation based on

metacognitive concepts, defining attention and its dimensions, and using attention training techniques.

Session 2: Detached Mindfulness and Suppression-Non-Suppression Experiment

Participants are introduced to the technique of detached mindfulness and engage in an experiment to understand the effects of suppression versus non-suppression of thoughts.

Session 3: Delayed Focused Attention

This session teaches the technique of delaying focused attention on uncontrollable beliefs, helping participants to gain control over intrusive thoughts.

Session 4: Attention Focusing on Safety Cues

Participants learn to focus their attention on safety cues, which helps in reducing anxiety and increasing a sense of security.

Session 5: Exposure and Response Prevention

The fifth session involves using exposure techniques and response prevention, focusing on beliefs about reassurance and reducing reliance on safety behaviors.

Session 6: Modifying Threat Monitoring

This session teaches techniques to change threat monitoring behaviors, emphasizing self-awareness and altering maladaptive vigilance.

Session 7: Verbal and Behavioral Attribution

Participants use techniques for verbal and behavioral reattribution, focusing on beliefs about danger and reducing catastrophic thinking.

Session 8: Reviewing Contradictory Evidence

The final session involves reviewing evidence that contradicts maladaptive beliefs and preparing participants to overcome obstacles in applying the learned techniques. Participants reflect on their progress and discuss strategies for maintaining their metacognitive skills.

2.3.2. Emotion Regulation Training

The Gross model of emotion regulation training aims to provide participants with the skills to understand, manage, and regulate their emotions effectively. This intervention consists of eight sessions, each designed to build on the previous one to gradually enhance participants' emotional awareness, self-evaluation, and application of emotion regulation strategies in real-life situations (Beyrami et al., 2014; Kazemi Rezaei et al., 2023; Mosayebi et al., 2023; Salehi & Kazemi rezaei, 2023; Sobhi et al., 2015; Wisman et al., 2023).

Session 1: Introduction

The first session focuses on familiarizing group members with each other and establishing a mutual relationship between the group leader and participants. The session includes discussing the main and secondary objectives of the group, setting personal and collective goals, explaining the rationale and stages of the intervention, and outlining the framework and rules for group participation.

Session 2: General Understanding of Emotion

This session aims to educate participants about emotions and triggering situations. It includes teaching the differences in the functioning of various emotions, providing information about the different dimensions of emotions, and discussing the short-term and long-term effects of emotions.

Session 3: Self-Evaluation

In this session, participants engage in self-evaluation exercises to understand their emotional experiences, identify their emotional vulnerability, and recognize their current emotion regulation strategies. This self-assessment helps in tailoring subsequent sessions to individual needs.

Session 4: Skill Training

The fourth session focuses on teaching skills to prevent social isolation and avoidance. It includes problem-solving strategies and interpersonal skills training, such as communication, assertiveness, and conflict resolution.

Session 5: Thought Stopping

Participants learn techniques to stop rumination and worry. The session also includes attention training to help participants redirect their focus away from negative thoughts and towards more constructive activities.

Session 6: Identifying Faulty Self-Evaluation

This session involves identifying incorrect self-evaluations and their effects on emotional states. Participants learn re-evaluation strategies to modify these faulty assessments, leading to healthier emotional responses.

Session 7: Application of Skills

Participants explore the use of inhibition strategies and examine their emotional consequences. The session includes exposure exercises, training in emotional expression, behavioral modification through environmental reinforcement changes, emotional discharge techniques, relaxation, and reverse action.

Session 8: Evaluation

The final session evaluates the achievement of individual and group goals, discusses the application of learned skills in natural environments outside the sessions, and addresses barriers to completing assignments. Participants reflect on their progress and plan for future maintenance of skills.

2.4. Data Analysis

SPSS-24 software was used for data analysis. Findings are presented in two sections: descriptive and inferential. The descriptive section describes demographic and population variables, while the inferential section addresses hypothesis testing using covariance analysis.

3. Findings and Results

Table 1

Descriptive Statistics Results (Mean and SD)

Variables	Time	Experimental Group 1	Experimental Group 2	Control Group
Guilt	Pre-test	100.70 (18.27)	96.55 (15.79)	103.85 (16.95)
	Post-test	90.85 (15.75)	87.75 (14.48)	101.55 (15.40)
Depression	Pre-test	101.55 (14.94)	99.45 (14.49)	96.90 (18.50)
	Post-test	94.50 (14.73)	86.60 (12.61)	95.80 (17.99)

Based on the results in [Table 1](#), for the respondents in experimental group 1, the mean scores for the variables "guilt" and "depression" in the pre-test phase were 100.70 and 101.55, respectively, and in the post-test phase, they were 90.85 and 94.50, respectively. For the respondents in experimental group 2, the mean scores for these variables in the pre-test phase were 96.55 and 99.45, respectively, and in the post-test phase, they were 87.75 and 86.60, respectively.

The statistical indices used in this research include frequency, mean, and standard deviation. The results of the descriptive statistics of the research variables, categorized by experimental group 1 (the group that received cognitive emotion regulation training), experimental group 2 (the group that received metacognitive therapy), and the control group, are presented in [Table 1](#).

Finally, for the control group respondents, the mean scores for the variables "guilt" and "depression" in the pre-test phase were 103.85 and 96.90, respectively, and in the post-test phase, they were 101.55 and 95.80, respectively.

all research variables in the experimental groups 1, 2, and the control group are normal in both the pre-test and post-test phases, as the Sig values for all of them are greater than 0.50.

Table 2

Results of Two-Way Repeated Measures ANCOVA for Cognitive Emotion Regulation Training and Metacognitive Therapy on Guilt and Depression

Variables	Statistical Index	Values	F	d.f (between)	d.f (within)	Sig
Time	Depression	0.056	12.566	6	33	0.000
	Guilt	0.034	12.566	6	33	0.000
Time*Group	Depression	0.363	15.121	6	33	0.000
	Guilt	0.661	15.121	6	33	0.000

According to [Table 2](#), the significance levels for all tests presented are less than the significance level of $\alpha = 0.05$. Thus, the use of two-way repeated measures ANCOVA for guilt and depression in the different groups is justified. The

effects of the time period (pre-test, post-test, follow-up) and the combined impact of the group (control and experimental) and emotion regulation training, and metacognitive training, are significant.

Table 3

Comparison Results of Emotion Regulation Training and Metacognitive Training on Depression and Guilt

Variables	T	d.f	Sig (p)
Depression	-1.241	38	0.092
Guilt	1.092	38	0.091

The results in [Table 3](#) show that the significance level for comparing the effect of emotion regulation training and metacognitive training on depression is 0.112, which is greater than 0.05. Therefore, there is no significant difference in their impact. Similarly, the significance level for comparing the effect of emotion regulation training and metacognitive training on guilt is 0.319, which is also greater than 0.05, indicating no significant difference in their impact.

4. Discussion and Conclusion

The aim of this research was to compare the effectiveness of cognitive emotion regulation training and metacognitive therapy on guilt and depression in mothers who have experienced miscarriage. The results indicated that both cognitive emotion regulation training and metacognitive therapy had a significant impact on reducing guilt and depression in these mothers. Therefore, these findings align with prior studies ([Abedi Shargh et al., 2017](#); [Ajele et al., 2021](#); [Aldao & Nolen-Hoeksema, 2010](#); [Aldao et al., 2010](#); [Bagheri Sheykhgafshe et al., 2022](#); [Beyrami et al., 2014](#); [Ghasemi et al., 2019](#); [Hagen et al., 2017](#); [Holdhus, 2021](#); [Kashani Vahid et al., 2024](#); [Kazemi Rezaei et al., 2023](#); [Mosayebi et al., 2023](#); [Pourjaberi et al., 2023](#); [Saeedi et al., 2012](#); [Salehi & Kazemi rezaei, 2023](#); [Sobhi et al., 2015](#); [Wells, 2009](#); [Wells et al., 2023](#); [Wisman et al., 2023](#); [Zeman et al., 2006](#)). Cognitive emotion regulation styles and the level of metacognition are both influenced by the conditions resulting from life adversities, as seen in studies on farmers affected by livestock diseases, indicating a direct relationship between cognitive emotion regulation styles of self-blame, other-blame, rumination, and planning with psychological distress. Additionally, cognitive emotion regulation styles of positive refocusing and positive reappraisal, and metacognition have an inverse relationship with psychological distress ([Capobianco et al., 2020](#)). Studies have shown that enhancing perceived social support reduces the mortality rate of patients and decreases the incidence of physical and psychological illnesses. Individuals with high levels of social support are at a lower risk for developing heart disease. There is a clear relationship between reduced social support and poor prognosis in patients with heart disease. Emotion regulation also plays a crucial role in adapting to stressful life events. Research shows that individuals' capacity to effectively regulate their emotions affects psychological, physical, and interpersonal well-being ([Aldao et al., 2010](#); [Kazemi Rezaei](#)

[et al., 2023](#); [Wisman et al., 2023](#)). Group therapy is believed to be effective in most psychological disorders because it allows individuals to see how they interact with society, fostering insight and new experiences in establishing connections with others, increasing their confidence ([Capobianco et al., 2020](#)). Women who frequently experience self-directed shame are more vulnerable to a range of psychological issues, correlating shame with numerous psychological symptoms, including low self-esteem, depression, anxiety, eating disorders, post-traumatic stress disorder, and suicidal ideation ([Bellhouse et al., 2018](#); [Iwanowicz-Palus et al., 2020](#)).

5. Limitations and Suggestions

Despite the significant findings, this study has several limitations. First, the sample size was relatively small, which may limit the generalizability of the results. Second, the study was conducted in a single city, Tehran, which might not represent the broader population of women who have experienced miscarriage. Third, the reliance on self-reported measures for guilt and depression could introduce bias, as participants may have underreported or overreported their symptoms. Finally, the study did not account for potential confounding variables such as previous mental health conditions, the support system, or the number of miscarriages experienced, which could have influenced the outcomes.

Future research should address these limitations by including a larger, more diverse sample to enhance the generalizability of the findings. It would also be beneficial to conduct longitudinal studies to assess the long-term effects of cognitive emotion regulation training and metacognitive therapy on guilt and depression. Additionally, future studies should consider incorporating objective measures of mental health and controlling for potential confounding variables. Research could also explore the mechanisms through which these interventions exert their effects, providing deeper insights into how cognitive and metacognitive strategies help alleviate psychological distress in women who have experienced miscarriage.

The findings of this study suggest that both cognitive emotion regulation training and metacognitive therapy are effective in reducing guilt and depression in mothers who have experienced miscarriage. Practitioners in the field of mental health should consider integrating these therapeutic approaches into their treatment plans for this population. It is essential to provide training for mental health

professionals on these interventions to ensure they can effectively deliver them. Additionally, healthcare providers should screen for guilt and depression in women who have experienced miscarriage and refer them to appropriate psychological services. Implementing these interventions in clinical settings could significantly improve the mental health and well-being of women dealing with the aftermath of miscarriage.

Authors' Contributions

Authors contributed equally to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

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

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