




Effectiveness of Mindfulness-Based Cognitive Therapy (MBCT) on the Psychological Well-Being of Infertile Women

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ABSTRACT

Objective: The present study aimed to investigate the effectiveness of Mindfulness-Based Cognitive Therapy (MBCT) on the psychological well-being of infertile women.

Methods and Materials: This study employed a quasi-experimental design with a pre-test and post-test control group. The experimental group received MBCT, while the control group received no treatment. A follow-up test was conducted two months later. The control group, which was on a waiting list, received MBCT after the completion of the follow-up test. The statistical population included all infertile women aged 22 to 45 years who visited two private infertility centers in Sari in the first six months of 2023 and had a medical file. Thirty patients who were willing to cooperate were selected through non-random purposive sampling. They were then randomly assigned to the experimental group (MBCT) and the control group. Data were collected using the 84-item Ryff Scales of Psychological Well-Being (RSPWB) (Ryff, 1980). The experimental group underwent eight 90-minute weekly group MBCT sessions. Data analysis was conducted using statistical tests with SPSS software, version 22.

Findings: The results indicated that MBCT was effective in improving the psychological well-being of infertile women ($P = 0.001$). The results also showed that the effect of the therapy was lasting during the follow-up period.

Conclusion: The study concluded that mindfulness-based cognitive therapy (MBCT) significantly enhances psychological well-being in infertile women. The intervention not only improved overall well-being but also showed lasting effects during the follow-up period. These findings support the implementation of MBCT as a valuable therapeutic approach for addressing the psychological challenges associated with infertility.

Keywords: Mindfulness-Based Cognitive Therapy, Psychological Well-Being, Infertility, Women.

1. Introduction

Infertility, defined as the failure to conceive after one year of regular, unprotected sexual intercourse (Tan et al., 2008), is described as one of the most distressing life experiences, comparable to the death of a first-degree relative, eliciting a grief reaction (Renzi et al., 2020; Tan et al., 2008). Infertility is associated with a wide range of psychological damages, including temporary or chronic despair, decreased self-esteem, increased levels of stress, anxiety, depression, anger, feelings of inferiority, inefficacy, sexual dysfunction, and marital discord (Boivin, 2001; Direkvand-Moghadam et al., 2015; Slade, 2007). This issue is not just a medical problem but often brings various crises into the lives of infertile couples. Therefore, the World Health Organization (WHO) has highlighted infertility as a significant reproductive health issue. According to WHO statistics, infertility affects about 80 million people worldwide. The reported infertility rates vary across different regions, with an average estimated at 20%. Since 1995, the prevalence of infertility has increased by 50%. Reports indicate that 10 to 15% of couples globally suffer from infertility (Obeidat et al., 2014; Renzi et al., 2020; Satheesan & Satyanarayana, 2018; Slade, 2007; Tan et al., 2008). Population-based studies in Iran indicate that the lifetime prevalence of primary infertility among couples is 17.3% (Direkvand-Moghadam et al., 2015).

Infertility is recognized as a stressful and sensitive experience that can impact social and marital life. Nearly one-tenth of the global population faces infertility, and the incidence is rising worldwide. Various factors, including changes in women's roles in social activities, the use of contraceptive methods, adverse economic conditions, and increasing age of marriage, contribute to the decline in fertility rates in industrialized societies (Navid et al., 2018). Infertility can have numerous negative effects on women's mental health (Kazemijaliseh et al., 2015; Navid et al., 2018), leading to the loss of parental identity and generational continuity, thereby impacting various aspects of marital life (Dooley et al., 2011). Overall, infertility can cause numerous psychological problems for infertile individuals, significantly affecting their functioning as a normal family. Studies report that infertility-related stress is 53.3% in women and 40.8% in men (Zaidouni et al., 2018). The prevalence of infertility in Iran is estimated at around 20%, higher than the global average of 12-15% (Zaidouni et al., 2018).

Psychological well-being is an essential factor to consider for infertile women, which, from the perspective of social psychologists, is a form of satisfaction (Hatefnia et al., 2019). Psychological well-being is defined as enhancing positive states and reducing negative states (Ryff, 1989; Ryff & Keyes, 1995). According to Ryff (1989), psychological well-being encompasses an individual's quality of life in relation to other social units. It is defined as "engagement with existential challenges of life" and is identified with Ryff's six-component model, which includes autonomy, personal growth, positive relations with others, purpose in life, self-acceptance, and environmental mastery (Ryff, 1989). The goal of psychological well-being is to create mental health by preventing mental illnesses, controlling factors contributing to psychological disorders, and establishing a healthy environment for proper human relationships (Ryff & Keyes, 1995).

Research has been conducted on mindfulness-based cognitive therapy (MBCT) and showed excellent effectiveness (Accoto et al., 2021; Boostani & Tabatabaiejad, 2023; Brotto et al., 2019; Galhardo et al., 2013; Karbalaie et al., 2021; Peterson & Eifert, 2011; Sarabadani et al., 2023; Zarastvand et al., 2020).

Given the increasing infertility rates in developing countries, including Iran, attention to the mental health of infertile individuals, particularly women who face more physical, psychological, and social stressors due to infertility and its treatment, is essential. Considering the discussed points, the main issue of this research is to examine the effectiveness of mindfulness-based cognitive therapy on the psychological well-being of infertile women. The present study seeks to answer the question: Is mindfulness-based cognitive therapy effective on the psychological well-being of infertile women?

2. Methods and Materials

2.1. Study design and Participant

This study employed a quasi-experimental design with a pre-test and post-test control group. The statistical population included all women who visited two private infertility centers in Sari. The sampling method was purposive. Thirty participants were selected based on inclusion criteria (diagnosed infertility by a gynecologist, aged 22-45, at least elementary education, no severe mental disorder or incurable disease, and not undergoing other psychological interventions during the study) and randomly assigned to the experimental (MBCT) and control groups.

Exclusion criteria included missing more than two treatment sessions. The experimental group received eight 90-minute weekly MBCT sessions, while the control group received no intervention. At the end of the sessions, both groups were invited separately for post-test. Two months later, all participants completed the psychological well-being questionnaire again for follow-up. Data were collected using questionnaires, medical records, and interviews and analyzed using descriptive statistics (mean and standard deviation) and inferential statistics (repeated measures ANOVA) with SPSS version 22.

2.2. Measures

2.2.1. Psychological Well-Being

Ryff's (1980) Psychological Well-Being Questionnaire includes 84 items based on the psychological well-being model. The construct consists of six factors: purposeful life, positive relations with others, personal growth, self-acceptance, autonomy, and environmental mastery (Ryff & Keyes, 1995). This questionnaire uses a 5-point Likert scale (strongly disagree to strongly agree), scored from 0 to 4. The reliability of this questionnaire using Cronbach's alpha was found to be 0.93. Mikaeili Mani (2010) also reported an internal consistency reliability above 0.70. In another study, Biani, Koochaki, and Biani (2008) reported an internal reliability of 0.82. Additionally, in 2012, Kalantar Kosheh and Navar Bafi standardized the Ryff Psychological Well-Being Questionnaire in a population of 850, with a reported alpha of 0.92 for the entire scale (Khalaj et al., 2020).

2.3. Intervention

2.3.1. Mindfulness-Based Cognitive Therapy

The treatment protocol implemented in this study consisted of eight 90-minute training sessions. Each session included introducing the session's goals and topics, in-session exercises, and homework assignments. MBCT was conducted once a week, with each session lasting 90 minutes (Brotto et al., 2019; Peterson & Eifert, 2011; Sarabadani et al., 2023; Zarastvand et al., 2020).

Session 1: Introduction and Body Scan Meditation

The first session involves introductions, administering the pre-test, and establishing connections among group members. The session introduces the concept of self-guidance and includes an exercise of eating a raisin mindfully. Participants are guided through a body scan

meditation and are assigned homework to focus attention on daily activities and practice the body scan meditation.

Session 2: Overcoming Obstacles

In the second session, participants discuss dealing with obstacles and challenges. The session includes a body scan meditation and exercises focused on thoughts and feelings. Homework includes ten minutes of mindful breathing and focusing on a daily activity differently, with a daily log of a pleasant event.

Session 3: Mindful Breathing and Movement

The third session focuses on mindful breathing and mindful movement. Participants practice a three-minute breathing space and gentle stretches. Homework involves practicing mindful breathing and movement, including the three-minute breathing space, three times a day.

Session 4: Being Present

The fourth session emphasizes being present in the moment. Activities include five minutes of mindful visual or auditory observation, a sitting meditation, and mindful walking. Homework assignments include sitting meditation and using the three-minute breathing space as a coping strategy during unpleasant emotions.

Session 5: Acceptance and Allowing

The fifth session covers acceptance and allowing. Participants engage in a sitting meditation, focusing on breath and body awareness, and learn to observe reactions to thoughts, feelings, and bodily sensations. Homework includes sitting meditation and the three-minute breathing space.

Session 6: Thoughts Are Not Facts

In the sixth session, the concept that thoughts are not facts is introduced. Participants practice sitting meditation, breath and body awareness, and exercises on moods and alternative perspectives. The session prepares participants for the end of the program and includes daily practice and reflection on a relapse prevention plan.

Session 7: Self-Care

The seventh session focuses on self-care, including sitting meditation, and awareness of breath, body, sounds, thoughts, and feelings. Participants explore the relationship between activities and mood. Homework involves selecting a pattern of practices from the course to implement after the program.

Session 8: Future Mood Management

In the final session, participants learn to use their skills to manage future mood states. Activities include a body scan meditation and concluding meditation. The session reviews the course content, and participants are assigned a

personalized home practice plan to continue for the next month. The session concludes with the post-test.

2.4. Data Analysis

To test hypotheses and confirm or refute them, repeated measures ANOVA was used. It is noteworthy that SPSS-22 software was employed for data analysis. Ethical considerations were observed by obtaining participants' consent, ensuring confidentiality of their information, and providing individual scores to those interested in their psychological status. The control group was assured of

receiving the intervention after the study if desired. Participants could freely withdraw from the study at any time.

3. Findings and Results

In this section, descriptive findings of the mean and standard deviation scores of pre-test, post-test, and follow-up for psychological well-being based on mindfulness are presented separately for the experimental and control groups.

Table 1

Means and Standard Deviations of Pre-Test and Post-Test Scores of Psychological Well-Being Subscales in Experimental and Control Groups

Dependent Variable	Group	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD	Follow-up Mean	Follow-up SD
Purpose in Life	Experimental (MBCT)	41.34	2.203	51.29	1.135	50.15	1.293
	Control	45.53	1.825	46.73	1.778	46.74	1.635
Positive Relations with Others	Experimental (MBCT)	46.83	3.264	50.65	1.984	49.27	1.812
	Control	46.21	3.725	45.21	3.725	45.07	3.814
Personal Growth	Experimental (MBCT)	47.23	3.044	52.53	1.535	52.08	1.681
	Control	46.95	3.474	48.28	3.073	47.90	3.013
Self-Acceptance	Experimental (MBCT)	45.58	3.793	49.50	2.378	48.91	2.586
	Control	44.50	3.611	43.50	4.911	43.71	5.030
Autonomy	Experimental (MBCT)	45.47	3.251	48.86	2.878	48.73	3.024
	Control	44.38	3.179	44.57	3.229	44.57	3.321
Environmental Mastery	Experimental (MBCT)	44.55	3.736	48.33	1.564	48.64	1.946
	Control	43.78	3.867	44.19	3.920	45.78	3.841
Psychological Well-Being	Experimental (MBCT)	276.53	16.539	299.73	4.394	297.73	2.752
	Waitlist	270.29	8.991	268.57	14.596	268.29	14.710

As shown in Table 1, the mean pre-test scores of psychological well-being in both the experimental (MBCT) and control groups were approximately equal. However, in the post-test, the mean scores of the psychological well-being in the experimental (MBCT) group were significantly higher than those in the control group. The follow-up scores in both the experimental (MBCT) and control groups are also presented. According to the hypotheses and the research hypotheses provided, the assumption of normal distribution was examined using skewness, kurtosis, and Kolmogorov-Smirnov tests. All values obtained from the examination of skewness and kurtosis were within the range of -2 to 2, indicating that the variables were neither skewed nor

kurtotic. As shown in Table 4, since the Kolmogorov-Smirnov test scores for psychological well-being were between -1.96 and +1.96 and the statistic was not significant, the assumption of normal distribution can be accepted with 95% confidence. To investigate the effect of mindfulness-based cognitive therapy on the psychological well-being of infertile women at pre-test, post-test, and follow-up stages, repeated measures ANOVA (one within-subjects factor and one between-subjects factor) was used. The three stages (pre-test, post-test, and follow-up) were considered as the within-subjects factor, and the two groups were considered as the between-subjects factor. It is noteworthy that analysis can be reported using either multivariate tests or univariate

statistics. This report used the first method, which involves using the assumption of sphericity, and multivariate tests are presented (Pallant, 2010, trans. Rezaei, 2013). To examine significant differences between the means of psychological well-being in the three groups at the three stages of treatment, assumptions of homogeneity of variances and sphericity were first examined. Since the F test scores in the

Levene's test were not significant, the assumption of homogeneity of variances was confirmed. Additionally, the assumption of sphericity was confirmed, and according to the results of the homogeneity of variances test (Mauchly's sphericity), which was 0.778 and not significant (0.120), homogeneity of variances in the three times of study was confirmed.

Table 2

Results of Repeated Measures ANOVA with Within-Group and Between-Group Factors for Subscales

Factors	Sources of Change	Subscale	Sum of Squares	df	Mean Squares	F	Significance	Effect Size
Within-Group Factor	Treatment Stages	Purpose in Life	289920.126	1	289920.126	37141.330	.000	.998
		Positive Relations with Others	278710.125	1	278710.126	12157.838	.000	.997
		Personal Growth	301644.633	1	301644.644	18906.886	.000	.998
		Self-Acceptance	264504.177	1	264504.199	8224.814	.000	.995
		Autonomy	267721.143	1	267721.133	9612.176	.000	.996
		Environmental Mastery	260760.588	1	260760.517	12684.081	.000	.997
		Psychological Well-Being	9878400.000	1	9878400.000	42864.333	.000	.999
Between-Group Factor	Group	Purpose in Life	186.769	2	93.386	11.966	.000	.982
		Positive Relations with Others	255.158	2	127.569	5.563	.000	.877
		Personal Growth	309.469	2	154.737	9.698	.000	.932
		Self-Acceptance	359.266	2	179.633	5.588	.000	.933
		Autonomy	210.618	2	105.312	3.782	.000	.861
		Environmental Mastery	256.777	2	128.389	6.229	.000	.942
		Psychological Well-Being	9799.476	2	4899.738	21.261	.000	.922

Results in Table 2 indicate that for the within-group factor, the calculated F value for the effect of stages (pre-test, post-test, and follow-up) is significant at the 0.05 level. This indicates that mindfulness-based cognitive therapy affects the psychological well-being of infertile women, and

there are significant differences between the mean scores of psychological well-being in the pre-test, post-test, and follow-up stages. Tukey's post-hoc test was calculated to examine the differences between the means in the treatment stages.

Table 3

Summary of Tukey's Post-Hoc Test Results for Determining Differences Between Pre-Test, Post-Test, and Follow-Up in the Experimental Group

Pre-test	Stages	Mean Difference	Standard Error	Sig.
Purpose in Life	Post-test	0.815	0.328	0.020
	Follow-up	0.526	0.324	0.032
Post-test	Follow-up	0.286	0.206	0.111
	Post-test	1.303	0.371	0.001
Positive Relations with Others	Follow-up	0.915	0.400	0.028
	Post-test	0.429	0.329	0.073
Personal Growth	Follow-up	2.028	0.347	0.000
	Post-test	1.565	0.357	0.000
Self-Acceptance	Follow-up	0.452	0.398	0.156
	Post-test	2.714	0.368	0.000
Autonomy	Follow-up	2.452	0.382	0.000
	Post-test	0.262	0.188	0.164
Environmental Mastery	Follow-up	1.786	0.317	0.000
	Post-test	1.572	0.355	0.000

Post-test	Follow-up	0.214	0.190	0.206
Environmental Mastery	Post-test	2.609	0.465	0.000
	Follow-up	2.286	0.487	0.000
Psychological Well-Being	Follow-up	0.333	0.255	0.373
	Post-test	12.690	2.030	0.000
	Follow-up	10.726	1.991	0.000
Post-test	Follow-up	0.561	0.439	0.148

Results in Table 3 indicate significant differences between psychological well-being scores at pre-test and post-test, and pre-test and follow-up. The difference between post-test and follow-up is not significant, suggesting the stability of the treatment effect. Comparing the means shows that psychological well-being scores significantly increased in the post-test and follow-up stages compared to the pre-test stage.

4. Discussion and Conclusion

The present study aimed to investigate the effectiveness of mindfulness-based cognitive therapy (MBCT) on the psychological well-being of infertile women. The results showed that MBCT significantly improved psychological well-being scores. These findings are consistent with the prior research (Accoto et al., 2021; Boostani & Tabatabaieinejad, 2023; Brotto et al., 2019; Galhardo et al., 2013; Karbalaie et al., 2021; Peterson & Eifert, 2011; Sarabadani et al., 2023; Zarastvand et al., 2020; Zemestani & Fazeli Nikoo, 2019).

Infertility, as a significant stressor in the lives of infertile women, often leads to reduced mental health and psychological well-being over time due to biased and extreme thinking, anxiety, and depression (Van den Akker, 2005). The stress of infertility may affect an individual's behavior, making them unable to control themselves. Recognizing and addressing these problems, along with providing mindfulness interventions, are crucial parts of treatment to improve psychological well-being. In MBCT, infertile women practice purposeful attention to an object through repeated exercises, observing their thoughts, feelings, or bodily sensations. Mindful individuals perceive internal and external realities freely and without distortion, possessing substantial ability to deal with a wide range of thoughts, emotions, and experiences (both pleasant and unpleasant) (Galhardo et al., 2013; Peterson & Eifert, 2011; Sarabadani et al., 2023). This non-judgmental observation can reduce the emotional responses triggered by infertility-related anxiety, which over time can decrease psychological well-being.

It can be argued that mindfulness exercises enhance infertile women's ability to tolerate negative emotional states caused by infertility, equipping them for effective coping. Thus, the fundamental mechanism in the effectiveness of MBCT on improving psychological well-being in infertile women is learning effective coping strategies during therapy sessions to deal with negative emotions and experiences related to infertility. Continuous mindfulness exercises increase awareness of body, feelings, and thoughts. In mindfulness, attention to the body and breath is practiced, and individuals under treatment become aware of various sensations in the body, even during breathing (Zemestani & Fazeli Nikoo, 2019). They learn that in anger, the body warms up, or in fear, the heart rate increases, and breathing rhythm changes, becoming short and slow. This increased body awareness through mindfulness exercises facilitates subsequent control. Since mindfulness moderates feelings without judgment and increases awareness of psychological emotions, particularly negative ones, it helps in clearly seeing and accepting emotions and physical phenomena as they occur, thereby potentially enhancing psychological well-being. Mindfulness therapy, by moderating negative behaviors and thoughts, promotes positive health-related behaviors, as one important aspect of MBCT is that individuals learn to cope with negative emotions and thoughts and positively experience mental events.

5. Limitations and Suggestions

The present study faced several limitations. First, the sample size was relatively small, which may limit the generalizability of the findings. Second, the study relied on self-reported measures, which can be subject to biases such as social desirability and recall bias. Third, the research was conducted in a specific cultural context, which may affect the applicability of the results to other populations. Additionally, the follow-up period was limited to two months, which may not be sufficient to capture long-term effects of the intervention. Finally, the study did not control for other potential variables that might influence psychological well-being, such as socio-economic status or other concurrent treatments.

Future research should consider increasing the sample size and including participants from diverse cultural backgrounds to enhance the generalizability of the findings. Longitudinal studies with extended follow-up periods are recommended to examine the long-term effects of mindfulness-based cognitive therapy (MBCT) on psychological well-being. Additionally, future studies should employ a mixed-methods approach, incorporating both quantitative and qualitative data, to gain a deeper understanding of participants' experiences and the mechanisms underlying the observed effects. Researchers should also control for other variables that might impact psychological well-being, such as socio-economic factors and concurrent treatments, to isolate the effects of MBCT more accurately.

The findings of this study suggest that mindfulness-based cognitive therapy (MBCT) can be an effective intervention for improving psychological well-being in infertile women. Mental health practitioners should consider incorporating MBCT into treatment plans for women experiencing infertility-related stress and psychological distress. Healthcare providers should also be trained in mindfulness techniques to offer comprehensive support to their patients. Additionally, policy makers should recognize the psychological impact of infertility and support the integration of mindfulness-based interventions in reproductive health services. Educational programs aimed at raising awareness about the benefits of mindfulness practices could further enhance the psychological resilience of women facing infertility.

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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