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The Effectiveness of Group-Based Acceptance and Commitment Therapy on Depression and Marital Satisfaction in Women with Infertility

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ABSTRACT

The present study aimed to investigate the effectiveness of group-based Acceptance and Commitment Therapy (ACT) on depression and marital satisfaction among infertile women in Tehran. Using a quasi-experimental design, a randomized controlled trial was conducted with assessments at baseline, post-intervention, and a two-month follow-up, including a control group. A total of 24 women diagnosed with infertility were recruited through convenience sampling from the infertility ward of Shariati Hospital in Tehran and randomly assigned to the experimental group (n = 12) and the control group (n = 12). The experimental group received ten sessions of ACT. All participants completed the Beck Depression Inventory and the Marital Satisfaction Questionnaire at three time points: baseline, post-intervention, and follow-up. Data were analyzed using multivariate analysis of variance (MANOVA). The findings indicated significant differences between the experimental and control groups in depression and marital satisfaction after the intervention and at the two-month follow-up. Group-based ACT led to a reduction in depression and an improvement in marital satisfaction among infertile women, both immediately after the intervention and during follow-up.

1. INTRODUCTION

The inability to have children is considered a tragedy for millions of couples worldwide [1]. In the past, infertility was regarded as a taboo, and in many societies where reproduction, extended families, or the preference for male children are highly valued, this stigma still persists. In certain cultures, women are exclusively blamed and stigmatized for infertility [2]. In such contexts, infertility may lead to divorce, particularly the repudiation of the infertile woman, while the fertile partner often remarries or, in some cases, resorts to polygamy in order to have children [3]. Female infertility undermines women's personal and social identity, challenging their sense of worth as mothers and wives, and threatens the very meaning and purpose of marriage and family life [4].

The experience of infertility, often referred to as the "infertility crisis," is accompanied by physical, psychological, and social stressors that affect every aspect of life. These may result in reduced intimacy, fear of separation, loss of

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self-esteem, social rejection, isolation, and decreased marital satisfaction [5]. This issue is particularly significant in countries with high fertility rates, where childbearing holds strong cultural and social significance for couples and their families [6]. Women are generally more vulnerable than men to the psychological consequences of infertility, experiencing higher levels of depression and emotional distress [7, 8].

Studies show that infertile women face profound psychological pressures, the most significant of which is the intrinsic need for motherhood. Other major stressors include hopelessness, depression, marital conflict, social blame, and distress when others conceive. Unlike other forms of stress, infertility-related stress is chronic and recurrent, with infertile couples experiencing disappointment monthly in the absence of conception [9]. Consequently, infertile patients are at heightened risk of depression, anxiety, and a decline in quality of life. Longer treatment durations and repeated therapeutic failures are associated with greater psychological distress [10].

Biological and psychological mechanisms are interlinked in this process. Smink et al. (2005) reported a significant association between adrenaline levels and depression in women undergoing in vitro fertilization, noting hormonal changes during oocyte retrieval. Similarly, research by Luke et al. revealed that one-third of women with infertility experienced psychological disorders, with 10% showing moderate to severe depression [11]. Moreover, Weissman (1987) found that increased marital satisfaction was associated with lower depression risk, whereas couples with conflicts exhibited greater hostility, anxiety, and depressive symptoms [12]. Since family is the primary setting for fulfilling physical, cognitive, and emotional needs [13], marital dissatisfaction represents one of the most frequently reported concerns among infertile couples [14].

Poor marital adjustment often stems from limited self-awareness and insufficient understanding of one's emotions, thoughts, and personality traits. Interventions aimed at enhancing self-awareness, developing effective communication skills, and addressing relational conflicts have been found beneficial [15]. Evidence also suggests a negative association between emotional avoidance and relationship satisfaction in intimate partnerships [16], while the expression of emotions and relationship quality are influenced by multiple factors, including marital satisfaction [17, 18].

One promising psychotherapeutic approach for such issues is Acceptance and Commitment Therapy (ACT), which belongs to the third wave of cognitive-behavioral therapies [19]. The central aim of ACT is to enhance psychological flexibility, defined as the ability to remain consciously connected to the present moment while experiencing difficult thoughts, emotions, and bodily sensations, and to act in alignment with personal values [20]. Unlike traditional therapies that target cognitive content, ACT emphasizes acceptance, mindfulness, and cognitive defusion techniques to foster flexibility [21, 22]. Psychological flexibility in ACT is cultivated through six core processes: acceptance, cognitive defusion, self-as-context, contact with the present moment, values clarification, and committed action. Mindfulness, as a key element, nurtures non-judgmental awareness, intentional attention, and present-moment focus, allowing individuals to disengage from automatic cognitive patterns tied to past or future concerns [23].

Mindfulness-based interventions have been associated with improvements in psychological outcomes (e.g., reduced depression, anxiety, and stress), psychosocial functioning (e.g., optimism, social support, and spirituality), and physical symptoms in patients with health-related stress [24].

Given the significant psychological and relational consequences of infertility, the present study sought to answer the following question: Does group-based Acceptance and Commitment Therapy reduce depression and improve marital satisfaction among infertile women?

2. METHOD

This study employed a quasi-experimental design in the form of a randomized controlled clinical trial. Following approval from the hospital administration, infertile patients referred to the infertility ward of Shariati Hospital in Tehran were randomly assigned to one of two groups: an experimental group receiving weekly Acceptance and Commitment Therapy (ACT) sessions, and a control group with no intervention. Written informed consent was obtained from all participants.

The statistical population consisted of all women who visited the infertility ward of Shariati Hospital in Tehran during the autumn of 2018. A sample of 24 women was randomly selected and allocated to the experimental group (n = 12) and the control group (n = 12).

Inclusion and exclusion criteria. Inclusion criteria included: not receiving pharmacological treatment since diagnosis, infertility duration of 1–6 years, having at least a middle school education, age between 25 and 45 years, no history of neurological or psychiatric disorders or hospitalization, no substance abuse, ability to attend group therapy sessions, and willingness to cooperate. Exclusion criteria for the experimental group included: absence from more than two intervention sessions, and withdrawal of consent to continue participation.

3. MEASUREMENT INSTRUMENTS

3.1. Demographic Information Questionnaire

Given the potential influence of background and biological factors on patients' mood states and quality of life, a researcher-developed questionnaire was used to collect demographic and clinical information. Items included age, education level, economic status, duration of marriage, duration of infertility treatment, prior treatments received, alcohol and tobacco use, history of psychiatric disorders, and history of suicide attempts.

3.2. Structured Clinical Interview for DSM-IV (SCID)

The Structured Clinical Interview for DSM-IV (SCID), developed by First, Spitzer, Gibbon, and Williams (1997), is a semi-structured diagnostic tool for psychiatric disorders. Two main forms are available:

SCID-I, which assesses major psychiatric disorders on Axis I of the DSM-IV. The Persian version, adapted and validated by Sharifi et al. (2004), demonstrated good reliability and validity, with inter-rater kappa values above 0.70 [25]. In Bakhtiari's (1999) study, test–retest reliability after one week was reported as 0.95.

SCID-II, designed to assess Axis II personality disorders, was translated and validated for use in Iran. Content validity was confirmed by clinical psychologists, and test–retest reliability after one week was 0.87 [26].

3.3. Beck Depression Inventory – Short Form (BDI-13)

The 13-item Beck Depression Inventory is a self-report scale assessing specific symptoms of depression. Each item is rated on a four-point scale (0–3), with total scores ranging from 0 to 39. It measures affective, cognitive, motivational, and physiological aspects of depression [27]. Studies in Iran have confirmed its psychometric properties. Hojat, Shapourian, and Mehriar (1986) reported significant correlations between the BDI and measures of anxiety, loneliness, and external locus of control. Rajei identified two factors negative affect toward self and anhedonia that accounted for 52.54% of variance, with Cronbach's alpha of 0.89 and concurrent validity of 0.67 with the 21-item BDI [28].

3.4. Marital Satisfaction Scale

The Marital Satisfaction Scale, developed by Mehrabian (2005), evaluates various aspects of marital satisfaction. It consists of 13 items scored on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Total scores range from 13 to 65, with higher scores indicating greater marital satisfaction. Several items are reverse-scored. Factor analysis identified two subscales: satisfaction and dissatisfaction with marriage. Rajei reported Cronbach's alpha of 0.90 overall (0.91 for women and 0.89 for men) [29]. Bloom and Mehrabian (1999) reported six-week test–retest reliability of 0.83 and Cronbach's alpha of 0.94 for the longer version. Mehrabian reported internal consistency reliabilities of 0.91–0.94 and test–retest reliability of 0.83 for the 12-item short form [30].

4. PROCEDURE

The intervention was conducted in the infertility ward of Shariati Hospital, Tehran, by two doctoral-level health psychologists trained in Acceptance and Commitment Therapy (ACT). All procedures adhered to ethical research standards, including obtaining informed consent and ensuring participant confidentiality. Participants in both the

experimental and control groups completed all research instruments at three time points: pre-intervention (baseline), post-intervention, and two-month follow-up.

The group-based ACT intervention consisted of 10 weekly sessions, each lasting two hours. While the experimental group received the intervention, the control group did not receive any therapeutic treatment during the study. For ethical considerations, participants in the control group were provided with a CD containing ACT exercises after the study's completion. Table 1 summarizes the structure and content of the 10 ACT sessions.

Table 1. Summary of Group-Based ACT Session Procedures

Session	Content
1	Group member introductions, pre-test administration, discussion of behavioral boundaries, rules, principles, and session contracts. Obtaining informed consent, outlining therapeutic goals and the possibility of change. Introduction to creative hopelessness, including addressing past ineffective coping strategies, low self-efficacy, and infertility-related challenges.
2	Introduction to core ACT concepts: psychological flexibility, acceptance, mindfulness, cognitive defusion, self-as-context, personal narrative, values clarification, and committed action. The session included six key components: 1) increasing acceptance of internal experiences while reducing ineffective control attempts, 2) enhancing present-moment awareness, 3) fostering cognitive defusion to allow independent action, 4) reducing over-identification with self-narratives, 5) clarifying personal values and translating them into behavioral goals, and 6) motivating committed action aligned with values while accepting internal experiences.
3	Review and discussion of homework: self-monitoring strategies, understanding the ineffectiveness of control attempts, daily experience journaling, desire journaling, and recording experiences of distress for creative hopelessness exercises.
4	Performance evaluation and discussion of experiences since the last session. Review of homework and introduction to mindfulness exercises and values clarification practices.
5	Continued evaluation of performance, differentiating conceptualized self from self-as-observer, assessing the participant's ability to defuse from thoughts and emotions, ongoing mindfulness practice, and further values clarification.
6	Emphasizing the importance of values and how values inform willingness/acceptance. Distinguishing between values as behaviors versus feelings. Practicing awareness of bodily sensations and discussing infertility-related experiences.
7	Helping participants identify incongruence between infertility-related behaviors and personal values. Using values as a source of commitment, applying them to behavioral activation and personal goals. Reviewing value-driven behaviors over the week.
8	Exploring connections between goals and activities, reinforcing willingness and cognitive defusion to support goal achievement. Continuing to set value-based behavioral goals, mindfulness practice, and discussions of infertility and self-efficacy.
9	Mindfulness training focusing on emotional awareness and skillful observation without judgment. Emphasizing maintenance of attention and understanding how mindfulness skills operate in daily life.
10	Evaluation of committed action, teaching participants to apply ACT skills independently. Preparing for potential post-treatment challenges, identifying barriers (FEAR algorithm), reinforcing ACT principles, reviewing previous session content, administering post-test, and planning follow-up activities. Suggested follow-up included monthly or brief (≤30 minutes) telephone sessions to maintain gains and prevent relapse.

5. RESULTS

The mean age of participants in the control group was 32.25 ± 3.07 years, and in the experimental group 32.33 ± 2.77 years. The mean duration of marriage was 8.58 ± 3.80 years for the control group and 7.66 ± 2.77 years for the experimental group. The average duration of infertility treatment was 6.41 ± 2.96 years for the control group and 5.00 ± 2.13 years for the experimental group.

Regarding education, 66.7% of participants in the control group and 58.3% in the experimental group had completed high school (diploma). Income levels in both groups were reported to be in the medium range.

Table 2. Means and standard deviations of age, duration of marriage, and duration of treatment by group

Variable	Group	Mean	Standard Deviation
Age	Control	34.25	3.07
	Experimental	34.33	2.77
Duration of Marriage (years)	Control	10.58	3.80
	Experimental	10.66	2.77
Duration of Treatment (years)	Control	7.41	2.96
	Experimental	6.01	2.13

The results presented in Table 3 indicate that the mean depression scores of the experimental and control groups were nearly identical at the pre-test stage. However, at post-test and two-month follow-up, the experimental group demonstrated significantly lower depression scores compared to the control group. This finding suggests that the group-based Acceptance and Commitment Therapy (ACT) intervention effectively reduced depression levels in women experiencing infertility. (For the F-ratio and detailed statistical analysis regarding depression reduction, see Table 3. Table 4 shows that the mean marital satisfaction scores were also approximately equal for both groups at pre-test. At post-test and follow-up, the experimental group exhibited higher marital satisfaction scores compared to the control group. These results indicate that the ACT-based intervention improved marital satisfaction among infertile women. (For the F-ratio and detailed statistical analysis regarding marital satisfaction, see Table 4.)

Multivariate analysis of variance (MANOVA) tests, including Pillai's trace, Wilks' Lambda, Hotelling's trace, and Roy's largest root, were statistically significant ($F = 37.05$, $p < 0.001$) for the two groups. These findings indicate that at least two groups differ significantly on the combined dependent variables, supporting the use of MANOVA for comparing group differences.

Table 3. Depression Scores of Experimental and Control Groups in Acceptance and Commitment Therapy (ACT)

Group	N	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD	Follow-up Mean	Follow-up SD	Pre–Post Difference Mean	Pre–Post Difference SD	Post–Follow-up Difference Mean	Post–Follow-up Difference SD
Experimental	12	19.75	2.66	13.58	2.15	12.82	2.17	6.17	1.17	0.76	1.62
Control	12	21.75	5.27	22.33	4.86	21.58	3.89	-0.58	2.31	0.75	1.13
Total	24	20.75	4.21	17.96	5.79	16.92	5.79	2.79	3.89	0.17	1.43

Note: *N = number of participants; SD = standard deviation.*

Table 4. Marital Satisfaction Scores of Experimental and Control Groups in Acceptance and Commitment Therapy (ACT) for Infertile Women

Group	N	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD	Follow-up Mean	Follow-up SD	Pre–Post Difference Mean	Pre–Post Difference SD	Post–Follow-up Difference Mean	Post–Follow-up Difference SD
Experimental	**12**	**30.33**	**3.57**	**48.91**	**4.12**	**50.16**	**4.96**	**-18.58**	**4.12**	**-1.25**	**3.40**
Control	**12**	**30.58**	**3.63**	**30.25**	**6.46**	**31.41**	**8.09**	**0.33**	**4.71**	**-1.16**	**4.53**
Total	**24**	**30.46**	**3.52**	**39.58**	**10.91**	**40.79**	**11.61**	**-9.12**	**10.58**	**-1.20**	**3.92**

Note: N = number of participants; SD = standard deviation.

Table 5. Multivariate Analysis of Variance (MANOVA) Results for Marital Satisfaction in Acceptance and Commitment Therapy (ACT)

Independent Variable	Dependent Variable	Sum of Squares	df	Mean Square	F	p-value
Group	Pre–Post Depression Difference	273.37	1	273.37	80.63	<0.001
Group	Post–Follow-up Depression Difference	4.16	1	4.16	2.12	0.159
Group	Pre–Post Marital Satisfaction Difference	2147.04	1	2147.04	109.44	<0.001
Group	Post–Follow-up Marital Satisfaction Difference	0.04	1	0.04	0.003	0.960

Note: *df = degrees of freedom; F = F-statistic; p = significance level.*

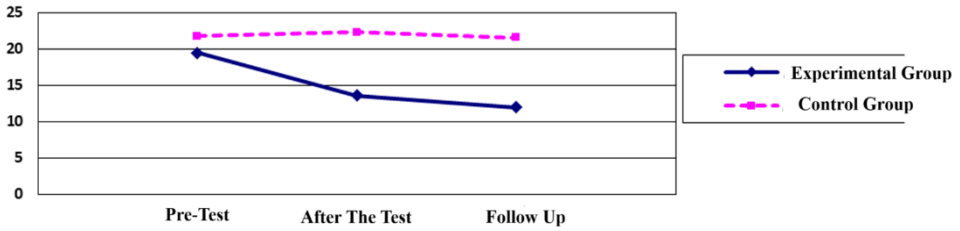

Fig. 1. Mean Depression Scores at Pre-test, Post-test, and Follow-up in Experimental and Control Groups in Acceptance and Commitment Therapy (ACT)

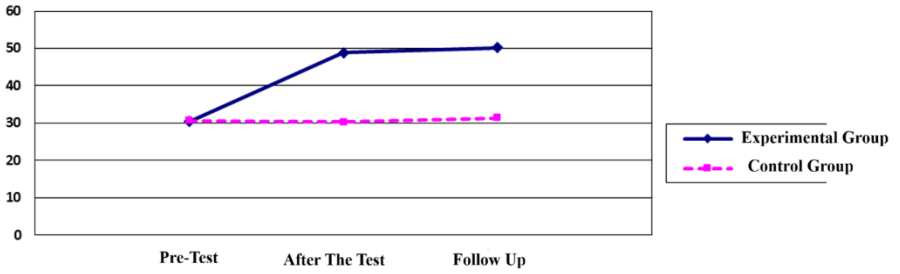

Fig. 2. Mean marital satisfaction scores at pre-test, post-test, and follow-up in the experimental and control groups receiving Acceptance and Commitment Therapy (ACT).
Note: The x-axis represents marital satisfaction scores, and the y-axis represents the group-based ACT intervention.

6. DISCUSSION AND CONCLUSION

This study aimed to evaluate the effectiveness of group-based Acceptance and Commitment Therapy (ACT) on depression and marital satisfaction in infertile women, comparing outcomes before the intervention, immediately after, and at a two-month follow-up with a control group. The results indicated that ACT significantly reduced depression and increased marital satisfaction in the experimental group compared to the control group, both post-intervention and at follow-up. These findings are consistent with prior research [24], which has demonstrated that mindfulness practices not only reduce stress but also significantly enhance mental well-being, psychological health, and reduce physical tension in patients [18].

Mindfulness exercises, by increasing individuals' awareness of the present moment through techniques such as meditation (focusing on breathing and bodily sensations), appear to improve control over both the body and mind, thereby reducing stress and anxiety. In this context, group-based ACT enhances self-awareness and self-acceptance in patients. Mindfulness is not merely a technique but a readily accessible approach for reducing suffering and increasing awareness, insight, wisdom, and compassion [14]. Carlson and Speca further showed that mindfulness meditation significantly enhances mental clarity, psychological health, and reduces bodily tension, highlighting the important role of ACT in promoting recovery and positive outcomes through structured therapeutic programs [12].

The findings of this study also revealed that group-based ACT significantly improved marital satisfaction in infertile women. These results align with previous research (Brown, 2003), which indicated that therapeutic effects of ACT in group settings are amplified by group-related factors, resulting in stronger treatment outcomes. Many infertile women experience a sense of uniqueness regarding their difficulties, which can exacerbate social isolation. Group therapy not only alleviates these negative feelings but also fosters relaxation and the development of social relationships, making this method clinically valuable and effective [16].

The incorporation of relaxation training throughout the sessions is a crucial stress-management skill that should be regularly applied in daily life. Expressing emotions in all sessions contributes to multiple therapeutic benefits. In this study, patients attended ten group sessions led by a consistent therapist, likely fostering stronger therapeutic alliance, facilitating treatment processes, and promoting continuity in behavioral change.

This study has several limitations. First, the small sample size, although without dropouts, limits precise estimation of the intervention's effect size. Second, self-report measures carry inherent issues, such as measurement

error and subjective bias. Third, potential confounding factors related to participants' individual characteristics or contextual variables were not controlled, which may have led to overestimation of the program's effects. Participants' personal optimism or motivation might have also influenced results. Future studies are recommended to implement placebo-like interventions to control expectancy effects and to recruit larger sample sizes to better estimate effect sizes. Additionally, as this study was conducted solely with patients at Shariati Hospital in Tehran, replicating the group-based ACT intervention in similar patient populations across other hospitals is suggested to generalize the findings.

Transparency Statement

The data supporting this study are available upon reasonable request to the corresponding author, subject to ethical and confidentiality considerations.

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Declaration of Interest

The authors declare that they have no competing interests.

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