

# Effect of Acceptance and Commitment Therapy (ACT) on Anxiety in Infertile Women during Treatment: A Randomized Trial

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## Abstract

**Background:** Regarding the prevalence of infertility in the community and its psychological problems such as depression and anxiety that affect the lives of infertile women, they need an appropriate treatment for reduce their anxiety. **Objective:** The present study with the aim of investigating the effect of acceptance and commitment therapy on anxiety in infertile women during treatment was performed. **Materials and Methods:** This study was clinical trial with pretest and posttest. Participants were 35 infertile women who referring to the infertility center in Arak that were selected with score of mild and moderate anxiety with convenient sampling method and they were randomly assigned in two experiment and control groups (18 and 17 infertile women respectively). Eight 90 minutes sessions twice in a week of acceptance and commitment therapy held for experiment group. Collecting data tool was Beck Anxiety Inventory. **Results:** There was statistically significant difference on score of anxiety in pretest and posttest between experiment and control groups ( $p < 0/05$ ). **Conclusion:** It seems that the approach of group acceptance and commitment therapy affected on reduce anxiety in infertile women.

**Keywords:** Acceptance and Commitment Therapy, Anxiety, Infertile Women

## Introduction

When a woman does not become pregnant after one year of unprotected and regular sexual intercourse, she is called infertile (Romeiro et al., 2017). Inability to become pregnant can be of two primary and secondary forms; primary infertility means delayed pregnancy for couples who have not had a pregnancy in the past, while secondary infertility occurs when couples have a history of fertility, but are currently unable to be pregnant (Anwar and Anwar, 2016). The problem may be from the husband (25-40%), wife (40-55%), or both (10%), or may have an unknown cause (10%) (Onat and Aba, 2015). Infertility is seen in 10-15% of couples (Durgun Ozan and Okumus, 2017). About 50-80 million people in the world have infertility problems, and two million couples annually add to this. Infertility has increased by about 5% over the past decade (Valiani and Abedian, 2015). In Iran, about one fourth of couples experience primary infertility during their common life (Vahidy and Ardalan, 2009). One of the most commonly used infertility treatment techniques is the Assisted Reproductive Technology (ART) such as intrauterine insemination (IUI), In vitro fertilization (IVF), Intracytoplasmic sperm injection (ICSI), Gamete Intra Fallopian Transfer (GIFT), and Zygote Intra Fallopian Transfer (ZIFT) (Asghari, Ali zadeh and Hoseini, 2017). The ART technique increases psychological disorders such as anxiety and depression (Sohrabvand et al., 2008; Maleki-Saghooni et al., 2017) because it has a lot of cost and little chance of success. Patients have to accept a risk, which may not be very successful (Maleki-Saghooni et al., 2017). It seems the infertile women has high level of depression, low self steem and sexual problems (Mosalanejad, Khodabakshi Koolae and Jamali, 2012). The World Health Organization (WHO) has identified infertility as a public health problem throughout the world (Boivin et al., 2007). Many couples consider this to be a major crisis and a stressor in their life. Several psychological problems result from infertility at the cognitive and emotional levels. Consequently, infertility becomes a biological-psychological-social crisis that threatens the mental health of the affected couple. On the other hand, psychological stress has

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increased due to adverse conditions and weakened the couples' ability to fertilize more than before (Besharat, Lashkari and Rezazadeh, 2015). However, having peace of mind and mental health reduces stress and thus increases the chances of fertility (Baghianimoghadam et al., 2013). Infertility has a profound psychological effect in couples, so that about 40% of them experience anxiety and 86% of them experience depression during their lives (Masoumi et al., 2013). Because of greater participation in the treatment process, these problems are more prevalent for women than men, and women are more vulnerable to treatment failure (Peterson et al., 2012). Infertility is a distressing and painful experience for them, so they have a greater sense of frustration, helplessness and anger and their relationship with their husbands, families and friends are disrupted; they are more dissatisfied with their lives and become subject to psychological, depressive, and anxiety-related illnesses, which can influence the quality of lives (Farrokh-Eslamlou et al., 2014). Therapeutic and cognitive-behavioral techniques are not only effective in preventing and treating various mental and psychological problems, but also play an important role in affecting women's physical health and pregnancy degree (Ramezanzadeh et al., 2007). Women have a more positive attitude toward receiving psychological assistance and seek counseling services (Peterson et al., 2012). Few studies have been carried out in the present era on the effects of various counseling and psychiatric methods and providing the best methods for the treatment of patients (Ramezanzadeh et al., 2007).

The first generation of behavioral approaches, in contrast to the original psychoanalytic approach, was based on classical conditional and factorial in the 1950s. The two characteristics of this generation that distinguished it from the clinical interventions at that time were the application of the principles of behavioral analysis in clinical work and the emphasis on the empirical assessment of behavioral therapy interventions (Zargar et al., 2013). The second generation of these treatments, called behavioral-cognitive therapy, was created by the 1990s that focused on cognitive aspects, the role of beliefs, cognition, schemes, and the information processing system in creating psychological problems. This group of treatments emphasized change. We are now days faced with the third generation of these treatments, which can be generally called acceptance-based models such as mindfulness-based cognitive therapy, metacognitive therapy and acceptance and commitment therapy (ACT) (Narimani, Alamdari and Abolghasemi, 2014). ACT receives its name from its original message: accept what is out of your personal control and be committed to the action that enriches your life. The purpose of ACT is to help authorities to create a rich, full, and meaningful life, while accepting the pain that inevitably with it (Ezadi and Abedi, 2012).

In ACT aim is to change relation with difficult thoughts and feelings, so that we no longer perceive them symptoms, but, on the contrary, they can be considered hazardless and regarded as uncomfortable psychological events. ACT seems to reduce symptoms through such a process (Harris, 2006).

ACT has six central processes that lead to psychological flexibility, namely acceptance, defusion, contact with the present moment, self as context, values, and committed action (Yang et al., 2017). Psychological flexibility is the ability of a person to communicate with the present time completely as a conscious person, and to change or persist in behavior when doing so serves valued ends (Hayes et al., 2013). Most ACT practices are metaphorical. Metaphors and exercises are used to integrate these processes in order to focus on psychological flexibility as a whole (Hayes, Pistorello and Levin, 2012). The ACT has shown evidence of effectiveness for various problems such as work stress, psychosis, depression, anxiety, body deformity, epilepsy, obsessive-compulsive disorder, social anxiety disorder, chronic pain, smoking cessation, diabetes, and addiction (Forman et al., 2007).

Eilenberg et al evaluated the effect of the ACT on health anxiety patients and concluded that the symptoms of anxiety decreased significantly and 87% of the patients were satisfied with this therapy (Eilenberg et al., 2013). The ACT significantly reduced the anxiety and depression scores of women with breast cancer (Mohabbat-Bahar et al., 2015). As the infertile women undergoing treatment need an appropriate counseling program for their anxiety reduction (Talaie et al., 2014) so the researchers decided to explore the effect of acceptance and commitment therapy on anxiety in infertile women during treatment.

## Materials and Methods

### *Participants and procedure*

This was a randomized trial study. During July to October 2016, 40 women referring to Arak Infertility Treatment Centre were selected by using convenient sampling method. All participants provided written informed consent for participation before entering the study. They divided into 2 twenty-subject intervention (A) or control (B) groups by using the random block method. The intervention group was divided into two subgroups of 10 individuals who received acceptance and commitment therapy approach. Two women in intervention group were been pregnant and three in control group existed because of their desire. They were finally reduced to 35 infertile women (18 in the intervention group and 17 in the control group) (Figure 1).

The inclusion criteria were as follows: women 18-45 years old, diagnosis of infertility minimum for 1 years, literacy, having mild anxiety score (8-15) and moderate anxiety score(16-25)according to Beck anxiety inventory, none smoking and drugs, not having medical and other psychiatric diseases, no history of assisted reproduction treatment.

The exclusion criteria were as follows: not attending at least one of the treatment sessions, positive pregnancy test, desire to exist from study, unpredictable events and crises that trigger anxiety: such as death of a loved, divorce, migration.

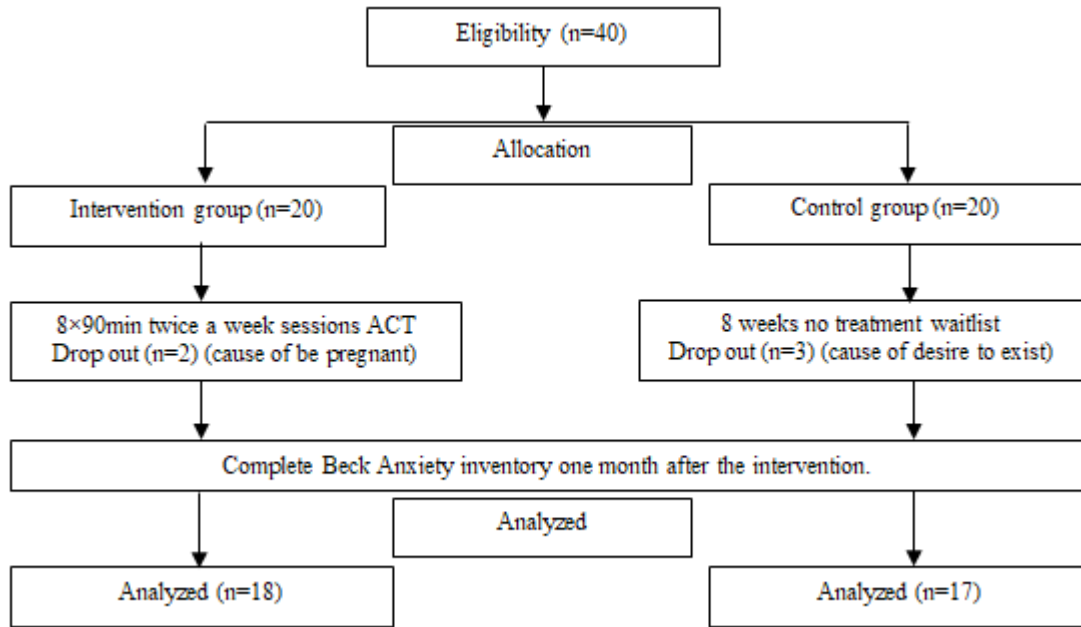


Fig. 1: Flowchart of participant's progression through the study

*Intervention*

After selecting the subjects, they randomly placed in the intervention or control groups and performed a pretest from both of them. Then, researcher held for the intervention group, approach of ACT in eight 90-minute sessions twice a week for 2 months (Table1). However, the control group did not receive any intervention. The post-test one-month after study filled by both groups.

Table 1: Protocol of acceptance and commitment therapy

Sessions	content
Session 1: introduction and short explaining about ACT and mindfulness	<ol style="list-style-type: none"> <li>1. Welcome and introduction members of group and therapist</li> <li>2. Short mindfulness exercise(focusing on the present moment)</li> <li>3. What is infertility?</li> <li>4. Mindfulness exercise: where do you want to go?</li> <li>5. What is ACT and mindfulness?</li> <li>6. Home assignment and end of session</li> </ol>
Session 2: creative hopelessness: how have you tried to manage your anxiety?	<ol style="list-style-type: none"> <li>1- Summarize session 1 and follow-up on home assignment</li> <li>2- creative hopelessness: metaphor: to dig yourself out of hole</li> <li>3- primary evaluation of values: metaphor: magical stick</li> <li>4- mindfulness exercise with creative hopelessness</li> <li>5- Home assignment and end of session</li> </ol>
Session 3: Control as a problem, not the solution	<ol style="list-style-type: none"> <li>1- Summarize session 2 and follow-up on home assignment</li> <li>2- Mindfulness breathing exercise</li> <li>3- Control as a problem, not the solution: metaphor: the little trigger exercise: don't think the banana, lie detector</li> <li>4- Home assignment and end of session</li> </ol>
Session 4:	<ol style="list-style-type: none"> <li>1- Summarize session 3 and follow-up on home assignment</li> </ol>

willingness: a new road for life with anxiety	<p>2- Why do we use control?</p> <p>3- Willingness-an alternative to control: metaphor: war with a monster ( Role-playing), the unwanted party guess (showing a film).</p> <p>4- Explain the pain versus suffering</p> <p>5- Mindfulness exercise with breath and body</p> <p>6- Home assignment and end of session</p>
Session 5: distance from your thoughts-defusion	<p>1- Summarize session 4 and follow-up on home assignment</p> <p>2- What trapped? Metaphors: angler mind, watching film, Hands as thoughts</p> <p>3- mindfulness exercise(objectivity)</p> <p>4- Home assignment and end of session</p>
Session 6: you are more than your story: observe your self	<p>1- Summarize session 5 and follow-up on home assignment</p> <p>2- Mindfulness exercise(watching thoughts drift by)</p> <p>3- Explain about self as conceptualized and move necessity to self as context</p> <p>4- The observing self-exercise: metaphor: sky, chess board</p> <p>5- Mindfulness self-observing exercise</p> <p>6- Home assignment and end of session</p>
Session 7: identify and clarify values in life and move in line with it	<p>1- Summarize session 6 and follow-up on home assignment</p> <p>2- mindfulness exercise</p> <p>3- the difference between values and goals(showing a film)</p> <p>4- value clarification for individuals and helping them to identify internal and external obstacles, ranking values and move in line with values: exercise: Bull's eye, metaphor: Funeral</p> <p>5- Home assignment and end of session</p>
Session 8: Commitment Action and preventing of relapse	<p>1- Summarize session 7 and follow-up on home assignment</p> <p>2- mindfulness exercise</p> <p>3- helping individuals to keep using the learn methods in order to manage obstacles while continuing to move forward in life: bus metaphor(showing a film)</p> <p>4- mindfulness exercise with a focus on ending treatment</p> <p>5- end the treatment: giving questionnaires and telling goodbye</p>

### Measurement

#### Beck Anxiety Inventory

The 21-item Beck Anxiety Questionnaire was created by Aaron T Beck et al. in 1988 for measuring anxiety in adolescents and adults, with each item measuring one of the common mental, physical, and anxiety panic symptoms. Its Cronbach's alpha was obtained as 0.92. The test-retest reliability of the questionnaire was obtained as 0.75 with a one-week interval (Beck et al., 1988). In the Iranian sample, its Cronbach's alpha was also obtained as 0.929, and its reliability was obtained as 0.77 using the test-retest method (Shams et al., 2011). Each question is scored from 0-3 (zero=never, three= severe). The sum of the scores is between 0-63, higher scores indicating more intensity of anxiety. A person is placed in one of the following four classes depending on his or her obtained score: Lack of anxiety (0-7), mild anxiety (8-15), moderate anxiety (16-25), severe anxiety (26-63) (Rafiei, 2013).

#### Statistical analysis

After completing the forms and encoding them, we entered the data into the spss23 software, and used the central and dispersion indices (mean and standard deviation) for the quantitative data, and used frequency for the qualitative data. We used the Chi-square test for qualitative data, the paired, independent t-test for comparison of means and Wilcoxon and Mann-Whitney U tests for the non-parametric data. The significance was considered less than 5%.

**Results**

The demographic characteristics of the intervention and control groups are reported in Table 2.

Table 2: demographic participants' characteristics

Variables		Intervention group		Control group		P-value
		Mean±sd	N (%)	Mean±sd	N (%)	
age		32.7±5.1		29.5±5.8		0.85*
Husbands' age		36.8±4.8		33.4±6.2		0.84*
Length of marriage		8.6±5.8		5.8±2.6		0.87*
education	primary		1(5.6)		2(11.8)	0.6**
	secondary		3(16.6)		1(5.8)	
	High school		5(27.8)		6(35.3)	
	Academic		9(50)		8(47.1)	
job	housewife		17(94.4)		14(87.5)	0.3**
	Employee		0(0)		2(12.5)	
	worker		1(5.6)		0(0)	
Husband's education	Primary		3(16.7)		0(0)	0.6**
	secondary		4(22.2)		3(18.8)	
	High school		6(33.3)		6(37.5)	
	academic		5(27.8)		7(43.7)	
Husband's job	employee		4(23.5)		4(23.5)	0.5**
	worker		7(41.2)		4(23.5)	
	unemployed		1(5.9)		1(5.9)	
	others		5(29.4)		8(47.1)	
Place of residence	urban		17(94.4)		15(93.8)	0.9**
	rural		1(5.6)		1(6.2)	
Economic level	good		1(5.6)		3(17.6)	0.014**
	moderate		9(50)		11(64.7)	
	poor		8(44.4)		3(17.7)	

\*independent t test; \*\*chi-square test

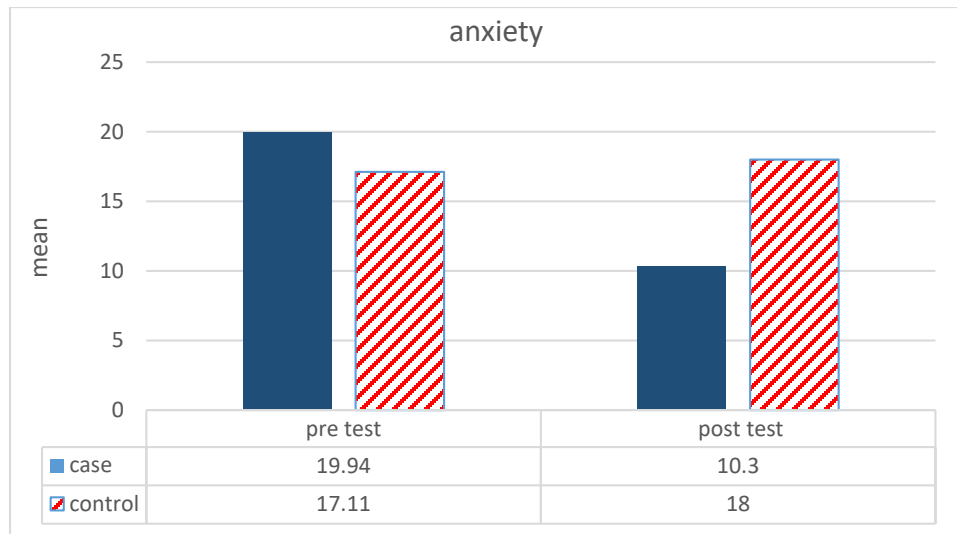
Table 3 shows the mean of anxiety scores in the pre and post-test in both intervention and control groups.

Table 3: The comparison of mean score of anxiety in the pre t and post test results between the intervention and control groups

anxiety	Group	Mean±sd	p-value
Pre test	Intervention	19.9±5.5	0.2*
	control	17.1±6.2	
Post test	Intervention	10.3±6.4	0.001*
	control	18±5.02	

\*independent t test

The result of independent t-test showed that there was a significant difference between the mean of anxiety scores 1 month after the intervention in the intervention and control groups ( $p < 0.05$ ).



**Fig. 2:** The mean scores of anxiety pretest and posttest in the two intervention and control group

The result of paired t- test showed that there was a significant difference between the mean of anxiety scores one month after the intervention in the intervention group ( $p < 0.05$ ).

## Discussion

The aim of this study was to investigate the effect of acceptance and commitment therapy on the anxiety in infertile women during treatment. The results showed that the acceptance and commitment therapy was effective in improving anxiety in infertile women during one-month compared to the beginning.

Eifert & et al. concluded that the ACT is an appropriate therapy for reducing infertility stress (Peterson and Eifert, 2011).

Swain & et al showed the effect of this approach on reducing anxiety in adolescents (Swain et al., 2013). The result of another study from Eifert et al has been shown that the use of ACT in three patients suffering from anxiety disorder reduced experiential avoidance and anxiety, increased acceptance and the skill of attention awareness, and improved the quality of life, which is consistent with the results of our study (Eifert et al., 2009).

The acceptance and commitment therapy can be an appropriate substitute for cognitive-behavioral therapy for anxiety disorders, especially for generalized, social and hybrid anxiety disorders (Landy, Schneider and Arch, 2015) A research conducted by Tanya et al., showed that the ACT reduced the symptoms of anxiety and depression in the elderly and was maintained during the three-month follow-up (Davison et al., 2016).

Eifert and Heffner believe that acceptance-based approaches enhance the tendency to experience anxiety instead of reducing it, and facilitate exposure to these unpleasant emotions by identifying personal values and goals (Eifert and Heffner, 2003).

Jourdain and Dulin also showed that the ACT could reduce anxiety by reducing experiential avoidance and increasing psychological flexibility (Jourdain and Dulin, 2009).

Zettle et al. also found in their study that the participants in the ACT group showed a reduction in experiential avoidance and abundance of negative thoughts and increasing psychological acceptance (Zettle, 2003).

Carolyn &et al showed that the ACT had a better performance than the cognitive-behavioral therapy for those who have high empirical avoidance (Davies et al., 2015).

Despite the importance of the third wave of cognitive-behavioral therapies, the ACT approach is an important area of emerging psychotherapies, having an effective role in treatment of stress, anxiety, depression and improvement of quality of life (Kahl, Winter and Schweiger, 2012).

It can be said that as ART leads to anxiety in infertile women (Nekavand et al., 2015) and since they have a lot of rumination about their infertility, they learned through acceptance and cognitive defusion to experience negative thoughts about their problem in a new way. Infertile women are aware of the costs of experiential avoidance and it seems that acceptance means experiencing pain in the path to their values instead of experiential avoidance that plays a major role in reducing anxiety. Clarification of values and commitment to them helps infertile women to progress towards life satisfaction.

One of the limitations of the study was the subjects' reluctance to participate in the study, and we explained to them that all their personal information would be kept confidential and the results would be reported in general and provided to them if desired. Another limitation was the impossibility of the husbands' participation in the sessions due to the culture of shame and humiliation in Iranian society as well as difficulty of expression of concern and problems in the public. It is suggested that future studies deal with the effect of the ACT on reducing the infertile couples' anxiety in groups or individually.

Due to the time limitation, it was not possible to study the effect of the ACT on the outcome of infertility treatment. Therefore, it is recommended that future research focus on the effect of the above approach on the outcome of infertility treatment. In addition, the above approach can be compared with other anxiety-reducing therapies in infertile women.

It is suggested that infertility centers be equipped with a psychiatric and counseling section to provide patients with psychological counseling along with medical examinations. Additionally, it is recommended to hold educational courses in order to familiarize the officials and staff of infertility centers with the ACT approach.

## Conclusion

Infertile women learned in this study that they can enjoy their lives and have meaningful lives despite their problems, it seems with this way reduced their anxiety.

It seems that the group acceptance commitment therapy, as a non-pharmacological method, low-cost, and no side effect, is effective in reducing the infertile women's anxiety.

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### *Conflict of interest*

There are no conflicts of interest.

### *Author Contributions*

Elahe Rahimi was involved in study design, data collection, analysis, and drafting of the manuscript. Mahtab Attarha was involved in the supervision of study, analysis and drafting of the manuscript, Abed Majidi and Ali Asghar Ghafarizadeh was involved in the data analysis process.

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