



# Effect of Acceptance and Commitment Therapy (ACT) on Anxiety and Quality of Life During Pregnancy: A Mental Health Clinical Trial Study

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## Abstract

**Background:** Pregnancy is a major event in a woman's life that is associated with conflicting emotions, joy, and anxiety.

**Objectives:** The present study was conducted to assess the effect of Acceptance and Commitment Therapy (ACT) on women's anxiety and quality of life during pregnancy.

**Methods:** This randomized clinical trial was conducted in 2016 on pregnant women presenting to health centers in Arak, Iran. First, eligible women were identified by referring to the health centers. Sampling was done conveniently after obtaining informed consent. Finally, 44 women were randomly allocated to ACT and control groups using two-arm blocks "A" and "B". Anxiety and quality of life were measured before the ACT, after ACT, and one month later in pregnant women using the Van den Bergh's Pregnancy-Related Anxiety Questionnaire and the 36-item Short-Form Health Survey (SF-36), respectively. The ACT group was followed up by telephone one month after the intervention. For the control group, we performed routine pregnancy care. Statistical analysis was done by the Kolmogorov-Smirnov test for normality of data distribution, followed by the chi-square test, independent *t*-test, and paired *t*-test.

**Results:** Anxiety decreased after the intervention and increased one month later, although it was less than before intervention ( $P = 0.001$ ). On the other hand, the quality of life improved after intervention, but it worsened one month later ( $P = 0.026$ ).

**Conclusions:** Counseling based on the ACT may be used for reducing anxiety in pregnant women; however, its effect on the quality of life remains to be explored further.

**Keywords:** Acceptance and Commitment Therapy, Anxiety, Counseling, Family Health, Patient Education, Pregnancy, Prevention, Primary Care, Quality of Life

## 1. Background

Pregnancy is a major event in a woman's life that is associated with two conflicting emotions, joy, and anxiety (1). These dual natural emotions emerge as a result of biological, social, and psychological changes in women during pregnancy (2).

Pregnancy-related anxiety is a negative emotion that is associated with various concerns, including concerns about the time and place of childbirth, maternal health during pregnancy and delivery, postpartum health, neonatal health, and the parenting role (3). Many studies have shown that psychiatric disorders begin to rise during pregnancy, and anxiety is the most common psychiatric disorder in this period (4, 5). A meta-analysis of 102 studies showed that the prevalence of anxiety before childbirth ranged from 18.2% in the first trimester to 24.6% in the

third trimester (6). The anxiety prevalence has been reported as 18% to 30% in Iran (7). Previous studies have shown that anxiety has different effects on the mother, fetus, and the child (8, 9). Maternal complications include preterm birth, difficult birth, and preeclampsia (10). Fetal complications include low fetal growth and low birthweight (8, 11, 12). Childhood and adulthood complications include emotional problems, cognitive-behavioral disorders, anxiety, depression, and serious diseases such as asthma and coronary artery disease (13, 14). The national guidelines in the UK (15), the US (16), and Australia (17) have recently emphasized the vital need for treating pregnancy-related anxiety respecting that identifying anxiety is the first step to its treatment in pregnant women.

Many different interventions have been conducted to reduce pregnancy-related anxiety, including anti-anxiety drugs such as benzodiazepines (18) and non-medicinal

interventions such as reflexology, massage therapy (19), aromatherapy (20), and music therapy (21). Psychological therapies such as counseling have also been proposed for reducing anxiety in pregnant women (22). Nowadays, counseling interventions are proposed by researchers to reduce the consumption of anti-anxiety drugs and prevent the side effects of these drugs, including drowsiness, sleepiness, dizziness, preterm delivery, and miscarriage (23-25).

One of the counseling approaches is Acceptance and Commitment Therapy (ACT) that is a psychological therapy belonging to the third generation of Cognitive-Behavioral Therapies (CBTs) proposed by Steven C. Hayes in 1986.

Counseling therapeutic approaches, such as CBT work through the avoidance of unpleasant thoughts and feelings. In the ACT, however, the patient is assisted in accepting the pain caused by unpleasant thoughts and feelings and makes the commitment that pain is an inevitable aspect of the life for everyone and attempts to avoid the suffering caused by pain as a more unpleasant feel of pain (26). What makes ACT different from other therapeutic methods is the use of metaphors, which makes therapy sessions more attractive and dynamic for patients (27).

The main objective of ACT is to increase psychological flexibility through six processes, including acceptance, mindfulness, cognitive defusion, self as context, values, and committed action. In this method, the patients learn that avoiding unpleasant thoughts and feelings not only fails to improve anxiety, but also exacerbates it. In the ACT, the patient eventually accepts that anxiety is an inevitable part of life and that it is possible to live a meaningful life despite having anxiety. In this method, patients learn to be aware of all their thoughts and feelings at the moment (present-moment awareness), detach themselves from these subjective experiences (defusion), and do not consider themselves the same as the context that they have formed of themselves in their mind (self as context). The patients receive guidance on how to identify their personal values and act in a committed manner toward their realization (28).

Several studies have been conducted on the positive effects of ACT on anxiety disorders, obsessive-compulsive disorders (29), social anxiety disorder and panic disorder (30), generalized anxiety disorder (31), post-traumatic anxiety disorder (32), breast cancer (33), chronic pain (34), adolescents' depression (35), and anorexia (36). However, to the best of our knowledge, no study had examined the effect of ACT during pregnancy on anxiety relief.

## 2. Objectives

The present study was conducted to assess the effect of ACT on anxiety and quality of life of pregnant women.

## 3. Methods

The present randomized clinical trial was conducted on 44 pregnant women visiting the health centers of Arak, Iran. Based on the formula for comparison of proportions ( $P_1= 67.2$ ,  $P_2= 34.5$ ) and given the power of 80% and  $\alpha$  of 0.05, the sample size was estimated at 22 in each group. The inclusion criteria included being a pregnant woman in the second or third trimester with a singleton pregnancy without chronic diseases, miscarriage, preterm labor symptoms, infertility, hypertension, placental abnormalities, rupture of the amniotic sac, obesity, diabetes (37), no history of psychological disorders or the use of psychotropic medications, no history of prenatal hospitalization, a minimum of primary school education, age of 18 - 35, and no addiction to alcohol, smoking, or narcotics. The exclusion criteria included the mother's absence in more than two training sessions and failure to perform the exercises and home assignments. The intervention and control groups were matched in terms of demographic and pregnancy variables. Data were collected using three questionnaires: (1) a demographic questionnaire (with items on age, parity, planned or unplanned pregnancy, the number of living children, education, occupation, and spouse's age, education, and occupation), (2) Van den Bergh's Pregnancy-Related Anxiety Questionnaire (PRAQ), and (3) the 36-item Short-Form Health Survey (SF-36).

The PRAQ was designed in 1989 to measure pregnancy-related fear and concern, including fear of childbirth (14 items), fear of giving birth to a child with physical or mental health issues (five items), fear of changes in the marital relationship (13 items), fear of changes in mood and its consequences for the child (16 items), self-centered fear or fear of changes in the personal life of the mother (seven items), and general anxiety during pregnancy (three items). The total score is the sum of the scores of all the items. The items are scored based on a seven-point Likert scale from 0 to 6. Higher scores indicate higher anxiety. The psychometric assessment of the PRAQ showed an acceptable correlation coefficient with the Spielberger state-trait anxiety questionnaire. The Cronbach's alpha coefficients were reported as 0.76 for all the subscales of the questionnaire throughout pregnancy (38). This questionnaire has high content validity, as well (39).

The quality of life was assessed using the SF-36, which contains eight subscales, including physical functioning,

physical role functioning, emotional role functioning, vitality, mental health, social role functioning, bodily pain, and general health perceptions. The items are either answered as 'yes' and 'no' or on a six-point Likert scale. The test-retest reliability of the SF-36 was reported as 0.84 and its validity as 0.934 (40).

### 3.1. Methods

The sample was selected randomly in November 2016. Arak city was divided into five districts (north, south, east, west, and center). One public health center was chosen from each district by drawing lots. Out of 100 women, 44 eligible women were selected for the study using convenience sampling. The subjects gave their written informed consent. The allocation to the control and intervention (ACT) groups (n=22 in each group) was done using double-arm blocks ("A" and "B") by the RAND function of excel software.

In the intervention group, one of the women was excluded from the study for the risk of miscarriage, and another one refused to participate. Thus, 20 women ultimately completed the sessions in this group. In the control group, one of the participants moved to another city; thus, the study ended with 21 control subjects (CONSORT Chart 1). In this study, we used intention-to-treat analysis approach.

The participants were briefed about the study and then asked to read the questionnaire items carefully and choose the best answers. The subjects' anxiety and quality of life were assessed in both groups before beginning the intervention by the researcher who was an M.Sc. student in midwifery counseling supervised by an expert in clinical psychology as the advisor professor. The ACT protocol (41) was performed during prenatal and extra prenatal visits for each intervention group over eight 90-minutes sessions held twice a week. The control group received no interventions but routine pregnancy care. The ACT protocol (41) was modified to focus on anxiety during pregnancy and validated by psychologist experts who were assistant professors at Tehran and Arak Universities. The follow-up of the ACT group was carried out by phone call one month after the completion of the sessions. Immediately after the sessions and one month later, the questionnaires were redistributed to the intervention and control groups to fill out. We did not have any missing data because the completion of questionnaires was precisely controlled by researchers. The content of the training sessions was presented to the control group as pamphlets after data analysis.

Table 1 presents a summary of the content of the sessions. Each intervention session involved assignments, group feedback, appropriate exercises, and review of the

content of previous sessions. The data extracted from the questionnaires were analyzed by the SPSS Statistics for Windows, version 18.0 (SPSS Inc., Chicago, Ill., USA). The demographic variables were assessed using the Fisher exact test, t-test, and repeated-measures test with the confidence interval of 95%.

### 3.2. Ethical Considerations

This study was approved by the Ethics Committee of Arak University of Medical Sciences (IR.ARAKMU.REC.1395.230) and registered at the Iranian Registry of Clinical Trials (IRCT2016092429949N1). The intervention was carried out after obtaining permission from the university officials and presenting it to the officials of health centers. The ethics of research, including obtaining informed consent and ensuring the confidentiality of the data, were observed at all stages of the study, and the participants completed informed consent forms.

## 4. Results

The demographic variables presented in Table 2 show the lack of a significant difference between the ACT (22.6 ± 1.515) and control (22.1 ± 1.383) groups (P = 0.205) in terms of the mean age. For the main outcomes of the study (anxiety and quality of life), the presumption of normality was established using Shapiro-Wilk test for all variables (P > 0.05) (Tables 3 and 4 and Figure 1).

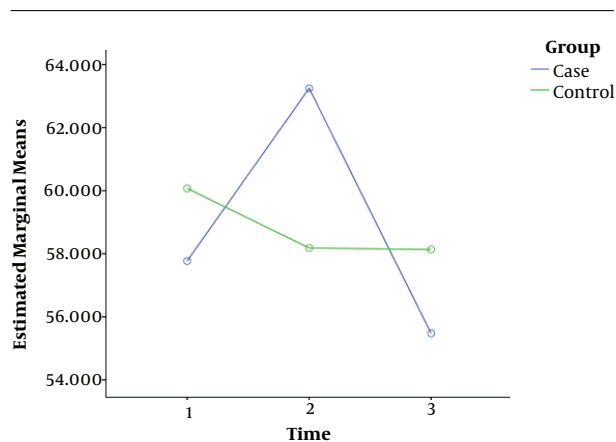


Figure 1. Mean quality of life before ACT, after ACT, and one month later in the intervention and control groups

The difference between the three measurement times (before ACT, after ACT, and one month later) in fear of changes in the personal life of the mother was not significant (P = 0.055). The interaction of group with time was significant (P = 0.001). In the control group, the mean score

**Table 1.** The Protocol of ACT Sessions Targeting Pregnancy-Related Anxiety in Women

Session	Protocol
1	Title: Welcoming and introduction to ACT. Content: (1) The familiarity of group members and the therapist, (2) Explaining the rules of the group, (3) A discussion of pregnancy, (4) A general description of the therapy approach, (5) Explaining pain and suffering, (6) Practicing mindfulness in the class and giving it as a home assignment
2	Title: Living in the present and mindfulness. Content: (1) A summary of the previous session and review of the assignments, (2) Answering questions, (3) A discussion of anxiety, (4) Explaining the objectives of ACT counseling, (5) The importance of living in the present moment and avoiding fusions with the past and the future, (6) A discussion of mindfulness and its goals and practicing it (having chocolates), (7) Home assignment: Writing down any unpleasant thoughts and feelings
3	Title: Experimental avoidance. Content: (1) A summary of the previous session and review of the assignments, (2) Answering questions, (3) 'Which do you choose: Mind control or moving toward the values?', (4) Using the "little tiger" and "the man in the hole" metaphors, (5) The polar bear exercise, (6) Home assignment: Writing down strategies for helping control unpleasant thoughts and feelings
4	Title: Acceptance. Content: (1) A summary of the previous session and review of the assignments, (2) Answering questions, (3) Acceptance: A new way of living with anxiety, (4) Using the "unwelcome party guest" (through a video) and the "bus" metaphors, (5) Home assignment: Writing about the short- and long-term effects of the control strategies
5	Title: Defusion. Content: (1) A summary of the previous session and review of the assignments, (2) Answering questions, (3) Defusion: Detachment from thoughts, (4) Role-play and practicing "taking your mind for a walk", (5) Using the "leaves on a stream" metaphor, (6) Home assignment: The use of defusion metaphors
6	Title: Self as context. Content: (1) A summary of the previous session and review of the assignments, (2) Answering questions, (3) Self as context: You are more than your life story, (4) A discussion of self as content, (5) Using the "chessboard" metaphor, (6) Home assignment: Practicing self-narratives
7	Title: Values. Content: (1) A summary of the previous session and review of the assignments, (2) Answering questions, (3) Identifying important life values and moving toward them, (4) Differentiating between "values" and "goals" (through a video), (5) Using dartboard exercises, (6) Home assignment: Writing down personal life values and prioritizing them
8	Title: Committed action. Content: (1) A summary of the previous session and review of the assignments, (2) Answering questions, (3) Helping the participants use barrier management techniques while moving toward their values and helping them learn committed action, (3) Practicing mindfulness with a focus on the completion of therapy, (4) End of the sessions and distribution of the questionnaires, expressing gratitude to the participants and saying goodbyes

of the fear of changes in the personal life of the mother increased during the study period. But in the intervention group, it first decreased and then increased. At both measurement times (after ACT and one month later), the mean score of the first dimension of anxiety was lower in the intervention group than in the control group.

The mean score of the second dimension of anxiety (fear of giving birth to a child with physical or mental health issues) was not significantly different between the three measurement times (before ACT, after ACT, one month later) ( $P = 0.150$ ). The interaction between group and time was significant ( $P = 0.001$ ). In the control group, the mean score of the second dimension of anxiety increased during the time. But in the intervention group, it reduced first and then remained constant. At both time points (after ACT and one month later), the mean score of the second dimension of anxiety was lower in the intervention group than in the control group.

The mean score of the third dimension of anxiety (fear of childbirth) was not significantly different between the three measurement times (before ACT, after ACT, and one month later) ( $P = 0.069$ ). The interaction between group and time was significant ( $P = 0.001$ ). In the control group, during the period, the mean score of the third dimension of the change was anxiety. But in the intervention group, it first decreased and then increased. At both time points (af-

ter ACT and one month later), the mean score of the third dimension of anxiety was lower in the intervention group than in the control group.

The mean score of the fourth dimension of anxiety (fear of changes in mood and its consequences for the child) was not significantly different between the three measurement times (before ACT, after ACT, and one month later) ( $P = 0.05$ ). The interaction between the group and time was significant ( $P = 0.05$ ). In the control group, the mean score of the fourth dimension of anxiety increased during the period. But in the intervention group, it first decreased and then increased. At both time points (after ACT and one month later), the mean score of the fourth dimension of anxiety was lower in the intervention group than in the control group.

The mean score of the fifth dimension of anxiety was significantly different between the three measurement times (before ACT, after ACT, and one month later) ( $P = 0.294$ ). The interaction between group and time was significant ( $P = 0.001$ ). In the control group, the mean score of the fifth dimension of the variable was anxiety during the time. But in the intervention group, it first decreased and then increased. At both time points (after ACT and one month later), the mean score of the fifth dimension of anxiety was lower in the intervention group than in the control group.

**Table 2.** The Demographic and Obstetric Variables of the Pregnant Women in the ACT and Control Groups<sup>a</sup>

Variable	ACT (N = 20)	Control (N = 21)	P Value
Age	22.6 ± 1.515	22.1 ± 1.383	0.205 <sup>b</sup>
Parity	1.2 ± 0.4	1.4 ± 0.5	0.6 <sup>b</sup>
Number of living children	0.3 ± 0.6	0.4 ± 0.5	0.089 <sup>b</sup>
Spouse's age	25.3 ± 4.028	25.3 ± 3.805	0.970 <sup>b</sup>
Spouse's education			0.06 <sup>c</sup>
University	3 (14.3)	8 (40)	
Non-university	18 (85.7)	12 (60)	
Occupation			0.42 <sup>c</sup>
Housewife	19 (95.5)	20 (95.2)	
Employed	0 (0)	1 (4.8)	
Self-employed	1 (5)	0 (0)	
Education			0.061 <sup>c</sup>
University	8 (40)	4 (19)	
Non-university	12 (60)	17 (81)	
Spouse's occupation			0.51 <sup>c</sup>
Worker	8 (40)	12 (57.2)	
Employed	4 (20)	2 (9.5)	
Self-employed	8 (40)	3 (33.3)	
Type of pregnancy			0.738 <sup>c</sup>
Planned	18 (90)	18 (85.7)	
Unplanned	2 (10)	3 (14.3)	

<sup>a</sup>Values are expressed as mean ± SD or No. (%).

<sup>b</sup>t-test.

<sup>c</sup>Fisher exact test.

The mean score of total anxiety was not significantly different between the three measurement times (before ACT, after ACT, and one month later) ( $P = 0.054$ ). The interaction between group and time was significant ( $P = 0.001$ ). In the control group, the mean score of total anxiety increased during the time, but in the intervention group, it first decreased and then increased. At both time points (after ACT and one month later), the mean score was lower in the intervention group than in the control group.

The mean score of the first dimension of the quality of life (physical functioning) was significantly different between the three measurement times (before ACT, after ACT, and one month later) ( $P = 0.013$ ). Over time, the mean score of physical functioning decreased. Also, the mean score was not significantly different between the two groups ( $P = 0.679$ ).

The mean score of the second dimension of quality of life (physical role functioning) had a significant difference between the three measurement times (before ACT, after ACT, and one month later) ( $P = 0.012$ ). The interaction be-

tween group and time was significant ( $P = 0.017$ ). In the control group, the mean score of physical role functioning was constant during the study period, but in the intervention group, it first increased and then decreased.

The mean score of the third dimension of quality of life (emotional role functioning) was not significantly different between the three measurement times (before ACT, after ACT, and one month later) ( $P = 0.494$ ). The mean score of emotional role functioning was not significantly different between the two groups ( $P = 0.249$ ).

The mean score of the fourth dimension of quality of life (vitality) had a significant difference between the three measurement times (before ACT, after ACT, and one month later) ( $P = 0.021$ ). The interaction between group and time was significant ( $P = 0.002$ ). In the control group, the mean score of vitality was constant during the time, but in the intervention group, it first increased and then decreased. At all three time points, the mean vitality was greater in the intervention group than in the control group.

The mean score of the fifth dimension of quality of life

**Table 3.** The Mean of the Components of Anxiety and Total Anxiety Before ACT, After ACT, and One Month Later in the ACT and Control Groups<sup>a, b</sup>

Pregnancy-Related Anxiety	ACT	Control	P Value Group	P Value Time	P Value Time × Group
<b>Self-centered fears or fear of changes in the personal life of the mother</b>			0.518	0.055	0.001
Before	52.82 ± 16.993	41.3333 ± 13.16			
After	37.52 ± 12.98	48.66 ± 11.20			
One month later	41.235 ± 15.50	49.571 ± 12.33			
<b>Fear of giving birth to a child with physical or mental health issues</b>			0.491	0.150	0.001
Before	21.90 ± 6.016	14.90 ± 6.72			
After	14.15 ± 6.33	19.33 ± 6.11			
One month later	14.00 ± 6.21	19.285 ± 6.81			
<b>Fear of childbirth</b>			0.108	0.069	0.001
Before	53.45 ± 14.16	43.428 ± 17.20			
After	35.640 ± 13.03	53.76 ± 12.81			
One month after	41.941 ± 17.76	55.428 ± 13.27			
<b>Fear of changes in mood and its consequences for the child</b>			0.081	0.183	0.001
Before	62.70 ± 17.088	49.23 ± 16.67			
After	42.60 ± 12.12	61.142 ± 10.34			
One month later	47.58 ± 14.13	63.04 ± 11.90			
<b>Fear of changes in the marital relationship</b>			0.127	0.294	0.001
Before	28.05 ± 7.52	21.57 ± 9.51			
After	18.41 ± 7.25	27.85 ± 9.51			
One month later	20.52 ± 7.2	28.04 ± 7.73			
<b>Total Anxiety</b>			0.101	0.54	0.001
Before	219.05 ± 51.01	170.47 ± 52.51			
After	148.35 ± 42.59	210.76 ± 30.21			
One month later	148.35 ± 54.74	215.38 ± 31.17			

<sup>a</sup>Values are expressed as mean ± SD.

<sup>b</sup>Repeated-measures test.

(mental health) had no significant difference between the three measurement times (before ACT, after ACT, and one month later) ( $P = 0.103$ ). The interaction between group and time was significant ( $P = 0.011$ ). In the control group, the mean score of mental health was constant during the time, but in the intervention group, it first increased and then decreased. At all three time points, the median mental health was higher in the intervention group than in the control group.

The mean score of the sixth dimension of quality of life (social role functioning) was not significantly different between the three measurement times (before ACT, after ACT, and one month later) ( $P = 0.127$ ). The mean social role functioning

(SF) was not significantly different between the two groups ( $P = 0.191$ ).

The mean score of the seventh dimension of quality of life (bodily pain) was not significantly different between the three measurement times (before ACT, after ACT, and one month later) ( $P = 0.467$ ). Also, the difference was not significant between the two groups ( $P = 0.399$ ).

The mean general health (GH) had a significant difference between the three measurement times (before ACT, after ACT, and one month later) ( $P < 0.005$ ). The interaction between group and time was significant ( $P < 0.011$ ). In the control group, the mean GH initially decreased and then remained constant over time, but in the intervention group, decreased after a primary increase. At both time points (after ACT and one month later), the mean GH was greater in the intervention group than in the control group.

The mean score of the total quality of life was not sig-

**Table 4.** The Mean of the Components of Quality of Life Before ACT, After ACT, and one Month Later the Intervention in the ACT and Control Groups<sup>a, b</sup>

Quality of Life	ACT (N = 20)	Control (N = 21)	P Value Group	P Value Time	P Value Time × Group
<b>Physical functioning</b>			0.679	0.013	0.355
Before	70.00 ± 16.543	71.190 ± 18.967			
After	66.76 ± 18.10	66.904 ± 19.524			
One month later	61.470 ± 19.666	67.381 ± 18.276			
<b>Physical role functioning</b>			0.573	0.012	0.017
Before	45.58 ± 39.76	52.38 ± 38.65			
After	58.82 ± 35.29	52.976 ± 39.50			
One month later	33.823 ± 35.29	52.381 ± 38.65			
<b>Emotional role functioning</b>			0.249	0.494	0.616
Before	35.29 ± 44.83	52.381 ± 35.85			
After	42.833 ± 32.86	52.381 ± 32.61			
One month later	37.245 ± 38.778	49.206 ± 34.34			
<b>Vitality</b>			0.096	0.021	0.002
Before	54.86 ± 24.48	51.50 ± 18.14			
After	68.52 ± 12.59	49.250 ± 16.081			
One month later	56.470 ± 18.937	50.250 ± 16.895			
<b>Mental health</b>			0.094	0.103	0.011
Before	59.76 ± 26.09	55.238 ± 20.223			
After	71.76 ± 18.99	51.809 ± 17.0			
One month later	58.823 ± 20.72	53.142 ± 19.47			
<b>Social role functioning</b>			0.886	0.127	0.191
Before	63.97 ± 22.04	66.071 ± 16.83			
After	72.20 ± 15.43	66.071 ± 13.19			
One month later	63.236 ± 20.477	65.119 ± 17.59			
<b>Bodily pain</b>			0.237	0.467	0.399
Before	60.88 ± 18.02	69.881 ± 20.48			
After	67.64 ± 16.38	68.452 ± 14.39			
One month later	61.617 ± 18.56	67.261 ± 13.03			
<b>General health perceptions</b>			0.614	0.005	0.011
Before	63.60 ± 24.33	69.34 ± 23.37			
After	64.550 ± 20.477	55.7 ± 15.714			
One month later	60.294 ± 16.05	55.47 ± 19.22			
<b>Quality of life</b>			0.994	0.052	0.026
Before	57.77 ± 17.75	60.07 ± 14.20			
After	63.24 ± 15.18	58.182 ± 13.49			
One month later	55.47 ± 15.10	58.135 ± 13.86			

<sup>a</sup>Values are expressed as mean ± SD.

<sup>b</sup>Repeated-measures test.

nificantly different between the three measurement times (before ACT, after ACT, and one month later) (P = 0.052). The

interaction between group and time was significant (P = 0.026). In the control group, the mean score of total qual-

ity of life was constant during the time, but in the intervention group, it first increased and then decreased.

## 5. Discussion

The present randomized clinical trial was conducted to determine the effect of ACT on pregnancy-related anxiety and quality of life in 41 pregnant women. The results showed that ACT could significantly reduce pregnancy-related anxiety. After attending the training sessions, the participants were empowered to live in the present moment rather than focusing on the past and future and to move toward their personal values and goals by recognizing them. Moreover, instead of reducing anxiety, they fostered a willingness to experience this emotion. In this study, maternal anxiety was measured using Van den Bergh's Pregnancy-Related Anxiety Questionnaire. The results showed no reductions in the mother's fear of giving birth to a child with physical or mental health issues, but the intervention reduced her fear of childbirth, fear of changes in the marital relationship, fear of changes in mood and its consequences for the child, and self-centered fears or fear of changes in her private life.

Pregnant women experience different types of fear that the most common cause of harm to the infant (42). This perception is highly stressful for pregnant women and ACT appears to detach this group from anxiety-provoking thoughts. Cognitive fusion can explain the women's failure in personally overcome these fears because the subjects' thoughts and behaviors are so inter-fused that the subject ends up distancing herself from the present moment and her values (43). Another reason for this failure might be the lack of a specific tool for assessing cognitive fusion.

The present study showed that mothers' pregnancy-related anxiety was originated from their fear of childbirth, its time and place, and their own health during childbirth. These thoughts make them constantly dwell in the future. In the training sessions, the pregnant women practiced and learned mindfulness through exercises. In this scenario, mindfulness means a focus on different aspects of anxiety with an open mind and curiosity and an emphasis on what happens in the present moment, whether pleasant or unpleasant (44). In the present study, pregnant women were taught to pay attention to their fetuses and their movements whenever they had these thoughts. With ACT, the fear of childbirth reduced significantly through mindfulness exercises.

A study conducted on the effect of mindfulness on maternal stress showed reductions in perceived maternal stress and pregnancy-related anxiety (3). Another study conducted on women presenting to outpatient psychiatric

units confirmed the effectiveness of ACT in the treatment of mood and anxiety disorders (45). A case study using a combination of ACT and the exposure method showed that the treatment of agoraphobia and severe pregnancy-related anxiety was possible with these methods. The authors recommended further studies on these two methods (46). It seems that other counseling methods can also be effective in reducing pregnancy-related anxiety. The results of a study of anxiety treatment in pregnant women using cognitive-behavioral techniques showed that fear of childbirth was significantly lower in the intervention group than in the control group (47); these results are in line with the present findings. The results of another study showed that teaching stress coping skills can significantly reduce perceived stress in pregnant women (48).

Pregnancy-related anxiety appears to not be limited to childbirth issues; other problems, such as marital issues, are also a cause of anxiety in pregnancy. In the present study, the fear of changes in the marital relationship reduced significantly after counseling based on ACT. Dart-board exercises were also used in this method (41). In this exercise, the subjects' values were clarified, and they learned that the family unit could help increase psychological flexibility and reduce anxiety. A study conducted on the effect of cognitive-behavioral therapy on 24 women with pregnancy-related anxiety found significant differences between the groups in all components of childbirth anxiety except for the fear of changes in the marital relationship (49), which is not consistent with the present findings. The study of the effect of cognitive-behavioral counseling on sexual functioning in 22 pregnant women showed that eight 90-minute counseling sessions could improve women's sexual functioning and increase their sexual satisfaction (50).

Anxiety can also be due to the fear of changes in mood and its consequences for the child. People often use avoidance strategies to cope with anxiety, but the intervention given in this study helped pregnant women use ACT skills through metaphors to accept anxiety. Using "the man in the hole" metaphor (44), the subject learned that avoiding anxiety and controlling it may have anxiety-reducing effects in the short-term, but they have rather destructive effects in the long-term and cause inflexibility and dysfunction. "The unwelcome guest" (44) also helped patients accept their anxious thoughts and feelings and consider them less threatening.

The present study also showed a significant reduction in self-centered fears or fear of changes in the personal life of the mother following ACT. Before therapy, the mothers equated themselves with their thoughts. By using the "chessboard" metaphor (44), pregnant women learned to see themselves as the context and view their thoughts only



as part of themselves; that is, their thoughts no longer made up their entire self, and their identity was distinct from their thoughts.

Nonetheless, the present findings showed no differences in the quality of life between women who received ACT and the control group. The quality of life during pregnancy appears to be strongly affected by the physiological and pathological changes in this period, and further studies seem necessary for improving pregnant women's quality of life.

In contrast to the present findings, a study on the effect of ACT on hypochondriacs showed an improved quality of life in this group in a 10-month follow-up (41). This improvement can be attributed to the duration of the follow-up. Another study showed that ACT was effective in treating anxiety and improving the quality of life (31), which disagrees with the present findings; this disparity of the results could be due to the different questionnaires used to assess the quality of life. In another study using ACT for healthy adaptation to a difficult situation, the quality of life improved in the subjects (51), which also disagrees with the present findings. This disparity of the results can be mainly attributed to different conditions experienced by the participants since the quality of life during the nine months of pregnancy is not comparable with the quality of life of a cancer patient.

ACT works on unwanted inner experiences. Barriers can form in the daily life of pregnant women that can create new behavioral patterns and might affect different aspects of the quality of life. Given the duration of the sessions and the particular conditions of pregnant women, the conditions were not conducive for some of the subjects; however, statistically, ACT did not fail to improve quality of life, and this index should be assessed more extensively using other tools.

Given that pregnancy leads to unique physiological changes and increases anxiety, further assessment of the psychological and social needs of pregnant women is necessary, and steps should be taken to reduce their anxiety by improving their quality of life.

### 5.1. Conclusions

Although ACT could not improve the quality of life of pregnant women, using mindfulness, cognitive defusing, self as context, values, and committed action, it helped reduce anxiety in this group. The assessment of the effect of ACT on the quality of life requires further studies. The low sample size was the limitation of this study.

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### Footnotes

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