KMAN PUBLISHING INSTITUTE
Journal Website

Article history:
Received 09 May 2024
Revised 11 July 2024
Accepted 21 July 2024
Published online 01 August 2024

Applied Family Therapy Journal

Volume 5, Issue 4 (SPECIAL ISSUE ON WOMEN), pp 74-85

E-ISSN: 3041-8798

Effectiveness of Acceptance and Commitment Therapy on Pregnancy Concerns, Stress Coping Schemas, and Interpersonal Sensitivity in Pregnant Women with Pregnancy Anxiety

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A r t i c l e I n f o

Article type:
Original Research

How to cite this article:
Davoudi, M., Pouladi Rishehri, A., & Danesh, E. (2024). Effectiveness of Acceptance and Commitment Therapy on Pregnancy Concerns, Stress Coping Schemas, and Interpersonal Sensitivity in Pregnant Women with Pregnancy Anxiety. *Applied Family Therapy Journal*, *5*(4), 74-85.
http://doi.org/10.61838/kman.aftj.5.4.9

A B S T R A C T

Objective: The aim of the present study was to determine the effectiveness of Acceptance and Commitment Therapy (ACT) on pregnancy concerns, stress coping schemas, and interpersonal sensitivity in pregnant women with pregnancy anxiety.
Methods: The research method was quasi-experimental, utilizing a pre-test, post-test design with a control group and a two-month follow-up phase. The statistical population consisted of all pregnant women with pregnancy anxiety at Shaheed Beheshti Women's Hospital in the city of Nowshahr, who scored one standard deviation above the mean and were willing to participate in the therapy sessions. A purposive sampling method was used to calculate a sample size of 75 participants (at least 25 per group). These 75 participants were then randomly assigned to two groups of 25 each (25 in the ACT experimental group and 25 in the control group). The Parker Interpersonal Sensitivity Questionnaire (1989), Wong and colleagues' Stress Coping Schemas (2006), and Alderdice and Lynn's Pregnancy Concerns Questionnaire (2011) were distributed among them. As mentioned, after collecting the data from the initial sample, the data were entered into SPSS software version 26.
Findings: The results showed that Acceptance and Commitment Therapy significantly reduced pregnancy concerns (F=68.93, P<0.001), interpersonal sensitivity (F=39.73, P<0.001), and increased stress coping schemas (F=265.90, P<0.001) in pregnant women with pregnancy anxiety.
Conclusion: It can be concluded that Acceptance and Commitment Therapy is effective on the dimensions of stress coping schemas in the subjects.

Keywords: *pregnancy, stress coping schemas, interpersonal sensitivity, Acceptance and Commitment Therapy.*

1. Introduction

Although pregnancy and childbirth are a part of the natural developmental process in women, the fact remains that despite advancements in prenatal care and education regarding physiological aspects, the psychological dimensions of pregnant women are rarely addressed (Campillo et al., 2017). Anxiety is the anticipation of a future threat (Hossein Khanzadeh et al., 2017). For women, pregnancy represents a life change that affects marital quality and makes motherhood stressful. Motherhood is a dynamic, learnable, and stressful process influenced by pregnancy conditions, the quality of marital relationships, spousal support, and cultural and social factors (Moulds et al., 2022; Tsartsara & Johnson, 2006). Anxiety and worry in pregnant women are associated with less sensitivity, intimacy, and independence, poor postnatal child care quality, and a higher incidence of anxiety disorders in children (Gdańska et al., 2017; Moulds et al., 2022; Tinglöf, 2015).

The first trimester is the acceptance phase of pregnancy, characterized by ambivalent feelings (pleasure and hatred) towards the fetus and self-focus. The second trimester is the acceptance phase of the fetus, marked by primary focus on the fetus, narcissism, and self-absorption. The third trimester is the preparation phase for birth, characterized by increased dependency on others (Moshki, Armanmehr & Cheravi, 2015). The psychological processes of the mother significantly impact fetal development and health, as the intrauterine environment is continuously influenced by the mother's emotions and psychological state. Pregnancy anxiety is sometimes viewed as a natural mechanism to cope with the mental concern about having a child, potentially preparing the mother for pregnancy and its changes. However, anxiety can become pathological, severely affecting the mother's mental health (Molgora et al., 2022; Moulds et al., 2022). Numerous factors during pregnancy can contribute to anxiety, with specific aspects being stressful for each woman. The frequency and intensity of anxiety depend on the woman's perception of stressors and her ability to cope with anxiety (Cersonsky, 2024; Choi et al., 2015; Fido, 2004).

Anxiety can also decrease the quality of relationships with spouses and children, reducing overall quality of life. Culturally, pregnant women may view their anxiety as a psychological issue, often describing it as a lack of willpower and fear of marital discord. The most common complaint among pregnant women about their anxiety is the fear of childbirth and its impact on their interpersonal relationships with their spouse (You et al., 2019). Pregnancy alone is so stressful that it can lead to psychological disorders, either triggering new issues or exacerbating preexisting conditions (Ryding et al., 1998; Tsartsara & Johnson, 2006; Vaajala et al., 2023).

High levels of anxiety during pregnancy not only increase the likelihood of choosing cesarean sections but also raise the risk of depression, anxiety, and reduced breastfeeding post-delivery. This can result in behavioral problems such as hyperactivity, negative emotions, irritability, excessive crying, and unstable conditions in infants, as well as impaired mental development at age two (Zemestani & Fazeli Nikoo, 2019).

Discomforts from episiotomy, negative body image, and hormonal changes may lead to sexual and marital relationship issues, creating another source of worry for mothers (Fitzpatrick, Kalbushuska & Dawson, 2021). Increased interpersonal sensitivity during this period can significantly contribute to the onset and persistence of pregnancy anxiety. When a stressor affects one's life, emotional and physiological thinking deviates from normal and balanced levels, cognitive activities become vulnerable, and behavioral problems manifest as anxiety and depression (Collins et al., 1992; Faramarzi & Pasha, 2015; Goudarzi et al., 2021a, 2021b; Hasanzadeh et al., 2013). Interpersonal sensitivity refers to distrust, inability to accept criticism, sensitivity to rejection, feelings of being attacked, jealousy, avoidance of intimate emotional relationships, inability to move on after ending close relationships, and lack of independence in group relations (Aydoğdu et al., 2017; Boyce et al., 1993; Jadidi & Sharifi, 2018; Khoshsorour & Mikaeili, 2021; Liu, 2024; Miller & Lenzenweger, 2012; Mohammadian et al., 2018).

Another factor influencing perception, especially under stress, is schemas. Cognitive processing occurs based on schemas. Maladaptive schemas create negative automatic thoughts. Pregnant women with pregnancy anxiety, like anxious individuals, have threatening and dangerous schemas (Abbasi et al., 2022; Cersonsky, 2024; Choi et al., 2015). These schemas cause individuals to encode and recall information consistent with their knowledge structure (Tsartsara & Johnson, 2006; Tunnell et al., 2019; Wu et al., 2021). Additionally, people in a particular mood have generalized schemas that align with their emotional state; thus, a sad person has schemas of sadness and depression for organizing information (Angazi et al., 2023; Feyzi et al., 2017; Goudarzi et al., 2021a). Stress coping schemas

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prioritize changing conditions and situations to cope with stress. Coping with stress through changing cognitions, attitudes, or behaviors is an effective therapeutic method. However, individuals using emotional schemas focus more on managing emotional reactions than solving problems or changing situations (Faramarzi & Pasha, 2015; Hasanzadeh et al., 2013).

Acceptance and Commitment Therapy (ACT), with its emphasis on flexibility, can be applied to many psychological problems and disorders. The goal of this therapy is not to change the form or frequency of distressing thoughts and feelings but to enhance psychological flexibility. There is substantial research evidence supporting the role of psychological inflexibility in a wide range of psychological disorders, including anxiety, depression, and impaired functioning (Feyzi et al., 2017; Tunnell et al., 2019) ACT assumes that people find many of their internal experiences (feelings, emotions, thoughts) distressing and continually attempt to change or escape them (Tunnell et al., 2019). This therapeutic approach helps clients recognize what truly matters to them and then use these values to guide behavioral changes in their lives. ACT gets its name from its core message: accept what is out of personal control and commit to action that enriches life. The goal is to help clients create a rich, full, and meaningful life while accepting the inherent challenges of life. By using ACT strategies, emotional responses to stressful events can be regulated, allowing individuals to respond to diverse environmental events with greater flexibility (Feyzi et al., 2017). ACT increases psychological flexibility and improves emotional regulation, making it effective in addressing various psychological issues, including pregnancy anxiety and interpersonal sensitivity in pregnant women. Given the above, this study aims to determine the effectiveness of ACT on pregnancy concerns, stress coping schemas, and interpersonal sensitivity in pregnant women with pregnancy anxiety.

2. Methods

2.1. Study design and Participant

This research employed a quasi-experimental method with a pre-test, post-test design, a control group, and a two-month follow-up phase. After determining and randomly assigning the experimental and control groups (25 participants each), the experimental group received ACT (seven 90-minute sessions), while the control group received no training or intervention. The statistical population consisted of all pregnant women with pregnancy anxiety in Nowshahr in 2021-2022 who sought treatment at Shaheed Beheshti Women's Hospital. As new patients continued to seek treatment, the population size varied, but at the time of the study, 178 women with pregnancy anxiety had medical records. The sample size was calculated to be 50 participants (25 per group) using purposive sampling and the inclusion criteria. Pregnant women with pregnancy anxiety who visited the hospital and scored one standard deviation above the mean on the Vandenburg Pregnancy Anxiety Questionnaire (1990) and were willing to participate in therapy sessions were selected. The sample size was chosen based on three criteria: (1) statistical power, an alpha level of 0.05, and an effect size of 0.8, (2) the standard group size for group intervention programs (20-25 participants), and (3) previous similar studies. Inclusion criteria included a diagnosis of pregnancy anxiety, willingness to participate, complete questionnaire responses, commitment to attend all sessions, and at least a secondary education level. Exclusion criteria included unwillingness to participate, incomplete questionnaire responses, and missing more than two sessions.

After obtaining research approval, participants were recruited from Shaheed Beheshti Women's Hospital in Nowshahr. Eligible participants were selected through purposive sampling and randomly assigned to experimental and control groups. The pre-test was administered, followed by the intervention for the experimental group in one of the hospital's rooms to prevent interaction between groups. The post-test was conducted one week after the sessions ended, and a follow-up test was conducted two months later. Ethical considerations included providing participants with information about the research, ensuring voluntary participation, maintaining confidentiality, and analyzing data without identifying information. Data were collected using self-report questionnaires in the pre-test, post-test, and follow-up stages.

2.2. Measures

2.2.1. Pregnancy Anxiety

This questionnaire, developed by Vandenburg (1990), measures fears and concerns related to pregnancy and consists of 58 items rated on a five-point Likert scale. Scores range from 58 to 290. Cronbach's alpha for subscales during pregnancy ranges from 0.66 to 0.76. In Hyzenick et al. (2000), Cronbach's alpha for subscales was 0.76. In Babanazari & Kafi (2008), Cronbach's alpha was 0.89 for

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fear of childbirth, 0.45 for fear of congenital disabilities, 0.47 for concern about marital relationship changes, 0.68 for concern about mood swings, 0.65 for self-centered feelings, and 0.54 for overall scale, indicating good internal consistency (Hossein Khanzadeh et al., 2017). In the present study, Cronbach's alpha for each component and the overall scale during pregnancy was 0.59 for fear of childbirth, 0.61 for fear of physical-psychological disabilities, 0.65 for concern about marital relationship changes, 0.68 for concern about mood swings, 0.61 for self-centered feelings, and 0.80 for the overall scale.

2.2.2. *Interpersonal Sensitivity*

Developed by Boyce and Parker (1989), this questionnaire measures interpersonal sensitivity or sensitivity to social rejection, consisting of 36 items and five subscales: interpersonal awareness, need for approval, separation anxiety, shyness, and fragile self-esteem. It uses a four-point Likert scale, with scores ranging from 36 to 144. Higher scores indicate greater interpersonal sensitivity. Boyce and Parker reported a total score reliability of 0.86 and subscale reliabilities ranging from 0.55 to 0.76. In Birami, Hashemi, and Ashouri (2017), Cronbach's alpha was 0.84 (Khoshsorour & Mikaeili, 2021; Mohammadian et al., 2018). In this study, Cronbach's alpha for the total questionnaire was 0.83, with subscale reliabilities ranging from 0.61 to 0.79.

2.2.3. *Stress Coping*

Developed by Wong, Reker, and Peacock (2006), this questionnaire consists of 74 items rated on a Likert scale from 1 (never) to 5 (always). It has nine subscales: religious (9 items), situational (8 items), emotional detachment (12 items), social support (8 items), acceptance (9 items), active emotional expression (8 items), tension reduction (8 items), self-reconstruction (8 items), and meaning-making (4 items). Farahani and Khanipour removed 15 items based on factor analysis. Internal consistency reliability was calculated using Cronbach's alpha, ranging from 0.72 to 0.98 for subscales (Boostani & Tabatabaeinejad, 2023). In this study, Cronbach's alpha for subscales ranged from 0.72 to 0.98, with an overall alpha of 0.87.

2.2.4. *Pregnancy Concerns*

Developed by Alderdice and Lynn (2011), this 12-item questionnaire measures stress related to pregnancy, including fears and maternal concerns about fetal and maternal health, relationships, and childbirth. Items 1-5 address concerns about birth and baby, items 6-8 address concerns about weight and body image, and items 9-12 address emotional concerns. Rated on a five-point Likert scale, the questionnaire has shown good criterion validity, test-retest reliability, and internal consistency. In Fathi & Golak Khabbiri (2017), Cronbach's alpha was 0.72 for concerns about birth and baby, 0.78 for weight and body image, and 0.83 for emotional concerns (Ghafoori et al., 2020; Karamoozian et al., 2017).

2.3. *Intervention*

2.3.1. *Acceptance and Commitment Therapy*

The ACT intervention was delivered to the experimental group in seven 90-minute sessions (Hayes et al., 2006).

Session 1: Introduction and Establishing the Therapeutic Alliance

Objectives: Introduce group members, assess and measure symptoms, explain panic disorder and anxiety, understand the concept of control efforts and their futility.

Content: Formation of the group, establishment of therapeutic alliance, setting rules for therapy sessions, providing information on the problem, using the metaphor of a person in a well, discussing experiences and evaluating them, and conducting the pre-test.

Homework: Identify and attempt to control distressing emotions and feelings. Assignment to record daily experiences.

Session 2: Mindfulness and Acceptance

Objectives: Review the previous session's experiences and outcomes, receive feedback from clients, help clients realize that their control strategies for managing anxiety have been ineffective, encourage letting go of the struggle with symptoms, introduce the concept of here and now.

Content: Discussion of paradoxes, review of linguistic contracts, mindfulness exercises focused on fear and anxiety, full awareness of thoughts and feelings, presentation of paradoxes, diaphragmatic breathing, and mindful walking and sitting.

Homework: Discover avoided interpersonal situations and engage with them through acceptance, practice mindfulness.

Session 3: Openness and Acceptance

Objectives: Foster openness to and acceptance of difficult feelings and impulses, assess the client's ability to defuse from thoughts and emotions.

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Content: Intervening in problematic language patterns, understanding the wandering mind through metaphors such as the annoying neighbor, bus passengers, and the lion metaphor.

Homework: Practice openness and mindfulness exercises.

Session 4: Self-Observation and Behavioral Goals

Objectives: Review the previous session's experiences and feedback, enhance self-perception as an effective individual, establish contact with oneself and others.

Content: Viewing oneself as a context, breaking the habit of reasoning, reducing self-destruction through thoughts and emotions, distinguishing between conceptual self and observing self, practicing psychological polarity, and using the chessboard metaphor.

Homework: Practice observing thoughts and identify a simple behavioral goal requiring willingness and defusion.

Session 5: Values Clarification and Social Support

Objectives: Demonstrate the importance of values and help the client understand how values (willingness/acceptance) make them valuable, emphasize the need for willingness to activate behaviors, and introduce stress coping schemas for interpersonal and situational stress.

Content: Discuss potential internal and external barriers to following values, the concept of relapse and readiness to cope with it, identify and clarify life values, and focus on the power of choice.

Homework: Practice clarifying values, distinguish between values as behaviors versus values as feelings, identify and create connections, and seek social support.

Session 6: Committed Action and Emotional Management

Objectives: Value selection, goal setting, and committed action, continue identifying coping schemas, and recognize emotional detachment, emotional support based on acceptance, and active emotional expression.

Content: Explain the role of choice in committed actions using the gardener metaphor, rest, identify obstacles to goals and willingness to accept them using the bubble on the road metaphor, manage emotions.

Homework: Complete a worksheet on identifying obstacles and coping strategies, practice managing relationships and emotions.

Session 7: Consolidation and Future Planning

Objectives: Review previous discussions, consolidate the overall sessions, plan for continued practice, and conduct the post-test.

Content: Summarize discussions, review exercises for the future, emphasize the necessity of continued practice.

Homework: Receive feedback and set exercises for the future.

2.4. Data Analysis

Data were analyzed using descriptive statistics (mean and standard deviation) and inferential statistics (multivariate covariance analysis) to test hypotheses. Multivariate analysis of variance and repeated measures analysis were used to compare the effectiveness of interventions and determine the persistence of treatment effects. SPSS version 26 was used for data analysis.

3. Findings and Results

The mean age of the sample individuals in the Acceptance and Commitment Therapy (ACT) group is 30.40, and in the control group, it is 30.84. The results of the one-way ANOVA test showed that the age distribution of the research sample does not significantly differ among the three groups; in other words, the groups are matched based on the age variable. Descriptive indicators of the research variables and their dimensions in the control and experimental groups are presented in Table 1.

Table 1

Means and Standard Deviations of Pre-test, Post-test, and Follow-up Scores of Research Variables

Variable	Test Group	Pre-test Mean (SD)	Post-test Mean (SD)	Follow-up Mean (SD)
Interpersonal Sensitivity	Control	114.44 (4.52)	109.44 (4.42)	108.16 (5.81)
	Experimental	114.96 (5.57)	96.04 (4.86)	103.04 (5.99)
Pregnancy Concerns	Control	45.96 (1.98)	44.68 (2.05)	47.48 (2.78)
	Experimental	45.92 (1.75)	35.04 (2.33)	37.00 (1.93)
Stress Coping Schema	Control	200.52 (9.25)	185.88 (8.75)	173.76 (6.28)
	Experimental	206.80 (10.80)	249.56 (7.84)	233.92 (7.35)

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The results of the Shapiro-Wilk test indicated that the data in the pre-test and post-test had a normal distribution (P > 0.05). To test this hypothesis, repeated measures ANOVA was used since the group variable and the within-group test variable (post-test and follow-up) are present. Before performing ANOVA, assumptions need to be checked and data screened. The Shapiro-Wilk test was used to check the normality of data, confirming the normal distribution of dependent data. To examine the equality of covariances of the dependent variable, M-Box test was used, showing that the assumption of homogeneity of variance-covariance matrices was not met (M Box = 43.415, P < 0.01), thus the Pillai's Trace effect was reported. The results indicated that Mauchly's test of sphericity was significant (P < 0.001), necessitating the adjustment of degrees of freedom for interpreting within-group F tests, using the Lower-bound correction for interpreting main and interaction effects. When sphericity is not assumed, the Greenhouse-Geisser, Huynh-Feldt, and Lower-bound tests are used, with Huynh-Feldt being the most common.

Before examining between-group effects, the assumption of homogeneity of regression slopes using Levene's test was checked, showing no significant F values for any within-group factors, confirming the homogeneity of variance among groups of the independent variable. After confirming assumptions, analysis was performed. The results of the mixed ANOVA are shown in Table 2.

Table 2

Mixed ANOVA Results for Research Variables

Variable	Source	Sum of Squares	Df	Mean Square	F	Sig.	Eta Squared
Interpersonal Sensitivity	Pre-test	9814.56	1.87	5222.36	336.72	0.001	0.82
	Group	2316.17	3.75	616.22	39.73	0.001	0.52
	Error	2098.58	135.31	15.50			
Pregnancy Concerns	Pre-test	1810.42	1.76	1024.60	273.96	0.001	0.79
	Group	908.45	3.53	257.06	68.93	0.001	0.65
	Error	475.78	127.22	3.74			
Stress Coping Schema	Pre-test	14353.31	1.22	11711.04	260.87	0.001	0.78
	Group	292559.29	2.45	11936.50	265.90	0.001	0.88
	Error	3961.38	88.24	44.89			

As shown in Table 2, the within-group test results indicate that the main effect of test type on the score of interpersonal sensitivity dimensions is statistically significant (P < 0.05). This means there is a significant difference among the various levels of the test variable (pre-test, post-test, and follow-up). The partial eta squared of 0.32 for interpersonal awareness indicates that 32% of within-group changes can be explained by the tests. Similarly, the main effect of test type on the score of pregnancy concerns is statistically significant (P < 0.05), with a partial eta squared of 0.79, indicating that 79% of within-group changes can be explained by the tests. The interaction effect of test * intervention (P < 0.05) was significant, meaning the pre-test, post-test, and follow-up scores for pregnancy concerns differ among the three groups, with a partial eta squared of 0.65 indicating that 65% of changes are explained by the interventions. Similarly, the main effect of test type on stress coping schemas is statistically significant (P < 0.05), with a partial eta squared of 0.78, meaning 78% of within-group changes can be explained by the tests. The interaction effect of test * intervention (P < 0.05) was significant, indicating differing pre-test, post-test, and follow-up scores among the three groups, with a partial eta squared of 0.88 indicating that 88% of changes are explained by the interventions.

4. Discussion and Conclusion

The present study aimed to determine the effectiveness of Acceptance and Commitment Therapy (ACT) on pregnancy concerns, stress coping schemas, and interpersonal sensitivity in pregnant women with pregnancy anxiety. Based on the findings, it can be said that ACT has a significant effect on the dimensions of interpersonal sensitivity in the research sample. This part of the findings is consistent with the prior results (Farahzadi et al., 2018; Feyzi et al., 2017; Ghasemzadeh Barki & SHahgholian Ghahfarokhi, 2020; Howard et al., 2023))(Crosby & Twohig, 2016; Eifert et al., 2009; Forman et al., 2007; Hayes et al., 2006; Rajabi & Yazdkhasti, 2014; Zettle, 2007; Zettle, 2015).

ACT emphasizes comprehensive awareness combined with openness to acceptance (Rajabi & Yazdkhasti, 2014;

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Zettle, 2015), meaning that individuals allow disease-related thoughts to be present in the mind without trying to control them. When these experiences, including thoughts and feelings, are observed with openness and acceptance, even the most painful ones seem less threatening and more tolerable (Hayes et al., 2006), reducing ineffective control attempts. In this approach, patients are taught that any action to avoid or control these unwanted mental experiences is ineffective or counterproductive and that they must fully accept these experiences without any attempt to eliminate them (Forman et al., 2007). The primary goal of ACT interventions is to create psychological flexibility, enabling individuals to choose appropriate actions among various options rather than merely avoiding distressing thoughts, feelings, memories, or urges. This approach accepts changing the function of thoughts and feelings rather than their form, content, or frequency (Hayes et al., 2006). The main advantage of this method over other psychotherapies is considering motivational aspects alongside cognitive aspects, leading to more enduring therapeutic effectiveness (Rajabi & Yazdkhasti, 2014).

In this study, ACT reduced components of interpersonal sensitivity. The results showed that in the post-test phase, there was a significant difference in interpersonal sensitivity between the experimental and control groups, meaning that ACT had a significant impact on interpersonal sensitivity in pregnant women with pregnancy anxiety, and the treatment effects persisted in the follow-up phase. ACT, by emphasizing values and considering oneself as context, reduced these components. These individuals acted according to the core message of ACT, which says to accept what is out of personal control and commit to action that enriches life (Eifert et al., 2009). Moreover, evaluation is one of the emphasized aspects in ACT, which applies a comparative relationship to two or more verbal events. Unlike comparisons made by other creatures, which are all based on experience, evaluations for humans can be entirely based on verbal events that have never been experienced (Hayes et al., 2006). This evaluation can create a lot of suffering for humans. For example, a relatively successful life can be seen as a failure compared to an ideal imagined life. Flexibility and acceptance are also emphasized in this therapy. Since non-evaluation and acceptance are therapeutic goals, individuals receiving this treatment learn to avoid evaluation and comparison, view life events and people they interact with without judgment, and accept them, which can improve non-judgmental attitudes and reduce interpersonal sensitivity.

Based on the findings, it can be said that ACT had a significant impact on the dimensions of pregnancy concerns in pregnant women with pregnancy anxiety. This part of the findings aligns with the prior results (Feyzi et al., 2017; Fung et al., 2021; Iri et al., 2019; Javidan, 2022; Khaleghi Kiadahi et al., 2022; Mahvash et al., 2024; Mirzaeidoostan et al., 2019; Noroozi Mehmandoost & Gholami Heydarabadi, 2019; Ostadian Khani et al., 2021; Rajabi & Yazdkhasti, 2014).

ACT, by using a wide range of mindfulness techniques and more experiential exercises, is more effective in increasing cognitive flexibility than in eliminating distressing thoughts (Iri et al., 2019). ACT, one of the most expressive third-wave behavioral therapies, is a contextually functional intervention based on relational frame theory, viewing human suffering as arising from psychological inflexibility and is reinforced by cognitive fusion and experiential avoidance. Increasing psychological flexibility through ACT aims to promote acceptance, defusion, self as context, connection with the present moment, values, and committed action based on these values.

ACT helps patients accept unpleasant thoughts and feelings and commit to meaningful actions, understanding that pain is an inevitable part of life and that avoiding pain leads to more suffering. What sets ACT apart from other therapies is its use of metaphors, making sessions engaging and lasting (Crosby & Twohig, 2016). In this method, clients learn that avoiding unpleasant thoughts and feelings does not reduce anxiety and worry but exacerbates them. ACT teaches clients to accept that anxiety is inevitable and to live meaningful lives despite it; it also helps individuals identify their values and take committed actions aligned with those values (Hayes et al., 2006). When individuals do not want unpleasant thoughts and feelings, they begin to criticize themselves and blame themselves for having anxiety. This self-blame increases unpleasant internal experiences like anxiety. Part of the pathology in pregnant women is that they constantly live in the past and future, either ruminating on unpleasant past thoughts or worrying about an uncertain future. In these conditions, they lose the present moment. For example, an anxious mother constantly worries about her family's health, academic performance, and future, meaning she lives in the future. Although she cares for her family, this worry prevents her from being aware of and enjoying the present moment with them, possibly neglecting important aspects of her own life, such as her health, social relationships, and appropriate parenting. This factor reduces general health and quality of life in pregnant women.

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E-ISSN: 3041-8798

This study helped pregnant women reduce their fears and worries using the skills of ACT, often through metaphors. The "Uninvited Guest" metaphor (Hayes et al., 2006) helped clients accept anxiety-inducing thoughts and feelings as less threatening. ACT focuses on values, enhancing clients' understanding that family and childbirth are significant values, increasing psychological flexibility and reducing concerns. According to this study's results, pregnancy-related worries decreased in the intervention group, although there was a slight increase after two months, it was not significant, indicating that the counseling approach was somewhat effective.

Based on the findings, it can be said that ACT had a significant impact on the dimensions of stress coping schemas in pregnant women with pregnancy anxiety. This part of the findings is consistent with the prior results (Ahmadi & Valizadeh, 2021; Gibson Watt et al., 2023; Gillanders et al., 2015; Hadian et al., 2023; Puolakanaho et al., 2019; Sedighi Arfaee et al., 2021; Wersebe et al., 2018).

ACT, by emphasizing value clarification and what matters to pregnant women, guides them toward a meaningful life and stress reduction. Increasing psychological flexibility ultimately increases resilience against stress. While significant improvements were observed in ACT intervention symptoms, the primary goal of ACT is to enhance psychological flexibility and live a value-based life, not necessarily to reduce depression or anxiety symptoms but to encourage more flexibility and adaptability to negative experiences (Tunnell et al., 2019). In ACT, increased psychological flexibility mediates the improvement of psychological problems, through mindfulness exercises, self-observation, awareness of bodily states, and strengthening the individual's relationship with thoughts (Zettle, 2007; Zettle, 2015).

An acceptance-based intervention can be particularly suitable for women with high-risk pregnancies as it introduces skills to stay present, create willingness to experience uncomfortable thoughts and feelings rather than fighting them. Additionally, it provides skills to experience worries, fears, and emotional or physical discomfort in an authentic yet non-judgmental and compassionate manner. Ultimately, an acceptance-based intervention may be uniquely beneficial for women with high-risk pregnancies as it allows them to accept and live through a period of pregnancy that is undesirable and creates significant uncertainty (Tunnell et al., 2019). In explaining the role of ACT on stress coping schemas, it can be said that situational stress coping schemas prioritize changing the stress-inducing conditions and situations. In situational stress coping schemas, individuals try to change the situation, doing what is necessary to overcome it without succumbing to problems (Forman et al., 2007; Hayes et al., 2006). Emotional detachment stress coping schemas involve emotional suppression or self-blame. Individuals with high self-blame feel lonelier and receive less social support from others, increasing pregnancy-related fears. On the other hand, social support coping allows individuals with greater perceived social support from family and others to experience higher psychological well-being in daily life (Watson et al., 2021). Perceived social support increases face-to-face interactions with family, reducing pregnancy-related fears. Thus, it is logical that ACT plays a diagnostic role in pregnancy anxiety. The research findings showed that ACT maintained its effectiveness in pregnant women with pregnancy anxiety in the follow-up phase, with significant differences between the intervention and control groups. The results indicate the stability of this intervention in the two-month follow-up phase. Generalization and maintenance of change, especially in the final sessions, were implicit parts of the intervention and training throughout the sessions, contributing to stable follow-up results.

5. Suggestions and Limitations

Researchers always face limitations in their research. Every study, despite its novelty and strengths, has methodological limitations. This study was no exception and faced limitations such as the statistical population being employees of subsidiary oil companies, caution in generalizing results to other populations, and the limited sample size, affecting the ability to generalize to a larger group of pregnant women. The lack of research examining psychological interventions on various aspects of anxiety, stress, and concerns in pregnant women was also a limitation. This study was conducted on employees of subsidiary oil companies in Shiraz, so it cannot be generalized to other employees in the country. Another limitation was not following up with mothers until childbirth. Using two treatment methods may cause an interference effect on the educational program for the researcher. The occurrence of pregnancy anxiety during pregnancy is a good predictor of these disorders in the postpartum period, making pregnancy an optimal time for screening and diagnosis. All healthcare providers must intervene timely and provide necessary guidance to help

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E-ISSN: 3041-8798

pregnant women maintain mental health and improve their quality of life, ultimately enhancing public health.

This study showed that ACT reduced pregnancy concerns, suggesting that empowering midwives with counseling approaches can improve care for pregnant women, especially in childbirth preparation classes. Specialists working with pregnant women should use ACT, which emphasizes cognitive defusion and value-guided behavior, to reduce their suffering during pregnancy and provide special booklets for pregnant women and their spouses. Given the effectiveness of this study, it is suggested that practical exercises and skills of this method be offered as educational sessions, workshops, films, and booklets to prevent psychological problems. Holding training courses and workshops for organizational counselors to familiarize them with group educational interventions, narrative exposure therapy, and ACT, emphasizing its use in reducing interpersonal sensitivity, stress, and concerns, are practical suggestions of this study.

In this study, the researcher examined the most common concern of mothers, pregnancy anxiety. Future studies should examine other concerns (e.g., labor pain). Considering the study was conducted on pregnant women, it should be conducted on other populations and compared with this study's results. As this study is quantitative, future research should use qualitative approaches (e.g., grounded theory based on semi-structured interviews and qualitative questionnaires with expert opinions). Future research should compare these interventions with other training methods (e.g., mindfulness-based stress reduction, emotion regulation). Future research should also control and adjust socioeconomic and cultural variables.

Authors' Contributions

All authors have contributed significantly to the research process and the development of the manuscript. This article is derived from the first author's doctoral dissertation.

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.

Acknowledgments

We would like to express our gratitude to all individuals helped us to do the project.

Declaration of Interest

The authors report no conflict of interest.

Funding

This research was carried out independently with personal funding and without the financial support of any governmental or private institution or organization.

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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E-ISSN: 3041-8798