Research Paper:
The Effects of Acceptance and Commitment Therapy Plus Positive Thinking Training on Distress and Wellbeing in Infertile Women With Marital Conflicts

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ABSTRACT

Background & Aims of the Study: Infertile women experience negative feelings, such as anxiety, depression, and despair; accordingly, such conditions create strategies to cope with infertility, i.e., significant for a sense of stability. The present study aimed to determine the effects of an integrated approach, consisting of Acceptance and Commitment Therapy (ACT) and Positive Thinking Training (PTT) on distress and wellbeing in infertile women with marital conflicts.

Materials and Methods: In this randomized controlled trial, 30 infertile couples referring to the Infertility Clinic in Tehran, Iran was explored. The integrated approach group completed NEO Personality Inventory (NEO-PI), Fertility Problem Stress Scale, and Ryff’s Psychological Wellbeing Scale before and 1 month after the completion of the intervention. A Dependent Samples t-test was used to analyze the collected data.

Results: According to the current research results, there was a significant difference in distress and wellbeing among the examined infertile women with marital conflicts (P<0.05). One month after the completion of the intervention, the mean overall distress score in the integrated approach group was significantly less than that of the pre-test phase (P<0.05). Furthermore, the mean overall score of wellbeing after the therapy sessions was significantly higher than that of the pre-test step in the study subjects (P<0.05).

Conclusion: Considering the effectiveness of the integrated approach based on ACT plus PTT on distress and wellbeing in infertile women, this method can be used in infertility clinics. Healthcare providers and counselors should receive training on ACT and PTT to improve mental health and wellbeing among infertile couples.
1. Introduction

Developing a child is a key driver of a family’s life. Some women, however, are infertile and cannot have a child. This condition changes the structure of psychiatric and personality disorders and causes them to generate emotional and psychological issues. Infertility is a problem and among the major factors impacting life and causing temporary or permanent depression in couples, leading to significant complications and stress [1]. Infertility is a global public health crisis that affects nearly 186 million individuals worldwide. Infertility exists in one in 8 women of reproductive age and one in 10 men of reproductive age [2]. A significant individual issue is an infertility through the development of an upsetting and crippling disorder. Significant psychiatric disorders are associated with infertility and its treatment. Stress and anxiety can impact marital maladjustment, sexual problems, and decrease self-confidence and sexual intercourse [3]. Chan et al. found that the greatest psychological distress was recorded by women experiencing fertility problems [4]. Infertility has detrimental biopsychosocial health consequences and can lead to relationship conflict. Studies conducted in Tehran highlighted significant differences in relationship satisfaction between fertile and infertile women; infertile participants’ marital satisfaction was less than that of their infertile counterparts [5]. Sayadi et al. found that in the experimental community, emotional-focused couple therapy significantly increased the post-test mean marital engagement score and their subscales (i.e., personal engagement, moral engagement, systemic engagement) [6].

Numerous researchers have investigated infertility-related psychological and personality traits [7-10]. Some studies have emphasized the importance of psychological causal factors of infertility and the psychological effects of infertility [11-13]. Other studies signified that an abnormal incidence of personality disorders cannot be the cause of reduced fertility alone [14]. Volgsten et al. found that the high scores on neuroticism-related personality traits were associated with depressive and anxiety disorders in infertile women [15]. Basirat et al. examined the differences between infertile women with and without Polycystic Ovary Syndrome (PCOS) concerning personality traits. They concluded that the personality characteristics of PCOS infertile women were not different concerning neuroticism, extraversion, agreeableness, and conscientiousness. The only exception was that women with infertile PCOS obtained a slightly higher mean experience openness score than those without PCOS [16]. The results of epidemiological studies, indicating a double prevalence of depressive and anxiety disorders in women compared with men, were explained by the personality characteristics of women. These include a tendency to self-aggression in a frustrating situation; increased responsibility for an unfavorable outcome in certain life circumstances; caring for the family members; neglecting self-health; double social burden, including, family and parental responsibilities, and a desire for professional realization [17].

According to the literature, this condition affects the psychological wellbeing of infertile women. Besides, the average psychological wellbeing problem is reported to be high [18]. The World Health Organization (WHO) incorporates mental health within the general concept of health and defines it as a multidimensional biopsychosocial concept that also includes the sense of psychological wellbeing [19]. Several studies have discovered infertility and psychological wellbeing [20-22]. Only a few studies have explored how they promote coping with infertility-induced stress [23].

Different approaches have been used for the research, education, and treatment of psychological wellbeing and distress among infertile women with marital conflicts. The effectiveness of Acceptance and Commitment Therapy (ACT) has been approved by numerous studies in this respect. For example, ACT-based counseling was examined on mental health and quality of life among infertile couples [3]. ACT has also been applied to treat infertility-induced stress [24]. Other studies investigated the effects of ACT on marital compatibility and life expectancy in infertile women [25]. Moreover, scholars assessed the effects of ACT and compassion-focused therapy on self-efficacy, quality of relations, and meaning in life among infertile women [26]. Moreover, there is another promising intervention that impacts psychological problems in infertile women, called Positive Thinking Training (PTT). Numerous studies have examined the effects of PTT on mental endurance, self-compassion, and resilience in infertile women [1]. Other studies reported the improvement of life satisfaction and quality of life in infertile women using PTT [27]. Moreover, the progress of psychological wellbeing and perceived quality of marital relationships were also examined using PTT on infertile women [28].

As described above, it is essential to address psychological problems in infertile women. We found no integrated approach to treating this population. This research, therefore, intended to evaluate the effects of an integrated approach, consisting of ACT plus PTT on distress and wellbeing in infertile women with marital conflicts.
2. Materials and Methods

This was a quasi-experimental study with a pre-test and post-test design. The statistical population of the study included infertile women with marital conflicts who visited infertility centers in Tehran City, Iran, in 2019-2020. The study population was identified by obstetricians and gynecologists as infertile. The inclusion criteria were presenting rumination, marital conflicts, ≥5 years have passed since the marital conflicts, and having at least a high school level of education. The exclusion criteria were being on the verge of divorce, presenting personality disorders and acute physical conditions, the absence of marital conflicts, as well as non-participation in all stages of measurement and intervention, measured by the self-reported demographic characteristics questionnaire. The purpose of the interview was then explained to them and a written informed consent form was received from them after declaring consent for participation in the study. Then, the interview began.

Given that ≥15 individuals were suggested for experimental studies [27, 28], 30 subjects were selected via the purposive sampling method. Furthermore, according to the following formula, the estimated sample size ranged between 15 to 20 individuals for the study group [28].

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d = \frac{\text{Effect size}}{\text{Standard deviation}} = \frac{5\%}{33} = 0.66, Z = 1.96, SD = 0.70, S = 16.56 95\% - Z\text{-score} = 1.96. \]

The experimental group consisted of infertile women who were matched for age, educational levels, and the duration of marriage with the cases. The necessary data were gathered by trained interviewers. The interviews were conducted using a semi-structured approach and initiated with demographic questions. Then, it was continued with game questions designed for research. In total, 7 questions were probed, i.e., developed on the studies and comments of 3 family therapy specialists to identify marital conflicts. Some of these questions were as follows: When you encounter conflicts, what kind of thoughts pop into your mind? What is the content of rumination thoughts about? How long do you get involved with these thoughts? Each interview lasted 45-60 min. The interviews’ data were saturated with 30 subjects. The sampling method is shown as a model concert in Figure 1.

NEO Personality Inventory (NEO-PI): The NEO-PI was developed by Costa and McCrae [29]. Openness (O), Conscientiousness (C), Extraversion (E), Agreeableness (A), and Neuroticism (N) are the Big-Five personality traits measured by the NEO-PI. It is a shorter version of the NEO Five-Factor Inventory (NEO-FFI), with only 60 items (12 per domain). Five Likert-type answered scales (0-4) were used. According to the NEO-FFI, it has a coefficient of internal consistency of 0.83 [29]. In the present study, we relied on the 60-item version (NEO-FFI), and the Cronbach’s alpha coefficient of the NEO-FFI ranged between 0.47 and 0.77, indicating moderate to high internal consistency. However, Garousi et al. [30] have confirmed the reliability and validity of the NEO-FFI.

Fertility Problem Stress Scale (FPSS): The FPSS was designed to measure infertility-related stress. This scale was developed by Schmidt [31] and is composed of 14 items. The scale covers 3 domains, as follows: personal (6 items), marital (4 items), and social (4 items). Respondents are graded on a Likert-type scale of 1 (strongly disagree) to 5 (strongly agree). Research undertaken to determine reliability revealed an internal consistency of 0.74, 0.79, and 0.82 for the subscales, respectively [31]. For the personal, social, and marital domains, Cronbach’s alpha coefficients were measured as 0.70, 0.76, and 0.85, respectively. We submitted a Persian version of the scale to a panel of experts for evaluation based on its contents (Table 1) [32].

The Ryff’s Psychological Wellbeing Scale (PWS): The PWS includes 18 questions and measures the 6 factors of self-determination, environmental mastery, personal growth, positive communication with others, purposefulness in life, and the acceptance of oneself. The test is a self-assessing instrument, i.e., responded on a 6-point continuum of an agreement to a strong disagreement (1-6). The total score for this scale ranges between 18 and 108. Ryff and Singer reported that the correlation coefficient of the PWS equaled 0.91 using Cronbach’s alpha coefficient [33]. Khanjani et al. reported a Cronbach’s alpha coefficient of 0.76 for this scale [34]. The Cronbach’s alpha coefficient in the present study was obtained as 0.85.

The intervention group received the intervention in 6 sessions. An MA clinical psychology student conducted PTT interventions on 3 groups of 6 participants. Activities included using strengths, gratitude visits, active-constructive response, counting blessings, savoring, and biography. Exercise is a crucial part of this therapy method; thus, the study participants practiced exercises in each session, which they expected to complete by the next session [35]. A PTT study includes teaching positive psychology techniques, such as developing self-esteem, improving self-respect, and recognizing others’ strengths. Pourrazavi and Hafezian [36], who developed a positive psychological approach, taught sessions weekly.
The pre-test scores of distress and wellbeing in the experimental groups, Dependent Samples t-test, and Chi-squared test were used to compare the demographic information. Moreover, Paired Samples t-test was used to study the pre-test and post-test differences respecting distress, and wellbeing in the intervention group. Numerical data were presented as Mean±SD and categorical data as frequency (percentage) among the examined infertile women. The normality of the obtained data was assessed by the Kolmogorov-Smirnov test.

3. Results

The study participants were infertile women; of whom 30% had less than a diploma education, 40% had a diploma, and 30% had an education level of above diploma. Among the study participants, 60% were women, aged 25 to 30 years and 40% were women, aged 31 to 35 years.

As per Table 2, the mean pre-test and post-test scores of psychosis were 39.40 and 33.30, respectively in the study participants. Moreover, the mean post-test value of neuroticism was less than that of the pre-test in the study subjects.

The mean pre-test and post-test scores of extraversion equaled 40.42 and 43.40, respectively in the study participants. Furthermore, the mean post-test score of psychosocial was higher than that of the pre-test in the explored females. The mean pre-test score of openness to experience was measured as 37.90; the mean post-test value of extraversion was calculated as 40.70 in the study participants. Additionally, the mean post-test score of openness to experience was higher than that of the pre-test phase in the study subjects.

The mean pre-test and post-test scores of consent in the examined infertile women equaled 37.90 and 39.60, in sequence. Moreover, the mean post-test value of consent in the explored infertile women was higher than that of the pre-test step. The mean pre-test and post-test scores of conscience in the examined infertile women were 39.40 and the mean post-test score of conscience in the explored women was higher than that of the pre-test step.

As per Table 3, the Mean±SD pre-test and post-test values of distress in the studied infertile women were calculated to be 105.50±10.87 and 89.40±13.83, in sequence. Additionally, the mean post-test value of distress in the studied infertile women was higher than that of the pre-test phase.

According to Table 3, the Mean±SD pre-test and post-test wellbeing statistics of the study subjects were computed as 67±5.39 and 79±8.74, respectively. Besides, the mean post-test values of wellbeing among the explored infertile women were higher than that of their pre-test.

As per Table 4, there was a significant effect of the provided integrated therapy (ACT+PTT) on the personality dimensions of infertility in the examined women (t= -5.53; P=0.031), i.e., significant at P<0.05. These
results indicated that the presented integrated therapy affected personality dimensions among the study subjects. However, the provided integrated therapy did not affect the personality dimensions of extraversion, openness, agreement, and conscience in the explored infertile women. According to Table 4, the provided integrated therapy

Table 1. Contents of the treatment sessions

| Contents of the treatment sessions (PTT) | Acceptance and Commitment Therapy (ACT) |
|-----------------------------------------|----------------------------------------|
| Session 1: In the first session, the members of the group got acquainted with each other and established the initial communication, their roles and responsibilities were clarified, and the pre-test was performed. In the second session, positive psychology was briefly explained to the study participants along with the concept of positive attitude and its benefits. | Session 1: Viewing the matrix from the viewpoint of one of the 5 senses, combined with paying attention to the mental experience. |
| The third session was dedicated to training the ability to identify one’s strengths, how to set goals and strategies for achieving them; the possible obstacles to a healthy life were further studied along with self-awareness, and a comprehensive view of the self and awareness of the benefits of positivism was provided accompanied by some exercises and an assignment. | In the second session, we evaluated prevention measures and actions and introduced the vicious cycle. |
| The fourth session concerned optimism skills training and defining the types of optimism. The fifth session aimed to help participants develop a positive attitude towards their surroundings using the assignments and exercises. | The third session: Identifying the thieves of ‘attention’ and problems with controlling internal events, introducing attention thieves’ hooks, and completing the hooks worksheet. |
| The fifth session was dedicated to training the ability to identify one’s strengths, how to set goals and strategies for achieving them; the possible obstacles to a healthy life were further studied along with self-awareness, and a comprehensive view of the self and awareness of the benefits of positivism was provided accompanied by some exercises and an assignment. | The fourth session: Developing verbal aikido, accepting unpleasant feelings, and avoiding conflict. |
| The sixth session addressed positive memories and their recount. In the seventh session, the focus was on hope and optimism and the group members were explained about the attributions and how to attribute their good and pessimistic personalities. | The fifth session: Drafting a self-compassion self-letter, introducing self-compassion, improving self-compassion. |
| The seventh session focused on reviewing the strengths of memories and increasing positive self-esteem. The penultimate session was dedicated to reviewing the assignments, receiving feedback on the provided tasks, offering evidence and valid criteria, and the conclusion of multiple topics. | The sixth session: Vision training through letter-writing from the future selves, controlling the power of vision. |
| At the last session, the topics were summarized and concluded, then the post-test was administered to both research groups. | |

Table 2. Comparing sociodemographic characteristics of the experimental group (n=30)

| Characteristic     | Training Group, No.(%) | P     |
|-------------------|------------------------|-------|
| Age (y)           | 31.5(5.3)              | 0.390 |
| Weight, kg        | 70.0(12.5)             | 0.359 |
| Duration of the marriage (y) | 5.0(2.2)              | 1     |
| Occupational status | Housewife 19.0(70.4) | 0.396 |
|                   | Employed 8.0(27.6)     |       |
|                   | Elementary 11.0(40.4)   |       |
|                   | Secondary 5.0(21.2)    |       |
| Educational level | Diploma 4.0(13.8)      |       |
|                   | BA 3.0(10.1)           |       |
|                   | MA and above 2.0(6.4)  |       |
significantly impacted distress in the explored women \( (t=2.94; P=0.031) \) at \( P<0.05 \). These results revealed that the presented ACT plus PTT positively affected distress in the study subjects.

As demonstrated in Table 4, the presented integrated therapy influenced wellbeing in the study participants \( (t=5.56; P=0.001) \), i.e., significant at \( P<0.05 \). These results highlighted that the performed ACT plus PTT therapy affected wellbeing in the examined infertile women.

### 4. Discussion

This research assessed the effects of an integrated approach, consisting of ACT and PTT on distress and wellbeing among infertile women with marital conflicts. According to the achieved results, there was a significant difference in neuroticism between the study group. However, the same data were not obtained for extraversion, openness to experience, agreement, and conscience. We found no similar research that had considered these variables with the same group. Asgari et al. found that infertile women who underwent treatment with ART relative to women who appeared to have surrogacy, sensations seeking as a personality trait, were lower. This research suggested that demographic characteristics are effective in infertile women’s happiness. In infertile women, there also exists a significant relationship between sensation seeking, versatility, and happiness [9]. The complex and reciprocal interaction of personality traits, feelings, and cognitions of personality impacts the personal manifestations of health and disease [37]. For instance, an individual with a fairly stable personality assumes that disease is induced by observable causes, is curable, has a shorter length; thus, it relatively presents minor psychological effects on them.

Stress and coping research in infertility indicated that uncertainty, negativity, loss of control, and complexity are personality traits correlated with this disorder [7]. Ahmadi et al. found that the mean scores in infertile women with personality disorders were considerably higher in infertile women with PCOS concerning 6 personality disorders (schizoid, avoidant, antisocial, depressive, sadistic, & pessimistic) and in 3 groups of extreme personality disorder patterns (schizotypal, borderline, & paranoid), compared to their counterparts without PCOS [7]. Basirat et al. observed that respecting neuroticism, extraversion, agreeability, and conscientiousness, the personality characteristics of PCOS infertile women

| Table 3. Descriptive Statistics and variables of the study |
|---------------------------------------------------------|
| **Variables** | **Phase** | **Mean±SD** | **Min.** | **Max.** |
| Neuroticism | Pre-test | 39.40±4.67 | 31 | 44 |
| | Post-test | 33.30±8.23 | 24 | 52 |
| Extraversion | Pre-test | 40.24±5.35 | 35 | 50 |
| | Post-test | 43.40±6.48 | 31 | 51 |
| Openness to experience | Pre-test | 37.90±8.07 | 30 | 58 |
| | Post-test | 40.70±4.29 | 33 | 48 |
| Agreeableness | Pre-test | 37.90±5.32 | 31 | 46 |
| | Post-test | 39.60±4.76 | 33 | 48 |
| Conscience | Pre-test | 39.40±4.78 | 31 | 46 |
| | Post-test | 41.40±5.62 | 35 | 51 |
| Distress | Pre-test | 104.50±10.87 | 59 | 103 |
| | Post-test | 89.40±13.83 | 88 | 116 |
| Wellbeing | Pre-test | 67.0±5.39 | 58 | 75 |
| | Post-test | 79.0±8.74 | 70 | 94 |
were the same. The only exception was that women with infertile PCOS obtained a slightly higher mean openness score to experience than those without PCOS [16]. Identifying the types of personality of an infertile woman will assist her in selecting a suitable treatment approach. Infertility is a phenomenon that therapists must be mindful of and professional enough to avoid tensions in the care of infertile women’s biopsychological health.

According to our study, the provided integrated therapy (ACT+PTT) helped reduce infertility-related distress. According to our review of studies, integrated approaches did not consistently produce consistent results; however, these conclusions agree with those reported by other studies [3, 38]. Hosseinpanahi et al. found that counseling based on ACT improved mental health and quality of life in infertile couples [3]. According to Sadri et al., opposing groups of infertile couples receiving affective couple therapy were measured for the quality of their relationship, marital conflict, and simplicity. They compared 10 counseling sessions versus none at all provided to the control group. Data analysis indicated a strengthening of the couple’s relationship, decreased marital conflict and enhanced simplicity among the explored infertile couples [38]. Consistent with the current study, the above-mentioned research suggested the effectiveness of ACT in infertile couples. Additionally, infertility-related stress can lead to marital conflicts and reduced life satisfaction, which adversely influence couples’ wellbeing [39]. In addition, Cognitive-Behavioral Therapy (CBT) may help reduce anxiety in women with infertility [40].

Several studies have used CBT to help women with infertility [40, 41]. The additional distress experienced by women with primary infertility is alleviated by self-compassion and the tendency not to suppress emotional expression. Traits that enable effective self-management buffer the effects of infertility on psychological health [42]. In this case, PTT impacts sexual self-esteem among infertile women [28]. According to the research data, the test group receiving ACT plus PTT, the level of pleasure significantly increased after the intervention. As a result, the wellbeing score was also statistically higher in the intervention group, compared to the pre-test step. Despite the lack of findings from specific integrated therapy research, other studies investigated the effects of alternative intervention approaches on distress and wellbeing. Their findings were consistent with those of this study. In this regard, different coping strategies appear to generate distinct impacts on individuals’ mental health. The subjective well-

Table 4. The effectiveness of integrated therapy (ACT and PTT) on the Variables

| Variables   | Phase   | Mean  | Mean Differences | df | t     | P   |
|-------------|---------|-------|------------------|----|-------|-----|
| Neuroticism | Pre-test| 39.40 | 6.10             | 9  | 2.53  | 0.03|
|             | Post-test| 33.30 |                  |    |       |     |
| Extraversion| Pre-test| 40.24 | 1                | 9  | -0.36 | 0.73|
|             | Post-test| 43.40 |                  |    |       |     |
| Openness to experience | Pre-test| 37.90 | 2.80             | 9  | -0.95 | 0.36|
|             | Post-test| 40.70 |                  |    |       |     |
| Agreeableness| Pre-test| 37.90 | 1.70             | 9  | -0.95 | 0.36|
|             | Post-test| 39.60 |                  |    |       |     |
| Conscience | Pre-test| 39.40 | 2                | 9  | 0.76  | 0.46|
|             | Post-test| 41.40 |                  |    |       |     |
| Distress    | Pre-test| 104.50| 15.10            | 9  | 2.94  | 0.016|
|             | Post-test| 89.40 |                  |    |       |     |
| Wellbeing   | Pre-test| 67    | 12               | 9  | 5.56  | 0.001|
|             | Post-test| 79    |                  |    |       |     |

Faraji M, et al. Effects of ACT Positive Thinking Training on Distress and Wellbeing Conflicts. Arch Hyg Sci. 2021; 10(3):215-224.
being and corresponding dimensions of infertile women are impaired. According to research, pregnant women with an infertility problem typically experience frustration, depression, anxiety, and feelings of worthlessness during the treatment process [27].

Comparing psychological wellbeing and self-esteem between infertile and pregnant women found that PTT helped infertile subjects maintain their mental endurance. PTT strengthens happiness by addressing problems and fostering prosperity in all valuable areas of life. In addition to psychological intervention, self-care can be equivalent to the inner richness and being more alert, focused, and having peace, comfort, compassion, and readiness to cope with problems or barriers to prevent their recurrence. Infertile women benefit from PTT by improving their ability to cope with challenging situations, enhancing their adaptability and strength to cope with challenges, and gaining their resilience. Implementing PTT may help improve psychological wellbeing by enhancing positive emotions, encouraging positive challenges, and enhancing the value of life [1].

5. Conclusion

Not only can infertility cause psychological issues, emotional stress, and mental pathology, but also infertility is the uncertain reproductive status of an individual, and related psychosocial, family, and cultural factors lead to psychological maladaptation, personal reactions, as well as clinically pronounced mental disorders. Not all patients who require biopsychological assistance are referred to a physician, despite the apparent need to research all these problems. Healthcare providers and counselors should be trained for ACT and PTT to improve distress and wellbeing in infertile women.

There were limitations to our study, and we have some questions to explore further. First, our study focused on a relatively small sample. Second, there was no immediate diagnosis of biopsychological illnesses. A third measure was the causes of marital conflict, which consisted of a few questions each. In the future, scholars are suggested to conduct more high-quality studies to obtain more conclusive results on the effectiveness and indication of mental therapies for infertility patients. The fertility group intervention combines existing scientific and theoretical approaches to offer comprehensive therapeutic support to infertile patients coping with stress and medical care related to infertility.

Ethical Considerations

Compliance with ethical guidelines

The Institutional Review Board of Alborz Branch of Islamic Azad University approved the study protocol and all participants provided signed written informed consent forms before enrollment (Code: IR.IAU. REC.1399.028).

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Authors' contributions

Conceptualization and supervision: All authors; Methodology: Hengameh Alimadadi; Investigation: Marzieh Faraji; Writing: Najmeh Moshfeghi; Original draft: Roshanak Namazi; Writing - review and editing: Sara Mousavi and Javad Seyyed Jafari; Data collection: All authors; Data analysis: Marzieh Faraji, Hengameh Alimadadi, Najmeh Moshfeghi, Roshanak Namazi; Funding acquisition and resources: All authors.

Conflict of interest

The authors declared no conflict of interest.

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