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DOI:
10.4103/jehp.jehp_512_20

The effect of counseling based on acceptance and commitment therapy on mental health and quality of life among infertile couples: A randomized controlled trial

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Received: 16-05-2020
Accepted: 06-06-2020
Published: 28-09-2020

Abstract:

INTRODUCTION: Infertility by creating a disturbing and debilitating condition is considered as an important individual, public, and social health problem. The purpose of this study was to determine the effect of counseling based on acceptance and commitment therapy (ACT) on mental health and quality of life in infertile couples.

METHODS: In this randomized controlled trial, 54 infertile couples referring to the Sanandaj-Iran Infertility Clinic were assigned into two groups of counseling and control by random blocking with a 1:1 ratio. The consulting group received 8 weekly 90-min sessions of group counseling based on ACT. The General Health Questionnaire-28 (GHQ-28) and Fertility Quality of Life were completed before and 1 month after the completion of the intervention. Primary outcome measures were mean score of mental health and quality of fertility life. Independent *t*-test, ANCOVA, and Mann-Whitney U-test were used to analyze data.

RESULTS: There was no significant intergroup difference in demographic information ($P > 0.05$). One month after the end of the intervention, the mean overall mental health score in the couples of the counseling group was significantly less than the control group (adjusted mean difference [aMD]: -8.4; 95% confidence interval [CI]: -10.4—-6.4; $P < 0.001$). Furthermore, the mean overall score of quality of life in the counseling group couples was significantly more than the control group (aMD: 14.8; 95% CI: 11.8—17.9; $P < 0.001$).

CONCLUSION: Based on the effectiveness of counseling based on ACT on mental health and quality of life in infertile couples, it can be used in the infertility clinics. Health-care providers and counselors should train in the ACT courses to improve the mental health and quality of life of infertile couples.

Keywords:

Acceptance and commitment therapy, counseling, infertile couples, infertility, mental health, quality of life

Introduction

Infertility is defined as the failure to achieve a pregnancy after 1 year of regular unprotected intercourse.^[1] An estimated 9%–32% of couples around the world suffer from infertility.^[2] According to a review study, the

rate of infertility in Iran was estimated at 34.1%.^[3] The prevalence of primary infertility has been reported by 20.2% in Iran.^[4]

Infertility by creating a disturbing and debilitating condition is an important

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How to cite this article: Hosseinpanahi M, Mirghafourvand M, Farshbaf-Khalili A, Esmailpour K, Rezaei M, Malakouti J. The effect of counseling based on acceptance and commitment therapy on mental health and quality of life among infertile couples: A randomized controlled trial. *J Edu Health Promot* 2020;9:251.

individual problem.^[5] Both infertility and its treatment techniques are associated with serious mental issues.^[6,7] Infertility stress and anxiety can cause marital maladjustment, sexual dysfunction, reduced self-confidence, and reduced sexual relationship,^[8] and in many infertile couples, these problems may prevent the continuation and completion of the treatment.^[9] A study has reported that the divorce rate is 3.7 times higher in infertile women.^[10] In addition, the prevalence of depression in this group equals to cancer- or heart disease-induced depression.^[11] In recent years, the mental health of infertile couples has been given a serious attention, and infertility has been an undeniable severe experience of helplessness for many couples.^[12]

According to the World Health Organization (WHO), mental health is defined as “subjective well-being, perceived self-efficacy, autonomy, competence, intergenerational dependence, and self-actualization of one’s intellectual and emotional potential among others.”^[13] In a study, the presence of mental disorders was reported in 40.2% of infertile women, with a prevalence of 23.3% for general anxiety disorder, 17% for major depression, and 9.8% for chronic depression.^[14] Peterson and Eifert (2011) observed severe depressive symptoms in 11.6% of infertile women and 4.3% of infertile men.^[15]

Many studies have shown that infertility has a negative effect on the quality of life.^[16] The WHO defines the quality of life as “an individual’s perception of his/her position in life in the context of the culture and value systems in which he/she lives and in relation to his/her goals, expectations, standards and priorities.”^[17] A systematic review study showed that infertility affects couples in the following four aspects of their life including mental health, marital relationships, sexual relationships, and quality of life.^[17] Irrational beliefs about the parenthood and economic burden of infertility treatments have an adverse impact on mental health of this group of patients, necessitating psychological and counseling supports.^[16] One of the most important approaches in this regard is counseling.^[18] Acceptance and commitment therapy (ACT) is a novel technique for behavioral therapy that employs mindfulness, acceptance, and cognitive diffusion skills to enhance psychological flexibility and prevent behavioral changes in favor of chosen values.^[19] Given the high prevalence of infertility and its adverse individual and social effects, the importance of mental health in this group, lack of using ACT in Iranian infertile couples, and previous recommendation of a meta-analysis study for further study on the effect of ACT on quality of life,^[20] this study aimed to determine the impact of counseling based on ACT on mental health and quality of life in infertile couples. Holding counseling classes in centers can be

a successful step in improving the quality of provided services and achieving healthier communities and greater prosperity.

Methods

Study design and participants

This randomized controlled trial was carried out on 54 infertile couples (both spouses), referring to the Besat Infertility Clinic in Sanandaj, Iran, between July 23, 2017, and February 20, 2018.

Inclusion criteria included couples with initial infertility of 1–10 years, couples 20–45 years old, having at least reading and writing literacy, and at least once failed treatment of infertility experience. Exclusion criteria included earning a score of 41 from the Mental Health Questionnaire, occurrence of an unpleasant event during the 6 months before the study (death or acute illness of relatives), not having any known mental or physical illness such as diabetes, depression (according to the participant’s statement), participation in another intervention study, and positive pregnancy test during the sampling and intervention.

Sample size

The estimated sample size was 10 based on Narimani *et al.*’s study^[21] into the quality of infertile women’s life (Narimani *et al.*, 2014), considering $m_1 = 11.05$, $m_2 = 13.44$, $SD_1 = 1.32$, $SD_2 = 1.76$, test power of 80%, and one-sided $\alpha = 0.05$. In addition, the estimated sample size was 24 based on Hashemi *et al.*’s study^[22] into infertile women’s mental health (Hashemi *et al.*, 2014), considering $m_1 = 41.83$, $m_2 = 33.47$, $SD_1 = 11.46$, $SD_2 = 1$, test power of 80%, and one-sided $\alpha = 0.05$. As a result, since the sample size was greater based on the mental health, the ultimate sample size estimation was 27 couples, considering a possible sample loss of 10%.

Sampling

For sampling, the researcher attended at the infertility clinic to obtain the phone numbers of the infertile couples. Then, through phone calls, the researcher was introduced and they were informed about the general objective of the study and provided with a brief description of the research. In this stage, the initial enrollment of the consenting infertile couples was performed, and they were scheduled to attend the clinic. The eligibility of the couples in terms of the inclusion and exclusion criteria was ensured at the clinic. Then, the eligible and consenting couples were asked to sign the consent form. After obtaining their informed written consent, the pretest questionnaires, including demographic information, General Health Questionnaire-28 (GHQ-28), and Fertility Quality of Life (FertiQoL) questionnaire, were completed

through self-reporting. Among 116 couples visiting the Besat Infertility Clinic, 24 couple were excluded for unwillingness to participate, 26 couple for ineligibility (7 couples aged over 45 years, 13 couples with secondary infertility, and 6 couples for illiteracy), 8 couples with scores of higher than 41 in the GHQ-28, and 3 couples for a death in the family within 6 months before the study; in addition, one couple was excluded as the female spouse developed diabetes. The remaining 54 couples were randomized into two equal-sized groups, namely intervention and control. There was no sample loss, and all participants were analyzed [Figure 1]. The researchers paid the cost of transportation of participants to the clinic. They appreciated the participants for their time by providing them with the results.

Randomization and intervention

The participants were equally allocated into the counseling and control groups (1:1), using the randomized block design with blocks of size 4 and 6. The allocation process was done by someone not involved in data sampling and analysis. To conceal the allocation, the type of intervention was written on a paper and sealed in an

opaque and sequentially numbered envelope according to random allocation sequence.

The first author (MH) provided counseling under supervision of a psychologist (KS) in groups of 8–12 based on the ACT approach. The counseling sessions were held in a room of infertility clinics at a friendly atmosphere that reinforced self-confidence of participants and facilitated their participation in group discussion. The control group did not receive any intervention. To avoid the contamination, participants receiving the intervention were requested not to share information with other participants. At the end of the study, the contents of the counseling sessions were prepared in the form of a booklet and given to the control group. A summary of the counseling sessions is as follows. At the end of each session, the couples were asked to practice the lessons covered during the week and to attend the next session well-prepared. During the intervention period, no couple was absent. During the sessions, exercises, questioning, and feedback were reviewed too. A summary of the counseling sessions was as follows:

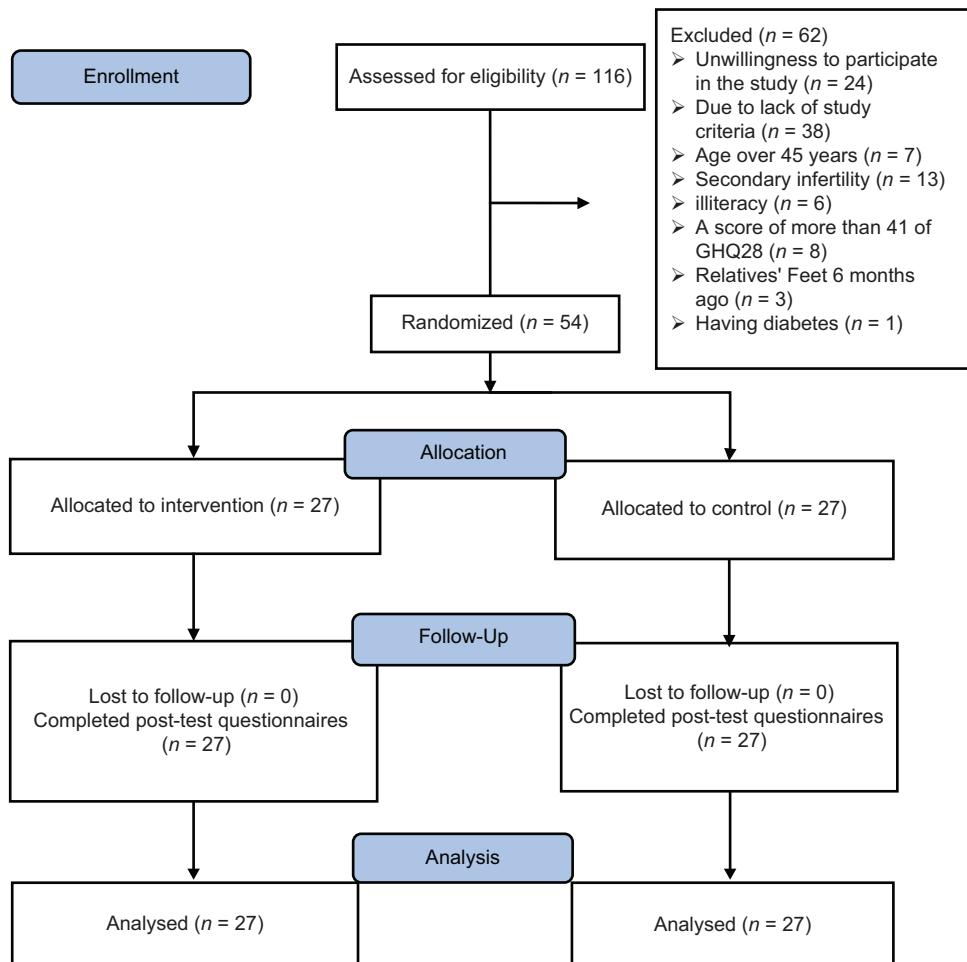


Figure 1: Flow chart of the study

- First session: Introducing the members, describing the rules and responsibilities of group members, presenting the objectives, and explaining the ACT-based counseling. General assessment: Determining the main complaints of the participants, determining the experimental avoidance of the participants, specifying the thoughts and their underlying feelings, and identifying the strengths of the participants
- Second session: Collecting the previous session's assignments; providing a brief description of the reproductive system physiology and anatomy, defining infertility, presenting infertility statistics and prevalence, and describing the effects of infertility on different life aspects. Informing about the methods of pharmacotherapy and surgical treatments for infertility and their success rates
- Third session: Collecting the previous session's assignments; delivering mindfulness technique education. Teaching mindfulness techniques to deal with empirical avoidance was reinforced by practice and repetition. Hence, the participants did mindfulness exercises several times a day by learning how to realize their feelings, emotions, and thoughts and observed everyday tasks such as conscious breathing and eating with full awareness. These exercises were performed in groups and in practice in the classroom, and the participants were asked to repeat them regularly at home
- Fourth session: The previous session assignments were retrieved from the couples at the beginning of the session, and the following subjects were discussed. Teaching hopelessness technique using hole and shovel metaphor; exercise: Thought suppression to show uncontrollability of mind; homework: Self-monitoring
- Fifth session: Collecting the previous session's assignments; introducing the acceptance concept: Using the guest metaphor and introducing concept of self-monitoring; Thought suppression techniques and relevant exercises: Watching the thoughts, taking the role of television reporter, or singing the thoughts
- Sixth session: Collecting the previous session's assignments; introducing the concept of values and commitment actions, difference between value and objective, and the list of value domains, and using birthday ceremony metaphor; homework: Completing the worksheet of objectives, values, effective measures, and barriers
- Seventh session: Collecting the previous session's assignments; starting the session with exercise of contact with the present moment, controlling and assessing worksheets, and introducing and teaching cognitive dissonance using the bus metaphor
- Eighth session: Collecting the previous session's assignments; reviewing mindfulness techniques, and reviewing exercises.

Data collection tool

The demographic inventory, GHQ-28 (General Health Questionnaire-28), and FertiQoL questionnaire were used for data collection. The demographic inventory was administered before the intervention. The GHQ-28 and FertiQoL were completed by the participants before and 1 month after the intervention in the form of self-report. The participants referred for posttest session 1 month after the intervention as individually (the woman and her spouse together). The demographic inventory included items on age, weight, length of marriage, duration of infertility, job, education, income, source of infertility knowledge, and cause of infertility.

The GHQ-28 was developed in 1970 by Hiller and Goldberg to measure four areas of physical function, anxiety symptoms and sleep disturbance, social function, and depression symptoms. Each area was comprised of 7 items. Each response was scored on a four-point scale (not at all, not more than normal, more than normal, and much more than normal), with lower scores indicating the normal mental health and higher scores reflecting a mental health problem. Each item was weighted on a four-point Likert scale scored from 0 to 3, resulting in an overall score between 0 and 84 and a cutoff score of 23. Participants with scores higher than 23 were considered susceptible to mental health problem, and those with scores higher than 41 were considered to have an acute condition. This questionnaire was validated by Norbala *et al.* in Tehran in 2001. They selected 879 men and women using random cluster sampling in a two-stage assessment study and reported, respectively, the overall classification error rate, specificity, and sensitivity of 12.3, 92.3, and 70.5, with a cutoff score of 23.^[23]

The FertiQoL questionnaire consists of 36 items with 24 items assessing the fertility-specific quality of life, 10 items assessing the fertility treatment quality of life, and 2 items assessing the overall life and medical health.^[7] This instrument is scored on a Likert scale scored from 0 to 4 with a greater score reflecting the higher quality of life. This is a valid and reliable instrument to measure the effects of fertility problems and their treatment methods on quality of life in Iran and throughout the world. It has been widely used by different studies in Iran.^[7,23,24] The face and content validity of this questionnaire was proved by some specialists in Iran. The Cronbach's alpha of the whole scale was 0.90 and acceptable for the subscales of fertility-specific quality of life and fertility treatment quality of life within the range of 0.72 and 0.92.^[24]

Data analysis

After data collection, the obtained data were analyzed with SPSS21. The normality of quantitative data was evaluated using the K-S test. The intergroup

comparison of demographic information was done using the independent *t*-test, Chi-square test, Chi-square test for trend, and Fisher's exact test. The independent *t*-test (if data were normally distributed) and the Mann–Whitney U-test (if data were not normally distributed) were employed to compare the mean overall score of mental health and its subdomains, as well as the mean score of quality of life and its subdomains before the intervention. With respect to the postintervention, ANCOVA with controlled baseline values (if data were normally distributed) and Mann–Whitney U-test (if data were not normally distributed) were utilized. All analyses were carried out based on the intention-to-treat analysis. In this study, $P < 0.05$ was set statistically significant.

Ethical consideration

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. In this manuscript after obtaining the approval of the Ethics Committee of Tabriz University of Medical Sciences (Ethics committee 83 reference number: IR.TBZMED.REC.1395.1179) and registering the study in the Iranian Registry Clinical Trial (IRCT20111122008170N13), the written informed consent was obtained from the participants.

Results

There was no significant intergroup difference in demographic information ($P > 0.05$). The mean (standard deviation [SD]) age of the females in the intervention and control groups was 31.5 (5.3) and 30.3 (4.6) years, respectively. The mean (SD) age of the males in the intervention and control groups was 33.3 (5.5) and 31.9 (4.8), respectively. The mean (SD) of the duration of infertility in the intervention and control groups was 3.0 (2.1) and 2.4 (1.2) years, respectively. The other sociodemographic characteristics of participants in the study groups are reported in Table 1.

Based on ANCOVA adjusted for baseline values, the mental health total score was significantly lower in the intervention women than the control women 1 month after the intervention (adjusted mean difference [aMD]: -9.1 ; 95% confidence interval [CI]: -11.9 – -6.3 ; $P < 0.001$). Furthermore, the total score of mental health was significantly lower in the intervention men than the control men 1 month after the intervention (aMD: -7.2 ; 95% CI: -10.1 – -4.2 ; $P < 0.001$) [Table 2].

Based on ANCOVA adjusted for baseline values, the FertiQoL total score was significantly higher in the

intervention women than the control women 1 month after the intervention (aMD: 15.4 ; 95% CI: 10.2 – 20.5 ; $P < 0.001$). Furthermore, this score was significantly higher in the intervention men than the control men 1 month after the intervention (aMD: 14.0 ; 95% CI: 10.2 – 17.7 ; $P < 0.001$) [Table 3]. The results of mental health and quality of life subdomains are presented in Tables 2 and 3, respectively.

Discussion

The results of this study indicate that counseling has been helpful on improving mental health and FertiQoL of infertile couples. These findings are consistent with other studies. For example, a pilot study (2011) in California on a couple with 5 years of infertility and failed *in vitro* fertilization (IVF) used ACT to treat infertility stress. They received a 1-year follow-up during two failed IVFs and for 1 year after it. The reported anxiety and depression were higher in the female spouse than her husband before the treatment; however, a significant reduction was observed in the general infertility stress, social infertility stress, sexual infertility stress, psychological distress, and depression. In addition, the level of stress after the second failed IVF was lower. The male participant reported a significant reduction in sexual infertility anxiety. This study showed the effectiveness of ACT in reducing the stress in infertile couples.^[15] Consistent with the current study, the above study showed the effectiveness of the ACT approach in infertile couple. The only differences between these studies were that the sample size included only one couple, and the lengths of intervention and follow-up were longer.

A clinical study in Tabriz, on 92 infertile women between 2012 and 2013, the intervention group received 2-h weekly sessions of infertility therapy based on the guidelines for counseling in infertility for 4 weeks, and the control group received the routine clinical care. Results showed an improvement in the adjustment of the counseling group. Researchers concluded the effectiveness of counseling as a complementary therapy in enhancing the adjustment of infertile women. It was recommended to investigate both spouses to achieve more complete results.^[25] There are differences between the current study and the above study in the counseling content and participants. This study also confirmed the positive effect of group counseling on the condition of infertile women.

In addition, a clinical trial was conducted in Iran on 30 infertile women to investigate the effect of ACT counseling on infertility stress and adoption. These participants were divided into two groups of intervention and control groups. The first group received

Table 1: Comparison of sociodemographic characteristics of the participants in two groups of counseling and control

Variable	Counseling (n=54), n (%)	Control (n=54), n (%)	P
Woman's age (year)	31.5 (5.3) [†]	30.3 (4.6) [†]	0.390*
Man's age	33.3 (5.5) [†]	31.9 (4.8) [†]	0.296*
Female weight (kg)	70.0 (12.5) [†]	73.0 (12.5) [†]	0.359*
Man weight (kg)	84.9 (13.0) [†]	82.9 (11.8) [†]	0.557*
Duration of marriage (years)	5.0 (2.2) [†]	5.0 (1.3) [†]	1*
Duration of infertility (years)	3.0 (2.1) [†]	2.4 (1.2) [†]	0.227*
Woman job			
Homemaker	19.0 (70.4)	22.0 (81.5)	0.396 [†]
Employed	8.0 (29.6)	5.0 (18.5)	
Man job			
Unemployed	2.0 (7.4)	0	0.745 [†]
worker	3.0 (11.1)	3.0 (11.1)	
Employee	5.0 (18.5)	9.0 (33.3)	
Self-employment	17.0 (63.0)	15.0 (55.6)	
Income level			
At a sufficient level	16.0 (29.6)	16.0 (29.6)	0.914 [†]
Too much	9.0 (16.7)	8.0 (14.8)	
Less than full	29.0 (53.7)	30.0 (55.6)	
Female education			
Elementary	12.0 (44.4)	6.0 (22.2)	0.128 [†]
Secondary	6.0 (22.2)	4.0 (14.8)	
Diploma	4.0 (14.8)	11.0 (40.7)	
Bachelor	3.0 (11.1)	5.0 (18.5)	
Master and higher	2.0 (7.4)	1.0 (3.7)	
Male education			
Elementary	7.0 (25.9)	8.0 (29.6)	0.458 [†]
Secondary	7.0 (25.9)	5.0 (18.5)	
Diploma	8.0 (29.6)	3.0 (11.1)	
Bachelor	4.0 (14.8)	9.0 (33.3)	
Master and higher	1.0 (3.7)	2.0 (7.4)	
Female infertility education			
Yes	20.0 (76.9)	17.0 (63.0)	0.268 [‡]
No	6.0 (37.0)	10.0 (23.1)	
Male infertility education			
Yes	22.0 (84.6)	17.0 (63.0)	0.458 [‡]
No	4.0 (15.4)	10.0 (37.0)	
The source of female information			
Book	4.0 (20.0)	4.0 (23.5)	0.833 [§]
Family physician	10.0 (50.0)	7.0 (41.2)	
Radio and TV	5.0 (25.0)	6.0 (35.3)	
Advice class	1.0 (5.0)	0	
The source of male information			
Book	1.0 (4.5)	6.0 (35.3)	0.051 [§]
Family physician	12.0 (54.5)	6.0 (35.3)	
Radio and TV	8.0 (36.4)	5.0 (29.4)	
Advice class	1.0 (4.5)	0	
Cause of infertility			
Female	24.0 (50.0)	27.0 (44.4)	0.616 [§]
Male	10.0 (24.0)	13.0 (18.5)	
Female and male	16.0 (18.5)	10.0 (29.6)	
Unknown	4.0 (7.4)	4.0 (7.4)	

All numbers are reported in terms of numbers (percentages) except those given with [†] which represents the mean (standard deviation). *Independent t-test, [†]linear-by-linear association, [‡]Pearson χ^2 Fisher's exact test

eight ACT-based sessions, and the second group did not receive any intervention. The results showed that

the ACT-based counseling reduced infertility stress and improved attitude toward adoption.^[26] This study similar

Table 2: Comparison of total mean score of mental health and its subscales in infertile couples

Variable	Mean (SD)		Adjusted mean difference (95% CI)	P
	Counseling (n=27)	Control (n=27)		
Overall mental health score				
Wife				
Before the counseling	29.4 (8.2)	32.2 (4.7)	-2.8 (-6.5-0.8)	0.128 [†]
A month after the end of the counseling	21.9 (8.5)	33.5 (7.0)	-9.1 (-11.9--6.3)	<0.001 [‡]
Husband				
Before the counseling	27.8 (8.2)	27.1 (5.4)	0.6 (-3.1-4.4)	0.743 [†]
A month after the end of the counseling	22.0 (6.3)	28.9 (7.2)	-7.2 (-10.1--4.2)	<0.001 [‡]
Physical scale				
Wife				
Before the counseling	9.0 (3.8)	11.5 (2.9)	-2.5 (-4.4--0.7)	0.007 [†]
A month after the end of the counseling	7.3 (3.7)	12.0 (3.3)	-2.4 (-3.7--1.3)	<0.001 [‡]
Husband				
Before the counseling	8.5 (3.2)	8.4 (2.2)	0.07 (-1.5-1.6)	0.923 [†]
A month after the end of the counseling	7.8 (2.7)	7.9 (2.5)	-2 (-3.3--0.8)	0.003 [‡]
Anxiety and sleep disorders				
Wife				
Before the counseling	7.9 (4.0)	7.7 (2.1)	0.1 (-1.6-1.9)	0.866 [†]
A month after the end of the counseling*	7.0 (3-8)*	9.0 (7-10)*	-	0.013 [‡]
Husband				
Before the counseling	7.0 (4-9)*	7.0 (6-7)*	-	0.803 [‡]
A month after the end of the counseling	7.0 (3-8)*	7.0 (7-9)*	-	0.013 [‡]
Social function				
Wife				
Before the counseling	11.0 (2.9)	11.5 (2.2)	-0.6 (-2.0-0.8)	0.397 [†]
A month after the end of the counseling	7.8 (2.8)	10.1 (2.4)	-2.3 (-3.8--0.9)	<0.001 [‡]
Husband				
Before the counseling	12.0 (9-13)*	11.0 (9-13)*	-	0.570 [‡]
A month after the end of the counseling	7.0 (7-10)*	10.0 (7-13)*	-	<0.001 [‡]
Depression				
Wife				
Before the counseling	1 (0-3)*	1 (0-2)*	-	0.812 [‡]
A month after the end of the counseling	0 (0-1)*	3 (0-4)*	-	0.007 [‡]
Husband				
Before the counseling	0 (0-3)*	0 (0-2)*	-	0.871 [‡]
A month after the end of the counseling	0 (0-0)*	0 (0-2)*	-	0.054 [‡]

*Median (percentile 25-75), [†]ANCOVA; [‡]Mann-Whitney U-Test; [§]Independent t-test. SD=Standard deviation, CI=Confidence interval

to the current study used the same intervention approach and both showed significant positive results. The only difference was that the former study did not include the spouses of the participants and infertile men.

Sadri *et al.* investigated the effect of affective couple therapy on the quality of relationship, marital conflict, and simplicity of infertile couples in the two groups, each containing 18 participants. In their study, the intervention group received 10 counseling sessions, whereas the control group did not receive any intervention. Data analysis indicated the improvement of couple relationship, reduction of marital conflict, and enhancement of simplicity among infertile couples.^[27] Similar to the current study, they applied group counseling to infertile couples and showed a significant improvement. The only difference was the

employed approach. However, this counseling was focused on infertile women and not much on infertile men or infertile couples.

Reports indicated positive effects of psychological intervention on the rate of fertility and psychological consequences of infertility, such as anxiety, depression, stress, and marital relationship.^[28] In a meta-analytical study (2014), 1821 patients with mental disorders and physical problems have been examined. Results showed that ACT outperformed the placebo and standard treatments in controlling the posttreatment conditions and follow-up evaluation of primary objectives; in addition, better results were obtained with respect to the secondary objectives, i.e., satisfaction or quality of life. ACT can be used as an effective psychological intervention to treat anxiety, depression, addiction, and

Table 3: Comparison of the mean total fertility quality of life score and its subscales in infertile couples

Variable	Mean (SD)		Mean difference (95% CI)	P
	Counseling (n=27)	Control (n=27)		
Overall quality of life of fertility				
Wife				
Before the counseling	75.3 (18.9)	61.4 (11.4)	14 (5.4-22.4)	0.002*
A month after the end of the counseling	85.1 (15.2)	58.1 (15.8)	15.4 (10.2-20.5)	>0.001†
Husband				
Before the counseling	79.7 (17.0)	74.4 (15.5)	5.2 (-3.7-14.1)	0.243*
A month after the end of the counseling	86.8 (12.4)	68.5 (16.5)	14.0 (10.2-17.7)	>0.001†
Emotional part				
Wife				
Before the counseling	12.9 (4.0)	10.4 (2.9)	0.9 (0.5-4.3)	0.014*
A month after the end of the counseling	14.9 (3.0)	9.1 (3.3)	4.0 (2.9-5.1)	>0.001†
Husband				
Before the counseling	14.0 (3.5)	14.0 (3.0)	0.03 (-1.8-1.8)	0.967*
A month after the end of the counseling	15.8 (2.4)	12.2 (3.9)	3.4 (2.3-4.5)	>0.001†
Mental/physical part				
Wife				
Before the counseling	12.4 (3.6)	9.8 (2.8)	2.6 (0.9-4.4)	0.004*
A month after the end of the counseling	14.5 (3.1)	9.5 (3.2)	2.9 (1.8-4.0)	>0.001†
Husband				
Before the counseling	14.4 (3.1)	13.4 (3.1)	1 (-0.7-2.7)	0.230*
A month after the end of the counseling	15.5 (2.3)	12.7 (3.1)	2.0 (1.2-2.9)	>0.001†
Interpersonal relations				
Wife				
Before the counseling	11 (8-15)*	8 (7-11)*	-	0.007†
A month after the end of the counseling	14.5 (3.1)	9.5 (3.8)	3 (1.7-4.3)	>0.001†
Husband				
Before the counseling	13 (12-18)*	12 (11-16)*	-	0.374†
A month after the end of the counseling	15.4 (2.8)	12.9 (3.9)	2 (1.1-3)	>0.001†
Social relations				
Wife				
Before the counseling	14 (3.8)	11.3 (3.2)	2.7 (0.8-4.6)	0.007*
A month after the end of the counseling	15.5 (3.3)	10.2 (3.8)	3.3 (1.9-4.8)	>0.001†
Husband				
Before the counseling	14.3 (3.6)	13.6 (3.5)	0.7 (-1.2-2.6)	0.469*
A month after the end of the counseling	15.5 (2.8)	12.8 (3.9)	2.1 (1.2-3.0)	>0.001†
Section for the treatment of infertility				
Wife				
Before the counseling	23 (20-30)*	20 (18-22)*	-	0.023†
A month after the end of the counseling	25.8 (4.7)	19.7 (4.9)	3.4 (1.8-5.5)	>0.001†
Husband				
Before the counseling	22 (20-30)*	20 (20-23)*	-	0.025†
A month after the end of the counseling	24 (20-30)*	20 (16-20)*	-	>0.001†

*Median (percentile 25-75), †Independent t-test, ‡Mann-Whitney U-Test, †ANCOVA. SD=Standard deviation, CI=Confidence interval

physical problems. However, better identification of ACT requires more concentrated studies into its effect on the quality of life.^[20]

Limitations and strengths

Among the limitations of the study was the lack of long-run follow-up to investigate the effect of counseling on the fertility success rate. Another limitation is a small sample size of this study. Among the strengths of the study are the participation of men and adherence to

all clinical trial principles, including the random and blinded allocation process.

Suggestions and findings implication

Although more relevant studies are required, it is recommended to hold individual counseling sessions in future studies. Furthermore, conducting of studies with large sample size is suggested. Regarding the positive effect of the ACT intervention on the mental health and infertile couple’s quality of life, it can be used in

the infertility clinics. It is also recommended that the therapist takes the ACT courses.

Conclusion

Results of the current study suggested that the ACT counseling can improve the mental health and quality of life of infertile couples. As a result, in addition to routine care, the infertile couples can be provided with suitable educational and counseling packages.

Acknowledgments

We hereby thank the participants in this project.

Financial support and sponsorship

This study was funded by the Tabriz University of Medical Sciences.

Conflicts of interest

There are no conflicts of interest.

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