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Original Article

The effects of cognitive behavioral therapy on self-esteem among couples with infertility

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Abstract

Background and aims: Infertility is the inability to conceive after one-year sexual activity without contraception. It can be associated with different psychological consequences. The aim of this study was to evaluate the effects of cognitive behavioral therapy (CBT) on self-esteem among infertile couples.

Methods: This randomized controlled trial was conducted in 2018 with a two-group pretest-posttest design. Participants were thirty infertile couples (60 individuals) who referred to the infertility clinic of Imam Khomeini hospital, Ahvaz, Iran. Couples with score 21 or less for the Eysenck Self-Esteem Questionnaire were randomly allocated to a 30-person control and a 30-person intervention group. Participants in the intervention group received CBT in eight sixty-minute weekly sessions, while their counterparts in the control group received no education. A demographic questionnaire and the Eysenck Self-Esteem Questionnaire were used for data collection. The data were analyzed through the SPSS software (v. 24.0) and the chi-square, independent-sample *t*, and paired-sample *t* tests.

Results: There was no significant difference between the intervention and the control groups respecting the pretest mean score of self-esteem (12.93 ± 3.31 vs. 12.8 ± 2.58; $P=0.863$). The posttest mean score of self-esteem in the control group was 12.76 ± 2.47 with no significant change compared with the pretest ($P=0.907$), while the mean score of self-esteem in the intervention group significantly increased to 21.43 ± 3.54 at posttest ($P<0.001$). The posttest mean score of self-efficacy in the intervention group was significantly more than the control group ($P<0.001$).

Conclusion: CBT can significantly improve self-esteem among couples with infertility.

Keywords: Self-esteem, Infertility, Cognitive behavioral therapy

Introduction

Infertility is a major problem of the contemporary world. By definition, infertility is the inability to conceive after one-year sexual activity without contraception. The prevalence of infertility has increased by 50% since 1995 and 10%–15% of couples currently suffer from infertility (1). According to the World Health Organization (WHO), one fourth of couples in the world had infertility in 2012 (2). Infertility rate in Iran is 20.2% which is considerably higher than the average global rate (3). Men and women equally experience infertility and 35% of infertilities are related to men, 35% are related to women, 20% are due to unknown causes, and the remaining 10% are due to preventable causes such as marriage age, infections, diseases such as tuberculosis and malaria, and occupational and environmental factors (4).

Infertility is a life crisis with a wide range of physical, emotional, financial, and sociocultural problems (5). It is not a disease but can affect all aspects of life and lead to different emotional and mental problems such as distress, despair, sense of guilt, depression, anxiety, and worthlessness (6,7). The perceived inability to conceive and have a child like others is one of the most negative life experiences and can turn into a mental crisis for the afflicted individuals. This sense of inability together with negative public reactions towards these individuals predispose them to mental strains and pressures (8), seriously damage their self-esteem (SE) (6,7,9), and give them senses of frustration and vulnerability to other mental disorders (9).

SE is the difference between perceived self or self-concept (i.e., objective self) and ideal self (i.e., the worthy self) and hence, low difference between them is associated with high SE while large difference between them is associated with low SE (10). SE is based on family relationships, social interactions, body image, and self-worth and has significant protective effects against mental strains and stressful life events. Individuals with high SE can easily cope with threats and events without experiencing distress and psychological disorganization. SE is a valuable and vital asset and a facilitator to the development of capabilities and creativity (11,12).

Infertility can significantly affect SE. A study showed that infertility reduces SE and leads to consequences such as anxiety and depression (13). Another study showed that the mean score of SE among infertile women was

significantly less than their fertile counterparts (69.83 ± 21 vs. 81.09 ± 24.6) (14). Another study also reported that compared with fertile couples, infertile couples had lower SE (32.7 ± 8 and 27.3 ± 8.9) (15).

Medical treatments for infertility, from medical and hormonal assessments to fertilization methods such as in vitro fertilization, put heavy physical and mental burden on couples (16). Therefore, psychological interventions for infertility management have received considerable attention in recent years because of the potential relationship between psychological factors and infertility (17). Cognitive behavioral therapy (CBT) is an intervention which helps clients overcome their disturbing thoughts and self-deceptions through identifying their automatic thoughts, self-disciplines, and cognitive errors, and making accurate judgments instead of inaccurate judgments (18). A study recommended CBT as the first line treatment for infertile couples because it is in line with their needs (19). Another study found that CBT significantly improved SE and mental health among infertile women (8). Therefore, CBT may be helpful to reduce the problems of infertile couples. The present study was conducted to produce more conclusive evidence in this area. The aim of this study was to evaluate the effects of CBT on SE among infertile couples.

Methods

Design

This randomized controlled trial was conducted with a two-group pretest-posttest design.

Participants and setting

The statistical population of the study consisted of all infertile couples who referred to the infertility clinic of Imam Khomeini hospital, Ahvaz, Iran in 2018. Sample size was calculated to be thirty (fifteen couples) per group based on the results of a previous study (8) and with a confidence level of 0.95, a power of 0.90, and a probable attrition rate of 20%. Accordingly, 60 eligible individuals (i.e., 30 couples) were conveniently selected and randomly allocated to a control (n = 30) and an intervention (n = 30) group through a table of random numbers. Eligibility criteria were primary infertility diagnosed by a gynecologist, agreement for participation, age of 18–45 years, score 21 or less for the Eysenck Self-Esteem Questionnaire, monogamy for male participants, educational level more than guidance school, no use of antipsychotic agents, no history of receiving CBT, and no significant life events during the last six months. Participants who participated in any other CBT program or had more than two absences from the CBT sessions in the present study were excluded. Eligible participants were identified through personal interview.

Instruments

Data collection instruments were a demographic questionnaire and the Eysenck Self-Esteem Questionnaire. The demographic questionnaire included items on age, gender, employment status, and financial status. The Eysenck Self-Esteem Questionnaire is a widely used valid instrument for SE assessment. It has thirty Yes/No items on life satisfaction and good feelings about self. The Yes and the No answers of items 1, 2, 5, 9, 10, 11, 16, 22, 23, 29, and 30 are scored respectively 1 and zero and the other items are scored reversely. Selection of question mark in each item was scored 0.5. The total score of the questionnaire was calculated through summing item scores. Total scores more than 21, 11–21, and less than 11 were interpreted as high SE, moderate SE, and low SE, respectively (20). A study on university students in Iran reported that the coefficient of the correlation of the scores of this questionnaire and the Ahvaz Self-Esteem Scale was 0.74 for male participants and 0.79 for female participants which confirms the acceptable validity of this questionnaire. Moreover, the Cronbach's alpha and the split-half coefficient of the questionnaire were 0.88 and 0.87, respectively (21). Participants in both groups completed the demographic questionnaire before the intervention and the Eysenck Self-Esteem Questionnaire before and after the intervention.

Intervention

Participants in the intervention group participated in eight 60-minute weekly CBT sessions (Table 1). The CBT program was developed based on the CBT practical guideline of Michael Free (22). The first author implemented the study intervention for all participants in the intervention group in a midwifery clinic in Ahvaz, Iran.

Data analysis

Collected data were analyzed using the SPSS software (v. 24.0). The Kolmogorov-Smirnov test was used for normality testing and the data were described using the measures of descriptive statistics, namely mean, standard deviation, and frequency. Between-group comparisons were made using the independent-sample *t* test for numerical variables and the chi-square test for categorical variables. Within-group comparisons were also made through the paired-sample *t* test. The level of significance was set at less than 0.05.

Results

Thirty couples with infertility (i.e., sixty individuals) participated in this study. Four participants had one absence and two participants had two absences from the intervention sessions. None of them were excluded (Figure 1). Age mean was 30.70 ± 4.27 in the intervention group and 32.43 ± 5.37 in the control group. Groups did not significantly differ from each other with respect to participants' age, educational level, employment status, and financial status ($P > 0.05$; Table 2).

There was no significant difference between the groups respecting the pretest mean score of SE

Table 1. Content of therapy sessions

Session	Content
1	Introduction; welcoming; familiarization with group goals and rules and session goal; explanations about the thought-behavior-physiology system and the ABC process; homework assignments.
2	Review of the assignments; review and discussion of the previous session; explanations about the main aspects of CBT and cognitive distortion or irrational errors and their identification; homework assignments.
3	Review of the assignments; review and discussion of the previous session; explanations about the negative cognitive triangle and rational errors and beliefs; homework assignments.
4	Review of the assignments; review and discussion of the previous session; explanation about schemas and spontaneous thoughts, and identification of schemas through the vertical arrow technique; homework assignments.
5	Review of the assignments; review and discussion of the previous session; review of the vertical arrow technique; explanations about the advanced vertical arrow technique and different types of beliefs; homework assignments.
6	Review of the assignments; review and discussion of the previous session; creating the main list of beliefs and cognitive maps; explanations about the subjective units of disturbance; homework assignments.
7	Review of the assignments; review and discussion of the previous session; explanation about the modifiability of beliefs; cost-benefit analysis; utility analysis of belief; homework assignments.
8	Review of the assignments; review and discussion of the previous session; explanations about the rational analysis of beliefs and methods to change negative beliefs; receiving members' feedback about the CBT intervention; termination of the intervention.

Table 2. Group comparisons respecting participants' characteristics

Characteristics			Groups		*P* value
			Intervention	Control	
			Mean ± SD or No. (%)	Mean ± SD or No. (%)	
Age		Female	26.67 ± 3.79	26.53 ± 4.86	0.934
		Male	31.13 ± 4.82	30.93 ± 3.95	0.902
Educational level	Female	Guidance school	1 (6.7)	2 (13.3)	0.827
		Diploma	11 (73.3)	10 (66.7)	
		University	3 (20)	3 (20)	
	Male	Guidance school	2 (13.3)	1 (6.7)	0.827
		Diploma	10 (66.7)	11 (73.3)	
		University	3 (20)	3 (20)	
Employment status	Female	Employed	4 (26.7)	5 (33.3)	0.428
		Self-employed	0 (0)	2 (13.3)	
		Housewife	11 (73.3)	8 (53.3)	
	Male	Employed	8 (53.3)	6 (40)	0.472
		Self-employed	7 (46.7)	9 (60)	
		Housewife	0 (0)	0 (0)	
Financial status	Female	Low	2 (13.3)	3 (20)	0.827
		Medium	5 (33.3)	6 (40)	
		Good	6 (40)	5 (13.3)	
		Excellent	2 (13.3)	1 (6.7)	
	Male	Low	1 (6.7)	2 (13.3)	0.935
		Medium	6 (40)	6 (40)	
		Good	6 (40)	5 (33.3)	
		Excellent	2 (13.3)	2 (13.3)	

($P = 0.863$). Moreover, the mean score of SE did no significantly change in the control group ($P = 0.907$), while it significantly increased in the intervention group ($P < 0.001$). Accordingly, the posttest mean score of SE in the intervention group was significantly more than the control group ($P < 0.001$) (Table 3).

Discussion

This study evaluated the effects of CBT on SE among infertile couples. Study findings indicated the significant positive effects of CBT on infertile couples' SE.

The mean of participants' age was 30.70 ± 4.27 in the intervention group and 32.43 ± 5.37 in the control group and the between-group difference was not significant. Two previous studies reported significant inverse correlation between age and SE among infertile couples (4) and infertile women (14). Our findings also showed that most participants in the intervention group (73.3% of

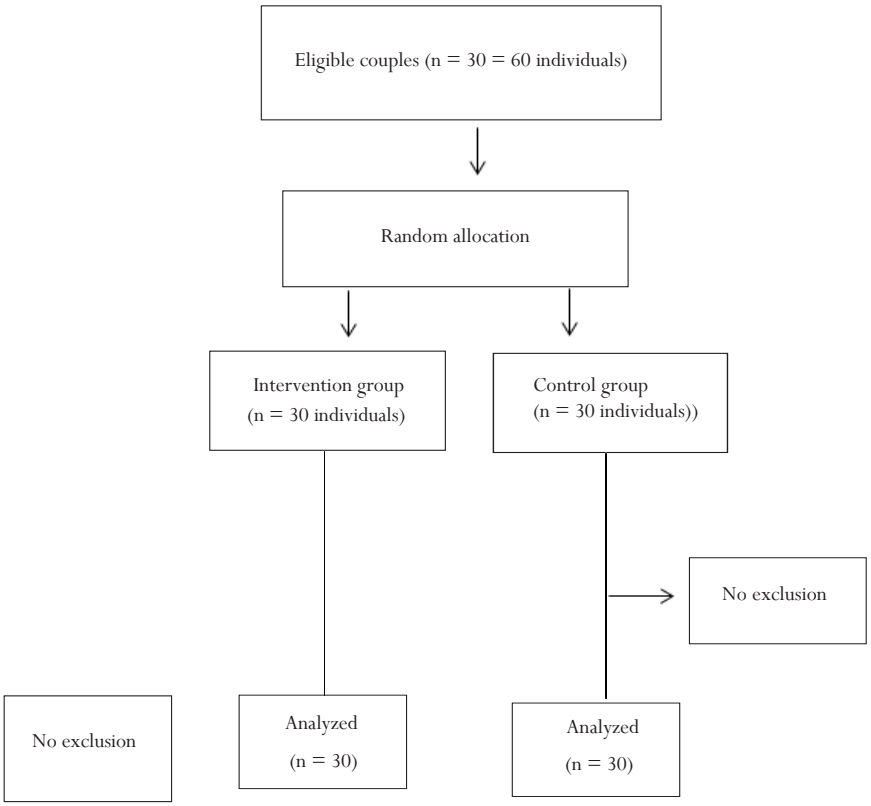

Figure 1. The flow diagram of the study.

women and 66.7% of men) and the control group (66.7% of women and 73.3% of men) had secondary diploma and the between-group difference was not significant. A previous study in Iran also reported the same finding (23). Another study reported that infertile women did not significantly differ from each other respecting their educational level (24). We also found that most female participants in the intervention (73.3%) and the control (53.3%) groups were housewife and the between-group difference was not significant. Moreover, most male participants in these groups were self-employed (53.3% vs. 60%) with no significant between-group difference. A previous study into the SE of fertile and infertile women also showed that 67% of fertile women and 70% of infertile women were housewife (14). Another study reported that employed women had higher SE than housewife women (25). Study findings revealed that 33.3% of women and 40% of men in the intervention group and 40% of women and 40% of men in the control group had medium financial status with no significant difference between the groups. Two studies reported that income had significant positive relationship with SE among infertile women (26) and women with hysterectomy (27). Low income can lead to marital conflicts and reduce SE, which is in turn associated with decrease in quality of life (27).

Table 3. Between- and within-group comparisons respecting the mean score of self-efficacy

Time	Group		*P* value
	Intervention	Control	
	Mean ± SD	Mean ± SD	
Before	12.93 ± 3.31	12.8 ± 2.58	0.863
After	21.43 ± 3.54	12.76 ± 2.48	<0.001
P value	<0.001	0.907	

Study findings also showed that the pretest mean score of SE was 12.93 ± 3.31 in the intervention group and 12.8 ± 2.58 in the control group with no significant between-group difference. This finding shows low to moderate SE in both groups at the beginning of the study. Two previous studies also reported that compared with fertile couples, infertile couples had less SE and more anxiety (13,15). Infertility treatments such as medical and hormonal assessments and fertilization methods impose heavy physical and mental burden on couples (16).

We also found that the CBT intervention of the study significantly improved SE among couples with infertility. CBT modifies and corrects inefficient cognitive factors such as negative thoughts and beliefs and thereby, leads to emotional and behavioral modifications and increases SE (16). Moreover, it enables individuals to identify their automatic thoughts, self-discipline, and cognitive errors, make accurate judgments, and thereby, manage their negative thoughts and self-deceptions (18). CBT has two main goals, namely assistance in achieving better feelings through cognitive reconstruction, and development of a realistic value system. CBT therapists neither tell their clients that their beliefs are irrational or false nor require them to accept therapists' beliefs. Rather, clients finally decide whether to refuse, modify, or accept their own beliefs and get aware of their emotional and behavioral consequences (18).

What does this paper contribute to the wider global clinical community?

- CBT is effective in significantly improving SE among couples with infertility.
- CBT can be used to reduce stress, anxiety, and concerns and improve SE, self-confidence, hope, and motivation among couples with infertility.

Limitations of the study

Couples with infertility in the study setting participated in different counseling sessions and hence, some of them might not have great motivation for participation in the present study. We attempted to motivate them for participation through follow-up telephone contacts, involvement of them in group discussions, creation of a happy atmosphere in CBT sessions, and provision of gifts during the study.

Conclusion

This study suggests the significant positive effects of CBT on SE among couples with infertility. As midwives are aware of infertility-related problems and concerns and have regular contact with the public, they can use CBT to reduce stress, anxiety, and concerns and improve SE, self-confidence, hope, and motivation among couples with infertility.

Conflict of Interests

The authors declare no conflict of interests.

Ethical Approval

The Ethics Committee of Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran, approved this study (code: AJUMS.REC.1397.810). The study was also registered in the Iranian Registry of Clinical Trials (identifier: IRCT20190219042754N1). Participants were informed about the study aim, study methods and confidentiality of the study data. Informed consent was gained from all participating couples.

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