

# The Effects of Cognitive Behavioral Therapy on Body Image in Infertile Women

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## Abstract

**Background:** Studies show that infertility can result in body image changes, which can majorly affect personality.

**Objectives:** The current study aimed to determine the effects of cognitive behavioral therapy (CBT) on body image in infertile women.

**Methods:** This clinical trial was performed on 24 infertile women, admitted to the Infertility Research and Treatment Center of Ahvaz, Iran in 2016-2017. In the first stage, convenience sampling was applied, and the participants were allocated to 2 groups (12 patients per group), using a table of random numbers. The experimental group participated in 10 sessions of CBT weekly, based on the 8-step program by Cash. body-self relations questionnaire and Beck Self-Concept inventory were completed in each group before, immediately after, and 1 month after the intervention.

**Results:** After the intervention, the mean scores of body image were  $156.9 \pm 3.4$  and  $148.7 \pm 4.8$  in the experimental and control groups, respectively; the difference was significant ( $P = 0.025$ ), and the effects persisted until the follow-up.

**Conclusions:** CBT based on the 8-step program by Cash can improve the body image of infertile women through challenging and improving their irrational beliefs about their bodies.

**Keywords:** Body Image, Cognitive Behavioral Therapy, Infertility

## 1. Background

Infertility is a stressful and critical experience in many cultures around the world (1). It is defined as failure to achieve a clinical pregnancy after 12 months (or more) of regular unprotected sexual intercourse (2). According to statistics reported by the world health organization (WHO), more than 70 million people (1 out of 6 couples) around the world and over 1.5 million couples in Iran suffer from infertility (3).

The increasing frequency of infertility among women, the associated psychological problems, and common social reactions towards infertility lead to several psychological problems and significantly affect other aspects of life in these infertile women (4). Infertility can cause feelings of helplessness and anxiety, interpersonal relationship problems, low self-esteem and self-confidence, isolation, and identity issues. These women consider themselves unattractive and regard life as meaningless (5).

Moreover, infertility results in changes of body image (6). Infertile women experience changes in body image due to reduced self-esteem (7). Body image is formed

at birth, completed during development, and changed throughout life; it is also of great importance due to its likely association with mental disorders and low self-confidence (8). Salter suggests that anxiety and sadness about infertility are major crises in life; in fact, when a woman experiences infertility, her body image is damaged (6).

In this regard, a study suggested that body image is less positive in infertile women in comparison with fertile women in different situations (9). Changes in body image following visible and invisible body changes can largely affect personality (6). Even infertility evaluations and application of assisted reproductive technologies can produce negative effects on women's body image and feelings (10). There is a significant correlation between body image disorder and overall psychological performance. A negative body image may result in depression, social anxiety, and poor sexual performance. Therefore, overcoming a negative body image is highly desirable (11).

There are various methods to deal with mental reactions caused by infertility. In recent years, cognitive behavioral therapy (CBT) has become popular among patients

and therapists and has shown effectiveness in the management of a wide range of maladaptive behaviors (12). In this regard, Cash assessed the effects of CBT on negative body image by developing an 8-step program (12). Controlled studies have shown that this program leads to significant improvements in the way individuals feel about their bodies. In addition, positive changes in body image increase self-esteem and psychological satisfaction (13).

House (2011) suggested that continuous use of CBT techniques for infertile women without physical and medical problems decreases anxiety, depression, and psychological symptoms; some of these women even become pregnant after treatment (14). Rahbarian et al. (2012) showed that cognitive behavioral group therapy enhances body image and self-image of women with burn injuries (15). Moreover, a study by Fadaei et al. (2011) suggested that CBT can affect negative body image in mastectomized women (16).

Similar studies have been conducted by Philips et al. (17), Hilbert (18), Wilhelm et al. (19), Azari et al. (20), and Zargar et al. (21). According to previous research, women's high sensitivity about their body image and self-acceptance causes them to suffer from mental disorders, such as anxiety and depression (22). Considering the importance of infertile women's body image and lack of a regular infertility counseling program in infertility treatment, in this study, we aimed to investigate the effects of CBT on body image in infertile women.

## 2. Methods

### 2.1. Participants

In this quasi-experimental study, a control group, pretest-posttest design was applied. The statistical population was selected through convenience sampling and included all infertile women, referred to the Infertility research and treatment center of the academic center for education, culture, and research (ACECR), Ahvaz, Southwest of Iran during October-December 2016. The ACECR center is a well-known, nongovernmental, referral center with many experts. Physicians, midwives, and other staff of hospitals and clinics in Ahvaz refer infertile women to this center.

In this study, the inclusion criteria were as follows: 1) age range of 18 - 45 years; 2) female infertility for a minimum of 2 years; 3) ability to read and write; 4) having concerns and a negative body image based on the questionnaire; 5) normal body mass index (BMI); 6) willingness to participate in the study; and 7) primary infertility. On the other hand, the exclusion criteria were as follows: 1) pregnancy; 2) being absent for more than 2 sessions; and 3) severe mental diseases during the program.

### 2.2. Sampling

The sample size was calculated based on a previous study (23) and the total score of body image, using the sample volume formula:

$$n = \frac{\left(z_{1-\frac{\alpha}{2}} + z_{1-\beta}\right)^2 [s_1^2 + s_2^2]}{(\bar{x}_1 - \bar{x}_2)^2} \quad (1)$$

For calculating the sample size, power was considered as 90% ( $\alpha$ , 0.01) and the confidence interval was considered 95%. The sample size was 9 according to the formula; considering a 20% dropout, the sample size increased to 12.

### 2.3. Interventional Program

The intervention included CBT based on an 8-step program to improve the body image of infertile women. The participants completed the Beck self-concept inventory. Twenty-four women with scores below 91 were selected and randomly allocated to control (n, 12) and experimental (n, 12) groups, using a table of random numbers.

Multidimensional body-self relations questionnaire (MBSRQ) was applied to assess the control and experimental groups. The experimental group participated in a weekly CBT program. Group psychological intervention by Cash (24) was presented in eight 60-minute sessions for 2 months. Both groups completed MBSRQ again to assess the effectiveness of therapy after the final step of the intervention and 1 month postintervention.

### 2.4. Data Collection Instruments

**Beck Self-Concept Inventory:** This 25-item self-report inventory is used to examine negative body image on a 5-point Likert scale. Scores  $\leq 71$  indicate a very poor body image, scores 72 - 81 indicate a poor body image, scores 82 - 91 indicate a medium body image, scores 92 - 101 indicate a strong body image, and scores  $\geq 102$  indicate a very strong body image. The psychometric features of this questionnaire have been approved in Iran (25).

**MBSRQ:** It is a 46-item questionnaire, developed by cash and grant to assess body image (26). The items assess 6 dimensions of body-self relations, including appearance evaluation, appearance orientation, fitness evaluation, fitness orientation, subjective weight, and body areas satisfaction, based on a 5-point Likert Scale. The psychometric features of the questionnaire have been approved in Iran (27, 28).

### 2.5. Statistical Analysis

Data were analyzed using SPSS version 23. Descriptive statistics (i.e., frequency, percentage, mean, and standard deviation) were calculated for demographic variables. Independent t test, Chi square, and Mann-Whitney U tests were used to compare the groups. The normal distribution assumption was tested by Kolmogorov-Smirnov test. Repeated measures analysis of variance was used to assess changes in each parameter during the study. Statistical significance was set at  $P < 0.05$ .

### 2.6. Ethical Considerations

This study was approved by the research ethics committee of Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran (IR.AJUMS.REC.1395.262). In addition, informed consents (oral and written) were obtained from all the participants. This study was registered in the Iranian registry of clinical trials (registration code, IRCT2016100529877N1).

## 3. Results

In this study, 24 infertile women were recruited, and 21 women remained in the study. Three women dropped out due to lack of cooperation (2 women from the experimental group and 1 woman from the control group) (Figure 1). Since all the information was gathered by the first researcher, there was no missing value considering the sampling size.

The mean age of the participants was  $28.1 \pm 4.04$  years. There were no significant differences between the groups in terms of age, BMI, duration of infertility, and education level. The sociodemographic characteristics of the participants are listed in Table 1. Kolmogorov-Smirnov test showed that the data were normally distributed.

The MBSRQ scores of the groups before the CBT program are presented in Table 2. The results of independent t test revealed no significant differences between the groups ( $P > 0.05$ ). Before the study, both groups were consistent in all dimensions, except for fitness orientation with a borderline difference ( $P = 0.05$ ). Body image scores in the control and intervention groups before and after the intervention are shown in Figure 2.

Table 2 presents the scores of MBSRQ in the groups before and after CBT sessions. The results of repeated measures analysis revealed a significant difference in the experimental group in all dimensions after the intervention ( $P < 0.05$ ), except for fitness orientation and subjective weight. However, no significant differences were indicated in the control group ( $P > 0.05$ ). In addition, the follow-up assessment at 1 month postintervention revealed a significant effect.

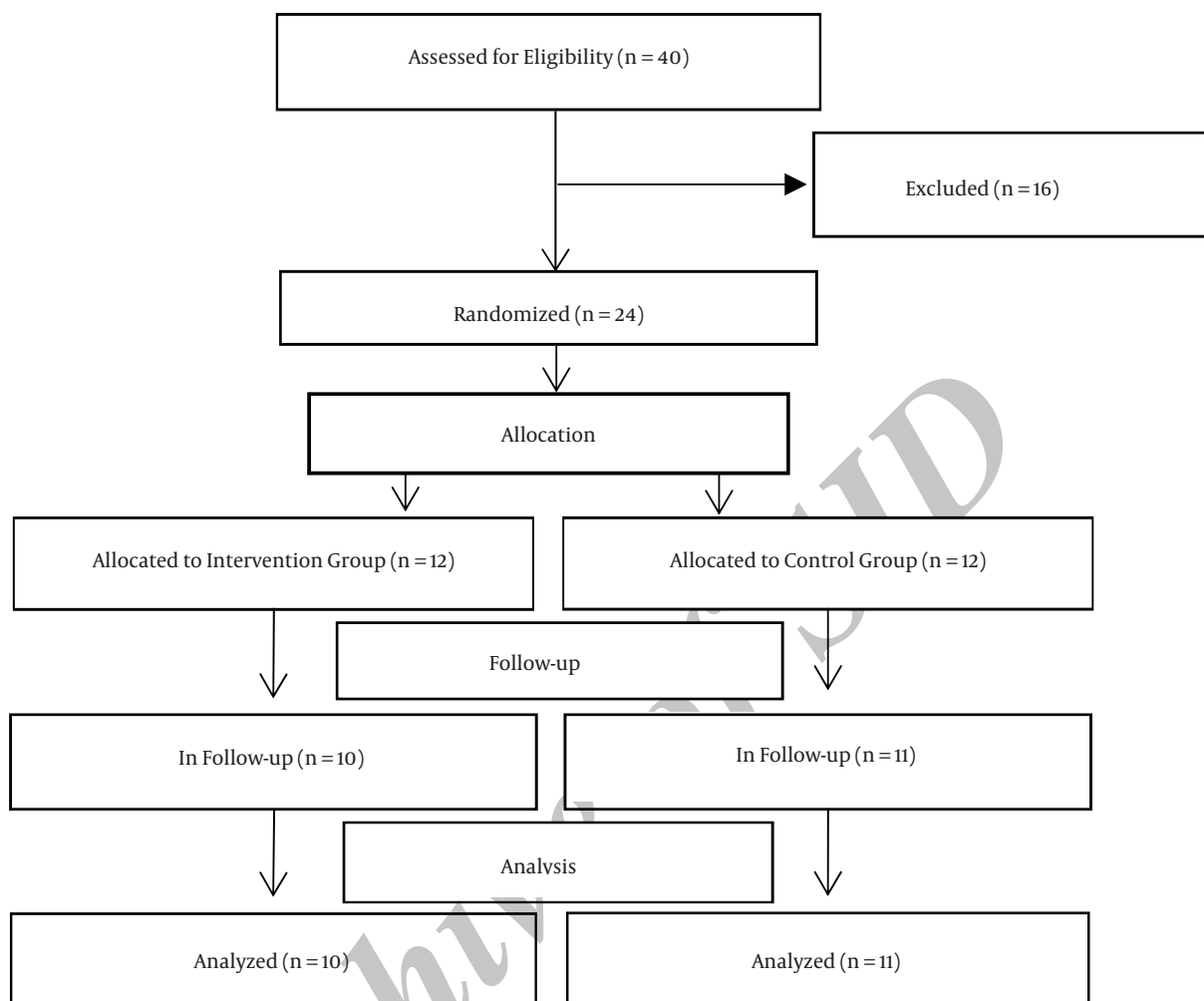
The intervention resulted in no significant differences in the control and experimental groups in the fitness orientation. However, there was a significant difference between the groups in fitness orientation ( $P = 0.03$ ). Moreover, after the intervention, there was a significant difference in the experimental group in subjective weight ( $P = 0.001$ ). However, there were no significant differences between the groups in terms of subjective weight. In general, the results revealed that the mean total score of body image did not change significantly after the intervention and 1 month postintervention in the control group. However, there was a significant difference in the experimental group after the intervention and 1 month postintervention ( $P < 0.05$ ).

## 4. Discussion

According to the results, the CBT program could improve appearance evaluation. Since this microscale has been designed for the overall evaluation of appearance (29) and assesses feelings of physical attractiveness and satisfaction, it can be effective in improving feelings; this finding is in accordance with a study by Raygan (30). In addition, the results revealed that this program enhanced appearance orientation, which refers to the relative importance of various aspects of body image and ways of seeing these features (31). It is in fact what was utilized in step 7, i.e., encouraging individuals to perform activities which create a more positive feeling about their appearance. The individuals' tendency to perform these activities draws our attention to the present results, which are in line with a similar study by Parizadeh (23).

Another improved subscale was fitness evaluation, which is an overall evaluation of fitness (11). The subscale of fitness orientation deals with appearance and focuses on eliminating avoidance behaviors related to appearance, encountering these behaviors, and refraining from intemperate behaviors; the results indicate that these actions have not been taken properly. Another subscale with no positive between-group change was subjective weight. This microscale assesses concerns about weight and diet (11). This finding is in accordance with studies by Raygan and Parizadeh (23, 30).

In addition, therapy caused a positive change in body areas satisfaction. This step deals with a part of individual's body, which causes dissatisfaction; it includes regular mirror desensitization and fosters positive self-talk. In general, the results revealed that CBT enhances the body image of infertile women in the posttest stage and 1-month follow-up. This finding is in agreement with the results of previous studies, focusing on the effect of CBT on groups



**Figure 1.** The Flow Diagram of Recruitment and Retention of Participants in the Study

**Table 1.** The Sociodemographic Characteristics of Infertile Women in the Intervention and Control Groups<sup>a</sup>

Variables	Intervention, (N, 10)	Control, (N, 11)	P Value
Age, y	27.6 ± 3.8	28.7 ± 4.2	0.53 <sup>b</sup>
<b>Education</b>			0.9
Under diploma	3 (30)	4 (36.4)	
Diploma	4 (40)	4 (36.4)	
Bachelor's degree	3 (30)	3 (27.3)	
<b>Duration of infertility</b>	2.6 ± 0.96	2.9 ± 1.1	0.6
<b>BMI, w/m<sup>2</sup></b>	22.4 ± 1.4	22.3 ± 1.5	*0.8

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

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

with a negative body image (24, 32-35), Iranian female students (30), and women undergoing mastectomy (16).

**Table 2.** Comparison of Body Image Within and Between Groups Before and After the Intervention<sup>a</sup>

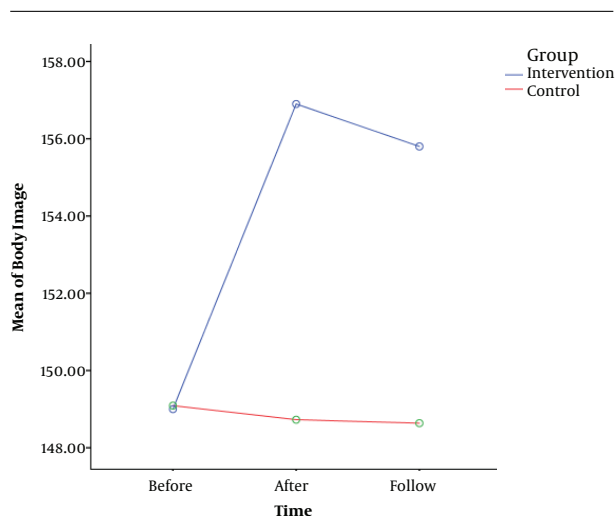
Variables	Time	Intervention, (N, 10)	Control, (N, 11)	P Value <sup>b</sup>
Body image	Pre-	149 ± 6.4	149.09 ± 6.2	0.7
	Post-	156.9 ± 3.4	148.7 ± 4.8	0.025
	Follow-up	155.8 ± 4.6	148.6 ± 5.3	
	P Value <sup>c</sup>	0.001	0.74	
Appearance evaluation	Pre-	15.9 ± 2.4	14.5 ± 1.2	0.1
	Post-	29 ± 1.5	14.6 ± 2.01	0.001
	Follow-up	28.3 ± 1.6	14.5 ± 1.4	
	P Value <sup>c</sup>	0.001	0.83	
Appearance orientation	Pre-	52.9 ± 3.7	52.6 ± 2.6	0.8
	Post-	38.3 ± 3.4	52.5 ± 2.4	0.001
	Follow-up	38.5 ± 3.9	52.2 ± 2.1	
	P value <sup>c</sup>	0.001	0.68	
Fitness evaluation	Pre-	8.2 ± 1.3	7.6 ± 1.02	0.3
	Post-	10.2 ± 0.63	7.7 ± 0.78	0.001
	Follow-up	10 ± 0.81	7.5 ± 0.93	
	P value <sup>c</sup>	0.001	0.23	
Fitness orientation	Pre-	39.3 ± 2.5	41.7 ± 2.8	0.05
	Post-	39.5 ± 0.97	41.1 ± 2.7	0.033
	Follow-up	39.4 ± 0.84	41.7 ± 2.8	
	P value <sup>c</sup>	0.86	0.118	
Subjective weight	Pre-	7.3 ± 1.05	7.09 ± 0.53	0.5
	Post-	6.6 ± 0.84	7.09 ± 0.30	0.38
	Follow-up	6.6 ± 0.84	7.09 ± 0.30	
	P value <sup>c</sup>	0.001	0.99	
Body areas satisfaction	Pre-	25.4 ± 2.4	25.4 ± 1.57	0.9
	Post-	33.3 ± 1.6	25.5 ± 1.43	0.001
	Follow-up	33 ± 2.2	25.6 ± 1.5	
	P value <sup>c</sup>	0.001	0.73	

<sup>a</sup>Values are expressed as mean ± SD.<sup>b</sup>Independent t test<sup>c</sup>Repeated measures test

In addition, studies have been performed on the effects of CBT on patients with body dysmorphic disorder (17, 19, 21, 36, 37), burns (15), and eating disorders (18, 20). In this program, individuals focus on their perceptions, thoughts, and feelings about body image and recognize how they have been developed (38). Since infertility causes low self-esteem, negative emotions, inefficiency, and negative body image, dealing with this condition and providing proper treatment seem essential (39).

From a cognitive behavioral point of view, body image

disorder occurs when an individual experiences a distortion in his/her perceptions, behaviors, cognition, or sentiments in relation to weight and body shape (38). Therefore, in this treatment, distortions are addressed comprehensively. CBT encourages individuals to pay less attention to the differences between the real and ideal self. This training is provided through monitoring and improving self-efficacy through cognitive restructuring. In this way, individuals can enhance their self-concept and remove threatening factors by challenging and replacing their irrational



**Figure 2.** Body Image Scores of the Groups Based on Time

thoughts (40); these results are in line with other studies (9, 13).

Research shows high vulnerability and sensitivity of women about their body image and self-acceptance; therefore, any harms could cause mental disorders, such as anxiety and depression (22). The proposed treatment can prevent mental disorders in infertile women through enhancing their body image. It is obvious that presence of resources, experts, or a group of specialists in fertility clinics plays an important role in reducing their problems.

The novelty of this clinical randomized trial is its main strength. To the best of our knowledge, no other study has been performed on the effects of an intervention on body image in infertile women. However, application of a self-report questionnaire is a limitation of our study; as a result, the participants might have hidden their private thoughts about their body image.

### 5.1. Conclusion

The results revealed that CBT based on the 8-step program by Cash can be effective in improving infertile women's body image. We suggest longer follow-up sessions to ensure long-term effectiveness of the intervention in future studies. Evaluation of the patients' socioeconomic status may provide more accurate results.

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### Footnote

**Conflicts of Interest:** The authors declare no competing interests.

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