



## Effect of Mood Regulation Skill Training on General and Sexual Self-Concept of Infertile Women

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### Abstract

**Background:** General and sexual self-concept are affected by various life problems, including infertility. Mood regulation skill also promotes physical and psychological health by affecting people's knowledge, values, and attitudes.

The present study aimed to determine the effect of mood regulation skill training on the general and sexual self-concept of infertile women.

**Methods:** This clinical trial was performed on 34 infertile women referred to Gorgan Infertility Center in 2018 that were selected using convenience sampling method and randomly assigned to intervention and control groups through block allocation. The mood regulation training program was administered to the intervention group during four 90-minute sessions once a week. Both intervention and control groups completed Rogers Self-Concept and Snell Sexual Self-Concept Questionnaires before and immediately and one month after the intervention. The data were analyzed in SPSS version 16, using repeated variance analysis and Bonferroni adjusted test.

**Results:** The results showed that before the intervention, the mean score of general self-concept in the intervention group was 9.41, and the positive, negative and situational sexual self-concept were 123.76, 12.18, and 43.18, respectively, and one month after the intervention, general self-concept was 6.21, positive sexual self-concept was 139.29, negative was 5.71 and situational was 54.24. Repeated analysis of variance showed that the intervention had a positive effect on the general and sexual self-concept of infertile women one month after the intervention and this effect was statistically significant ( $P < 0.05$ ).

**Conclusion:** Mood regulation training has a positive effect on the general and sexual self-concept of infertile women and can be used in service centers.

### Introduction

Self-concept refers to a set of one's emotions and perceptions and this perceived self will affect one's behavior and perception of the world that is acquired through social interactions and is enhanced by one's interactions with others in the environment (1). Self-concept is at the core of all personal and social behaviors (2) and is considered an important element in mental health (3). As such, poor self-concept manifests itself as a reduction in self-esteem, and performance, and a lack of motivation (4). General self-concept in the form of self-esteem and self-efficacy affects general health and sexual self-concept (5).

Sexual self-concept refers to one's perception of oneself as a sexual being (2), in other words, one's perceptions and feelings about sexual matters and the understanding of one's sexual aspects (3). This phenomenon occurs during the process of psychosocial development with the sexual schema and helps the individual to gain awareness in their sex life (2), influenced by cognition, beliefs, and the environment (4) and is significantly related to sexual experiences and behaviors (5). Sexual self-concept and its dimensions are important psycho-sexual variables (6) and are affected by various life problems including infertility (7).

Infertility harms the infertile women's self-concept and attitude to life (8), because of their sense of inability, worthlessness, and inadequacy, they have a poor image and their level of "self" acceptance is significantly low (9). Their negative attitude to life due to having no child makes them feel a great deal of responsibility towards their community and spouses, causing serious harm to their self-concept (7). Individuals with more negative emotions experience more stress and dissatisfaction in their interactions, and their dissatisfaction with self and life affects their self-concept (10). Negative self-concept, social pressures, isolation, and loneliness are the most important psychological problems of infertile women and their physical problems in the form of insomnia, eating disorders, obsessive thoughts, and symptoms of depression (8). They also experience higher levels of sexual dysfunction due to limitations in sexual attitudes and a reduction in self-esteem that results in reduced libido or ability to respond to sexual pleasure (11 and 12). Sexual self-concept is an important

component of self-concept (13) that increasing its positive dimensions (such as self-esteem and sexual satisfaction) and reducing its negative dimensions (such as sexual anxiety) can enhance sexual performance in individuals (14). Ghorban Shiroudi et al. (2012) found that cognitive-behavioral therapy improved sexual self-concept (15) and Ramezani et al. (2016) in their study showed that sex-psychological training can change the sexual self-concept of women (16).

Adaptation to various problems in personal and social life is largely influenced by self-concept, and experts have used a variety of methods to improve self-concept problems, including training mood regulation skills (17). Mood regulation skills are life skills that enable individuals to transform their knowledge, values, and attitudes into actual abilities, prepared to deal with situations, and with positive and adapted behaviors improve their physical, and psychological health (18). This skill is used as an important protective factor for those experiencing psychological problems in their relationships (19) and individuals can modify their emotional responses (20).

Infertility is a major crisis in individuals' life (11), and infertile women face many stresses at different times of life, leading to problems such as negative self-esteem, anxiety about relationships with others, and inadequate social performance (21). Infertility can also lead to sexual problems in men by affecting sexual self-concept (11), as sexual self-concept predicts sexual performance, and women with negative sexual self-concept have poorer sexual performance (22). Studies have shown that group psychological interventions in infertile couples undergoing infertility treatment reduce their psychological problems such as sadness and depression and increase marital satisfaction, quality of life, and pregnancy rate (23-25), as well as group cognitive-behavioral therapy, has been effective on depression in infertile women and emotion regulation group training plans have been effective on emotional well-being and marital satisfaction (27), but given that in the recent studies the effect of skills training on sexual and general self-concept of infertile women has not been investigated, the present study was designed and conducted aimed to determine the effect of mood regulation training on the general and sexual self-concept of infertile women.

### Methods

This clinical trial study was conducted on infertile women referred to Gorgan infertility center as a referral center in Northeast of Iran in 2018. Due to the lack of similar research to estimate the sample size, the pilot study was conducted. Sample size was calculated  $n=66$  using a formula for determining sample size compared to a ratio in two-group studies, comparing general self-concept scores before and after pilot study, with a sample size of  $n=10$  in each group (intervention and control), at the confidence level of 0.95 and 80% test power, but due to the permanent closure of the center during the implementation of the project and the absence of an alternate center, 50 eligible infertile women were recruited through convenience sampling method. Due to the reduction in sample size, the test power was calculated again after the end of the study and with the minimum test power of 0.80, it was possible to present the results with generalizability at confidence level of 0.95. The inclusion criteria were: Iranian nationality, at least high school education, having primary infertility, not having adopted child, not taking psychiatric medication, not drug addiction of spouse, not having history of life skills training. Exclusion criteria were having an adopted child, taking psychiatric medication, drug addiction of spouse, a history of life skills training.

The data was gathered using a questionnaire including Beck Depression Inventory, Rogers's self-concept, and Snell sexual self-concept questionnaires.

Beck Depression Inventory was developed by Beck in 1961 and consists of 21 items, each of which contains 4 sentences. The scores specified by the subject should be added together. The sum of the scores varies from 0 to 63 and a negative score is not considered.

The self-concept questionnaire was designed by Rogers in 1951. A score between 0 and 7 is considered a natural self-concept, between 7.01 and 10 is a moderate self-concept and a score of 10.01 and above is considered a weak self-concept.

The Sexual Self-Concept Questionnaire was designed by Snell in 1995 and its validity and reliability were measured in Iran by Ziaei (2013). The minimum score in the dimension of positive, negative, and situational sexual self-concept is zero and the maximum score in the dimension of positive is 176, negative 64, and situational 77.

At the beginning of the study (October 2018), all eligible and volunteer women were recruited through the convenience sampling method and completed Beck Depression Inventory II, Rogers Self-Concept Questionnaire, and Snell Sexual Self-Concept Questionnaire. The subjects with depression scores ranging from 36 to 63 were excluded from the study and the rest of the samples were descended based on general self-concept score using randomized block allocation (designed and implemented by computer) in intervention and control groups (Figure 1). The general self-concept scores descended for the participants resulted in inhomogeneity in the consecutive scores. Then, the mood regulation program was organized in four 90-minute sessions weekly, in 7-10 women in each group for the intervention group (Table 1). Rogers Persian Self-concept Questionnaire and Snell Sexual Self-Concept Questionnaire at three-time points; before the beginning of the training sessions, immediately after the end of the last session and one month later were completed by women in both intervention and control groups.

Table 1. The content of the mood regulation training program

Session	Training session content
1	Introduction, explain class objective, rules for attending sessions familiarity with the concept of negative mood, physiological symptoms, and present assignments
2	Reviewing previous session assignments, providing feedback, identifying negative thoughts and presenting assignments
3	Reviewing previous sessions assignments, providing feedback, investigating a variety of cognitive errors and presenting assignments
4	Review assignments and topics discussed in previous sessions, investigating the reasons and evidence for the advantage or disadvantage of negative thoughts, provide solutions to reduce negative thoughts, completion of questionnaires and acknowledgments

The data were analyzed by software SPSS version 16. Independent t-test and Mann-Whitney test were used to compare quantitative demographic variables in both groups and chi-square and Fisher exact tests were used to compare qualitative demographic variables in both groups. The normality of quantitative variables was studied by the Shapiro-Wilk test. Analysis of variance with repeated measures was used to compare the mean of general self-concept and the dimensions of sexual self-concept in intervention and control groups before, immediately, and 1 month after mood regulation training. Adjusted Bonferroni test was used to compare the means of the two variables three times ( $P<0.05$ ). Given the nature of the data, the analysis was performed using the GEE method, and P-Value values in the first three digits by the two methods were the same. But concerning the comprehensible outputs of repeated variance analysis, results are reported based on this method.

## Results

No statistically significant difference was found between the two groups in terms of quantitative demographic variables (age, duration of marriage, and duration of infertility) ( $P<0.05$ ).

Qualitative demographic variables (education and job of spouse) were also compared between the two groups and the results of Fisher exact and chi-square tests showed that frequency distribution was homogeneous between intervention and control groups and only frequency distribution of female job was not homogeneous in the two intervention and control groups, as homogeneity of general self-concept scores at the beginning of the study did not affect homogeneity in the results of other tests (Table 2).

Table 2. Comparison of frequency distribution of qualitative demographic information between infertile women in intervention and control groups

Variable	Intervention	Control	P-value	
	N (%)	N (%)		
Education of wife	Diploma	6 (50)	6 (50)	*0.40
	Associate degree	2 (100)	0 (0)	
	Bachelor	7 (53.8)	6 (46.2)	
	Master of science	2 (28.6)	5 (71.4)	
Education of husband	High school	4 (100)	0 (0)	0.26*
	Diploma	4(40)	6(60)	
	Associate degree	2(33.3)	4(66.7)	
	Bachelor	6(54.5)	5(45.5)	
Job of wife	Employee	4(26.7)	11(73.3)	0.01**
	Housewife	13(68.4)	6(31.6)	
Job of husband	Employee	6(42.9)	8(57.1)	0.48**
	Self-employee	11(55)	9(45)	

\*\* Chi-square test \* Fisher exact test

The mean of general self-concept and the dimensions of sexual self-concept at the beginning of the study were the same in both groups but reduced immediately after the intervention in the control group and increased in the intervention group and one month after the intervention increased in the control group but reduced significantly in the intervention group. In other words, the general and sexual self-concept of infertile women was affected by the intervention, but the effect of the intervention does not appear immediately (Figure 2).

Repeated analysis of variance was performed to compare general self-concept and dimensions of sexual self-concept in the studied groups before, immediately, and one month after the intervention given the assumption that data is normal. The results showed that general and sexual self-concept dimensions were improved in the intervention group, one month after the intervention, compared to the two previous stages, and the difference was statistically significant, but in the control group, no statistically significant difference was found. The dimensions of sexual self-concept also had a significant difference in the intervention group one month after the intervention compared to the two previous stages, but in the control group, the status became more inappropriate over time, which was statistically significant (Table 3).

Table 3. Comparison of General Self-Concept Scores and Dimensions of Sexual Self-Concept in three time points in both groups

		Mean $\pm$ SD			Test result (1, 2 and 3)	Adjusted Bonferroni test		
		1*	2**	3***		1 and 2	1 and 3	2 and 3
General self-concept	Intervention	9.41 $\pm$ 3.40	10.13 $\pm$ 3.81	6.21 $\pm$ 2.03	0.0001	0.71	0.007	0.002
	Control	9.81 $\pm$ 3.75	8.97 $\pm$ 3.30	10.78 $\pm$ 2.67	0.255	0.99	0.98	0.346
Positive Sexual Self-Concept	Intervention	123.76 $\pm$ 15.77	117.65 $\pm$ 19.46	139.29 $\pm$ 12.07	0.0001	0.149	0.008	0.003
	Control	123.53 $\pm$ 24.93	123.82 $\pm$ 26.99	103.53 $\pm$ 21.29	0.001	0.99	0.02	0.034
Negative Sexual Self-Concept	Intervention	12.18 $\pm$ 5.87	12.94 $\pm$ 8.01	5.71 $\pm$ 3.65	0.001	0.99	0.004	0.022
	Control	10.76 $\pm$ 9.77	15.53 $\pm$ 9.13	23.65 $\pm$ 8.66	0.0001	0.009	0.002	0.028
Situational Sexual Self-Concept	Intervention	43.18 $\pm$ 7.80	42.06 $\pm$ 7.757	54.24 $\pm$ 9.08	0.0001	0.99	0.0004	0.001
	Control	42.94 $\pm$ 6.55	41.71 $\pm$ 5.87	35.94 $\pm$ 7.63	0.009	0.449	0.022	0.068

\*Before intervention

\*\* Immediately

\*\*\* One month after intervention

## Discussion

The purpose of the present study was to determine the effect of mood regulation training on the general and sexual self-concept of infertile women. The results of statistical analysis showed a significant difference in the mean scores of general self-concept and the dimensions of sexual self-concept between the intervention and control groups, one month after the intervention, indicating a difference between the intervention effect and time in the study. According to the results, it takes one month to have a positive effect on mood and sexuality self-concept in infertile women. According to the searches, no research was found on the effect of mood regulation training on general and sexual self-concept. No study on the effect of mood regulation training on general and sexual self-concept was found but the study results were consistent with other studies on the effectiveness of this training on improving the performance of other research samples. Afrooz et al. (2013) found mood regulation training effective on students' self-concept with learning disabilities (17) and Madahi and Madah (2014) found mood regulation training effective on students' anxiety and stress. The study results of Riahi et al. (2013) also showed the positive effects of mood regulation training on the mental health and depression of mothers with autistic children (28). Despite different variables and samples in the above studies, mood regulation skill training had a positive effect on the variables studied. But in the above studies, the results of the training were established immediately after the end of the training sessions, while in the present study the positive results were obtained one month after the training, this difference can be explained by the type of approach used in the studies because, in a study, Afrooz et al. (17) emphasized management of anger and stress and self-control behavior and emotion regulation. In a study, Madahi and Madah (18) emphasized how to deal with anxiety and stress and in a study, Riahi et al. (28) emphasized challenging malicious beliefs and psychological training about autism disorder, but in the present study concerning the approach used, recognizing and finding cognitive errors in thoughts and behaviors, and then trying to reduce their negative impacts was time-consuming, in other words, first, awareness, change attitude, and then act was considered. Thus, the desired outcome was not achieved immediately after training and occurred at the second follow-up stage (one month later). On the effectiveness of interventions on the follow-up period over time, Hamid (2011) in a study entitled determination of the effectiveness of stress management training on anxiety, depression, and infertility of 40 infertile women found that in the experimental and control groups a significant difference was found between anxiety and depression at the end of the sessions and the level of depression in the experimental group was significantly lower than the control group at the post-test and 12-month follow-up (29). Vahid Vaeqef et al. (2015) in their study found that cognitive-behavioral sex training improved women's sexual self-concept after completing training sessions and at 6-month follow-up (30).

Consistent with the present study, Rahmani Fard et al. (2018) found self-awareness based on stress cognitive therapy of infertility effective on the mental health of infertile women (31). Fahami et al. (2015) found the positive effect of communication skills training on sexual function and marital quality of infertile women (32). Soltanzadeh et al. (2017) also showed that group reality therapy reduced anxiety in infertile women undergoing assisted reproductive therapy (33) and Hamzehpour (2014) found cognitive behavioral therapy affected by depression in infertile women (29). Different interventional studies have been used in the same target group as in the present study, considering the prevalence of infertility in the community and its related psychological problems (depression and anxiety) that affect the lives of infertile individuals (26) as well as infertility treatments that indirectly affect mood by affecting hormones (10-13), mood regulation training is an appropriate approach to influence general and sexual self-concept of infertile women.

The other objective of this study was to determine the level of general self-concept of infertile women before and after the intervention. The results showed that the self-concept of infertile women before the intervention in both groups was moderate, one month after mood regulation training in the intervention group was normal and poor in the control group. In other words, infertile women's general self-concept is affected by the intervention, but the effect of the intervention does not appear immediately. Reisi et al. (2017) aimed to determine self-concept status among infertile women receiving donor oocytes and fertile women found that the majority of participants in both groups were poor and infertile women had weaker self-concept than fertile women (34). Taghizadeh et al (2015) also found that self-concept and self-discrepancy were weak in the two groups of female candidates and donor oocytes were poor (35). For explaining this difference, it can be noted that most of the present study samples were at the beginning of infertility treatment. Infertility did not significantly weaken their self-concept which was at a moderate level, but in the above studies, the samples were at the more difficult stages of treatment, i.e. candidate for ovum donation, and anxiety and distress caused by this problem further weakened their self-concept. Vaishali (2014) in a study found that women who suffer from eating disorders have a poorer self-concept than normal women (36). Rahro et al. (2017) also found that individuals with type 2 diabetes had a poorer self-concept than healthy controls (37). In the same studies with different target groups, physical and psychological problems (such as eating disorders, type 2 diabetes, and emotional breakdown) have caused individuals to become vulnerable and weaken their self-concept.

The other objective of this study was to determine the mean dimensions of sexual self-concept in infertile women in the intervention and control groups before, immediately, and one month after the intervention. The results showed that one month after mood regulation training, positive sexual self-concept increased in the intervention group and negative self-concept reduced, whereas in the control group positive sexual self-concept reduced and negative self-concept increased. In other words, sexual self-concept dimensions of infertile women have been affected by the intervention and the interaction between intervention and time. Ziaei et al. (2018) also showed that sexual self-concept counseling improved women's sexual health at fertility ages (14). Given that different counseling and training plans improve one's sexual self-concept, we also used mood regulation training in our study, which is a form of psychological training that reduces negative mood symptoms and improves individuals' self-esteem and health. As a result, changes occur in sexual self-concept in infertile women.

In future studies, it is suggested to conduct similar studies in different cities, considering the ethnic and cultural differences of the cities of the country. Also, given that the present study was time-constrained, further research is suggested to determine the effect of interventions on general and sexual self-concept with long-term follow-up tests. Similar studies with other educational or psychological interventions are also recommended to determine the effect on general and sexual self-concept in infertile women or other target groups.

It is necessary to mention at the beginning of the study, to observe the ethics of the research, with a detailed explanation to the research sample about the purpose and process of the research, respecting the rights of participants to terminate or continue cooperation at each stage of the research, not mentioning them in the forms for confidentiality and informed written consent, the volunteers voluntarily participated in the study. After the end of the study, the control group was informed that if they would like to attend a training session (due to the closure of the infertility center) it will be held elsewhere.

## Conclusion

Given that infertility has a negative effect on people's self-concept, the use of psychological interventions to reduce these negative effects and improve self-concept and thus self-confidence and self-esteem is essential. Considering the positive results of this study, using mood regulation training to improve the general and sexual self-concept of this group of the population, this skill training can be used in infertility treatment centers.

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## Ethical statement:

This study was approved by the ethics committee of the Golestan University of Medical Sciences

## Conflict of interest:

The authors declare that they have no conflict of interest

## Author contributions:

N G, T Z, F N and N B design the study, N G collecting the samples and data, N G, T Z and F N doing the intervention, N B doing statistical analysis, N G writing the manuscript, T Z, F N, N B and S GH editing the manuscript. All authors approved the final version of manuscript for submission.

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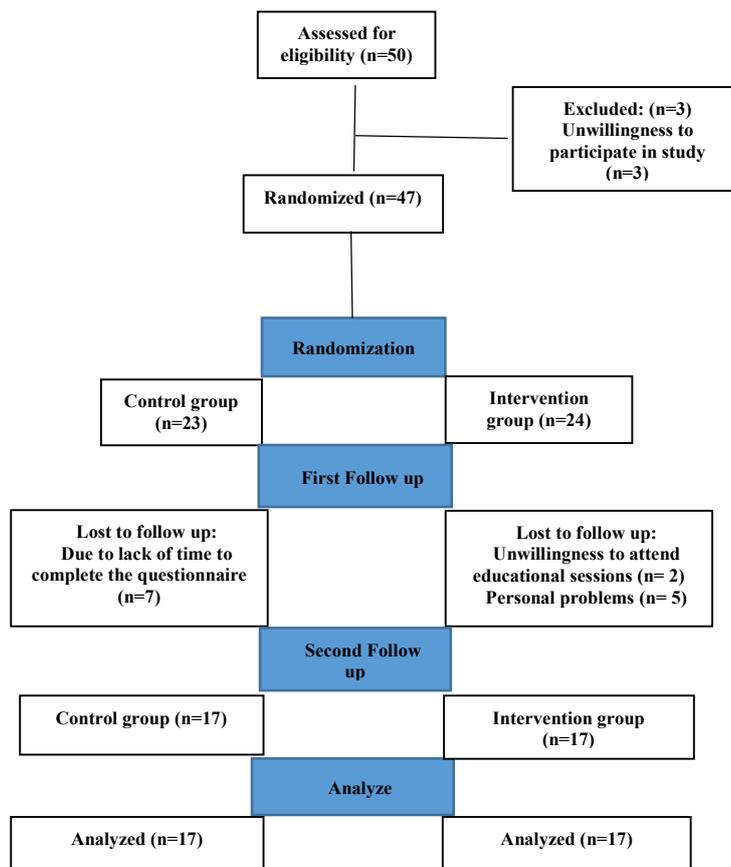


Figure 1. Comparison of general self-concept between intervention and control groups at 3 times, Before, Immediately and One month after the intervention

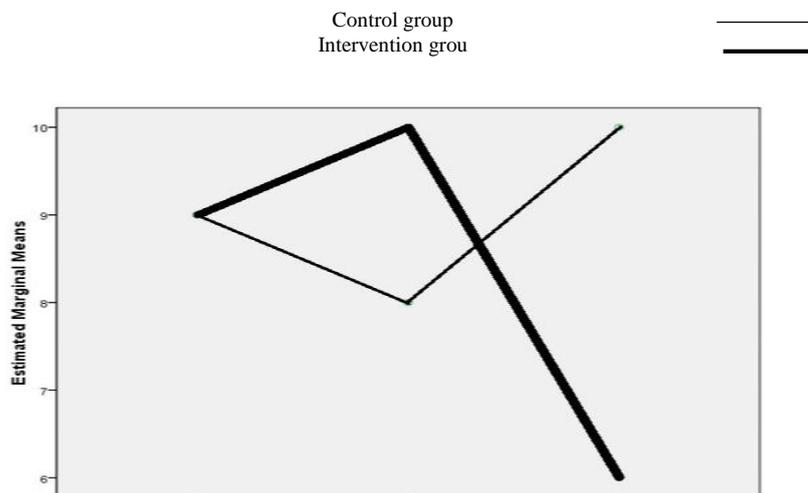


Figure 2. Flowchart of the process of participants' allocation and analysis

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