

Original Article



The Effectiveness of Implementing Family-Centered Empowerment Model on Irrational Thoughts of Iranian Infertile Women: A Randomized Clinical Trial

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Abstract

Introduction: Infertility is one of the main problems of the family and is one of the factors that determine the identity and personality of Iranian infertile women. Family-centered empowerment model is a step toward increasing the self-efficacy of patients and enabling them to take responsibility of their illness. This study aimed to determine the effectiveness of applying family-centered empowerment model on irrational thoughts of Iranian infertile women.

Methods: This study was a randomized clinical trial conducted on 80 infertile women and their husbands that were randomly divided into two intervention and control groups. Irrational Parenthood Cognitions questionnaire was given to the intervention and control groups to complete before and 3 months after the intervention. Data were analyzed using SPSS Statistics for Windows, version 13.0 (SPSS Inc., Chicago, IL, USA).

Results: The mean (SD) of irrational thoughts' scores in the control group before and after the study were 33.92 (5.98) and 33.20 (6.83) respectively, and in the intervention group were 34.55 (5.61) and 19.97 (3.52), respectively. The result of independent t-test showed a significant reduction in irrational thoughts of women in the intervention group after the family-centered empowerment model intervention.

Conclusion: The family-centered empowerment model after three months of continuous implementation was able to effectively reduce the irrational thoughts about having children in infertile women.

Introduction

Giving birth and becoming a parent is considered as a natural and expected role of the family and a usual part of the adulthood.¹ According to Kaplan "pregnancy is the symbol of self-actualization and identity in women".² Infertility is one of the main problems in reproductive health.³ From the psychological and physiological perspectives, pregnancy and childbirth is considered as a basic requirement for women. Infertility is defined as failure to achieve pregnancy after one year of regular and unprotected sex.⁴ In Iran in 2014, according to the official statistics, the rate of primary infertility was 21.1%, secondary infertility was 7.8%, and infertility during the whole life was 6.4%, and the main causes of primary and secondary infertility was menstrual disorders.⁵ Also, in a systematic review that published in Iran in 2020, the total rate of infertility was 88.7% and primary cross-sectional infertility was 3.09% among 12 studies, as well as secondary infertility reported as 18.2%. Among the

4 articles that examined lifetime infertility, the rate of primary lifetime infertility was 13.96%.⁶

The level of infertility varies worldwide and is estimated to be less than 5% to over 30%. Furthermore, one of every ten couples has primary or secondary infertility.⁷ Experience of infertility by related stressful factors can affect an individual's personal life, social support and marital relationship.⁸⁻¹¹ Although, infertile people are not ill, they may require emotional and psychological support of healthcare providers due to undergoing repeated diagnostic tests and treatments at infertility treatment centers.³ As a result, diagnosis and treatment of infertility has often been described as one of the greatest sources of stress in life, comparable with other major life stressors such as divorce, death of loved ones and chronic diseases.⁹⁻¹³

One of the social aspect of infertility is retreat of interactions. Infertile women get retreated by their friends who have just become mothers in such way that causes

many changes in their lifestyle, thoughts and attitude, which cause them to withdraw from social events.¹⁴ Thus, infertility has many psychological consequences including irrational thoughts and beliefs.¹⁵ David et al believe that, irrational beliefs lead to misunderstanding and distortion of realities, environmental stimuli and others' behaviors that disrupt people's social adaptability and do not allow them to adapt.¹⁶ According to these theories, irrational thoughts are involved in the etiology of all emotional and psychological disorders. Based on these theories, rational thinking leads people to health, reduces internal conflicts in them, and helps them to form relationship with sounding environment. On the other hand, irrational thinking is absolutist, is not real, is not a support for people, and prevents people to face the challenges effectively. Psychological problems are the result of people's misunderstanding because emotion is the product of understanding.¹⁷

In recent years, the demand for promotion of empowerment in healthcare system has increased and the concept of empowerment has become a popular term in the health literacy.¹⁸⁻²² Also, the application of educational techniques to change the behaviors of patients has been revised in such way that, the focus of education has shifted from "minor revision to comply with treatment" to "self-efficacy and empowerment of patients".¹⁷ Implementation of an empowerment model, by increasing self-esteem and self-efficacy, leads to self-control and preventive behaviors that are necessary for quality of life and healthy living.²³⁻²⁷ Women's empowerment process is the perception of women from the things that they are going to do, and their growth, desire and bravery in that regard, until they reach desirable competence. Therefore, improving the women's condition is among the main indicators of development in every society. In other words, without considering women, development is not going to happen in any country.²⁸ Empowerment strategies have been implemented through different patient support groups, and their effect on self-efficacy and activation of patients have been proved.²⁹ Behboodi Moghadam et al in their study examined the effectiveness of empowerment model on the quality of life in HIV positive women in Tehran and showed that, the model was effective in increasing the quality of life of the women.³⁰ Liu et al conducted a study to examine the effectiveness of empowerment strategy through support group on patients with premature infants and concluded that, the strategy was effective as it reduced the depression and anxiety of the parents and increased their self-efficacy in caring for their premature infants.³¹ However, before implementing the empowerment model, it is important to first identify the patients who are at risk of psychological incompatibility as the healthcare workers are not able to give extra care for these patient in order to prevent such problems.²¹ Experts, who are familiar with the theory of research, can answer the questions and design the intervention and evaluate its effect so, a

combination of theory, research and performance affects the promotion of health behavior.^{30,31}

This study aimed to determine the effectiveness of family-centered empowerment -model on irrational thinking of infertile women. This study was the first study in Iran that paying attention the empowering infertile couples. The other studies in this domain just pointed out the treatment of infertility without paying attention to ancillary issues such as emotional support and empowering the couples which can have critical roles on the outcome of infertility treatment and total health status of infertile couples.

Materials and Methods

This study was a randomized clinical trial to evaluate the effects of family-centered empowerment model on irrational thinking of 80 infertile women in 16 months (August 2014 to December 2015). [Figure 1](#) shows the detail of enrolment according to the standard CONSORT diagram.

The study population comprised of all infertile women attending the infertility clinics of Shariati and Moheb-yas hospitals during the sampling period (first six months of 2015). Inclusion criteria were to be infertile, have primary infertility, have ability to read and write, be Iranian, Muslim, have no known physical or mental illness, to be between 18 and 40 years old. Exclusion criteria were being diagnosed with known physical and mental illness during the study, becoming pregnant during the study, and not participating in all the intervention sessions and not been participating in other meetings and support groups at the same time. Allocation of subjects was performed with simple randomization method. Infertile women selected the card in a sequentially numbered sealed opaque envelope and were entered into an intervention or control groups. In total, 80 subjects were selected (40 subjects from each hospital) that later were divided into two intervention and control groups.

First, the researcher obtained the permission from Ethic Committee of Tehran University of Medical Sciences and registered the study in clinical trial database with the code of IRCT201410236284N9, then attended the Shariati and Moheb-yas hospitals and obtained permission to conduct the study.

Preferably 5 participants were in each intervention session that lasted for two hours (taking into account the competence and willingness of the participants), which was held once a week. In total, 5 group sessions (one session per week) were conducted and 2 sessions were held individually. The first session was held individually to enroll the women and confirm their participation in the study, followed by the completion of the questionnaire. In the meetings, women were asked to highlight their needs. The second individual session was held with the women after the end of treatment and follow-up meeting with the presence of their husbands to answer the questions they

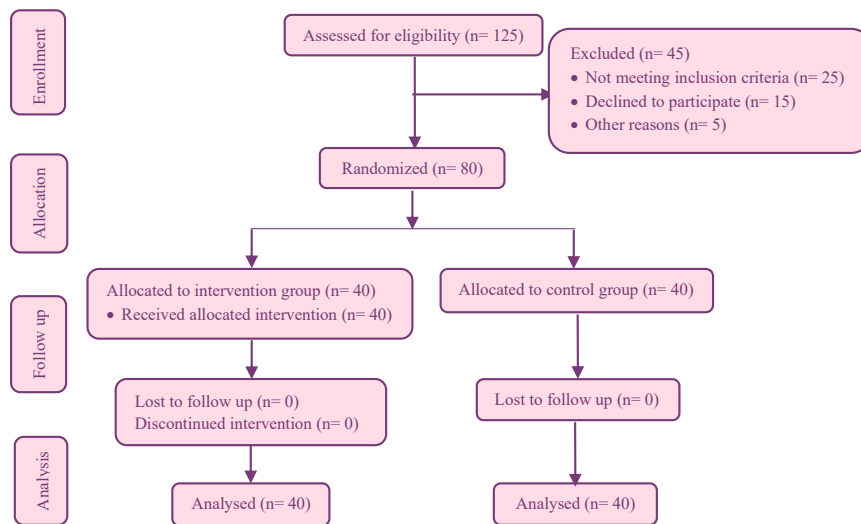


Figure 1. CONSORT diagram of the study

might have, which lasted from 30 minutes to 2 hours. The intervention was implemented step by step based on the four-stage empowerment model.³² The stages included; the perceived threat of outcomes, self-efficacy through problem-solving method, self-esteem through educational partnership, and the fourth stage was evaluation. Relaxing technique was used in all the meetings and it was decided that, the content and assignments of each session, along with the pamphlet should also be given to their husbands.

The first stage of the model was carried out in two sessions. The first session included; increasing the knowledge and awareness about infertility, function and introduction to reproductive system and the process of natural impregnation, which continued with questioning and answering. The second session started with the brief description of the first session and continued with explanatory lecture about the causes of infertility, its treatment, and technology used for infertility treatment.

The second stage (self-efficacy through problem-solving method) was carried out with group discussion and choosing the best solution with the help of infertile women by the researcher and supervision of a psychologist. This stage was also held in two sessions (session III and IV). In the session III, the participants talked about their personal experience regarding infertility, problems and psychological consequences of infertility, irrational thoughts and causes of them. A lecture was also delivered on stress and its role on hormones and glands as well as strategies to control the stress. In the session IV, the process of problem-solving through problem-solving steps, statement of the problems expressed by the women, the aims and theories, and brainstorming regarding infertility problems and effective factors were discussed in order to reach logical suggestions on how to deal with the irrational thoughts with the help of the psychologist. Anger management methods were also explained through an interactive method.

Stage three (self-esteem through educational partnership) was implemented in the fifth session. Some of the husbands were presence in this session, and some questions were asked of them about discussed issues in order to determine whether the studied women were capable to transfer the content of trainings to their husbands. At the end of session, all contents of the training session were given to the participants through a booklet.

The fourth stage was on evaluation, which was carried out in the form of two evaluations methods; formative evaluation process and final evaluation of outcomes. Formative evaluation process was carried out by asking verbal questions by the researcher on cognitive contents of the previous sessions, evaluation of homework in the next sessions, and evaluation of the level of interest and learning of the subjects in terms of emotional dimension. To make sure their overall empowerment in all dimensions, in the individual session, questions were asked on their overall empowerment and undertaking of practical skills such as; control of stress and anger caused by problem-solving, and control of stress and relaxing techniques.

The final evaluation was carried out 3 months after the intervention, in which the questionnaire was given to the patients in both groups to complete once again. To respect research ethic at this stage, the educational booklets were also given to the control group.

In this study, the "Irrational Parenthood Cognitions" questionnaire was used.³³ This tool was designed in 2003 by Fekkes and colleagues.³⁴ The Cronbach's alpha coefficient of the questionnaire was 0.84 that included 14 questions. The responses of this questionnaire were based on 5-point Likert scale including; "strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree, and strongly disagree", which indicated the numbers of 4 to 0 respectively indicating the scores in a scale from 0 to 56. The higher scores than average indicated the higher level of irrational thoughts and a

strong desire to have children in order to live happily.³³ This questionnaire was used in Iran by Amanati on 20 infertile women attending infertility center of Valie-Asr in Tehran, and its Cronbach's alpha coefficient was estimated to be 0.84.³³ It also was used in the studies of Faramarzi et al and Goli et al as a valid instrument. In the present study, the Cronbach's alpha coefficient was also used for reliability check.^{18,19} For this purpose, 15 infertile women were selected by convenience sampling method from the infertility clinics, which indicated the internal consistency of the scale (Cronbach's alpha=0.83). The permission to use the questionnaire of "Irrational Parenthood Cognitions" was obtained.

Another tool used in this study was demographic questionnaire, which included; demographic characteristics such as age of the women and spouses, marriage age, educational level of participants and their spouses, employment and economic status of participants and their spouses.

An informed written consent was obtained from the study participants and they were assured about the confidentiality of their information and the aim and method of the study were explained to samples also they are allowed to withdraw from the study at any time with any reason. Then, the study subjects who met the inclusion criteria entered into the study.

After collecting the data from the subjects, the data were analyzed using statistical software SPSS version 13 (SPSS Inc., Chicago, IL, USA) using descriptive and inferential statistics.

Results

The result showed there was not any statistically significant differences relate to demographic characteristics among participants. In the other word, there were homogen in their age, husband's age, marriage age, women's and husband's education, job, income status, ability to pay of infertility treatment cost (Table 1).

The values in Table 2 indicated that, the mean and standard deviation of irrational thoughts in the intervention and control groups before the intervention had no statistically significant differences and the two groups were homogeneous (Independent *t* test was used, $P>0.05$). Whereas the mean and standard deviation of irrational thoughts' score in the intervention and control groups after the intervention showed a statistically significant difference using independent *t* test, and favored the intervention group ($P=0.00$).

Table 3 compares the difference in mean and standard deviation of irrational thoughts' score before and after the intervention in the intervention and control groups, which showed a statistically significant difference in the intervention group.

Discussion

The results of this study showed that, the participants

Table 1. The characteristics of participants

Variables	Intervention group (n=40)	Control group (n=40)	P value ^b
	No. (%)	No. (%)	
Age ^a	30.55 (3.12)	28.65 (4.1)	0.12
Husband's age ^a	35.07 (4.28)	32.95 (4.7)	0.17
Marriage age ^a	27.12 (3.21)	29.03 (2.43)	0.14
Women's education			
Lower high school	16 (40)	22 (55)	0.32 ^c
University	24 (60)	18 (45)	
Husband's education			
Lower high school	24 (60)	17 (42.5)	0.17 ^c
University	16 (40)	23 (57.5)	
Women's job			
Housewife	28 (72.5)	32 (80)	0.09 ^c
Employee	12 (27.5)	8 (20)	
Family income status			
Adequate income	16 (40)	22 (55)	0.09 ^c
Almost adequate	14 (35)	8 (20)	
Low income	10 (25)	10 (25)	
Ability to pay the costs of infertility treatment			
Able to pay	3 (7.5)	9 (22.5)	0.07 ^c
Somewhat able to pay	31 (77.5)	24 (60)	
Unable to pay	6 (15)	7 (17.5)	

^a Mean (SD), ^b Independent *t* test, ^c Chi-square test.

Table 2. Comparing the relative and absolute frequency distribution of irrational thoughts' score in both intervention and control groups before and after the intervention

Variable	Intervention group (n=40)	Control group (n=40)	P value ^a
	No. (%)	No. (%)	
Before			
≤28	6 (15)	9 (22.5)	-
>28	34 (85)	31 (77.5)	
Mean (SD)	34.55 (5.61)	33.92 (5.98)	0.63
After			
≤28	37 (92.5)	17 (42.5)	-
>28	3 (7.5)	23 (57.5)	
Mean (SD)	19.97 (3.52)	33.20 (6.83)	0.00 [*]
P value ^b	≤0.001	0.12	-

^a Independent *t* test, ^b Paired *t* test, ^{*} Statistically significant.

of both group of intervention and control didn't have any significant differences relate to demographic characteristics. Also we found that, the application of family-centered empowerment model to improve the knowledge and reduce irrational thinking about parenting is effective in infertile women. Results of independent *t* test showed that, despite the homogeneity of the two groups before the intervention. There was a significant difference between two groups in terms of the scores of irrational thinking after the implementation of the empowerment

Table 3. Comparison of the difference in mean and standard deviation of irrational thoughts' score before and after the intervention in the intervention and control groups

Variable	Intervention group (n=40)	Control group (n=40)	P value ^a
	Mean (SD)	Mean (SD)	
Irrational thought	-14.57 (4.08)	-0.72 (8.28)	0.00 [*]

^aIndependent t test, ^{*}Statistically significant.

model. In other words, irrational thinking of women in the intervention group decreased significantly after the implementation of the empowerment model, but there was no significant difference in the control group. Results of Fekkes et al study is consistent with the results of this study and show that, irrational thoughts about having children can increase the psychological and emotional problems in these women. High level of irrational thoughts is associated with decreased performance especially emotional and psychological performances.³⁴ Our study was applied the family empowerment model in the context of infertility. In this regard, Borhani et al evaluated this strategy on quality of life of school-aged children with thalassemia major and concluded the average quality of life in the test group reached 35.19 while it was 28.02 in control group and the observed difference was statistically significant.³⁵ Also, Etemadifar et al in their study showed a family-centered intervention model reduced the stress, anxiety, and depression of caregivers because of feasibility, simplicity, and utility of intervention.³⁶ About this intervention which considered as a new approach for improving the quality of life, Hoseinpour et al reported a significant effect of this strategy on the quality of life of parents of neonates who admitted the Neonatal Intensive Care Unit (NICU).³⁷ In the other situation such as pemphigus vulgaris,³⁸ myocardial infarction,³⁹ hypertension,⁴⁰ hemodialysis patients⁴¹ and brucellosis,⁴² this intervention could promote the patients quality of life from the other aspect of efficacy, with the management of stress and anxiety, this model of care could significantly effect on anxiety of mothers of children with cancer,⁴³ perceived satisfaction and self-concept of multiple sclerosis patients care givers.⁴⁴

This model was focused on psychological issues of caregivers, and an emphasis on their empowerment helped them in managing their problems in the caregiving situation and achieved greater psychological potency in the caring process.⁴⁵

Shahrestani et al conducted a study on infertile women undergoing in vitro fertilization treatment to determine the effectiveness of treatment understanding based on mindfulness on improving the dimensions of perceived stress of infertility and their irrational understanding. They concluded that, the group treatment understanding based on mindfulness is effective in improving the dimensions of perceived stress of infertility and their irrational understanding, which is consistent with our

findings. Engagement of infertile people with irrational thoughts about the parenting increases their mental pressure.⁴⁶ It also has a key role in creating a negative attitude in infertile people towards themselves.

According to the study of Besharat et al irrational beliefs have a significant but negative correlation with adaptation to infertility, and as the level of these irrational beliefs is more in people, their adaptation to infertility is reduced.⁴⁷ In the study of Goli et al the level of irrational thoughts and the need for having children in order to have a happy life was high, which had an inverse relationship with their quality of life.¹⁹ Irrational beliefs lead to decreased quality of life as they are in conflict with the components of quality of life.⁴⁷

Infertile women due to lack of ability to reproduce think that, they are not sexuality appealing due to their condition and because of these thoughts, they avoid sexual relation with their husbands and try to suppress their sexual desire.⁴⁵ According to a study of Honarparvaran et al irrational beliefs have an adverse effect on sexuality, which means, with increase in the irrational beliefs, sexuality decreases in infertile women.¹⁵

On the other hand, there was no significant relationship between demographic variables and the scores of irrational thoughts, while, the study of Ogawa et al with increasing age, the depression and anxiety increased in infertile women. Also, increased depression and anxiety was not associated with the duration of infertility and if the male partner was infertile, rates of anxiety and depression in women was less,⁴⁸ which is not consistent with the findings in our study.

Another study by Shahnooshi & Karimi which conducted to examine the social consequences of infertility in Isfahan suggested that, there is a significant relationship between the duration of infertility and mental health, marital conflict, reduced social relations and the possibility of divorce. There was also a significant relationship between mental health of infertile women and their education and religion. On the other hand, the results showed a significant relationship between the mental health of infertile women and their age, occupation and place of residence.⁴⁹ Furthermore, the study of Goli et al indicated that, there was inverse relationship between the level of education of women, men and economic status, and irrational thoughts, and a direct relationship was found between irrational thoughts and amount of family and friends' pressure on the couple to have children. The mean score of irrational thinking among employed women were significantly less than housewife women. No significant correlation was found between irrational thinking about having a child with the type of infertility, age of spouses, duration of marital life and history of treatment.¹⁹

Faramarzi et al study also indicated that, scores of irrational thinking had an inverse correlation with age and a positive correlation with the period spent searching

for infertility treatment and pregnancy. The scores of irrational thinking had a poor relationship with level of education of both spouses.¹⁸ Fekkes and colleagues in their study concluded that, younger women had higher scores of irrational thinking.³⁴ Very few studies have been conducted on the application of family-centered empowerment model for infertile women in Iran. Among them is the study of Sheibani which was conducted to determine the effect of family-centered empowerment model on the self-efficacy of adolescents with major Thalassemia, which showed the effectiveness of model.⁵⁰ We can also refer to the study of Teimouri et al to examine the effect of family-centered empowerment model on quality of life as parents of children with asthma, their results showed the effectiveness of this model.⁵¹

Similar studies have been conducted with different interventions such as counseling and massage therapy, which resulted in decreased mental/psychological problems and increased healthy thoughts of women.^{50,51} But, none of them examined the effect of family-centered empowerment model on infertile women. It should be noted that, infertile women due to lack of fertility ability are faced with different perfectionist thoughts and try to suppress their sexuality due to irrational thoughts. Thus, these thoughts are reversely correlated with their sexual performance.^{52,53} However, Berger et al believed that, one of the strategies of these women for coping with their condition is denial and avoidance, and this happens when their denial coincides with other stress symptoms and negative perceptions. However, the result is not always negative and sometimes can leads to growth after emotional trauma⁵⁴ and counseling can promote it.⁵⁵

According to the best of knowledge irrational thought can decrease the chance of success in infertile women⁵⁰ which should be closely considered. Also, there is also adequate information about the effects of infertility on mental-psychological status of couples.⁵⁵ Therefore, more studies are suggested to control the irrational thoughts of infertile couples to receive the best outcome in infertility treatment. This study alongside to the similar literature could show a significant result of implementing family-centered Empowerment Model to control irrational thoughts of infertile Women.

Conclusion

In general, it could be stated that, correcting the thoughts with family-centered Empowerment Model can promotes their health and may increase their chance to successful pregnancy. Step by step implementation of this model is suggested for infertile couples with different causes of infertility. It is also suggested that, intervention in group and individually with longer duration along with follow ups should be conducted over the longer period of time to reach long-time results.

Research Highlights

What is the current knowledge?

Thre promotion of emotional health can have positive effects on infertility tratment. In this regard control of irrational thoughts can have dirrect effect on emotional health.

What is new here?

This study tailored the family centered empowerment model as an effective intervention fto infertile persons and create the material relate to administer this sterategy.

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Authors' Contributions

MM, EE: Conceptualization, data handling, experiments design, data analysis, provision of study material and equipment's, supervision, draft preparation, writing and reviewing, study validation, study consultation, project administration; MA: Conceptualization, data handling, experiments design, data analysis, provision of study material and equipment's, supervision, draft preparation, writing and reviewing; MA, FA, EE: Data handling, data presentation, draft preparation. All authors have read and approved the manuscript.

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Data Accessibility

The datasets are available from the corresponding author on reasonable request.

Ethical Issues

Ethical approval was obtained from the Institutional Ethical Committee (Reference No. 9111373001, dated November 16, 2014).

Conflict of Interests

No conflict of interest has been declared for this study by authors.

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