



## The Effectiveness of Mindfulness-Based Stress Reduction Program and Group Conscious Yoga on Anxiety, Depression, Stress in Infertile Women

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**Abstract:** The present study aimed to examine the effectiveness of mindfulness-based stress reduction program and group conscious yoga on depression, Anxiety, stress in infertile women.

With a quasi-experimental design, a randomized controlled trial with assessment in baseline, after intervention and two-month follow-up was conducted on participants of control group. A total of 24 female patients with infertility diagnosis among patients who referred to the Infertility Center of Shariati hospital in Tehran were selected in an available way and were assigned randomly into the experimental (n=12) and control groups (n=12). All participants completed Anxiety, depression and stress questionnaire (DASS-21), in three phases of baseline, after treatment and follow-up. Data were analyzed using multivariate repeated measurement variance analysis model.

Finding showed that there was a significant difference between experimental and control group after finishing mindfulness-based stress reduction program treatment sessions and 2-month follow up compared to the pre-test in terms of depression and stress. Depression and stress significantly decreased compared to the pre-test, but there was no significant difference in terms of anxiety.

Group mindfulness-based stress reduction program has decreased depression and stress in infertile women after finishing the treatment sessions and 2-month follow-up but there is no change in anxiety.

**Key words:** Infertile women, mindfulness-based stress reduction program, conscious yoga, anxiety, depression, stress,

### Introduction

Infertility, some people call it 'infertility crisis', brings physical, psychological and social stress and it affects all aspects of individual's life and causes intimacy reduction, fear of separation, self-confidence reduction, rejection, isolation, and marital satisfaction reduction (Urbelarrea, 2008; Aflatoonian, 2009). This phenomenon is of greater importance particularly in countries with high fertility rates that fertilization has special cultural and social properties for couples and their families (Karami Nouri, 2001). In some cultures and communities, just women are considered guilty and are blamed for infertility (Reddy and Reddy, 2009). Infertility brings more problems and depression for women rather than men (Rayka, 2001; Peterson, 2002). Evaluation of psychological stress resulted from infertility in infertile women showed that the substantial need for having children is the most important psychological pressure that infertile women suffer from. After that, disappointment, depression and problems caused by it, struggle between couples, being blamed by others and feeling sad because of childbearing in people around them, bring the greatest amount of stress. Stress due to infertility is different from other kinds of stress in terms of duration. Infertile couples experience chronic stress every month although no fertilization has taken place (Sreshthaputra, Veltiovanych, 2008). That is the reason infertile patients are at risk of depression and anxiety on one hand and reduction of quality of life on the other hand. Longer duration of infertility and more unsuccessful therapeutic experiences bring greater psychological stress and damage (Urbelarrea, 2008; Aflatoonian, 2009). Smeenk et al., 2005 stated that there is a significant difference between Adrenaline hormone and depression. Changes occurred in Adrenaline and Noradrenaline hormones during egg lying in women who were in cycles of IVF. Luck et al examined psychological problems in women who were receiving infertility treatment or faced with treatment failure. Results of the study showed that one-third of infertile women had psychological problems and 10 percent of them had mild to severe depression (Lok, Lee, Cheung, Chung, Lo, Haines, 2002). Mindfulness-based stress reduction program

(MBSR) is presented by Kabat-Zinn in Medical Centre of Massachusetts University in 1979 (Kabat-Zinn, 1990, 2003, 2005). It is an 8-week program; each session lasts 2 to 2.30 hours. Mindfulness skills are taught for coping with life stresses and raising awareness of the present moment and include thought-related meditation, relaxation and Hatha yoga (Kabat-Zinn, 1990; Matousek, Dobkin, Pruessner, 2010). Meditation and mindfulness exercises result in increasing self-awareness and self-acceptance abilities in patients (Baer, 2006). Mindfulness can be defined as a way of "being" or "understanding" which involves understanding personal emotions (Bauer, 2003). In mindfulness-based stress reduction treatment, there are seven key attitudes that are the foundation for the practice of mindfulness. They include being non-judgmental, patient, novice mind, honesty, non-effort, acceptance, being free (Brantly, 2005).

Researchers suggest that using mindfulness technique significantly increases mental clarity and mental health and decreases physical stress (Ryble et al., 2001). It also reduces recurrence of depression strikes (Teasdale et al, 2000) and activates brain areas that are associated with positive emotions and beneficial effects of immunization functioning (Davidson, Kabat – Zinn, Schumacher, Rozenkeranz, Muller and Santroly, 2003). It is reported in a study that mindfulness -based intervention has an effect on mindfulness and stress reduction. It improves mental status (fear of recurrence, stress, anxiety and depression), psychosocial characteristics (optimism, gaining support from others, and spirituality) and physical symptoms in patients (Langcher et al., 2011; Shannan , 2010).

Considering the problems that infertile women face and evidences related to the effect of mindfulness-based stress reduction program on different psychological variables, this study was designed with the aim of examining the effectiveness of mindfulness-based stress reduction program on improving anxiety, depression, stress in Infertile Women.

### **Method**

This study is quasi-experimental with a randomized controlled trial. After obtaining approval from the hospital, from the patients with a diagnosis of infertility who referred to the Infertility Center of Shariati hospital, a random sample was selected and participants were assigned into one of the two groups. One, those who were receiving weekly mindfulness-based stress reduction program and group conscious yoga (experimental group) and the other, those without intervention (control group). From all patients participating in the study, written informed consent was obtained.

### **Participants**

All women who referred to Division of Infertility of Shariati hospital in Tehran in the summer of 2013 consisted the statistical population of this study. A sample size of 24 patients were randomly assigned into experimental group (12 patients) and control group (12 patients). Inclusion and exclusion criteria for this study included: receiving no drug treatments from the time of diagnosis, duration of infertility from 1 year to 6 years, having education of higher than guidance school, the age between 25 to 40 years, lack of history of neurological and psychiatric diseases and hospitalization, lack of substance abuse, ability to participate in group treatment sessions and willingness to cooperate. Exclusion criteria included: Failure to attend more than two sessions of intervention sessions and not wanting to continue to participate in the intervention sessions.

### **Tools**

#### **A: Demographic Information Questionnaire**

Due to the influence of contextual factors and biological characteristics on mood states and quality of life in patients, researcher-made demographic questionnaire was prepared. It includes questions about age, education, economic condition, duration of marriage, starting period of infertility treatments, performed treatments so far, smoking and alcohol consumption by patient, history of mental illness and suicide.

#### **B: Structured Clinical Interview (SCID)**

Was adapted by Frist et al (1997) (First, Spitzer, Gibbon, Williams, 1997). It is a tool for diagnosis based on four criteria of Diagnostic and Statistical Manual of Mental Disorders. This tool has two main versions: 1- Form SCID-I which assesses major psychiatric disorders (axis I in the DSM-IV) deals. This form have been translated and adapted by Sharifi et.al (2005). This interview has good validity and reliability for the diagnosis of mental disorders. For example, Zanaryny (2000), in examining diagnostic reliability between raters, for most diagnoses has reported more than 70 percent alpha. Bakhtiar's study (2000), Clinical psychology professionals and professors has confirmed the validity of this tool. Test-retest reliability with an interval of one week was 0/95 (Bakhtiar, 2000) 2 - Form SCID-II also assesses personality disorders (axis II DSM-IV). This test has been designed based on branching plan and includes some openended questions and one rule-out question which provide opportunity for interviewer to be guided in the new fields, based on previous answers of respondents

(Marnat, 2003). Bakhtiari (2000; as quoted by Kabirnezhad et al, 2009) has translated and adapted this form (Kabirnezhad, Aliloo, Hashemi, 2000). Semi-structured clinical interview is used for personality disorders to assess the 10 DSM-IV personality disorders of axis II and was set in 1997. Content validity is approved by using experts' opinions and test-retest reliability coefficient. Reliability and validity of this tool has been accepted in various studies (Kabirnezhad, Aliloo, Hashemi, 2009). In Bakhtiari's study (2000), the content validity of the translated version of the interview was confirmed by three professors of psychology, and test-retest reliability coefficient of the tool with an interval of one week was % 87

### C: Anxiety, depression and stress questionnaire (DASS-21)

The short form of this questionnaire with 42 questions has been examined by Leviband (1995) to assess depression, anxiety, and stress (Lovibond, Lovibond, 1995). Confirmatory factor analysis results has confirmed the existence of the 3 factors of depression, anxiety and stress. Retest coefficient of 3 subscales of this questionnaire was mentioned with sample consisted of 20 patients between 71%-81% at an interval of two weeks (Crawford, Henry, 2003). Reliability and validity of this questionnaire were studied on a number of subjects in England (Mendlowicz, Stein, 2000). Retest reliability for depression, anxiety and stress are reported respectively 80%, 76% and 77% and Chronbach's alpha for them are reported respectively 81%, 79% and 78%. Validity of this scale was examined by confirmatory factor analysis and in main components method. KMO index value was equal to 90% and in Krovit Bartlett's test  $\chi_2$  index was equal to 3092.93 that was significant in the level of 0.0007 and it suggested adequacy of sample and selected variables for factor analysis.

### Method

The study was conducted at Infertility Division of Shariati hospital in Tehran by two master psychologists who were familiar enough to the intervention, according to the ethical standards of research such as informed consent and maintaining secrets of participants. Participants of experimental and control groups completed questionnaires in 3 stages, before intervention (pre-test), after intervention (post-test) and 2 months after intervention (follow-up). Treatment was done in 8 group sessions. Eight intervention sessions of this study were followed based on mindfulness-based stress reduction program (Chaskalon, Wiley, 2011) and were conducted once a week in 2 hours for participants of experimental group. Participants of control group did not receive any interventions. Due to ethical considerations, at the end of the research, participants of control group were given a CD of yoga practices. A summary of functional instructions of mindfulness-based stress reduction program is presented in table 1.

Table 1. Summary of functional instruction sessions of mindfulness-based stress reduction program

Session	Topic
First	The introduction of automatic guidance system/ knowing how to use present moment awareness of bodily sensation, thoughts and emotions in reducing stress/ practicing eating raisins <sup>1</sup> , giving feedback and discussion about the practice/ three - minute breathing, giving assignment for next week and distributing leaflets of the first session and CDs of meditation
Second	Re-examining body workout/ giving feedback and discussion about examining body workout/ practicing breathing mindfulness meditation/ yoga stretching exercise/ distributing leaflets of the second session and CDs of meditation
Third	Having conscious sitting with awareness of breathing (the sitting meditation)/ practicing yoga exercises (in the hospital chapel)/ practicing three -minute breathing /distributing leaflets of the third session and video tape of yoga practices
Fourth	Re-examining body workout /practicing exercises related to conscious yoga (in the hospital chapel)/ 5-minute practicing of "seeing or hearing"/ re-practicing conscious session with awareness of breathing and body/ distributing leaflets of fourth session and CDs of meditation
Fifth	Practicing breathing /re-practicing conscious session (awareness of breathing, body, sounds and thoughts)/ explaining the stress and identifying participants' reactions to stress/ examining awareness of pleasant and unpleasant events on feeling, thoughts and bodily sensations/ practicing conscious yoga exercises/ practicing 3-minute breathing /distributing leaflets
Sixth	Practicing conscious yoga/ practicing sitting meditation (mindfulness of sounds and thoughts)/ distributing leaflets of the sixth session and number 4 video tape to participants
Seventh	Practicing mountain meditation/ sleep hygiene/ repeating exercises of the previous session/ making a list of enjoyable activities/ distributing leaflets of the seventh session
Eighth	Examining body workout /overview of program/ examining and discussing programs

<sup>1</sup>Object attention training

	/practicing stone, beads and marbles meditation
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### Findings

Age mean and standard deviation are (3.07±32,25) in control group and (2.77 ±32,33) in experimental group ; The mean and standard deviation of the duration of marriage is (3.80±8.58) in control group and (2.77 ±7.66) in experimental group; the mean and standard deviation of the time that the women were receiving the treatment were (2.96±6.41) for control group and (2.13 ±5) for experimental group.66.7 percent of participants of control group and 58.3 percent of participants of experimental group had diploma. The results of this analysis also showed that both groups were of average economic situation. Frequency of the examined components are presented in the following graph.

Table2. Mean and standard deviation of age, duration of marriage and duration of treatment in research groups

	Group	Mean	SD
Age	Control	32.25	3.07
	Experimental	32.33	2.77
Duration of marriage	Control	8.58	3.80
	Experimental	7.66	2.77
Treatment time	Control	6.41	2.96
	Experimental	5	2.13

Table 3. Mean and standard deviation of Depression, Anxiety, stress of separate tests in groups

	Control(n=12)			Experimental(n=12)		
	pre-test	post-test	follow	pre-test	post-test	follow
Depression	13.50±1	12.33±1.15	12.83±0.93	14.75±2.13	6.66±1.43	10.83±1.26
Anxiety	3.50±1.78	3.25±1.35	3.66±1.82	4.41±3.02	4.25±2.49	3.66±1.96
stress	16.08±0.90	14.50±1.50	14.50±1.78	15.50±1.97	9.16±1.80	10.83±1.64

As it can be seen in table 3,depression and stress mean in experimental group significantly increased in post-test in comparison to the pre-test while the mean of these components in control group had no significant changes in these three stages. M -Box test results shows (Sig=0.214, F=1.391) for stress component in terms of amount, and (Sig=0.265, F=1.276 0.276) for depression component .So, the null hypothesis is not rejected and dependent variables are equal in different groups. In (Sig=0.018, F=2.55) component, observed covariance matrices in dependent variables are not equal in different groups.

Table 5. Results of repeated measures variance analysis

	Sum of squares	DF	F	significance level	Eta square
Depression	47.227	1	17.362	0.0001	0.441
Anxiety	1.185	1	0.673	0.421	0.030
stress	100.042	1	78.839	0.0001	0.782

According to the results of table 4, mindfulness-based stress reduction program and conscious yoga significantly decreased depression (Sig=0.0001, F=17.362) and stress (Sig=78.83, F=0.0001) in infertile women. Eta square shows the amount of effectiveness of intervention on depression and stress .Results of repeated measures variance analysis showed that there is no significant difference between groups in terms of amount of anxiety in three stages(Sig=0.67,F=0.421).

### Discussion

The results of the present study showed that mindfulness-based stress reduction program had a significant effect on the amount of depression, stress and anxiety in infertile women in comparison to before the treatment, 2-month follow-up and control group. These results are consistent with the results of (Masoumian, Shaeiri, (2012; Rahimian, Beshart 2012). is consistent.

Researchers have shown that doing mindfulness meditation ,in addition to reducing stress, significantly increases mental well-being and mental health and decreases physical stress in patients (Carn,2009). In fact, it seems that mindfulness practices increase awareness of the present time through techniques such as meditations (paying attention to breathing and body, and focusing the consciousness on here and now) and yoga (conscious regular practices). It also has an effect on controlling the body and therefore the mind, and reducing stress and anxiety. In this regard, the group MBSR intervention increases self-awareness and self-acceptance abilities in patients (Kabat-Zinn, 2005). Mindfulness is not a method or technique, but it is defined as an available method for reducing pain and increasing awareness, insight, wisdom and sympathy. Carlson and Space showed doing mindfulness meditation in addition to its effect on stress reduction, also causes significant increase in mental clarity, mental health and decreases physical stress in patients. These researchers resulted mindfulness-based stress reduction program has an important role in improvement symptoms and brings about positive results for participants after participating in this program (Carlson, Speca, Patel, Goodey,2003).As the results showed, group MBSR program and conscious yoga significantly increased the quality of life and its subscales (physical and mental health) in infertile women. In explaining the effectiveness of group mindfulness-based stress reduction program ,it can be said that therapeutic effects of MBSR program in group processes is increased by the factors related to group and so, more therapeutic consequences are influenced. Many infertile women feel unique in their problems. This feeling intensifies social isolation. Group therapy not only eliminates these negative feelings, but also develops relief and expands the relationships in these patients .Clinical application of this approach is beneficial and effective (Imel, Baldwin, Bouns, MacCoon, 2008). Using relaxation training widely and emphasis on it indicates that it is a valuable stress management skill that should be used regularly in individual's life and should be a consistent part of individual's coping skills. Expressing emotions during all sessions of program has different treatment advantages. Patients who participated in the study received eight sessions of group intervention with a special trainer. It can be inferred it is likely that a more strong alliance is developed between the patients and the trainer and it facilitates the healing process and better continuity of the treatment. Lack of group sessions for participants of control group and longer follow-up due to time limitation are of the limitations of this study. This study has particular limitations. The first limitation of this study is a small sample size. Although the number of participants did not decrease in this study but small sample size is one of its limitations that obstacles accurate measurement of program effect. The second limitation is related to using self-report tools. These tools have some essential problems (measurement error, lack of self-insight and etc.) The third limitation is related to lack of contextual and individual factors control. It is possible that participants overestimated effect of the program because of some contextual factors. Another possible hypothesis is that individuals overestimated the effect of the program because of personal willingness, optimism and factors like that. It is recommended, to conduct pseudo-therapy programs (placebo program) on control group in future studies to control expected effect. It is also recommended to use samples with larger size to achieve a true effect size. This study was conducted on patients of Infertility Center of Shariati hospital in Tehran. Researchers are recommended to implement group mindfulness-based stress reduction program on similar patients in other hospitals to expand the findings of this study.

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