Original Article

A Shift Toward Childbearing in One-Child Families Through a Mindfulness-Based Stress Reduction Program: A Randomized Controlled Trial

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Abstract

Objective: Fertility patterns are a key to the estimation of future population size, but they are restricted by serious indecision. One-child families are one of these patterns that is caused by a set of factors and one of these factors is the fear of re-pregnancy. In this regard, this study aimed to use a mindfulness-based stress reduction (MBSR) program to reduce the fear of women who have been experiencing anxiety after their first pregnancy and delivery.

Materials and methods: This interventional study was conducted on 67 one-child women, who at least 6 years have been passed since the birth of their child and according to the short form of the Pregnancy Related Anxiety Questionnaire (PRAQ-17), have been experienced anxiety. These women were randomly divided into control and intervention groups. For the intervention group, the MBSR program was conducted in 8 sessions, once every week, each session lasting 2.5 hours. At the end of the program, a second PRAQ-17 was completed by both groups.

Results: The findings showed that the MBSR approach in the intervention group significantly decreased the anxiety score in total (p=0.001) and individually in all subcategories.

Conclusion: The MBSR approach can reduce the anxiety of one-child women who have experienced anxiety after their pregnancy and childbirth. Thus, using this method in helping women with pregnancy-related anxiety is recommended to increase the birth rate.

Keywords: Reproductive Behavior; Fear; Pregnancy; Anxiety; Mindfulness

Introduction

Population growth and age composition are constantly happening that could have profound economic, social, and political effects in many countries (1). In Iran, the total fertility rate declined from 3.6 in 1986 to 1.6 in 2010, and population growth reduced from 3.9% in 1986 to 1.29% in 2010

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(2). A decline of 70% in fertility rates during the last 30 years, ranked Iran among the countries with total fertility below 2.1 children that is a below-replacement level fertility rate. According to the World Bank's predictions, with this current population decline in Iran, by 2025, fertility rate will reach under 1%, and Iran's demographic composition will be quite aged (3, 4).

The reduction in fertility rate can show itself with an increase in the number of one-child families (2). Whereas having one-child families has been criticized by psychologists for major security, social, economic, and religious problems, these families will be faced single-parent children make unhappy people, self-conscious, who want everything for themselves (5). In China, with more than 40 years of experience in one-child policy, finally all one-birth restrictions were ended in 2015, Chinese believe that the long-term psychological consequences of prioritizing one-child families have yet to be fully explored and it is not clear what problems they will face in the future if they want to make an effort to have children (1).

Some researchers believe that one of the most important reasons for fertility reduction in Iran is the increase in the number of one-child families that have been caused an increased risk of population aging (2). So that, the percentage of definite one-child families has tripled from 2009 to 2014 (6). It is estimated that 18.9% of Iranian families are one-child families. This pattern has been reported to be 19.9% and 16.4% in urban and rural areas respectively, which now seems more from the rational choice of women rather than government policies (2).

Fertility is affected by a combination of social and medical causes (3). Despite the apparent simplicity of pregnancy and childbirth, they constitute a complex period and important milestones in the life of a woman (7). Concerns about pregnancy and childbirth, the health of the fetus, and the acceptance of the necessary commitment and the added responsibility for the child are some causes of anxiety and barriers to re-pregnancy in women (8, 9). Researchers have found about 63%-93% of Iranian pregnant women have some degree of fear and anxiety, with 23%-50% reporting fear at high and very high levels (10-13). But while there are no statistics of anxiety after childbirth, the prevalence rates of which are much higher than one might predict and is even higher than it is during pregnancy (14, 15). Prolonged and severe anxiety about pregnancy and childbirth can turn into a form of phobia called tokophobia that prevent pregnancy forever (16, 17). Whereas, a positive correlation has been found between anxiety and fear of birth. The causes of the fear of childbirth have been described as biological (the fear of pain), psychological (related to personality, previous traumatic events and being a mother in the future), social (inadequate support systems, economic disabilities) or secondary fears (due to the previous birth experience) (18).

Psychology support for women with severe fear has been found to bring about a 50% reduction in pregnancy complications such as; an increased risk of preterm delivery, low birth weight and cesarean sections. In addition, the cost of psychology support is less than that of dealing with these complications (19, 20). There are various methods targeting behavior change for psychology support and reducing anxiety and stress (21). One of these methods is a mindfulness-based intervention, which is considered a kind of third-generation or third-wave cognitive-behavioral therapy (22). Mindfulness-based stress reduction (MBSR) approach was used for the first time in the 1970s to help patients suffering from stress resulting from serious medical conditions (23). Thereafter, MBSR has been examined for reducing anxiety stemming from many causes. In this method, the mind becomes a tool that helps patients accept the emotions they feel and the physical phenomena they encounter in life. Through mindfulness-based exercises and techniques, the individual enables to control her thoughts, feelings, and physical states through moment-to-moment awareness (23, 24).

However, MBSR was able to help solve anxiety during pregnancy. But whether it can positively affects the anxiety that prevents re-pregnancy in one-child women is yet to be investigated (25). Thus, the present study aimed to evaluate the pregnancy-related anxiety in one-child women and to evaluate the efficacy of MBSR on this anxiety to take a step in the direction in childbearing and increase the young population rate.

Materials and methods

***Trial design*:** This study was an intervention trial including 70 women, who had only one child and at least 6 years have passed since the birth of their child (some data for the distribution of second birth intervals in one-child families show that over 90% of the birth intervals fall within the 5 years cut off (26). And the second child can be born on average more than 6 years after the birth of the first child (6). These women were

randomly assigned to the intervention (n = 35) and control (n = 35) groups. The study was approved by Kerman University of Medical Sciences Research Ethics Committee (IR.KMU.REC.1396.1705), and the study protocol was registered in the Iranian Randomized Controlled Trial Registry (http:www.irct.ir) with Ref. No.: IRCT20171129037676N1.

First, we randomly selected four primary schools in the city of Sirjan, located in southeast Iran, where we identified the mothers of students who were only children, and in case they had decided not to have any more children, we gave them a package containing a form with a few lines of information about the study, a demographic questionnaire, and the short form of the Pregnancy Related Anxiety Questionnaire (PRAQ-17). After checking the collected questionnaires, mothers who matched the inclusion criteria and had scored equal to or greater than 18 on the PRAQ-17 were considered anxious and were therefore selected for the study. The selected women signed consent form, received a code to participate in a draw, and were then randomly assigned to the control or intervention group.

Considering allocation concealment, as the researcher was responsible for enrolling and allocating the draw codes to participants, dividing them into control and intervention groups, collecting data before and after the intervention, and also for teaching the MBSR method, masking of participants and the study investigator to group allocation was not possible. However, in analyzing statistics, the analyst was blinded.

Participants: All women provided written informed consent before data collection. The inclusion criteria were as follows: 18- to 35-year-old married Iranian women who had a child 6 years or older and did not intend to have another child because of the bad memories of their previous pregnancy and childbirth, and who were suffering from pregnancy-related anxiety according to the short form of Pregnancy Related Anxiety Questionnaire (PRAQ-17) (Vandenberg Anxiety Questionnaire (VAQ). The original PRAQ was made in 1989 by Vandenberg. It was later revised and shortened (34 items) by Huizink et al (27). The reliability of the Iranian questionnaire based on Cronbach's alpha coefficient was confirmed as 0.78 and for five factors was between 0.69 and 0.76. The Beck Anxiety Inventory was used simultaneously to assess the validity. The data in the Iranian sample also support the 5-factor structure. This indicates that despite cultural differences in psychological variables in different societies, concerns about pregnancy-related issues are universal and separate from cultural differences. Therefore, to accurately assess and diagnose anxiety during pregnancy, the PRAQ questionnaire is a useful tool to identify all dimensions of anxiety and assess the severity of anxiety during this period (28, 29). The short form of Pregnancy Related Anxiety Questionnaire (PRAQ-17) has 17 questions categorized into five subgroups including (i) fear of childbirth (items 4,11,16), (ii) fear of giving birth to a disabled child (Items 1,6,9,13), (iii) fear of changing in marital relationships (Items 2, 8, 12, 14), (iv) fear of changing in mood and its impact on the child (Items 7,10,17), and (v) self-centered fears (Items 3, 5, 15). The score for each question ranged from 1 to 7 according to the Likert scale; therefore, pregnancy-related anxiety scored from 17 to 119. Individuals who scored more than or equal to 18 were considered with anxiety and were recruited for the study.

However, women who had important psychological and emotional changes such as the death of relatives, sudden financial problems, marital and divorce problems, and drug addiction during the study were excluded from the study.

Data collection: While there was no intervention in the control group, for the intervention group, the mindfulness-based stress reduction (MBSR) approach was conducted in 8 sessions of 2.5 hours, once a week (24, 30). Briefly, the first session consisted of meditation on eating a raisin and then scanning the body for 30 minutes, followed by a talk on how it felt to do these meditation exercises; the second session began with a body scan meditation and proceeded by a discussion of the experience; in the third session participants took part in relaxing and conscious Yoga movements as a way to calm the physical symptoms of stress and to promote awareness of the body's subtle movements; in session 4 the participants took part in a sitting meditation with an emphasis on breathing, body sounds, and thoughts (also called four-dimensional meditation); session 5 activities included sitting meditation and presenting and performing the movements of the conscious mind of the body; session 6 consisted of the exercise called breathing space for three minutes; in session 7, four-dimensional meditation and awareness of everything that comes into consciousness at the moment were practiced. Session 8 was called "Use what you have learned so far; "a three-minute breathing space

exercise was followed by a discussion of ways to cope with the obstacles to meditation. As a follow-up process, homework in which participants were invited to express their experiences of the exercises related to each session was assigned, and participants were asked to reflect in a non-judgmental manner (31).

After completion of these sessions, both groups were evaluated again at the 9th session. To conduct the study educational sessions were held at two public places (both located in the center of the city of Sirjan).

The main outcome was the effects of MBSR on pregnancy anxiety. The secondary outcomes were effects on the 5 anxiety subscales including fear of childbirth, fear of giving birth to disabled children, fear of changing in marital relationships, fear of changing in mood and its impact on the child, and self-centered fears.

Sample size: Considering $\alpha = 5\%$ and $\beta = 20\%$, and based on our previous study (32), the stress level intervention was 38.51 ± 10.03 and 32.25 ± 83.7 before and after the intervention, respectively. Therefore, the sample size was initially considered 22 women in each group, according to Formula 1. Based on the number of the targets, 10 people were later added to the sample size, followed by an addition of 30% attrition size, raising the final sample size to 35 women in each group (33). The following formula (Formula 1) was used for sample size calculation:

$$n = \frac{\left(Z_1 \frac{\alpha}{2} + Z1 - \beta\right)^2 \left(s_1^2 + s_2^2\right)}{\Delta^2}$$

Statistics: All data were entered into Stata version 14. The Kolmogorov Smirnoff test was used for testing the normal distribution of data. In descriptive analysis we used, mean±standard deviation (SD) for quantitative and number (%) for qualitative variables. The χ^2 test was used to compare categorical data between the two groups, and the paired t-test was used for numerical data. A p value <0.05 was considered significant. Multivariate analysis of covariance (six analyzes of covariance), Mancova test, was used to assess the effect of the MBSR on each subscale, with pre-intervention levels as covariates. The results were evaluated using a 95% confidence interval, which represent a significance level of 0.05 ($p<0.05$).

Results

Figure 1 shows the CONSORT flowchart of the women enrolled in the study. A total of 70 women who experienced anxiety following their previous pregnancy were enrolled in this study. A total of 67 (95.7%) women completed the study. None of the women missed the follow-up, but one woman (2.8%) in the control group and two women (5.7%) in the intervention group did not complete the study.

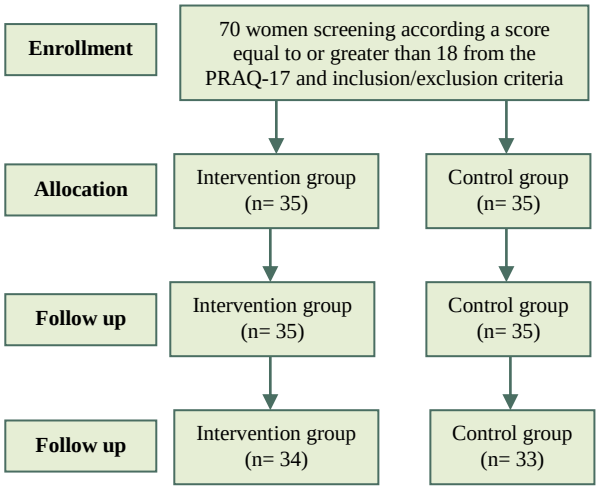

Figure 1: CONSORT flowchart

In this study, 70 anxiety women with mean±SD age of 29.48±4.12 years in the control group and mean±SD age of 29.94±3.92 years in the intervention group were candidates for participation in the research. The majority of women in both groups had a diploma or academic education, were employee and were in average economic situation. Also, %80 in the control group and %82.9 in the intervention group had wanted pregnancy. There was no significant difference in demographic characteristics between the participants of the two groups (Table 1).

The mean and standard deviation of anxiety in the pre-test stage was 48.08 ±19.9 and 45.91±19.05 in the control group and the intervention group, respectively (p=0.516). Table 2 shows that there is no significant difference between the intervention and control groups at baseline regarding the anxiety scale and subscales including fear of childbirth (p=0.184), fear of giving birth to disabled children (p=0.782), fear of changing in marital relationships (p=0.527), fear of changing in mood (p=0.291), and self-centered fears (p=0.316). Overall, these results showed that there was no significant difference between the groups in terms of baseline anxiety scores.

Table 2 also indicates that the total anxiety scale scores in post-test stage decreased in the intervention group (33.35±14.32) $p < 0.001$.

Table 1: Demographic data

Variable	Control Group (Mean±SD)	Intervention Group (Mean±SD)	P value
Mother's age	29.48± 4.12	29.94± 3.92	0.63
	(%)	(%)	
Education			0.91
Middel school	11.4%	11.4%	
High school	42.9%	45.7%	
Academic	42.9%	42.9%	
Occupation			0.78
Housewife	25.7%	22.9%	
Employee	74.3%	77.1%	
Economic situation			0.87
Poor	11.4%	8.6%	
Average	65.7%	71.4%	
Good	22.9%	20%	
First Pregnancy			1
Wanted	80%	82.9%	
Unwanted	14.3%	14.3%	

Also, all of the anxiety subscales; fear of giving birth (p<0.001), fear of giving birth to disabled children (p<0.001), fear of changing in marital relationships (p<0.001), fear of changing in mood (p<0.001) and its impact on the child, and self-centered fears (p<0.001) were significantly different between the two groups.

Results of multivariate analysis of covariance (MANCOVA test) on the mean of post-test scores of pregnancy-related anxiety and its subscales show that there is a significant difference between the intervention and control groups in terms of dependent variables at the level of p=0.001. Therefore, it can be said that at least one of the subscales of pregnancy-related anxiety (fear of giving birth, fear of having a disabled child, fear of changing marital relationships, fear of changing in mood and its effect on the child or self-centered fears) has been caused by the use of the MBSR approach (64% of the total variance). The test power was equal to 1, which means that the null hypothesis was rejected with a power of one.

According to Table 2, the value of F for total pregnancy-related anxiety was 88.56, which is significant at the level of p=0.001. Therefore, the hypothesis of the research, that the MBSR approach to reducing pregnancy-related anxiety in women has a significant effect, is confirmed. Also, among the subscales of anxiety the maximum value of f belongs to the fear of changing in marital relationships **(***F*=50.15, *P*=001) and then fear of giving birth (*F*=46.83, *P*=001). In addition, it is observed that the greatest effect size is related to the subscales of fear of giving birth and the fear of having a disabled child (0.43), which shows that 43 percentage of the total variance in the intervention group is due to the effect of the independent variable (MBSR approach). And the smallest effect of intervention was related to self-centered fears (0.2), which indicates that 20% of the total variance in the intervention group is due to the effect of the MBSR approach (Table 3).

Table 2: Total anxiety and anxiety subscales in the intervention and control groups

Variable	Group	Pre-test phase (Mean±SD)	Post-test phase (Mean±SD)	p-value*
Pregnancy-related anxiety (total score)	Intervention	32.05 ± 3.36	17.73 ± 3.97	< 0.001
	Control	29.06 ± 3.12	33.64 ± 4.98	0.451
	p-value**	0.516	0.015	
Fear of giving birth	Intervention	30.72 ± 3.9	14.67 ± 3.01	< 0.001
	Control	23.74 ± 3.42	4.075 ± 5.50	0.097
	p-value**	0.184	< 0.001	
Fear of having a disabled child	Intervention	35.10 ± 4.27	16.97 ± 2.35	< 0.001
	Control	36.82 ± 4.52	37.62 ± 3.21	0.212
	p-value**	0.782	< 0.001	
Fear of changing in marital relationships	Intervention	38.36 ± 5.72	17.97 ± 3.06	< 0.001
	Control	33.37 ± 5.38	32.05 ± 4.45	0.671
	p-value**	0.527	0.011	
Fear of changing in mood	Intervention	24.41 ± 4.37	19.54 ± 3.37	0.002
	Control	31.80 ± 5.37	49.40 ± 5.62	0.283
	p-value**	0.291	< 0.001	
Self-centered fears	Intervention	30.11 ± 5.26	15.26 ± 2.46	< 0.001
	Control	23.27 ± 4.24	37.18 ± 3.75	0.332
	p-value**	0.316	< 0.001	

* paired t-test for the within group comparison. ** Independent t-test for comparison between two groups

Table 3: Results of covariance analysis in MANCOVA test on effect of MBSR on total anxiety and its subscales

Variable	Sum of squares	Degrees of freedom	Average squares	F	significance level	Effect size	Statistical power
Pregnancy-related anxiety (total score)	8501.42	1	8501.42	88.56	0.001	0.59	1
Fear of giving birth	539.26	1	539.26	446.83	0.001	0.43	1
Fear of having a disabled child	391.65	1	391.65	26.16	0.001	0.43	0.99
Fear of changing in marital relationships	555.74	1	555.74	50.15	0.001	0.3	1
Fear of changing in mood	225.09	1	225.09	24.87	0.001	0.29	0.99
Self-centered fears	112.64	1	112.64	15.61	0.001	0.2	0.97

Discussion

Pregnancy and childbirth is sometimes with emotional and physiological complications such as fear, anxiety, stress, and even depression (12). The fear of pregnancy and childbirth may overshadow the whole life of women and lead to difficulties in the mother–infant relationship and postpartum depression (19).

Having more information on overcoming these fear and anxiety not only would benefit the women, but reliable information on this issue can also be important for health providers (34). Therefore, this study was designed to test the effect of MBSR on pregnancy-related anxiety in women who do not intend to become pregnant again due to pregnancy fear and anxiety. The results of this study showed that the MBSR method can reduce this anxiety.

Several studies have shown the efficacy of MBSR in coping with stressful diseases such as fibromyalgia, epilepsy, psoriasis, hypertension, coronary heart disease, different types of cancer, and diabetes (35). Looking at these studies in terms of intervention methods, it is clear that stress-based mind-awareness has an undeniable effect on reducing anxiety (36-38). Many studies also was done on pregnant mothers showed that MBSR caused a significant reduction of anxiety in the studied subjects and improved pregnancy outcomes and delivery (39-42). Given that existing articles reviewed either MBSR during pregnancy or up to 1 year after delivery, but we looked at this method of reducing anxiety at least 6 years after the first delivery when pregnancy-related anxiety is yet present as a barrier to re-pregnancy in women. The results of the present study showed that MBSR could affect pregnancy-related anxiety, as the mean score of anxiety in the intervention group was reduced significantly ($p<0.05$). It is worth mentioning that an increase was observed in the mean anxiety scores in the control group in the post-test in our study, as in the study of Shamsabadi et al (5). It is possible that these people became more sensitive to environmental stressors by completing the pre-test questionnaire. Anyway, it seems that in intervention group the MBSR method was affected the mind and the individual's actioned; subjects instantly acquainted themselves with patterns of thought, feelings, and interactions with others, and they then selectively (not automatically) decided how to respond to external stimuli in the most optimal manner (36). In addition, mindfulness allows individuals to go back and analyze their living conditions and react in new ways instead of responding out of habit (40). Using MBSR, women learn to have more reasonable expectations from phenomena and are, therefore, less likely to face despair, leading to an improvement in relationships and higher stability and satisfaction in life. One of the mechanisms of mind-consciousness is metacognitive consciousness, which refers to the beliefs that people have about their thinking. This knowledge includes beliefs about specific types of thinking as well as beliefs related to the strength or functioning of their memory. These beliefs affect the way people respond and how they adapt their thinking (31). In this technique, the mind has active awareness of emotions, memories, and dreams. Ultimately, one can identify mistakes and adjust the mind in a way that is more realistic and honest in thought and action (42). It seems that in the present study the women with bad memories from the first pregnancy and delivery were able to adjust their thoughts to overcome their fear of pregnancy.

Our results showed that the Persian version of PRAQ-17 has acceptable psychometric properties to be used for measuring pregnancy-related anxiety and the subscales of anxiety in a brief format. Moreover, it is one of two tools that showed moderate to strong suitability to measure different subscales of pregnancy-related anxiety which can be simply applied in clinical practice (43, 44). Aksoy Derya et al found that the subscale of concerns about own appearance in the experiment and control groups was no statistically significant difference between the groups (45). While question of concerns about own

appearance, which is part of the fear of changing in the mood of the mother factor, was significant in our experimental group. These differences between the two studies can be the result of cultural differences. The results of a quasi-experimental study showed the effect of mindfulness education on reducing stress and fear and improving self-efficacy. Albeit, the low number of samples and the absence of control groups were limitation of the research (46). We also found reducing fear of change in personal life (self-centered fears). The findings of Byrne et al are also consistent with the results of these studies (47). While Zarenejad et al showed that MBSR in pregnant women did not affect the self-efficacy in coping with childbirth (46). Aksoy Derya et al showed that worries about bearing a physically or mentally handicapped child and pregnancy-related anxiety total mean scores were significantly lower in the experimental group ($p<0.05$) (45). Everything we also achieved in this study. In this study, also MBSR significantly succeeded in decreasing the subscales of anxiety i.e. fear of giving birth and fear of changing in marital relationships. About the subscales the fear of giving birth Aksoy, Derya et al and Byrne et al the same as us found that this fear statistically significantly decreased after intervention in experimental group (45, 47). In addition, we found that fear of changing in the marital relationships was one of the most worrisome matters for women, confirming that marital affairs are among the priorities of life and are of great importance. Resultantly, recognizing and modifying the psychological changes experienced by women concerning sexual activity will go a long way in maintaining family health and creating natural and instinctive relationships, and it should be considered among the main components of care (48). It seems that MBSR can take significant steps towards solving problems of this kind.

Now among the urban, upper income, educated, middle classes, it is no longer unusual to find families stopping at one child (26). there is no doubt that Iran's population control policy needs to be revised to increase fertility levels (49). MBSR can be argued that the conscious mind has an undeniable effect on this issue.

In this study, we did not take the depression of women into account. Studies have shown that stress and depression may induce anxiety (33); these are two areas we did not inquire about. Also, we did not ask about the hospital conditions, mode of delivery, and the health provider who had taken care of the women during labor, while these factors themselves may be the sources of the anxiety the mothers had experienced.

Conclusion

Mindfulness sessions have been able to significantly reduce pregnancy-related anxiety. It can be concluded that the country's health system can help increase the fertility rate and create a healthy generation with less expensive training of MBSR method.

Conflict of Interests

Authors have no conflict of interests.

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