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Effectiveness of Mindfulness-Based Group Counseling on Prenatal Anxiety in Primiparous Women

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Abstract

Background: *Anxiety during pregnancy is a natural mechanism for coping with maternal concerns that prepares a woman for specific changes and motherhood. However, this natural anxiety can be exacerbated and pathological during this period, and this study aimed to investigate the effect of mindfulness-based group counseling on pregnancy-related anxiety in primiparous women.*

Methods: *This study was a clinical trial on 56 pregnant mothers (30 controls and 30 test subjects) referred to Mashhad health centers. To collect data, a demographic information checklist, Kessler Psychological Distress Scale, and Vandenberg Pregnancy Anxiety Questionnaire were used. Data collection occurred in three time periods: before, immediately, and one month after the intervention. After collection, the data was entered into SPSS18 and analyzed using descriptive and analytical statistics.*

Results: *In this study, the results showed that the average gestational age of the participants in the two groups was 20 weeks. 43.9% of the participants reported their stress level as moderate and 33.3% as severe, and only 10.5% of all had visited a psychiatrist during their lives. Before the intervention, there was no significant difference in the average anxiety score between the two groups, while immediately after the intervention (P-value=0.006) and also one month later (P-value=0.050) a significant decrease in anxiety scores was observed in the intervention group.*

Conclusions: *Given the effectiveness of mindfulness-based group counseling programs in reducing anxiety, planning for implementing these programs during pregnancy should be done.*

Keywords: Counseling, Mindfulness, Anxiety, Pregnancy, Primiparous women.
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Introduction

Pregnancy, especially the first experience, is considered a unique and multifaceted stage in every woman's life, influenced by a combination of physiological, hormonal, psychological, and social changes. This period is accompanied by an increase in plasma volume, changes in sex hormones, and adaptations of the cardiovascular and immune systems. Simultaneously with these transformations, significant changes occur in cognition, emotional perception, and psychological coping mechanisms. Nulliparous women, due to the lack of previous experience and the sudden encounter with the role of motherhood, often face a higher level of anxiety and psychological stress. Factors such as concerns about fetal health, fear of pain and obstetric interventions, insufficient knowledge of the physiological process of pregnancy, and socio-economic limitations can exacerbate their psychological pressure. Anxiety in such conditions, as a natural adaptive response, has a protective meaning and function; however, if this anxiety is severe, persistent, or accompanied by dysfunctional thoughts and feelings, it elevates from a physiological to a pathological level and manifests as pregnancy anxiety disorder, which has long-term and multifaceted consequences[1-7].

Epidemiological data indicate that anxiety during pregnancy has a significant prevalence; according to various studies, between 25% and over 70% of pregnant women experience some degree of anxiety, stress, or depression. This rate is reported to be higher in populations of low- and middle-income countries, and in Iran, research has shown that approximately 90% of pregnant women, regardless of its severity, face instances of anxiety. The type of anxiety is divided into two main categories based on the content of the concern: pregnancy and childbirth-related anxiety, which includes concerns about maternal health, fetal health, the process and pain of childbirth, the possibility of using interventional methods or childbirth risks; and parenting responsibility-related anxiety, which mainly includes concerns about the ability to care for the newborn, economic issues, changes in family relationships, and long-term responsibilities associated with the parental role[8-17].

The consequences of high anxiety during pregnancy can be examined at two levels: mother and infant. In the mother, evidence suggests an increased risk of preeclampsia, preterm birth, spontaneous abortion, increased need for medical interventions, prolonged postpartum hospitalization, decreased likelihood of natural childbirth, and increased likelihood of developing postpartum depression. In the infant, this anxiety is associated with reduced birth weight and head circumference, lower Apgar scores, the occurrence of anemia, increased incidence of hyperactivity and sleep problems, delayed cognitive and motor development, inadequate nutrition and

behavioral abnormalities, and even an increased risk of developing chronic cardiovascular diseases later in life. The biological mechanisms of these effects are complex and include the activation of the hypothalamic-pituitary-adrenal (HPA) axis, repeated secretion of stress hormones such as cortisol, altered placental blood flow patterns, and modulation of maternal immune system function, all of which can collectively affect fetal mental and physical development and function[18-23].

To manage this condition, a wide range of pharmacological and non-pharmacological interventions exist; however, concerns about the unwanted effects of drugs on the fetus have led pregnant women to prefer non-pharmacological approaches. Among these approaches, psychological interventions, especially cognitive-behavioral therapies (CBT), have an established position. The third wave of CBT, namely mindfulness-based interventions, based on the concept of purposeful and non-judgmental attention to the present moment, have been proposed as a method to reduce anxiety, improve quality of life, enhance sleep quality, improve autonomic nervous system function regulation, support healthy fetal development, and strengthen the mother-infant bond[24-30].

Despite positive reports in this area, systematic reviews have presented inconsistent and sometimes contradictory results. A significant portion of this inconsistency is due to methodological limitations of existing studies, lack of sufficient control over confounding variables, and failure to select participants based on nulliparity or multiparity status. Since the anxiety of nulliparous women often differs from that of multiparous women in terms of severity and contexts of occurrence, generalizing results from mixed samples increases the risk of misinterpretations and inaccurate decision-making. Therefore, conducting precise and focused research on nulliparous women is an undeniable necessity, both scientifically and practically. Based on this, the present study aimed to investigate the effectiveness of mindfulness-based group counseling on pregnancy-related anxiety in nulliparous women, in order to not only measure changes in anxiety levels but also analyze the psychological and social dimensions related to the acceptance and efficacy of this intervention in the target group.

Materials and Methods

Study Design: This is a randomized clinical trial of two parallel groups, the intervention and control groups. Variables were examined three times in both groups: at the beginning, at the end, and one month after the intervention.

Participants: The minimum required sample size was calculated based on the article "The efficacy of metacognitive therapy on metacognitive beliefs, meta worry and anxiety of pregnant women" in Tabriz city[31], as 27 pregnant women in each group:

$$n = \frac{\left(z_{(1-\alpha/2)} + z_{(1-\beta)}\right)^2\left(\sigma_1^2 + \sigma_2^2\right)}{\left(\mu_1 - \mu_2\right)^2} = \frac{(1.96 + 1.04)^2\left(17^2 + 36^2\right)}{(236 - 213)^2} = 27$$

Considering possible data loss, an alpha error of 5%, and power of 85% a total of 60 pregnant women, 30 in each group, were included in the study.

Inclusion criteria: Pregnant women who were 18 to 35 years old, at 12th-24th weeks of their first and singleton pregnancy, absence or history of psychiatric diseases (depression, having suicidal thoughts, etc.), obtained at least 10 points from the 6-item Kessler questionnaire, and voluntarily agreed to participate in the study were included.

Exclusion criteria: Pregnant women who had a history of abortion, a high-risk pregnancy (history of infertility, gestational diabetes, pre-eclampsia, placenta previa, etc.), chronic diseases, taking psychiatric drugs in the last year, and who had attended regular mind–body practices (yoga, meditation or mindfulness) were excluded from the study.

Reasons for dropping out were disinclination to continue, absence in more than two sessions, occurrence of stressful events or pregnancy problems (hemorrhage, premature birth, preeclampsia, etc.) during the study.

Samples: Pregnant women were recruited from the Mashhad Urban Comprehensive Health Centers, by multi-stage sampling in which the health centers were divided into 3 socio-economic levels (poor, medium and good) in 2018. Potential participants were evaluated regarding the inclusion and exclusion criteria from each health centers' pregnant women's lists. Then they were invited for a brief meeting by a telephone call. The objective and methods of the study were explained to the pregnant women, and Kessler's psychological distress scale were given to select the desired samples. Then they gave written informed consent, and were registered in a central list to divided into groups using the random allocation method. A code was assigned to each and randomization was performed via computer-generated block randomization (4-random-block). CONSORT reporting guidelines were followed. (Figure 1)

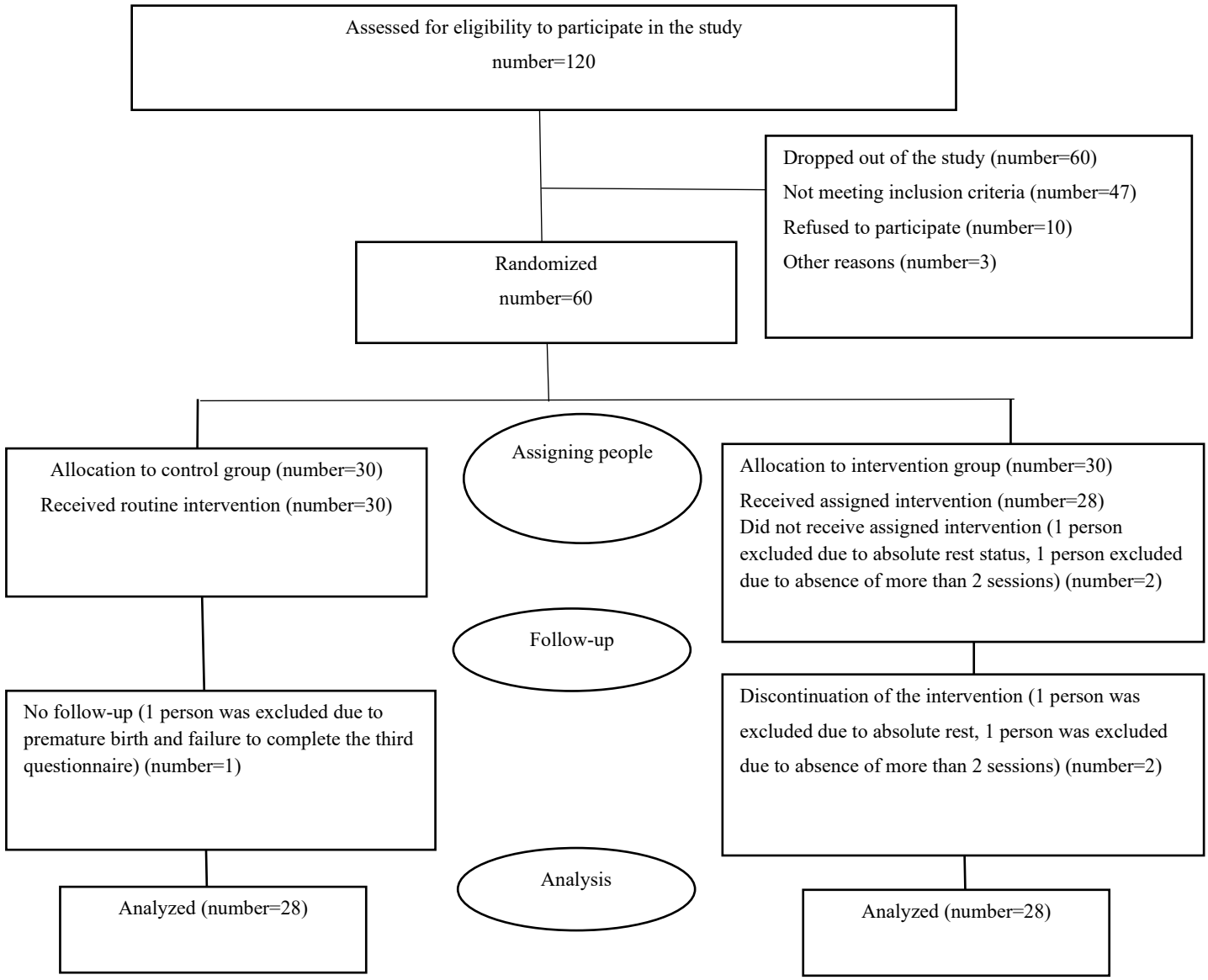

Figure 1. Sampling flowchart

The demographic information checklist included the individual's and spouse's age, duration of marriage, gestational age (weeks), educational status, employment status, spouse's employment status, familial relationship with spouse, marital relationship status, income level, housing status, and self-reported stress status.

Kessler's psychological distress scale, which is for identifying non-specific mental disorders in the general population, designed in 2002 by Kessler and his colleagues, and had 10 items (K10). The short version of the Kessler questionnaire that was compiled as 6 items (items 2, 4, 5, 8, 9, and 10 of the original questionnaire=k6)[32], has been used to evaluate the mental health status of pregnant women in Iran. The internal reliability of the K6 questionnaire has been considered acceptable according to various studies (α=0.78-0.90)[33]. In 2014, Amir Ismaili et al translated Kessler's questionnaire into Farsi and checked its validity and reliability. Equal to 0.87 was Cronbach's alpha coefficient for the K6 questionnaire. Its final score was between 0 and 24, and a score of 10 was the appropriate cut-off point for diagnosing mood or anxiety disorders. At this point, the sensitivity and specificity of the tool were 0.73 and 0.78, respectively. The correlation coefficient of the k6 questionnaire was determined between 0.59 and 0.73. The internal reliability of the questionnaire was obtained above 0.80. Psychometric properties of this questionnaire were Similar to the GHQ-12 questionnaire[32]. In this study, women who scored above 10 were classified as anxious and entered the study.

Vandenberg Pregnancy Anxiety Questionnaire (PRAQ) was created by Vandenberg in 1989 to assess worries and fears

during pregnancy. It has 58 subjects and the final score is 55 to 385. In this tool, 5 subscales are examined including “fear of childbirth” (14 items), “fear of giving birth to a child with physical or mental problems” (5 items), “fear of changes in marital relationship status” (13 items), “fear of changes in mood and its consequences on the child” (16 items), “self-centered fears and fear of mother's personal-life changes” (7 items). Its correlation coefficient with Spielberger's State-Trait Anxiety Questionnaire has been shown to be acceptable, and the Cronbach's alpha coefficient of all subscales throughout pregnancy was reported as 0.76[34]. The last three questions of the questionnaire are for describing the general state of pregnancy and are not included in the scoring. Women In the intervention group completed this questionnaire three times (before the intervention, at the end of the intervention, and one month after the intervention). Women in the control group also filled out the questionnaire three times (at the beginning of the study, six weeks later, parallel to the intervention group, and one month after the second time).

Intervention group: Participants in groups of 6 to 8 had joined mindfulness-based counseling sessions each week that were totally 6 sessions and each was 90 minutes. Coordination of women in each group was based on the suitable place and time for them. The sessions were hold in a furnished room in the health center, suitable for pregnant women to attend. The mindfulness counseling sessions were implemented in collaboration with a psychologist who was experienced in CBT and mindfulness counseling[35]. The content of each session is shown in Table 1.

Table 1. Mindfulness-based group counseling sessions

Session	Content
1th Session	Welcoming, mindfulness based cognitive therapy description, group discussion about mental health in pregnancy, practice to eat raisins with awareness, meditation with body scan, talk about homework (45 minutes body scan + mindful eating)
2th Session	Checking the assignments, settle the participants' pregnancy issues, meditation with body scan, 10 minutes mindful breathing, do the mental and emotional exercise, talk about homework (mindful breathing + note down pleasant daily events)
3th Session	Checking the assignments, mindful movements, do stretching and breathing exercises, 3-minute breathing with intervals, explain pleasant events, talk about homework (do mindful stretching exercise + note down unpleasant daily events)
4th Session	Checking the assignments, 4-minute mindful seeing and hearing, sitting meditation (awareness of breathing, body, sounds, and awareness), 3-minute breathing with intervals, mindful walking, talk about homework (sitting meditation + mindful breathing in challenging situations)
5th Session	Checking the assignments, sitting meditation, awareness of body and breathing, 3-minute breathing with intervals, talk about homework (sitting meditation + do body expansion exercise)
6th Session	Checking the assignments, sitting meditation, awareness of breathing process and body posture (by imagination a challenging situation), 3-minute breathing with intervals, review and summarize what had been taught, talk about homework (create a plan in low mood manner + regular mindful breathing).

Control group: The participants in the control group received only routine prenatal care, and they were applied no intervention.

Data analysis: The data were analyzed using the SPSS software and a P-value less than 0.05 is considered significant. Variables were described by frequency, frequency percentage, mean and standard deviation. Chi-square or Fisher's exact test was used for qualitative variables and independent t-test for quantitative variables. The mean scores of prenatal anxieties in two groups were compared with independent t-test. We carried out repeated-measure analysis to investigate the effect of time, group, and interaction between group and time.

Results

Demographic characteristics of participants mentioned in Table 2. It was determined that there was no significant difference in terms of personal characteristics except participants’ age, spouse's age, and marriage length among the groups (P-value>0.05). These heterogeneous variables were adjusted in the repeated-measure model. The average gestational age of the participants in two groups were 20 weeks. 43.9% of participants mentioned their stress level as moderate and 33.3% as severe, and only 10.5% of all had visited a psychiatrist in their life.

Table 3 shows the comparison of the anxiety and its subscales’ scores between and within groups at different times. there was no significant difference before the intervention between two groups, while immediately after the intervention (P-value=0.006) and also one month later (P-value=0.050) there was a significant decrease in the anxiety scores within the intervention group (Figure 2).

Time effect, group effect, and time-group effect base on the repeated-measure analysis show that pregnancy anxiety and all its subscales confirm the hypothesis of the article (P-value<0.05).

Table 2. Demographic characteristics between the groups

Variable	Total participants (n=57)	Intervention group (n=28)	Control group (n=29)	P-value
Age (years)	23.98±3.38	25.11±3.22	22.9±3.22	0.01*
Spouse's age (years)	28.42±3.15	29.32±3.17	27.55±3.22	0.03*
Marriage length (xxx)	3.14±1.46	3.57±1.46	2.74±1.37	0.032*

Gestational age (weeks)		20.07±2.93	20.14±2.62	20.0±3.26	0.85*
Educational status	Diploma and less	21 (36.8%)	5 (17.9%)	16 (55.2%)	0.13**
	Associate	15 (26.3%)	9 (32.1%)	6 (20.7%)	
	Bachelor's	21 (36.9%)	14 (50%)	7 (24.1%)	
Occupation status	Housewife	50 (87.7%)	25 (89.3%)	25 (86.2%)	1.00***
	Employed	7 (12.3%)	3 (10.7%)	4 (13.8%)	
Spouse's occupation status	Employee	19 (33.3%)	8 (28.6%)	11 (37.9%)	0.22**
	Self-employment	38 (71.4%)	20 (71.4%)	18 (62.1)	
Consanguinity with husband	Yes	9 (15.8%)	2 (7.1%)	7 (24.1%)	0.14***
	No	48 (84.4%)	26 (92.9)	22 (75.9%)	
Marital relationship status	Average	8 (14%)	3 (10.7%)	5 (17.2%)	0.86**
	Good	32 (56.1%)	16 (57.1%)	16 (55.2%)	
	Very good	17 (29.8%)	9 (32.1%)	8 (27.6%)	
Level of income	Lower than expense	5 (8.8%)	2 (7.2%)	3 (10.3%)	0.26**
	Equal to expense	29 (50.9%)	12 (42.9%)	17 (58.6%)	
	Higher than expense	23 (40.4%)	14 (50%)	9 (31%)	
Lodging status	Rented	43 (75.5%)	20 (71.4%)	23 (79.3%)	0.46**
	Owner	14 (24.6%)	8 (28.6%)	6 (20.7%)	
Stress status by self-report	A little	11 (19.3%)	6 (21.5%)	5 (17.2%)	0.20**
	Somewhat	25 (43.9%)	14 (50%)	11 (37.9%)	
	Very much	21 (36.8%)	8 (28.5%)	13 (44.8%)	

***t-test / **Chi-square test / ***Fisher's exact test**

Table 3. PRAQ and its subscales' total mean scores in two groups

	Variable		Intervention group	Control group	P-value*	P-value**	P-value***	P-value****
	The PRAQ scores	Before the intervention	164.29±40.83	154.59±39.86	0.36	0.001	<0.001	<0.001
		After the intervention	136.39±33.15	163.10±36.48	0.006			
		Follow up	146.04±31.64	164.10±36.05	0.050			
The PRAQ subscales scores	**Fear of childbirth**	Before the intervention	30.50±11.78	28.59±9.44	0.50	0.025	<0.001	<0.001
		After the intervention	26.00±7.63	31.79±8.10	0.008			
		Follow up	29.32±7.73	32.72±8.88	0.12			
	Fear of bearing a physically or mentally handicapped child	Before the intervention	17.36±8.03	15.93±5.68	0.44	<0.001	<0.001	<0.001
		After the intervention	13.71±5.78	15.72±5.14	0.17			
		Follow up	14.82±5.76	15.69±4.26	0.52			
	Fear of changes in marital relationship status	Before the intervention	43.82±13.0	41.24±11.33	0.42	<0.001	<0.001	<0.001
		After the intervention	35.93±11.03	41.21±11.36	0.081			
		Follow up	38.54±10.77	41.0±11.54	0.40			
	Fear of mood-changes	Before the intervention	30.29±7.06	29.10±7.54	0.54	<0.001	<0.001	<0.001
		After the intervention	26.46±6.47	32.55±6.63	0.001			
		Follow up	29.14±5.60	34.03±6.66	0.004			
	Mother's-self-centered and life-changes fears	Before the intervention	42.32±12.30	39.72±11.68	0.417	<0.001	<0.001	<0.001
		After the intervention	34.29±10.77	41.83±11.79	0.15			
		Follow up	34.21±10.44	40.66±10.74	0.26			

*** According to independent t-test analysis / ** related to Time effect / *** related to group effect / **** related to time-group effect.**

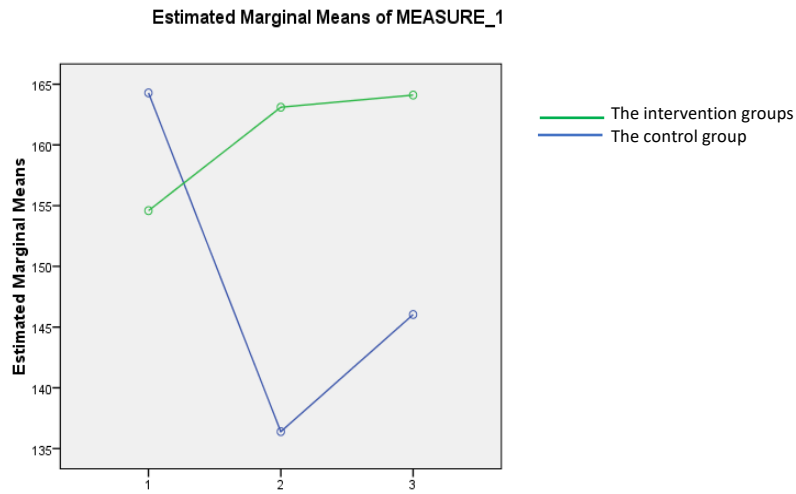

Figure 2. The mean score of pregnancy related anxiety between two groups at three times (before the intervention, after the intervention, and one month after the intervention)

Discussion

Birth and pregnancy which is a special experience in a woman's life, can perceived as an anxious circumstance for some women. Due to anxiety consequences, it is important to alleviate it and make the pregnancy period a better experience. In this study, the pregnancy related anxiety score decreased from 164 to 136 after mindfulness counseling in the intervention group. This showed the intervention had a decreasing effect on the pregnancy related anxiety, and this effect had been remained in the follow-up period. There are studies which are in line with our results.

A single blind randomized control Trial study which consists childbirth education and mindfulness sessions showed after the intervention level of mindfulness was higher while "fear of child birth" and anxiety symptoms had been decreased. As mentioned, "fear of child birth" is One of the two main arms of anxiety[36].

In another clinical trial study, mindfulness-based stress reduction program could lower maternal anxiety in the intervention group, however a reduction in anxiety scores appeared in the control group which in the authors' idea may because of time passing in pregnancy and coping with it or may be a result of reading the questionnaires at the beginning the study and that made an awareness for all mothers even those who did not get mindfulness sessions[37]. A study in the Netherlands showed mindfulness-based childbirth can decrease "fear of childbirth" in the intervention group. In this article pregnancy anxiety also assessed but no significant differences were seen between two groups, it may be the result of a new non validate assessment for pregnancy anxiety that had been used as the authors said[38].

A Randomized Control Trial study showed the mindfulness-based cognitive therapy had a decreasing effect on the symptoms of depression and anxiety in pregnant women, and this effect remained until one month after the intervention. The difference with ours was the questionnaires had been used which were Beck's Depression and Anxiety Questionnaire[26]. Research about the effect of mindfulness-based yoga on maternal physical and mental distress during pregnancy by Beddoe et al.'s showed women in their third trimester of pregnancy had a greater reduction in anxiety and stress than those who were in their second trimester. The participants in our study were almost in their second trimester. The similarity of this intervention with the present study was that the samples were primygravid and had singleton pregnancies[39].

There are more consistent results, which are the clinical trial studies or cross sectional studies[40-44] and also a systematic review in 2024 showed awareness-based educations and mindfulness decrease "fear of childbirth" which is an item of anxiety in pregnancy[45]. Mindfulness is defined as receptive attention and an open attitude to the present moment and it can improve mental health outcomes in pregnant women[46]. Its exercises increase body awareness and improve access to body sensations. Furthermore, body awareness is an important element in self-care and decision-making skills[47], which are important features in a healthy pregnant woman.

Lönnberg et al investigated parents perspectives during Mindfulness Based Childbirth and demonstrated most parents experienced mindfulness as a valuable preparation for the challenges in life and also they got deeper self-knowledge and self-compassion[48]. Furthermore, data analysis showed that the intervention had a decreasing effect on some subscales of pregnancy related anxiety scale, which were "fear of childbirth" and "fear of changes in mood", and this effect

remained for the subscale “fear of changes” in the follow-up phase.

Karamozian et al.’s study “Effectiveness of stress management group therapy on prenatal anxiety and physiological parameters of newborns”, showed their intervention had a reducing effect on the subscales “fear of giving birth to a physically or mentally disabled child”, “fear of child delivery” and “fear of change in mood”, that were in line with our study except for the subscale “fear of giving birth to a physically or mentally disabled child” that had been a decreasing effect, but not significantly, in our study. Both interventions had no significant effect on the other two subscales[34].The study of Pardakhti shows that the educational program for parents on pregnant women during 8 sessions could reduce the scores of the subscales “fear of childbirth”, “fear of giving birth to a physically or mentally disabled child”, and “fear of changes in the mother's life”[49] that the results were in line with the present study. By results, if pregnant women pay enough attention to themselves and their moods, and be in the present moment, the pregnancy anxiety would be lower. And so, we will have healthier mothers and a better new generation due to consequences of anxiety. Risk factors for anxiety in pregnancy should be determined with a detailed history before and during pregnancy, and anxiety related to pregnancy should be assessed. Once the anxiety has been determined, interventions such as counselling can be provided to alleviate it. There are other benefits from these sessions such as: better ability to cope with worries by hearing similar concerns from others and understanding of not being alone, solving specific concerns and questions during pregnancy by the mentor and probably making new friendships with others.
A good participation of pregnant women is required to do home exercises, which may not be fully possible. However, the women can be followed by phone calls or text messages to encouraged doing their home exercises. For those who have a problem which cause them to rest more at home, the classes can hold online, that has been shown to be effective in an article[50]. Among the weaknesses of this study, first, the limited sample size and the selection of participants from a specific city reduce the generalizability of the results to other populations. The use of self-report tools for measuring anxiety increases the likelihood of response bias or the results being influenced by cultural and social factors. The short follow-up period limits the ability to assess the long-term reliability of mindfulness effects. Also, the failure to examine other psychological and physical outcomes related to pregnancy, such as depression, perceived stress, or sleep quality, prevented a more comprehensive picture of the program's effects from being presented, and among the strengths of this study. This study, by utilizing a structured and standardized group intervention method based on mindfulness-based stress reduction (MBSR) principles, helped reduce anxiety in primiparous women in a controlled environment. The use of an experienced instructor with official mindfulness training certification increased the credibility of the intervention's implementation. Furthermore, the relative homogeneity of the sample in terms of age, socioeconomic status, and stage of pregnancy allowed for the reduction of confounding effects. This research also addressed a significant gap in the country's research literature by focusing on a vulnerable group (primiparous women with pregnancy anxiety). It is suggested that future research should be conducted with multi-center randomized controlled trial designs and larger sample sizes to increase the generalizability of the findings. Additionally, long-term follow-up periods (three to six months postpartum) are recommended to assess the sustained effects of mindfulness. Employing objective tools for measuring stress and anxiety, such as cortisol hormone measurements or physiological indicators, can make the data more valid. Simultaneously examining other psychological and physical outcomes such as depression, satisfaction with the pregnancy experience, sleep quality, and bonding with the fetus will also provide a more comprehensive view. Also, comparing mindfulness counseling with other short-term psychotherapy methods such as CBT or interpersonal psychotherapy (IPT) can increase the explanatory power of the findings.

Ethical Considerations

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Conflict of Interest

There is no conflict of interest.

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References

1. Van Bussel JC, Spitz B, Demyttenaere K. Women's mental health before, during, and after pregnancy: A population-based controlled cohort study. Birth 2006;33(4):297-302. doi: 10.1111/j.1523-536X.2006.00122.x

2. Ayano G, Tesfaw G, Shumet S. Prevalence and determinants of antenatal depression in Ethiopia: a systematic review and meta-analysis. PloS one 2019;14(2):e0211764. doi: 10.1371/journal.pone.0211764

3. Bjelica A, Cetkovic N, Trninic-Pjevic A, Mladenovic-Segedi L. The phenomenon of pregnancy-A psychological view. Ginekologia polska 2018;89(2):102-106. doi: 10.5603/GP.a2018.0017

4. Dinç S, Erdoğan E, Doğan RA. The effect of mindfulness-based childbirth education intervention on fear of childbirth: systematic review and meta-analysis. Revista da Associação Médica Brasileira 2024;70(7):e20240167. doi: 10.1590/1806-9282.20240167

5. Cookson H, Granell R, Joinson C, Ben-Shlomo Y, Henderson AJ. Mothers' anxiety during pregnancy is associated with asthma in their children. Journal of Allergy and Clinical Immunology 2009;123(4):847-853. e11. doi: 10.1016/j.jaci.2009.01.042

6. Sun S, Luo C, Zeng X, Wu Q. The relationship between pregnancy stress and mental health of the pregnant women: the bidirectional chain mediation roles of mindfulness and peace of mind. Frontiers in Psychology 2024;14:1295242. doi: 10.3389/fpsyg.2023.1295242

7. Kingston D, Austin M-P, Hegadoren K, et al. Study protocol for a randomized, controlled, superiority trial comparing the clinical and cost-effectiveness of integrated online mental health assessment-referral-care in pregnancy to usual prenatal care on prenatal and postnatal mental health and infant health and development: the Integrated

Maternal Psychosocial Assessment to Care Trial (IMPACT). Trials 2014;15(1):72. doi: 10.1186/1745-6215-15-72

8. Yuvarani G, Manoranjitham R, Tharani G, Kamatchi K, Vaishnavi G. A study to compare the effects of aerobic exercises and yoga on depression and maternal anxiety orienting among primiparous women. 2020; doi: 10.51248/.v40i3.38

9. Dennis C-L, Falah-Hassani K, Shiri R. Prevalence of antenatal and postnatal anxiety: systematic review and meta-analysis. The British Journal of Psychiatry 2017;210(5):315-323. doi: 10.1192/bjp.bp.116.187179

10. Yin X, Sun N, Jiang N, et al. Prevalence and associated factors of antenatal depression: Systematic reviews and meta-analyses. Clinical psychology review 2021;83:101932. doi: 10.1016/j.cpr.2020.101932

11. Kheshti A, Gholami A. The Assessing mental Health in pregnancy and relative psychopathologic factors in Jahrom. Journal of Jahrom University of Medical Sciences 2007;5(3):23-29. doi: 10.29252/jmj.5.3.4.23

12. Mansouri N, Azizi A, Jamshidi E. Factors associated with mental disorders in pregnant women covered by primary health care: a population-based study. Family Medicine & Primary Care Review 2022;24(4) doi: 10.5114/fmpcr.2022.120855

13. Huizink AC, Mulder EJ, de Medina PGR, Visser GH, Buitelaar JK. Is pregnancy anxiety a distinctive syndrome? Early human development 2004;79(2):81-91. doi: 10.1016/j.earlhumdev.2004.04.014

14. Serçekuş P, Vardar O, Özkan S. Fear of childbirth among pregnant women and their partners in Turkey. Sexual & Reproductive Healthcare 2020;24:100501. doi: 10.1016/j.srhc.2020.100501

15. Janssen LE, Gieskes AA, Kok M, de Groot CJ, Oudijk MA, de Boer MA. Stress-reducing interventions in pregnancy for the prevention of preterm birth: a systematic review and meta-analysis. Journal of Psychosomatic Obstetrics & Gynecology 2023;44(1):2281238. doi: 10.1080/0167482X.2023.2281238

16. Mohammadi ZD, Bosaknejad S, Sarvghad S. A survey on the effectiveness of stress management training with cognitive-behavioral group therapy approach on state/trait anxiety, pregnancy anxiety and mental health of primiparous women. Jentashapir Journal of Health Research 2012;3(4)

17. Henrichs J, Van Den Heuvel MI, Witteveen AB, Wilschut J, Van den Bergh BR. Does mindful parenting mediate the association between maternal anxiety during pregnancy and child behavioral/emotional problems? Mindfulness 2021;12(2):370-380. doi: 10.1007/s12671-019-01115-9

18. Bayrami M, Zahmatyar H, BAHADORI KJ. Prediction strategies to coping with stress in the pregnancy women with first experience on the based factors hardiness and social support. 2013;

19. Mangoli M, Ramezani T, MOHAMMAD AS. Screening mental disorders in pregnancy. 2003;

20. Green JM, Kafetsios K, Statham HE, Snowdon CM. Factor structure, validity and reliability of the Cambridge Worry Scale in a pregnant population. Journal of health psychology 2003;8(6):753-764. doi: 10.1177/13591053030086008

21. Shayeghian Z, Tabatabaey S. Effect of Maternal Anxiety during Third Trimester on Pregnancy Outcomes and Infants' Mental Health. Hayat/Ḥayāt 2008;14

22. MOLAVAI H, Movahedi M, Bengar M. Correlation of stress during pregnancy with apgar scores and physical conditions of neonates. 2004;

23. Brouwers EP, van Baar AL, Pop VJ. Maternal anxiety during pregnancy and subsequent infant development. Infant Behavior and Development 2001;24(1):95-106. doi: 10.1016/S0163-6383(01)00062-5

24. Kazemi Zahrani H, Behnampour N. The effect of mindfulness-based stress reduction on the somatic, cognitive, behavioral anxiety and quality of sleep of pregnant mothers. Journal of Research in Behavioural Sciences 2020;18(2):227-236. doi: 10.52547/rbs.18.2.227

25. Kabat-Zinn J. Mindfulness-based interventions in context: past, present, and future. 2003; doi: 10.1093/clipsy.bpg016

26. Zemestani M, Fazeli Nikoo Z. Effectiveness of mindfulness-based cognitive therapy for comorbid depression and anxiety in pregnancy: a randomized controlled trial. Archives of women's mental health 2020;23(2):207-214. doi: 10.1007/s00737-019-00962-8

27. Shahtaheri E, Hosseinian S, Ebrahimi M, Jalilabadi Z, Mirderikvand F. The impact of stress reduction program based on mindfulness and conscious yoga on depression, perceived stress and quality of life in pregnant women. Acta Medica Mediterranea 2016;32(5):2047-2050.

28. Felder J, Mirchandaney R, Manber R, et al. Feasibility and acceptability of mindfulness-based stress reduction and prenatal sleep classes for poor prenatal sleep quality: Pilot randomized controlled trial. Behavioral sleep medicine 2024;22(5):739-753. doi: 10.1080/15402002.2024.2359415

29. Nakaki A, Gomez Y, Darecka K, et al. Effects of mediterranean diet or Mindfulness-Based stress reduction during pregnancy on fetal brain development detected by neurosonography: A secondary analysis of a randomized clinical trial (IMPACT BCN). Fetal Diagnosis and Therapy 2025;52(1):46-58. doi: 10.1159/000540580

30. de Waal N, Lodder P, Nyklíček I, et al. Trait mindfulness during pregnancy and maternal-infant bonding: Longitudinal associations with infant temperament and social-emotional development. Early Human Development 2024;196:106082. doi: 10.1016/j.earlhumdev.2024.106082

31. Shaker Dioulagh A, Hoseinnezhad S, Nabizade D. THE EFFICACY OF METACOGNITIVE THERAPY ON METACOGNITIVE BELIEFS, META WORRY AND ANXIETY OF PREGNANT WOMEN. Research. Nursing and Midwifery Journal 2019;16(11):787-798.

32. Hajebi A, Motevalian A, Amin-Esmaeili M, et al. Adaptation and validation of short scales for assessment of psychological distress in I ran: The P ersian K10 and K6. International journal of methods in psychiatric research 2018:e1726. doi: 10.1002/mpr.1726

33. Ferro MA. The psychometric properties of the Kessler Psychological Distress Scale (K6) in an epidemiological sample of Canadian youth. The Canadian Journal of Psychiatry 2019;64(9):647-657. doi: 10.1177/0706743718818414

34. Karamoozian M, Askarizadeh G, Darekordi A. The impact of prenatal group stress management therapy on anxiety in mothers and newborns physiological parameters. 2015;

35. Dimidjian S, Kleiber BV, Segal ZV. Mindfulness-based cognitive therapy. Cognitive and behavioral theories in clinical practice 2010:307-331.

36. Kuo T-C, Au H-K, Chen S-R, et al. Effects of an integrated childbirth education program to reduce fear of childbirth, anxiety, and depression, and improve dispositional mindfulness: A single-blind randomised controlled trial. Midwifery 2022/10/01/ 2022;113:103438. doi: 10.1016/j.midw.2022.103438

37. Zarenejad M, Yazdkhasti M, Rahimzadeh M, Mehdizadeh Tourzani Z, Esmaelzadeh-Saeieh S. The effect of mindfulness-based stress reduction on maternal anxiety and self-efficacy: A randomized controlled trial. Brain and Behavior 2020;10(4):e01561. doi: 10.1002/brb3.1561

38. Veringa-Skiba IK, de Bruin EI, van Steensel FJA, Bögels SM. Fear of childbirth, nonurgent obstetric interventions, and newborn outcomes: A randomized controlled trial comparing mindfulness-based childbirth and parenting with enhanced care as usual. Birth 2022;49(1):40-51. doi: 10.1111/birt.12571

39. Carroll LJ. The impact of mindfulness-based prenatal yoga on maternal stress during pregnancy. 2014.

40. Goodman JH, Guarino A, Chenausky K, et al. CALM Pregnancy: results of a pilot study of mindfulness-based cognitive therapy for perinatal anxiety. Archives of women's mental health 2014;17:373-387. doi: 10.1007/s00737-013-0402-7

41. Sobhani E, Babakhani N, Alebouyeh MR. The effectiveness of mindfulness-based stress reduction on the depression, anxiety, stress, and pain perception in females with obstructed labour-induced chronic low back pain. Iranian Journal of Psychiatry and Clinical Psychology 2019;25(3):266-77. doi: 10.32598/ijpcp.25.3.266

42. Shahoie R, Karimi A, Sharifish S, Soufizadeh N, Khanpour F. Evaluation of the effectiveness of mindfulness-based stress reduction on anxiety in pregnant women. Scientific Journal of Nursing, Midwifery and Paramedical Faculty 2019;5(3):83-94.

43. Bayram GO, Bay F. SAĞLIK PROFESYONELİ KADINLARIN DOĞUM KORKULARINI NASIL DÖNÜŞTÜREBİLİR? HOLİSTİK BAKIM ÖRNEĞİ. KTO Karatay Üniversitesi Sağlık Bilimleri Dergisi 1(2):39-51.

44. Duncan LG, Bardacke N. Mindfulness-based childbirth and parenting education: promoting family mindfulness during the perinatal period. Journal of child and family studies 2010;19:190-202. doi: 10.1007/s10826-009-9313-7

45. Dinç S, Erdoğan E, Doğan RA. The effect of mindfulness-based childbirth education intervention on fear of childbirth: systematic review and meta-analysis. Revista da Associacao Medica Brasileira (1992) 2024;70(7):e20240167. doi: 10.1590/1806-9282.20240167

46. Sari YP, Hsu YY, Nguyen TTB. The Effects of a Mindfulness-Based Intervention on Mental Health Outcomes in Pregnant Woman: A Systematic Review and Meta-Analysis. The journal of nursing research : JNR Dec 1 2023;31(6):e306. doi: 10.1097/jnr.0000000000000586

47. Treves IN, Tello LY, Davidson RJ, Goldberg SB. The relationship between mindfulness and objective measures of body awareness: A meta-analysis. Scientific reports 2019;9(1):17386. doi: 10.1038/s41598-019-53978-6

48. Lönnberg G, Nissen E, Niemi M. What is learned from mindfulness based childbirth and parenting education?-participants' experiences. BMC Pregnancy and Childbirth 2018;18:1-9. doi: 10.1186/s12884-018-2098-1

49. Pardakhti S, Hoseinian S. Effectiveness of training towards parenthood program on primigravida women pregnancy anxiety. international journal of philosophy and social-psychological sciences 2016;2(4-2016):67-74.

50. Balsam D, Bounds DT, Rahmani AM, Nyamathi A. Evaluating the Impact of an App-Delivered Mindfulness Meditation Program to Reduce Stress and Anxiety During Pregnancy: Pilot Longitudinal Study. JMIR pediatrics and parenting Dec 25 2023;6:e53933. doi: 10.2196/53933