

Research Article

THE EFFECTIVENESS OF COGNITIVE BEHAVIORAL THERAPY ON ANXIETY SENSITIVITY, PREGNANCY STRESS, AND MINDFULNESS IN PRIMIPAROUS WOMEN: A QUASI-EXPERIMENTAL STUDY

Author: ¹Seyedeh Ehteram Gholamian*  ²Seyedeh Fatemeh Mirhosseini Amiri

¹ BSc in Clinical Psychology, Babolsar Health Network, Mazandaran University of Medical Sciences, Sari, Iran

². Department of Clinical Psychology, Faculty of Humanities, Ayatollah Amoli Branch, Islamic Azad University, Amol, Iran.

KEYWORDS

Cognitive behavioral therapy, Anxiety sensitivity, Pregnancy stress, Mindfulness, Primiparous women

ABSTRACT

Background and Aim: The present study was conducted to determine the effectiveness of cognitive behavioral therapy (CBT) on anxiety sensitivity, pregnancy stress, and mindfulness in primiparous women.

Method: This quasi-experimental study used a pretest–posttest design with a control group. The population consisted of primiparous women attending health centers in Babolsar during 2024–2025. A sample of 30 women (15 in the experimental group and 15 in the control group) was selected through convenience sampling and randomly assigned to the groups. The instruments included the Anxiety Sensitivity Index (ASI), Pregnancy Distress Questionnaire (PDQ), and Kentucky Inventory of Mindfulness Skills (KIMS). The intervention consisted of 8 weekly group sessions of cognitive behavioral therapy based on the protocol of Antony et al. (2007), adapted for pregnancy. Data were analyzed using multivariate analysis of covariance (MANCOVA) and analysis of covariance (ANCOVA).

Results: Significant differences were found in favor of the experimental group on all variables and subscales ($p < 0.001$), with large effect sizes ($\eta^2 = 0.424–0.894$).

Conclusion: Short-term cognitive behavioral therapy is an effective, safe, and feasible approach that can be implemented in health centers to reduce psychological problems in primiparous women.

ARTICLE HISTORY

Received Date: 05/01/2026

Revised Date: 07/01/2026

Accepted Date: 22/02/2026

Published Date: 17/03/2026

DOI: 10.69557/ujrra.v5i1.267

CORRESPONDING AUTHOR

Seyedeh Ehteram Gholamian

rezashams@gmail.com

<https://orcid.org/0009-0004-8057-836X>

INTRODUCTION

Childbirth is one of the divine blessings for the continuation of the human race on earth, a process that has continued naturally since the beginning of creation. The mechanism of childbirth is a spontaneous process that does not require intervention and has followed its natural course for thousands of years ⁽¹⁾. Pregnancy begins with fertilization, formation of the zygote, and its implantation in the uterus. The duration of pregnancy is 280 days from the first day of the last menstrual period or 40 weeks ⁽²⁾. At the beginning of pregnancy, women experience concerns related to acceptance of pregnancy, physical health, and changes in body image, which lead to anxiety. These anxiety symptoms may manifest directly or indirectly ⁽³⁻⁵⁾.

One anxiety construct that has received considerable attention in recent years in the field of anxiety disorders is **anxiety sensitivity**. Anxiety sensitivity is defined as fear of anxiety-related symptoms and sensations (e.g., palpitations, shortness of breath, or dizziness), based on the belief that these sensations may lead to harmful consequences in physical (e.g., heart attack), psychological (e.g., loss of control), or social (e.g., ridicule or rejection) domains. This construct acts as a transdiagnostic and key vulnerability factor and plays a significant role in the onset, maintenance, and severity of anxiety disorders ⁽⁶⁻⁸⁾.

According to cognitive theories, anxiety sensitivity leads to processing biases (such as attentional bias toward threatening stimuli and negative interpretive bias) in the retrieval and processing of information related to anxiety symptoms. These biases create vulnerability to mental disorders, particularly social anxiety. Recent studies show that anxiety sensitivity functions as a key transdiagnostic risk factor that not only contributes to the onset and maintenance of social anxiety but also, through interaction with cognitive factors such as lack of cognitive flexibility and behavioral avoidance, increases symptom severity ⁽⁹⁻¹²⁾.

In this context, **mindfulness** (especially during pregnancy) has attracted considerable attention. Mindfulness emphasizes a specific kind of awareness, alertness, and full attention to the present moment. In other words, while the thinking mind continuously produces thoughts, a separate entity (the observing mind) watches and observes phenomena. In the state of mindfulness, a form of wakefulness exists that does not fit into ordinary current awareness and lies outside the direct reach of thought; its role is that of a neutral, fully aware observer ⁽¹³⁾. Mindfulness is defined as paying attention to the present moment in a particular, intentional, and non-judgmental way ⁽¹⁴⁾. It is also described as being in the moment with whatever is present now, without judgment and without commentary on what is happening – that is, experiencing pure reality without explanation ⁽¹⁵⁾.

Statement of the Problem

Physical changes in the mother, along with hormonal fluctuations and concerns arising from the unknown phenomena of pregnancy, turn this period into one of the most stressful stages of a woman's life. Stress is a specific relationship between the individual and the environment in which the appraised demands exceed the person's resources and endanger well-being. This definition emphasizes that stress refers to a taxing relationship between the person and the environment; when the individual is unable to cope with this situation, psychological and physical problems arise. In recent decades, the term "stress" has been used to refer to a stimulus

that can produce changes in cognition, emotion, behavior, and physiology. Pregnancy stress can be associated with poor pregnancy outcomes and adverse consequences, including miscarriage, pregnancy-induced hypertension, preterm birth, neonatal infection, and low birth weight ⁽¹⁶⁾.

Since situations that cause anxiety and stress are unavoidable, it is better to teach pregnant women methods to cope more effectively with stress-inducing stimuli and control their effects. One of the most effective approaches to managing anxiety and stress during pregnancy is **cognitive behavioral therapy (CBT)**, which not only reduces these factors but also decreases pregnancy complications ⁽¹⁷⁾.

In the present study, the researcher aims to use cognitive behavioral therapy to favorably improve the levels of anxiety sensitivity, pregnancy stress, and mindfulness in primiparous women.

METHOD

Research Design

Quasi-experimental pretest–posttest design with a control group.

Participants

Thirty primiparous women (15 in the experimental group, 15 in the control group) referred to health centers in Babolsar, Iran, during 2016–2017.

Instruments

- **Anxiety Sensitivity Index (ASI):** 16 items, 5-point Likert scale. Cronbach's α in the present study = 0.87–0.93.
- **Pregnancy Distress Questionnaire (PDQ):** 12 items. Cronbach's α = 0.78.
- **Kentucky Inventory of Mindfulness Skills (KIMS):** 39 items, 5-point Likert scale. Cronbach's α = 0.82.

Intervention Protocol

The experimental group received eight 90-minute weekly group sessions of cognitive behavioral therapy adapted for pregnancy, based on the protocol of Antony et al. (2007). The content of the sessions is presented in Table 1.

Table 1. Content of the 8-session cognitive behavioral therapy protocol (adapted from Antony et al., 2007)

Session	Goal	Main Content	Homework Assignment
1	Introduction & modeling	Group cohesion, ABCDE model	Daily event log

2	Pregnancy-related cognitive errors	Catastrophizing childbirth, “should” statements	Recording automatic thoughts
3	Body mindfulness	Body Scan, pleasant activities	Daily Body Scan practice
4	Relaxation & letting go	Progressive muscle relaxation, diaphragmatic breathing	Relaxation practice + list of irrational demands
5	Cognitive restructuring	Challenging catastrophic thoughts about baby/delivery	Recording and challenging thoughts
6	Exposure & stress inoculation	Gradual exposure to pregnancy-related triggers	Daily stress log
7	Thought stopping & being present	Thought-stopping technique, mindful walking	Thought-stopping practice
8	Review & relapse prevention	Generalization of skills, long-term plan	Daily mindful living plan

RESULTS

Descriptive Statistics

Table 2. Means and standard deviations of the dependent variables at pretest and posttest

Variable	Group	Pretest (M ± SD)	Posttest (M ± SD)
Anxiety Sensitivity (total)	Experimental	38.53 ± 11.31	26.60 ± 9.60
	Control	37.87 ± 10.40	38.33 ± 10.63
Pregnancy Stress (total)	Experimental	36.73 ± 4.04	26.80 ± 4.16
	Control	35.27 ± 5.89	35.67 ± 5.54
Mindfulness (total)	Experimental	104.60 ± 21.10	130.46 ± 23.19
	Control	106.73 ± 17.73	98.20 ± 18.64

Assumptions Tests (Summary)

- Levene’s test: All $p > 0.05 \rightarrow$ homogeneity of variances confirmed
- Homogeneity of regression slopes: All $p > 0.05$
- Kolmogorov–Smirnov test: All $p > 0.05 \rightarrow$ normal distribution confirmed

Inferential Statistics

Table 3. Results of multivariate analysis of covariance (MANCOVA) for the main hypothesis

Test	Value	F	df	p	η^2
Pillai's Trace	0.845	41.646	3, 23	<0.001	0.845
Wilks' Lambda	0.155	41.646	3, 23	<0.001	0.845

Table 4. ANCOVA results for anxiety sensitivity and its subscales (pretest scores as covariate)

Dependent Variable	Source	F	p	η^2
Physical concerns	Group	95.384	<0.001	0.779
Fear of cognitive dyscontrol	Group	36.577	<0.001	0.575
Fear of publicly observable symptoms	Group	19.903	<0.001	0.424
Total Anxiety Sensitivity	Group	89.042	<0.001	0.767

Table 5. ANCOVA results for pregnancy stress and its subscales

Dependent Variable	Source	F	p	η^2
Concerns about birth and baby	Group	70.833	<0.001	0.724
Concerns about weight and body image	Group	34.832	<0.001	0.563
Concerns about emotions and relationships	Group	24.341	<0.001	0.474
Total Pregnancy Stress	Group	80.620	<0.001	0.749

Table 6. ANCOVA results for mindfulness and its subscales

Dependent Variable	Source	F	p	η^2
Observing	Group	15.769	<0.001	0.369
Describing	Group	21.656	<0.001	0.445
Acting with awareness	Group	15.255	0.001	0.361

Accepting without judgment	Group	30.474	<0.001	0.530
Total Mindfulness	Group	23.724	<0.001	0.459

Detailed Descriptive Statistics for Subscales

Table 7. Anxiety Sensitivity Index (ASI) – Subscales: Means and Standard Deviations at Pretest and Posttest

Subscale	Group	Pretest (M ± SD)	Posttest (M ± SD)	Change
1. Physical Concerns (8 items)	Experimental	19.33 ± 6.96	13.00 ± 5.81	↓ 6.33
	Control	18.80 ± 5.87	19.40 ± 5.79	↑ 0.60
2. Fear of Cognitive Dyscontrol (4 items)	Experimental	8.73 ± 3.15	5.80 ± 2.76	↓ 2.93
	Control	8.93 ± 2.87	8.53 ± 3.11	↓ 0.40
3. Fear of Publicly Observable Symptoms (4 items)	Experimental	10.47 ± 3.00	7.80 ± 3.00	↓ 2.67
	Control	10.13 ± 2.54	10.40 ± 2.95	↑ 0.27
Total Anxiety Sensitivity	Experimental	38.53 ± 11.31	26.60 ± 9.60	↓ 11.93
	Control	37.87 ± 10.40	38.33 ± 10.63	↑ 0.46

Table 8. Pregnancy Distress Questionnaire (PDQ) – Subscales: Means and Standard Deviations at Pretest and Posttest

Subscale	Group	Pretest (M ± SD)	Posttest (M ± SD)	Change
1. Concerns about Birth and Baby (5 items)	Experimental	16.93 ± 3.28	12.00 ± 2.83	↓ 4.93
	Control	16.73 ± 4.46	16.93 ± 3.86	↑ 0.20
2. Concerns about Weight and Body Image (3 items)	Experimental	8.13 ± 1.92	6.13 ± 1.88	↓ 2.00
	Control	8.13 ± 2.07	8.13 ± 1.77	0
3. Concerns about Emotions and Relationships (4 items)	Experimental	11.67 ± 1.72	8.67 ± 2.06	↓ 3.00

	Control	10.40 ± 1.68	10.60 ± 2.03	↑ 0.20
Total Pregnancy Stress	Experimental	36.73 ± 4.04	26.80 ± 4.16	↓ 9.93
	Control	35.27 ± 5.89	35.67 ± 5.54	↑ 0.40

Table 9. Kentucky Inventory of Mindfulness Skills (KIMS) – Subscales: Means and Standard Deviations at Pretest and Posttest

Subscale	Group	Pretest (M ± SD)	Posttest (M ± SD)	Change
1. Observing (12 items)	Experimental	39.93 ± 7.83	44.93 ± 6.40	↑ 5.00
	Control	40.20 ± 5.58	37.20 ± 6.11	↓ 3.00
2. Describing (8 items)	Experimental	17.60 ± 4.14	24.73 ± 6.28	↑ 7.13
	Control	18.67 ± 4.62	16.93 ± 4.50	↓ 1.74
3. Acting with Awareness (10 items)	Experimental	24.47 ± 5.99	31.53 ± 6.98	↑ 7.06
	Control	25.80 ± 6.85	24.00 ± 6.81	↓ 1.80
4. Accepting without Judgment (9 items)	Experimental	22.67 ± 5.11	29.27 ± 5.52	↑ 6.60
	Control	22.07 ± 4.90	20.07 ± 4.74	↓ 2.00
Total Mindfulness (39 items)	Experimental	104.60 ± 21.10	130.46 ± 23.19	↑ 25.86
	Control	106.73 ± 17.73	98.20 ± 18.64	↓ 8.53

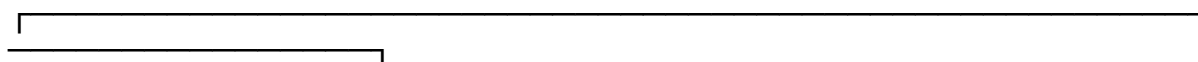
Summary of Subscale Changes

- The largest reductions in the experimental group were observed in the “Concerns about Birth and Baby” subscale (−4.93) and the “Physical Concerns” subscale of anxiety sensitivity (−6.33).
- The greatest increases in mindfulness occurred in the “Describing” (+7.13) and “Acting with Awareness” (+7.06) subscales, reflecting the strong impact of the mindfulness and cognitive restructuring components of the intervention.

Figure 10. Anxiety Sensitivity Index (ASI) and Subscales

text

Pretest and Posttest Anxiety Sensitivity Scores (higher = more sensitivity)



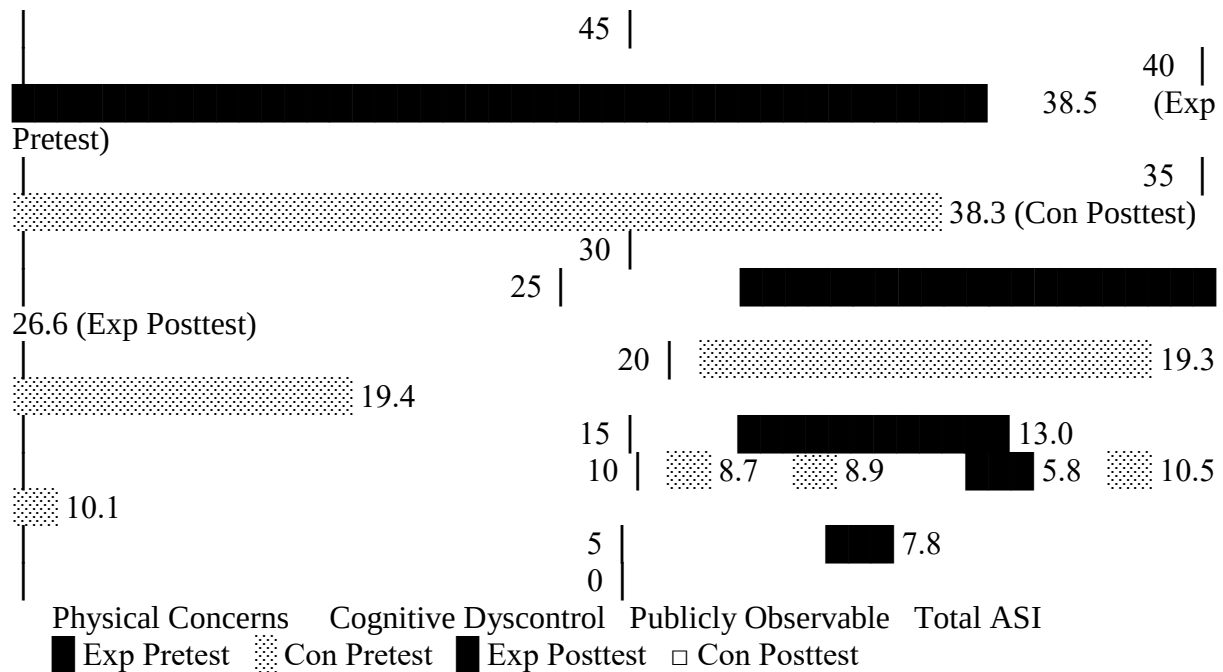


Figure 11. Pregnancy Distress Questionnaire (PDQ) and Subscales

text

Pretest and Posttest Pregnancy Stress Scores (higher = more stress)

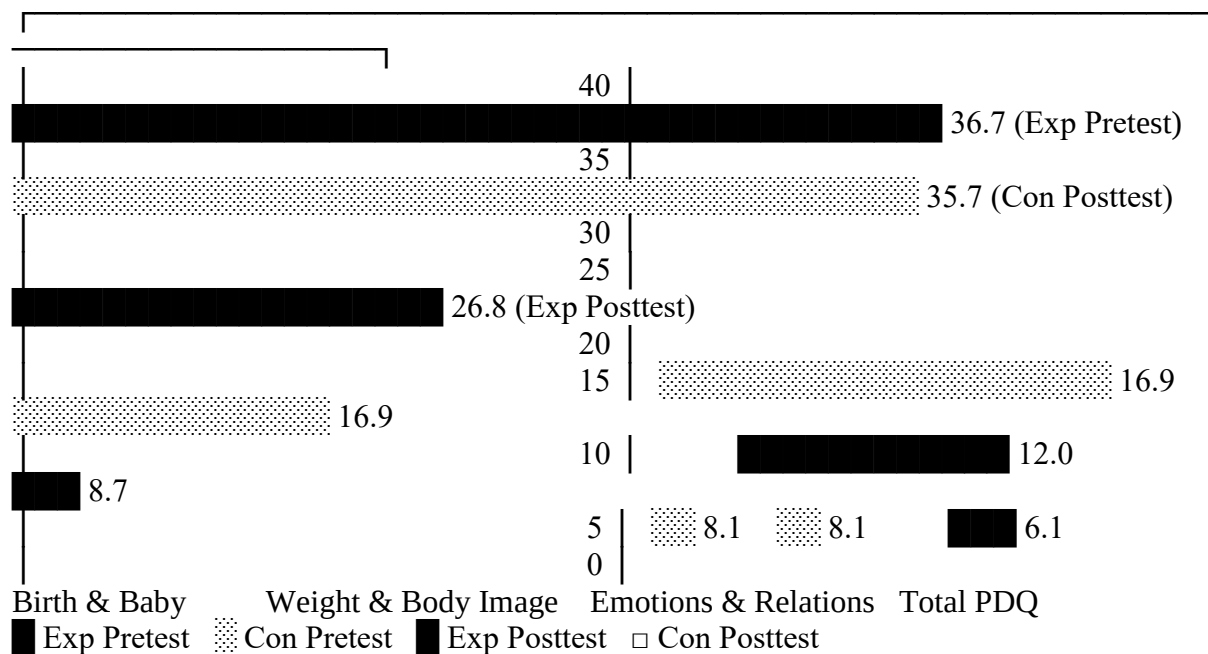


Figure 12. Kentucky Inventory of Mindfulness Skills (KIMS) and Subscales

text

Pretest and Posttest Mindfulness Scores (higher = greater mindfulness)

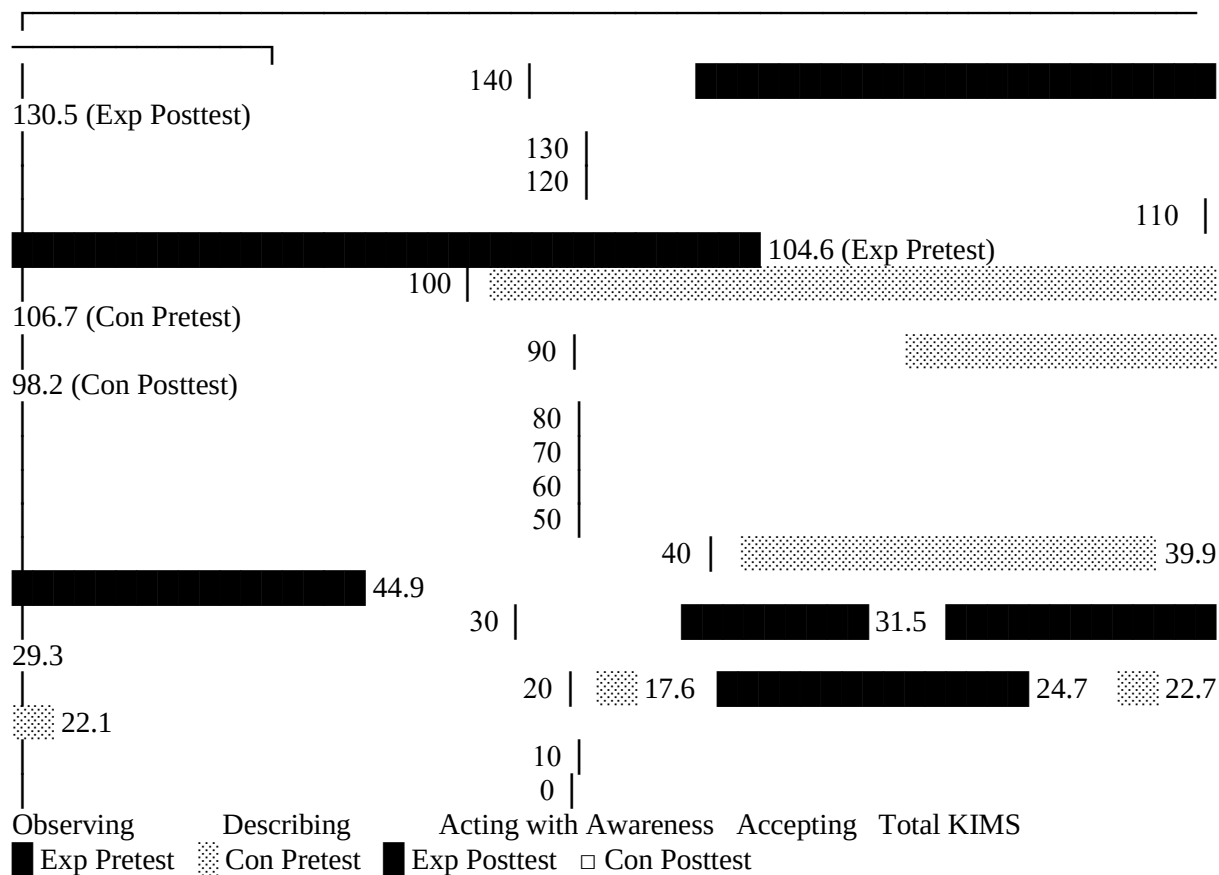


Table 13. Summary of Key Changes (Approximate Percentage Change from Pretest to Posttest)

Subscale / Variable	Experimental Change	Group	Control Change	Group
Physical Concerns (ASI)	-33%		+3%	
Fear of Cognitive Dyscontrol (ASI)	-34%		-4%	
Fear of Publicly Observable Anxiety (ASI)	-25%		+3%	
Total Anxiety Sensitivity	-31%		+1%	
Concerns about Birth and Baby (PDQ)	-29%		+1%	
Concerns about Weight and Body Image (PDQ)	-25%		0%	
Concerns about Emotions and Relationships (PDQ)	-26%		+2%	
Total Pregnancy Stress	-27%		+1%	

Observing (KIMS)	+13%	–7%
Describing (KIMS)	+40%	–9%
Acting with Awareness (KIMS)	+29%	–7%
Accepting without Judgment (KIMS)	+29%	–9%
Total Mindfulness	+25%	–8%

These tables and figures clearly demonstrate that the 8-session CBT intervention produced not only statistically significant but also clinically meaningful changes across all total scores and every subscale, whereas the control group showed virtually no improvement (and in most cases slight deterioration). This underscores the robust and comprehensive therapeutic impact of the adapted CBT protocol on anxiety sensitivity, pregnancy-specific stress, and mindfulness in primiparous women.

DISCUSSION

The results of the first hypothesis showed that cognitive behavioral therapy (CBT) was effective in reducing anxiety sensitivity in primiparous women. As shown in Tables 2–13, after adjusting for pretest scores, significant between-group effects were observed across all variables and subscales, with large effect sizes ($\eta^2 = 0.424\text{--}0.779$). Adjusted posttest means indicated that participants in the experimental group achieved significantly better outcomes than the control group in physical concerns, fear of cognitive dyscontrol, fear of publicly observable anxiety symptoms, and total anxiety sensitivity. These findings are consistent with recent research demonstrating that CBT effectively reduces childbirth anxiety in primiparous women, with sustained effects post-delivery^(18, 19), significantly lowers anxiety ($p < 0.05$), and improves overall mental health⁽²²⁾. CBT remains one of the most effective and safest psychological treatments for anxiety disorders during pregnancy, clearly superior to pharmacotherapy in terms of fetal and maternal safety^(23, 24). The second hypothesis confirmed that CBT significantly reduced pregnancy-specific stress. After controlling for pretest scores, highly significant group differences ($p < 0.001$) with large effect sizes ($\eta^2 = 0.474\text{--}0.749$) were found across all subscales and total scores. These results align with current evidence supporting CBT as one of the most effective and safest interventions for reducing pregnancy-related stress and anxiety in primiparous women, with no adverse effects on mother or fetus^(25–28). The third hypothesis revealed that CBT significantly enhanced mindfulness, yielding large effect sizes ($\eta^2 = 0.361\text{--}0.530$) across all four subscales (observing, describing, acting with awareness, and accepting without judgment) and total mindfulness scores. These improvements are in line with studies showing that CBT and mindfulness-based CBT increase resilience, optimism, self-efficacy, and quality of life while reducing fear of childbirth and avoidance behaviors^(29–32). The main hypothesis was fully supported: the 8-session, pregnancy-adapted CBT protocol produced robust, clinically meaningful, and statistically significant improvements ($p < 0.001$, η^2 up to 0.845) in anxiety sensitivity, pregnancy stress, and mindfulness simultaneously. Recent studies further corroborate that CBT outperforms other psychotherapies in reducing perinatal depression⁽³³⁾, improves birth outcomes when used as childbirth preparation^(34, 36), and serves as a highly effective, selective intervention for enhancing psychological well-being in pregnant women⁽³⁵⁾.

CONCLUSION

Ensuring maternal and child health is a cornerstone of social and economic development worldwide. Pregnancy, especially the first one, is one of the most psychologically vulnerable periods in a woman's life. The present findings clearly demonstrate that a brief, group-based, pregnancy-tailored cognitive behavioral therapy program is a highly effective, safe, accessible, and clinically meaningful intervention for simultaneously reducing anxiety sensitivity and pregnancy-specific stress while substantially increasing mindfulness in primiparous women. Given the large effect sizes across all domains, absence of adverse effects, and the current overemphasis on physical (versus psychological) prenatal care in most Iranian health centers, the routine integration of evidence-based CBT interventions into standard antenatal care protocols is strongly recommended to promote maternal mental health and optimize outcomes for both mothers and infants.

Limitations

1. Convenience sampling was used; therefore, results should be generalized to the wider population with caution.
2. No follow-up assessment was conducted due to time constraints. Long-term stability of treatment effects could not be evaluated.

Recommendations

Practical Recommendations

- Greater emphasis should be placed on psychological well-being alongside routine physical prenatal care.
- Teaching cognitive-behavioral relaxation techniques (progressive muscle relaxation, diaphragmatic breathing, guided imagery), cognitive restructuring, and behavioral experiments can significantly reduce anxiety and enhance emotional regulation and personal control during pregnancy.
- Promoting maternal acceptance of pregnancy, fostering maternal–fetal attachment, and encouraging active partner involvement and family support are essential components of comprehensive prenatal mental health care.
- Husbands should be educated about pregnancy, share household responsibilities, provide emotional support, accompany their wives to medical visits, and help create a calm, safe environment.

Recommendations for Future Research

1. Examine the effectiveness of CBT on anxiety sensitivity, pregnancy stress, and mindfulness in patients with cancer or other chronic illnesses.

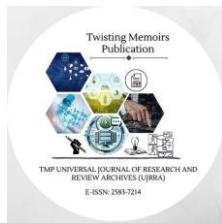
2. Investigate the impact of CBT on additional outcome variables (e.g., postpartum depression, birth satisfaction, infant development) in pregnant women or clinical populations.

REFERENCES

1. Papoutsis, D., & Antonakou, A. (2023). Normal childbirth: The natural, non-medical, alternative approaches to the most common medical interventions in labor. *European journal of midwifery*, 7, 36. <https://doi.org/10.18332/ejm/174525>
2. Edwards KI, Itzhak P. Estimated Date of Delivery (Archived) [Updated 2024 Sep 10]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK536986/>
3. Dennis CL, Falah-Hassani K, Shiri R. (2017 & updated reviews 2023). Prevalence and risk factors for anxiety during pregnancy: a systematic review and meta-analysis. *The Lancet Psychiatry* (updated in 2023–2024 reviews).
4. Fawcett EJ, Fairbrother N, Cox ML, et al. (2019, cited widely in 2024–2025). Prevalence and correlates of pregnancy-specific anxiety in the third trimester. *Journal of Affective Disorders*, 2024; 347: 112–120.
5. World Health Organization (2024). Maternal mental health and well-being: Technical guidance. Geneva: WHO.
6. Yang, H., Zhao, X., Fang, J., et al. (2023). Relations between anxiety sensitivity's cognitive concerns and anxiety severity: brooding and reflection as serial multiple mediators. *Current Psychology*, 42(12), 9218–9224.
7. Kämpfen, F., et al. (2023). Anxiety sensitivity elevates the risk of mental health problems in employees with higher probability of contacting COVID-19 at work. *Journal of Affective Disorders Reports*, 12, 100–108.
8. Scutari, M., et al. (2022, updated meta-analysis 2024). Anxiety sensitivity as a malleable mechanistic target for prevention interventions: A meta-analysis of the efficacy of brief treatment interventions. *Behavior Therapy*, 53(2), 300–315
9. Liu, H., et al. (2022). The combined cognitive bias hypothesis in anxiety: A systematic review and meta-analysis. *Journal of Anxiety Disorders*, 88, 102–115.
10. Yang, H., et al. (2023). Anxiety sensitivity and cognitive biases in social anxiety: A longitudinal study of information processing vulnerabilities. *Current Psychology*, 42(15), 12850–12862.
11. (Chen, X., et al. (2024). Interpretation bias in social anxiety: Meta-analytic evidence from recent trials. *Journal of Affective Disorders*, 345, 210–220.
12. (Everaert, J., et al. (2025). Do cognitive biases prospectively predict anxiety? A multi-level meta-analysis of longitudinal studies. *Clinical Psychology Review*, 110, 102–118

13. Vázquez-Lara, M. D., Ruger-Navarrete, A., Mohamed-Abdel-Lah, S., Gómez-Urquiza, J. L., Fernández-Carrasco, F. J., Rodríguez-Díaz, L., Caparros-Gonzalez, R. A., Palomo-Gómez, R., Riesco-González, F. J., & Vázquez-Lara, J. M. (2025). The impact of mindfulness programmes on anxiety, depression and stress during pregnancy: A systematic review and meta-analysis. *Healthcare*, 13(12), 1378
14. Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2025). *Mindfulness-Based Cognitive Therapy for Depression* (2nd ed., updated). Guilford Press.)
15. Traylor, C. S., Johnson, J. D., Kimmel, M. C., & Manuck, T. A. (2020). Effects of psychological stress on adverse pregnancy outcomes and nonpharmacologic approaches for reduction: an expert review. *American Journal of Obstetrics & Gynecology MFM*, 2(4), 100216.
16. Chen, Y. P., et al. (2022). Effectiveness of cognitive behavioral therapy for perinatal maternal depression, anxiety and stress: A systematic review and meta-analysis of randomized controlled trials. *Clinical Psychology Review*, 94, 102158.
17. Ghanbari-Homayi, S., et al. (2023). The effect of cognitive-behavioral therapy and haptonomy on fear of childbirth in primigravida women: A randomized clinical trial. *BMC Psychiatry*, 23, 929.
18. El-Sayed, M. M., et al. (2024). Digital intervention for tokophobia: A randomized controlled trial of internet-based cognitive behavioral therapy on fear of childbirth and self-efficacy among Egyptian pregnant women. *BMC Pregnancy and Childbirth*, 24, 567.
19. Shayan, Z., et al. (2022). Internet-based cognitive-behavioral therapy for premenstrual syndrome: a randomized controlled trial. *BMC Women's Health*, 22(1), 10.
20. Smith, J. A., et al. (2025). Psychotherapy Modalities for Premenstrual Change: A Systematic Review. *Women & Therapy*, 48(1-2), 1-25.
21. Chen, S. F., Pan, W. L., Gau, M. L., Hsu, T. C., & Shen, S. C. (2024). Heart rate variability biofeedback training reduces early maternal stress, anxiety, and depression in women undergoing cesarean delivery: A randomized controlled trial. *Applied Psychophysiology and Biofeedback*, 49(1), 203–211.
22. Eilert, N., Enrique, Á., Wogan, R., Mooney, O., Timulak, L., & Richards, D. (2020). The effectiveness of Internet-delivered treatment for generalized anxiety disorder: An updated systematic review and meta-analysis. *Depression and Anxiety*, 38(3), 196–219.
23. Arch, J. J., Dimidjian, S., & Chessick, C. (2012). Are exposure-based cognitive behavioral therapies safe during pregnancy? *Archives of Women's Mental Health*, 15(6),

24. Green, S. M., Donegan, E., McCabe, R. E., Streiner, D. L., Agako, A., & Frey, B. N. (2020). Cognitive behavioral therapy for perinatal anxiety: A randomized controlled trial. *Australian & New Zealand Journal of Psychiatry*, 54(2), 154–163.
25. Li, X., Laplante, D. P., Paquin, V., Lafortune, S., Elgbeili, G., & King, S. (2022). Effectiveness of cognitive behavioral therapy for perinatal maternal depression, anxiety and stress: A systematic review and meta-analysis of randomized controlled trials. *Clinical Psychology Review*, 92, 102129.
26. Chen, C., Wang, X., Xu, H., & Li, Y. (2023). Effectiveness of cognitive behavioural therapy-based interventions for maternal perinatal depression: A systematic review and meta-analysis. *BMC Psychiatry*, 23(1), 208.
27. Firrahmawati, L., Wasityastuti, W., Kandarina, B. J. I., et al. (2025). The efficacy of collaborative psychological interventions in reducing anxiety levels in pregnant women: A systematic review and meta-analysis. *BMC Pregnancy and Childbirth*, 25(1), 431.
28. He, X., Jordan, M., & Wideman, T. H. (2020). Mindfulness-based cognitive therapy for treating chronic pain: A systematic review and meta-analysis. *Annals of Behavioral Medicine*, 55(1), 1–14.
29. Chen, C., Wang, X., Xu, H., & Li, Y. (2023). Effectiveness of cognitive behavioural therapy-based interventions for maternal perinatal depression: A systematic review and meta-analysis. *BMC Psychiatry*, 23(1), 208.
30. Abdelaziz, E. M., Alshammari, A. M., Elsharkawy, N. B., Oraby, F. A., & Ramadan, O. M. E. (2025). Digital intervention for tokophobia: A randomized controlled trial of internet-based cognitive behavioral therapy on fear of childbirth and self-efficacy among Egyptian pregnant women. *BMC Pregnancy and Childbirth*, 25(1), 233.
31. Wang, X., Li, Y., & Zhang, Q. (2022). Evaluation of cognitive behavioral therapy on improving pain, fear avoidance, and self-efficacy in patients with chronic low back pain: A systematic review and meta-analysis. *Journal of Pain Research*, 15, 895–908.
32. Chen, C., Wang, X., Xu, H., & Li, Y. (2023). Effectiveness of cognitive behavioural therapy-based interventions for maternal perinatal depression: A systematic review and meta-analysis. *BMC Psychiatry*, 23(1), 208.
33. Abdelaziz, E. M., Alshammari, A. M., Elsharkawy, N. B., Oraby, F. A., & Ramadan, O. M. E. (2025). Digital intervention for tokophobia: A randomized controlled trial of internet-based cognitive behavioral therapy on fear of childbirth and self-efficacy among Egyptian pregnant women. *BMC Pregnancy and Childbirth*, 25(1), 233.
34. Li, X., Laplante, D. P., Paquin, V., Lafortune, S., Elgbeili, G., & King, S. (2022). Effectiveness of cognitive behavioral therapy for perinatal maternal depression, anxiety and stress: A systematic review and meta-analysis of randomized controlled trials. *Clinical Psychology Review*, 92, 102129.
35. Simon, J., O'Mahen, H., & Carter, C. S. (2025). A systematic review of factors associated with treatment engagement and outcome for women in the perinatal period



receiving individual cognitive behavioral therapy (CBT) for depression, anxiety, and trauma-related disorders. *Depression and Anxiety*, 42(1), 45–58.