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# Randomized Trial of Psychological Interventions to Preventing Postpartum Depression among Iranian First-time Mothers

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## ABSTRACT

**Background:** The current study was conducted to examine the effect of cognitive behavior therapy on the reduction postpartum mood disorder and increasing the self-esteem of at-risk Iranian mothers.

**Methods:** In this quasi-experimental study, 135 at-risk mothers were selected from the population by means of cluster sampling and randomly assigned into one of two groups: Intervention ($n = 64$), or control ($n = 71$). The control group received usual medical care, and the intervention group received an eight sessions' cognitive behavior program during pregnancy. Assessments were administered at two time points (pretest at the beginning of the third trimester and posttest at 2 weeks postpartum). Beck anxiety, beck depression, Edinburgh postpartum depression, (PPD) Coopersmith self-esteem, and religious attitude questionnaire were used to collect data.

**Results:** The mean age of participants was $25.8 \pm 3.7$ years. One-third of them had either bachelor or higher degrees in education (33%). About two-third of participants were unemployment with similar distribution in both the groups (intervention = 80%, control = 83%). The majority (70%) of the participants had cesarean section deliveries. There were no statistically significant differences respects to sociodemographic characteristics between the control and intervention groups ($P > 0.05$). The multivariate analysis of covariance results showed that the average scores of PPD were reduced significantly in the intervention group ($P < 0.001$). Also while the mean score of anxiety in the intervention group decreased from 23.31 (standard error [SE] =12.11) to 16.64 (SE = 8.33) and self-esteem increased from 29.09 (SE = 3.51) to 31.81 (SE = 2.76), no change was statistically significant in comparison to the control group.

**Conclusions:** According to the findings of the present study, cognitive behavior intervention is effective in reducing PPD in at-risk mothers.

**Keywords:** Anxiety, cognitive behavior intervention, postpartum depression

## INTRODUCTION

Mood disorders such as depression and anxiety are among one of the most common complications during pregnancy and the postpartum period.[1,2] Postpartum depression (PPD) occurs approximately in one out of every eight deliveries.[3] Researchers emphasized that the prevalence of PPD varies in different part of the world,[4]

while USA women fell at the midpoint, the lowest levels of PPD were reported for European and Australian women, on the contrary, the highest depressive symptom scores were seen for women from Asia as well as South America.[4] Research finding also shows the prevalence of PPD is nearly twice in developing countries in comparison to developed ones.[5]

Researchers reviewed 59 studies from North America, Europe, Australia, and Japan and estimated the prevalence of PPD to be 13%.[6] Recent estimates suggested higher prevalence in Asia and Middle East. For instance, the prevalence of 37% in Bahrain,[7] 21% in Lebanon,[8] and 36% in Pakistan was reported.[9]

In Iran, the reported rates of PPD ranged in different cities of the country, 34.8 in Ilam,[10] 20.3% in Shiraz,[11] 22% in Sari,[12] 34% in Tabriz,[13] 23% in Tehran,[14] and 32% in Hamadan.[15] A recent meta-analysis of 41 studies indicated that PPD prevalence in Iran was 25.3% with the highest prevalence among a woman with a history of depression 45.2% and unwanted delivery 43.4%.[16]

A literature review on PPD indicated that cultural forces and socioeconomic elements play a pivotal role in the manifestation of PPD symptoms.[17] Researchers also had expressed that although PPD is a phenomenon that affects women from a wide range of society and cultures, the manifestation of symptoms could be different.[18] Recently, a growing number of researches have suggested some factors such as previous history of depression, anxiety or stress, poor social support, social relationships, low self-esteem, limited community resources, marital conflict, physical abuse, and postpartum physical complications are related with PPD and could modify depressive symptoms.[19,20] In addition, authors highlighted the role of cultural-based factors, including negative belief, poor quality of life, lack of family support, and mutual understanding among family members in the occurrence of PPD.[21,22]

In spite of the importance of cultural factors of PPD, there is a little study considering differences in the cultural context of Western and Non-Western societies. Cross-cultural comparisons of the depressive symptoms among people of Swiss, Iran, Canada, and Japan indicated that symptom of depression experienced differently. For example, guilt feelings were present in 68% of the Swiss sample and 32% of the Iranian sample; suicidal ideas were present in 70% of the Canadian subjects and 40% of the Japanese subjects and somatization was present in 57% of the Iranian cohort and 27% of the Canadian cohort.[23]

In addition to the diversity of the Western and Non-Western country in terms of prevalence and symptomatic variation of PPD, some studies were found different risk factors of PPD in the Non-Western country.

Kheirabadi *et al.*, for example, noted that low level of education and undesired gender of the child to be risk factors of PPD in Iranian sample.[24] Satisfaction of living with spouse family and contentment of husband's family about the gender of the child showed significant correlation with PPD in Iranian's mothers.[25]

Speaking of the potential interaction of different risk factors and PPD, some studies suggest that emergency cesarean sections were associated with a higher risk for PPD.[26,27] While, only in the recent years, a significant increase has been reported in the rate of cesarean section in Iran, which became six-fold over the past three decades.[28,29]

Finally, in the cultural context of PPD, some researchers noted the role of religion in PPD symptoms[30] and highlighted the role of religious and cultural beliefs as a cause of depression. For example, in some Muslim's society depression reported to be caused by "lack of faith" or "failure to pray regularly" or as a result of "moral transgression."[31] A number of studies have found that the religiosity and spirituality have an inverse association with depressive symptoms.[32] Especially, Mann *et al.*, reported the protective effects of antenatal religiosity/spirituality in PPD.[30]

Iran is an Islamic country and majority of its social and institutional structures are formally organized in religious structure,[33] and according to the Iranian religious beliefs, giving birth to a child clears mother's sin and it is like praying for God's.[34,35] Iranian mothers are expected to be very happy after giving birth. These cultural and religious expectations may prevent help-seeking behavior and hinder diagnosis of PPD. Recently, several studies on PPD have been conducted in Iran, the majority of them were not experimental studies, and examine only the relationship between maternal fatigue and PPD,[36] Effects of PPD on life quality,[22] or studying risk factors and prevalence of PPD.[16] Few experimental studies addressed psychosocial treatments aimed at improving psychological health of Iranian woman with PPD. One experimental study only examines the effect of interpersonal psychotherapy on marriage and PDD.[37] To our best knowledge, no previous study to date investigated the effects of an antenatal psychological intervention to prevent PPD in Iranian samples. Therefore, in the present study, we designed a psycho-educational program based on cognitive behavioral treatment. We aimed to study the effectiveness of the intervention in preventing PPD.

## METHODS

### Study design and participants

This quasi-experimental study was conducted in 2013. The design of the study was pre- and post-test with

control group and random assignment. This design is one of the vigorous designs that promote external validity while enhancing internal validity. Since individuals were randomly divided into two groups and randomly assigned into two groups, all extraneous variable including maturation, history, and selection have been controlled.

Five hundred and thirty-four women referred to two obstetric clinics in Tehran, Iran, between August 2012 and March 2013 were screened for the study. The women were enrolled in the study if they had scored 13 or higher on the Beck Depression Inventory (BDI). Women were eligible for the trial if they were aged 18–32 years; had a single birth; an uncomplicated pregnancy, ability to read and write. Exclusion criteria included using antidepressant/anti-anxiety medications and personal history of psychiatric disorder.

According to the sample size formula, $[(Z_\beta + Z_\alpha)]^2/(d)^2$, $Z_{1-\alpha} = 1.96$, confidence interval $= 95\%$, $Z_{1-\beta} = 0.85$, $d = 0.20$, 196 participants were selected for both study group. To determine sample size, we carried out effect size based on previous research.[38,39]

At first, 196 participants took part in the study, but 61 (34 in the intervention group and 27 in the control group) were excluded due to failure in cooperation and not reliable responses to the questionnaires. Finally, 135 participants were remained in the study. They were placed randomly into the intervention group ($n = 64$) and control group ($n = 71$) based on their numbers.

This proposal was approved by the Research Council of Baghiatallah University of Medical Sciences, Tehran, Iran. In terms of ethical points and the intervention program as well as the questionnaires was given to the research council in order to assure confidentiality. All participants affirmed their consent to participate in the study before collection of the data. This trial was registered at IRCT.ir with a reference number as IRCT2014040617134N1.

### Variable assessment and study instruments

A range of self-report measures was used in the study. These will be measured as follows:

*Edinburgh postnatal depression scale*

As the primary outcome assessed postnatal distress, it consists of 10 questions scored on a 4-point Likert scale to determine the presence and severity of the PPD symptoms.[40] The author reported good psychometric properties of Edinburgh Postnatal Depression Scale (EPDS).[41] It has been translated and validated in Iran and has shown desirable validity for identifying PPD with satisfactory sensitivity (95%) and specificity (88%).[42,43]

*Beck depression inventory*

It has 21 items and widely used for measuring the severity of depression or to screen depressive symptoms.[44] BDI

has a sufficient reliability for many population and its common psychometric properties reported to be acceptable.[45] The Iranian version of BDI considered having high reliability and sound instrument to measure depression in Iranian population.[46]

Beck Anxiety Inventory (BAI) is a good tool to use as a severity indicator. The BAI has been widely used in different population in mental health care.[47] Evidence suggests that the BAI is reliable and valid when measures general anxiety.[48] The research concluded that the Iranian version of BAI with good internal consistency (0.92), validity (0.72), and reliability of (0.83), is within the acceptable range.[49]

Religious Attitude Scale Questionnaire of Khodayarifard *et al.*, was utilized to measure religious attitude. The questionnaire composed of 40 questions based on 5-point Likert scale.[50] The scoring for the Religious Attitude Scale Questionnaire is computed as following; 4–84 is a mild level of religious attitude; 85–165 moderate level of religiousness; 166–200 high level of religious attitude. The content of questionnaire categories was ethics, values, the effect of religion on personal and social lifestyle and behavior, ideology, and religious beliefs. Khodayarifard *et al.* stated the questionnaire had a high reliability of Cronbach's alpha coefficient ($\alpha = 0.89$). The test-retest stability correlations for all subscale ranged from 0.91 to 0.97.[50]

In this study, outcomes were measured at two points: In pretest before and in posttest after the intervention which was 2 weeks after delivery. The intervention package, enhancing cognitive behavioral skills program (ECBSP), was designed and implemented for participants in the intervention group while the control group received routine antenatal care by obstetrics nurses.

A multidisciplinary team of therapists with a variety of professional backgrounds including midwives, health psychology, psychotics, and licensed clinical psychologist with a concentration of cognitive-behavioral therapy designed the ECBSP. The intervention package included 8, 40–60 min sessions of cognitive behavioral therapy (CBT) intervention delivered individually to participants by recorded film and interactive workbook. The intervention program was facilitated by the trained psychologist to conduct the ECBSP. The sessions were integrated into the women's standard prenatal visits.

The essence of the ECBSP is to identify and test automatic negative thoughts in subjects. The rationale provided was that when negative thoughts were triggered, the person would expect negative and aversive event about him or herself, the world, and the future. The treatment consisted of training in self-monitoring, self-focused attention, relaxation, understanding of the problem, and setting up an alternative view of

the problem, revising automatic thoughts, behavioral approach tasks, and exposure to worry cues. Other themes of the ECBSP included education on depressive and anxiety symptomatology, positive communication, realistic expectation about pregnancy, delivery, and parenting, recording their mood, pleasurable activities, and relaxation exercise. The patients received the homework to ensure transfer of skills from therapeutic contexts to daily life.

### Statistical analysis

The characteristics of the participants on the baseline variables were evaluated using Chi-square analysis and independent *t*-tests to detect any significant differences between the two groups before introducing the ECBSP. We used SPSS software version 16 (SPSS Inc, Chicago, USA). for all the analyses conducted in this study. Multivariate analysis of covariance (MANCOVA) was performed to analyze possible differences between the experimental and the control group at posttest.

## RESULTS

The mean age of sample was 25.8 years (Standard deviation [SD] = 3.7); 33.8% hold bachelor's or higher degrees, 81% of women were unemployed, and over 74% had a cesarean delivery. Participants were all living with their husband and were the first mother. No statistically significant differences were identified between participants in the intervention and control group in terms of demographic characteristics [Table 1].

Table 2 presents the means and SDs on the dependent variables. Descriptive results indicated that the average of depression and anxiety scores changed in posttest in comparison with those in pretest for the intervention

**Table 1: Participant demographic characteristics at baseline**

| Variables | Intervention group | Control group | $t/\chi^2$ (*P*) |
|---|---|---|---|
| Age (years) (mean±SD) | 25±3.58 | 26±3.82 | 0.89** |
| Education (*n*, %) | | | |
| High school | 6 (9.4) | 12 (16.9) | 0.16* |
| Diploma | 21 (32.8) | 32 (45.0) | |
| Associate | 10 (15.6) | 8 (11.3) | |
| Bachelor | 23 (35.9) | 18 (25.4) | |
| Master | 4 (6.3) | 1 (1.4) | |
| Type of birth (*n*, %) | | | |
| Natural | 17 (26.6) | 18 (25.4) | 0.87* |
| Cesarean | 47 (73.4) | 53 (74.6) | |
| Occupation (*n*, %) | | | |
| Employed | 13 (20.3) | 12 (16.9) | 0.61* |
| Unemployed | 51 (79.7) | 59 (83.1) | |

*Statistical test was Chi-square test, **Statistical test was independent sample *t*-test. SD=Standard deviation

group; however, in the control group, there were changes only in the average of self-esteem and religious attitude. In order to study the significance of differences between two groups, MANCOVA was used. The result of the MANCOVA reported that two groups had a significant difference in at least one of the dependent variables ($P < 0.01$). Box's test of equality of covariance matrices showed that the correlation between the dependent variables does not differ significantly between the groups (Box's M = 19.73, F = 1.2626, $P > 0.217$). Furthermore, the results of MANCOVA after controlling of pretest scores showed that there were significant differences between intervention and control groups in scores of BDI and EPDS ($P < 0.05$). We did not find any statistically significant differences in mean anxiety symptom, self-esteem, and religious attitude score when comparing participants of the intervention group with the control group ($P > 0.05$) [Table 2].

## DISCUSSION

Each year, about 25% of Iranian women are diagnosed with PPD.[16] Other mood disorders such as postpartum stress and anxiety increase each year but the little attention the problem has received.[51] Therefore, the need to early identification and intervention to prevent postpartum disorder has been growing. In this study, researchers tried to investigate whether a randomized controlled trial of ECBSP program based on CBT considering the religious and cultural context of Iran, would be effective in preventing postpartum mood disorders and improve self-esteem of at-risk pregnant mothers for PDD. To our best knowledge, this is the first trial of CBT aiming to reduce depression and anxiety by the end of pregnancy as well as increasing the mother's self-esteem. The findings from this study suggest that ECBSP can partly prevent the worsening of mood disorders. This finding was consistent with previous studies that reported a positive effect of antenatal CBT intervention on reduction and prevention of PPD.[52-55] One characteristic that motioned study had in common and could explain the reduction in the depression scores is early identification of at-risk mother for PDD and introducing CBT intervention in earlier phase of the disorder that could lead to more improvement of psychological health. Other researchers had consistently revealed that by teaching participants to identify and challenge negative thought, the individual will be able to positively shift their perceptions about themselves and the world around them.[56] Although some of the studies reported that antenatal intervention had not effected on the reduction of PDD.[57]

Improvements in depression were not accompanied by changes in anxiety, self-esteem, and the religious attitude. These latter findings confirm those of Reynolds and Coats (1986) and Misri *et al.* (2000). Reynolds

**Table 2: Comparison of the two groups' means and SD before and after intervention by *t*-test and between groups by MANCOVA analysis**

| Variables | Groups | Number | Pretest (mean±SD) | Posttest (mean±SD) | *P* values within groups | *P* values between groups |
|---|---|---|---|---|---|---|
| BDI | Intervention | 64 | 21.17±10.92 | 14.86±5.95 | 0.001 | 0.001 |
| | Control | 71 | 16.92±4.91 | 16.13±5.63 | 0.135 | |
| BAI | Intervention | 64 | 23.31±12.11 | 16.64±8.33 | 0.001 | 0.32 |
| | Control | 71 | 17.77±7.96 | 14.55±6.14 | 0.001 | |
| EPDS | Intervention | 64 | 17.33±6.87 | 13.05±5.70 | 0.001 | 0.32 |
| | Control | 71 | 13.52±5.81 | 12.48±5.01 | 0.058 | |
| Self-esteem | Intervention | 64 | 29.09±3.51 | 31.81±2.76 | 0.001 | 0.13 |
| | Control | 71 | 28.74±3.70 | 31.12±2.85 | 0.001 | |
| Religious attitude | Intervention | 64 | 150.57±17.33 | 153.81±14.74 | 0.033 | 0.99 |
| | Control | 71 | 148.75±23.12 | 153.03±13.62 | 0.079 | |

BDI=Beck Depression Inventory, BAI=Beck Anxiety Inventory, EPDS=Edinburgh Postnatal Depression Scale, SD=Standard deviation, MANCOVA=Multivariate analysis of covariance

and Coats,[58] studied the effectiveness of CBT on the reduction of depression symptoms and found no significant change in self-esteem although there was a positive significant change in depression.

One possibility of not changing the level of self-esteem was that the intervention period may be too short to affect the self-esteem. Although the current study did find improvements in PPD symptoms following the treatment, it failed to show any benefits in terms of anxiety. That is consistent with Misri *et al*.[59] Lack of improvement in anxiety may be due to lack of partner participation. Previous research has highlighted the importance of involving women's partners in the treatment of postpartum mood disorders.[59] One explanation for our failure to observe a change in self-esteem may be due to the fact that self-esteem is formed through a complex interaction of the factors, and it is a complex concept to operationalize and evaluate.[60]

The participants of the present research reported the high score on religious attitude scale and considered to be highly religious people. The results of the study did not show any significant differences between two groups and changes as a result of intervention on participant's religious attitudes. This finding is not consistent with that from Moradi *et al*. about positive effects of religious on depression.[61] Many other researchers reported the positive effect and relation between religious attitude and mental health, self-esteem, depression, suicide, and anxiety in Persian sample.[62] It is important to note that our intervention was designed to address negative though and lack of the skills underlings the postpartum mood disorder not changing in the religious attitude of participants. Another possible explanation related to the failure of indicating the role of religious attitude in PPD may be results of making no discrimination between intrinsic and extrinsic religious orientation. For instance, Bazmi and Allahvirdiyani reported that while there is a negative significant relationship between inward

religious orientation with depression, anxiety, and stress in Iranian population, outward religious orientation indicated positive association with these disorders.[62] Hence, the findings about the religious attitude should be considered with a substantial cautious as Dein *et al*. reported that a great controversy has surrounded the relationship between religious involvement and mental health.[63]

The refusal to participate rate was calculated 31%, which is lower than similar research with nearly 50% drop out.[64,65] One of the main limitations of the study was the absence of follow-up stage. Also, participant's characteristics may limit the generalizability of the study findings. Therefore, replication study to verify the effectiveness of the CBT on PPD in long-term is crucial.

## CONCLUSIONS

Risk factors of PPD may be different among Iranian women. Cultural context and religious attitude could affect manifestation of PPD symptoms in Iranian society. To decrease PPD, we suggest ECBSP in the antenatal period for at-risk mothers. Early identification of women at-risk for PPD may aid in the prevention and alleviation of depressive symptoms and comorbidities. Finally, the findings have demonstrated the feasibility of early identification of at-risk mothers by antenatal screening and the application of CBT intervention. In conclusion, this study once again clears the evidence that preventive CBT intervention can reduce the severity of PPD.

## ACKNOWLEDGEMENTS

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