Original Article

Effect of Problem-Solving Therapy and Relaxation on the Severity of Postpartum Depressive Symptoms: A Randomized Controlled Trial

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ABSTRACT

Background: Postpartum depression with high prevalence and unpleasant complications needs to be identified and treated. **Objective:** This study aimed to compare the effect of problem-solving therapy (PST) and relaxation on the severity of postpartum depressive symptoms. **Methods:** This randomized controlled trial was performed in health-care centers of Mashhad city, Iran, in women on the 3rd postpartum week. A total of 120 women were selected conveniently and randomly assigned to three groups (i.e., PST, relaxation, and control groups). The women completed Edinburgh Depression Scale and Beck Depression Inventory (BDI). Problem-solving skills were educated during six weekly sessions. Progressive muscle relaxation exercises and guided imagery were performed daily and once a week during 6 weeks, respectively. In the control group, women received usual postpartum care. All groups completed a daily checklist for recording depression symptoms. The three groups completed the BDI once again a week after the end of the intervention. Data analysis was conducted using Chi-square, paired t-test, analysis of variance (ANOVA), and repeated measures ANOVA. **Results:** The mean difference of severity of depressive symptoms was significantly different between the three groups at 9 weeks after delivery (-14.86 ± 6.15 in PST group, -10.71 ± 5.23 in relaxation group, and -4.72 ± 4.51 in the control group, $P < 0.001$). The frequency of mild depression decreased from 57.1% to 3.8% in PST group, from 65.4% to 23.1% in the relaxation group, and from 60.7% to 33.3% in the control group. **Conclusion:** Both PST and relaxation can reduce the severity of depressive symptoms. However, the effects of PST were more than those of relaxation.

KEYWORDS: *Depressive symptoms, Postpartum depression, Problem-solving, Relaxation therapy*

INTRODUCTION

*P*ostpartum depression (PPD) is an episode of depression that occurs during the first 2 weeks after childbirth.[1] The prevalence of PPD in the first delivery is about 10%–15%; however, this rate varies in different studies.[2] The prevalence of PPD in Iran is almost 3 times of the developed countries.[3]

Pharmacotherapy and psychological and psychosocial interventions have been proved as effective treatments for PPD.[4] A meta-analysis concluded that different types of psychological interventions are equally effective for treating PPD.[5]

Recently, a study reported a relationship between problem-solving ability and PPD and concluded that the problem-solving skills of postpartum depressed mothers should be improved.[6] A meta-analysis has also concluded that problem-solving therapy (PST) is equally effective as alternative psychosocial therapies and medicinal treatments and more effective than no treatment and relaxation.[7] However, some of the

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researchers have criticized the PST because of its time-consuming nature.[8-10] Some also referred to the dissociable and solitary of postpartum depressed mothers and concluded that these patients should use simple approaches that can be applied at home.

Relaxation techniques have been shown as an effective adjunctive therapy for anxiety and depression and can be applied after a brief training.[11,12] The positive effects of relaxation are attributed to the fact that it can decrease the arousal of autonomic and central nervous systems and increase in parasympathetic activity.[13] Some of the evidence showed that two sessions of relaxation can increase the positive mood[14] and decrease the severity of PPD.[15] However, Field *et al.* have reported that relaxation techniques were not as effective as massage therapy in postnatal depression.[16]

Due to the conflicting results about the effects of relaxation therapy on PPD, and the fact that no previous study compared the effects of PST and relaxation on PPD, the question comes to mind that which method is more effective on the severity of PPD?

Objectives

The present study aimed to compare the effect of PST and relaxation on the severity of PPD.

METHODS

This nonblinded randomized controlled trial was conducted on depressed women (in the 3rd week postpartum) referred to eight health-care centers in Mashhad city from December 2009 to June 2010. To calculate the sample size, a pilot study was conducted on 30 women who were equally placed into three groups of 10. The mean pre- and post-difference of the PPD scores in the PST, relaxation, and control groups was 13.64 ± 7.52, 12.66 ± 5.53, and 8.00 ± 3.60, respectively. Then, using the following parameters ($\beta = 0.10$, $\alpha = 0.05$, $\mu_1 = 13.6$ and $\mu_2 = 8.0$, $S_1 = 7.5$, $S_2 = 3.6$), 24 people were estimated to be needed in each group. However, we recruited 40 women in each group to cover the dropout. The people who participated in the pilot study were not included in the main study.

Before starting the sampling, a randomization plan was prepared using the SPSS software version 13 (SPSS, Inc., Chicago, IL, USA). To this end, we entered the numbers 1–120 in the data sheet of the software. Then, using the "random numbers" option in the "compute" and "function group box" in the transform menu, the 120 supposed samples were randomly divided into three equal groups.

Inclusion criteria were age of 18–35 years, gestational age of 38–42 weeks, being literate, having a healthy neonate and single pregnancy, lack of a history of ≥2 abortion and drug abuse, no history of infertility or other comorbidities, nonsmoking, lack of a known mental disorder and dysthymia, not having a child with physical disability, mental retardation or a chronic disease, not being hospitalized for mental disorders during the last month, lack of any delivery, and postpartum complications or major stressful life events during the last 6 months. Exclusion criteria included a participant's decision to withdraw from the study, absence from more than one educational session, failure to follow the relaxation exercises for >3 times, manifestation of severe major depressive symptoms, using of narcotic and sedative drugs during the follow-up period, experiencing any major psychosocial crises such as death of close relatives, divorce, hospitalization, and getting a serious illness during the study.

Instruments

The research instrument consisted of five parts, including a personal information sheet, Edinburgh Postnatal Depression Scale (EPDS), Beck Depression Inventory-II (BDI-II), three checklists for recording depressive symptoms, problem-solving sessions, and relaxation exercises.

The personal information form included three parts. The first two parts consisted of questions about demographic characteristics (i.e., age, education level, occupation, family income, parity, spouse support) and pregnancy and delivery information (wanted/unwanted pregnancy, route of delivery, neonate gender, satisfaction of neonate gender, nausea and vomiting, and anemia during pregnancy) that completed at the beginning of the study. The third part consists of four questions about infant's feeding, insomnia, access to aid in newborn care, and working outside the home, which was completed 9 weeks after delivery.

The EPDS is a 10-item questionnaire for assessing depressive symptoms and PPD screening. Each question is scored 0–3 summing up a total score of 0–30.[9] The EPDS was adapted to Persian by Montazeri *et al.*[17] In the present study, the Cronbach's alpha coefficient of the EPDS was 0.75. It has three cutoff scores of 10, 13, and 15 for screening, determining of symptoms, and diagnosis of PPD, respectively. The 84%–100% sensitivity and 82%–88% specificity were reported for the cutoff score of 10.[18]

The BDI-II is a 21-item questionnaire that assesses the depressive symptoms severity. It was translated into Persian by Dobson and Mohammad Khani.[19] The range of total score is 0–63, with a cutoff score of 14 for depression.[20] In this study, the Cronbach's alpha coefficient was 0.82.

The checklist of documentation of relaxation sessions contains items for recording the date and time of relaxation practice and the degree of perceived tension before and after the exercise based on a numerical scale, in which one stands for the lack of tension and complete relaxation and 10 stands for full tension. All mothers were trained to complete this checklist at home and at the beginning of each relaxation session.

The checklist of documentation of problem-solving sessions contains items for recording the date and time of problem-solving sessions, solutions proposed and implemented between the two sessions, and success for solutions. This checklist was completed by a researcher at the beginning of each session in the health-care center.

The depressive symptoms checklist includes questions on symptoms of depression (i.e., depressed mood, severe crying, hopelessness, emptiness, lack of pleasure in all or part of the daily activities, decreased or increased appetite, insomnia, severe fatigue or loss of energy, feeling worthless, guilt, difficulty in concentrating and making decisions, anxiety, thoughts of death or suicide, and infanticide). This checklist was completed daily by mother at home and assessed by the investigator at the beginning of each problem-solving session. The subject was referred to a psychiatrist if there were five or more symptoms for 2 weeks or more.

Procedures

The women filled out the personal information form in 3 weeks after delivery. Of 290 women who completed EPDS, 121 ones had a score of 10 or above; then, the BDI-II was completed by them. After getting the score of 14–28 from BDI-II, a clinical psychologist interviewed the women to confirm depression. Women were randomly assigned to three groups of PST, relaxation, and control. Sessions were held by the researcher (midwife) in each center separately and individually.

During the study, loss of sample occurred for the following reasons: two women being employed, five women did not participate in the sessions, and 14 women did not participate after the third session due to travel, disease of newborn, too much housework, and lack of enough time to do relaxation exercises. The three groups completed BDI-II again 9 weeks after the delivery. Finally, statistical analysis was performed on 80 women [Figure 1].

Problem-solving therapy

Every patient in the PST group was trained about the five problem-solving skills (i.e., general orientation, problem definition and formulation, generation of alternatives, decision-making, and verification) during
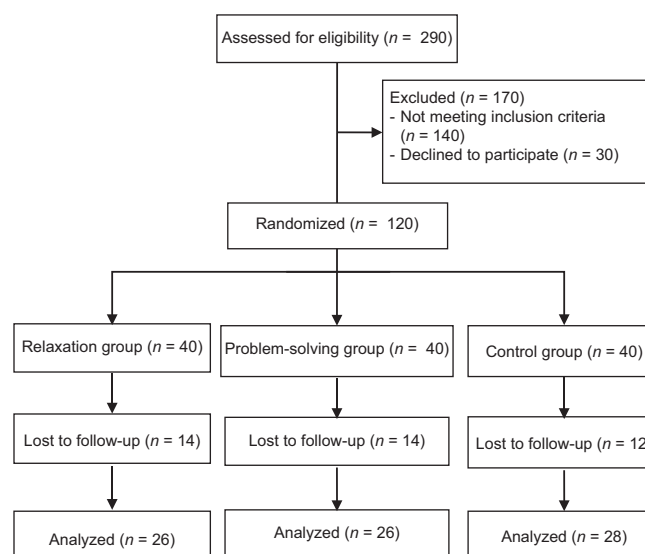

Figure 1: Consort flow diagram

six 45–50 min weekly sessions. In these sessions, first, a list of depressive symptoms in the Beck questionnaire was prepared and then the problem was selected based on the priority and was characterized that when did this problem start and why it was caused. Afterward, multiple solutions were sought through brainstorming. At the beginning of the next session, the effectiveness of the suggested solutions was evaluated and the checklist of problem-solving sessions was completed by the researcher. Women also completed the depression symptoms checklist as daily at home.

Relaxation

The relaxation technique was taught to every patient in the relaxation group. At the first session, women were taught how to do relaxation exercises according to Jacobson's method[21] and exercises were implemented once by the researcher. In the second session, the mother was asked to perform exercises in the presence of the researcher. Her performance was evaluated and technical problems were rectified by the researcher. Then, the relaxation CDs were delivered to women, and they were asked to perform daily exercises at home and complete the relaxation exercise checklist before and after exercise. Moreover, the women referred to the health-care center for the implementation of guided imagery weekly (10–20 min). The women completed the depression symptoms checklist as daily at home.

The first researcher conducted all the PST and relaxation therapy sessions. A clinical psychologist taught PST (through six sessions of 2 h) and relaxation therapy (through four sessions) to the researcher and also supervised the researcher's performance on the first 10 patients in the PST group and the first five patients

in the relaxation group. Afterward, the researcher conducted the remaining sessions.

The control group attended at the health-care centers once a week for 6 weeks and the researcher administrated usual care in the postpartum period according to the booklet of safe motherhood. These women also completed the depression symptoms checklist as daily at home. If they had questions about infant care and breastfeeding, the midwife answered them.

Ethical considerations

Research proposal was approved by the Research Ethics Committee of Mashhad University of Medical Sciences (ethics approval code: 26/1/5/29). All participants were informed about the study aims without knowing the type of intervention and completed written, informed consent form. Moreover, all of them were assured that their information will remain confidential, and in case of unwillingness, they can withdraw from the study. The research team was careful to preserve the participants' rights according to the Helsinki Ethical Declaration. The trial is registered at Iranian Registry for Clinical Trials with registration code IRCT138810152956N2.

Data analysis

Data analysis was done by SPSS version 13. Demographic data were described by descriptive statistics, including indicators of central tendency, mean and standard deviation, and frequency distribution. Normality of the quantitative variables was examined using the Kolmogorov–Smirnov test and the distribution was normal for all variables. For determining homogeneity of the baseline data of the three groups, one-way analysis of variance (ANOVA) was used for quantitative variables and Chi-square and Fisher's exact tests for nominal and categorical variables. ANOVA was also used to compare the mean difference of severity of depressive symptoms in 3rd and 9th postpartum weeks among the three groups and paired t-test was used to compare the mean depressive symptoms in each group before and after interventions. Repeated measures ANOVA was used for studying the effect of interventions on the mean tension and the mean success of the implemented solutions in the PST during the multiple measurements. $P < 0.05$ was selected as the significance level for all tests.

RESULTS

The mean age of women in the PST, relaxation, and control groups was 25.80 ± 4.23, 24.82 ± 4.15 and 25.75 ± 4.72 years, respectively ($P = 0.680$). Moreover, no significant difference was found in other personal characteristics of the three groups [Table 1].

At baseline, there was no significant difference between the study groups in depressive symptoms ($P = 0.512$), while the difference was significant after the intervention ($P < 0.001$) [Table 2]. While the Tukey test showed no significant difference between the PST and relaxation groups ($P = 0.052$), there was a significant difference between two intervention groups and the control group ($P < 0.001$). Moreover, a significant difference was observed between the three groups in

Table 1: Personal characteristics of the interventions and control groups[a]

Variable	Group			P
	Problem solving	Relaxation	Control	
Education level				
Primary school	6 (23.1)	2 (7.7)	10 (35.7)	0.254[b]
Secondary school	5 (19.2)	8 (30.8)	9 (32.1)	
High school	13 (50.0)	14 (53.8)	7 (25.0)	
Collegiate	2 (7.7)	2 (7.7)	2 (7.1)	
Income				
Less than enough	0	0	1 (3.6)	0.984[b]
Enough	18 (69.2)	17 (65.4)	19 (67.9)	
More than enough	8 (30.8)	9 (34.6)	8 (28.5)	
Parity				
Primiparous	13 (50.0)	15 (57.7)	14 (50.0)	0.812[c]
Multiparous	13 (50.0)	11 (42.3)	14 (50.0)	
Unwanted pregnancy				
Yes	10 (38.5)	8 (30.8)	6 (21.4)	0.392[c]
No	16 (61.5)	18 (69.2)	22 (78.6)	
Source of helping at home				
Husband	9 (34.6)	11 (42.3)	7 (25.0)	0.869[b]
Other children	1 (3.8)	1 (3.8)	2 (7.1)	
Her or his family	9 (34.6)	9 (34.6)	13 (46.4)	
Nobody	7 (26.9)	5 (19.2)	6 (21.4)	
Husband support				
Yes	19 (73.1)	18 (69.3)	20 (71.4)	0.99[b]
No	0	1 (3.8)	1 (3.6)	
Partly	7 (26.9)	7 (26.9)	7 (25.0)	
Neonate gender				
Male	12 (46.2)	7 (26.9)	13 (46.4)	0.253[c]
Female	14 (53.8)	19 (73.1)	15 (53.6)	

[a]Values are expressed as n (%), [b]Fisher's exact test, [c]Chi-square test

Table 2: Depressive symptoms severity in the intervention and control groups

Group	Depressive symptoms severity[a]		P[b]	Mean difference of severity
	Preintervention	Postintervention		
Problem solving	19.27 ± 5.38	4.36 ± 3.52	<0.001	-14.86 ± 6.15
Relaxation	18.45 ± 4.81	7.70 ± 4.62	<0.001	-10.71 ± 5.23
Control	20.00 ± 5.81	15.00 ± 6.44	<0.001	-4.72 ± 4.51
P[c]	0.512	<0.001		<0.001

[a]Data are presented as Mean ± SD. [b]The results of the paired samples t-test, [c]The results of the analysis of variance

terms of the mean difference of the depressive symptoms severity ($P < 0.001$) [Table 2]. The Tukey test showed significant differences not only between the PST and relaxation groups ($P = 0.018$) but also between the two intervention groups and the control group ($P < 0.001$). As is evident in Table 2, the PST group and control group, respectively, experienced the highest and the lowest changes in the severity of depressive symptoms.

The frequency of mild depression decreased from 57.1% to 3.8% in PST group, from 65.4% to 23.1% in the relaxation group, and from 60.7% to 33.3% in the control group. Moreover, the frequency of moderate depression reached zero in the two intervention groups and decreased from 39.3% to 25.9% in the control group.

Repeated measures ANOVA showed that although the mean tension was gradually decreased during the four consecutive assessments (i.e., 5, 6, 7, and 8 weeks after delivery; based on the data retrieved from the relaxation documentation checklist); however, these changes were not statistically significant ($P = 0.217$) [Figure 2].

Repeated measures ANOVA also showed that although the mean success of the implemented solutions in the PST group was gradually increased during the six consecutive measurements; however, these changes were not statistically significant [Table 3].

DISCUSSION

The results of the present study showed that both PST and relaxation can reduce the severity of depressive symptoms. However, the effects of PST were more than those of relaxation. Several studies have confirmed the beneficial effects of relaxation therapy[22,23] and PST in the treatment of depression.[10,24-26] Mynors-Wallis also reported that PST was as effective as antidepressant medication in patients with major depression.[27] Components of problem-solving teach individuals how to confront with problems and negative thoughts and how to administer new solutions to overcome their problems. Nonetheless, it seems that the severity of the depression might effect on the impact of PST. Therefore, although some patients with severe depressive disorder can successfully be treated with PST, it is more difficult to treat patients with poor concentration and lack of motivation.[28]

The present study showed that although both interventions could decrease the frequency of mild and moderate depression, the frequency of mild and moderate depression has decreased in the control group too. It seems that communication with the health-care team and listening to professional advice, especially if
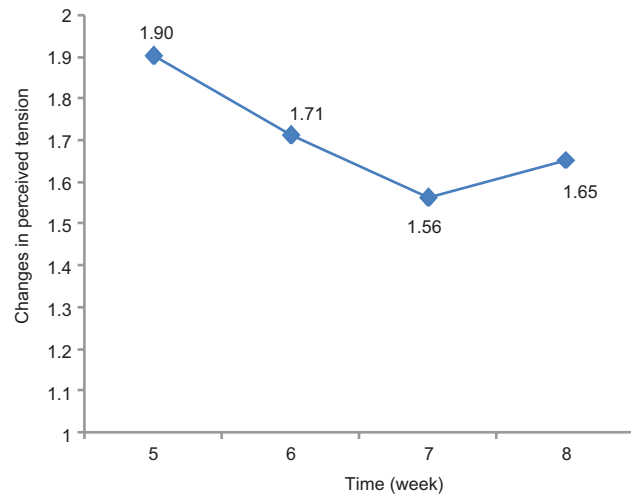
Figure 2: Comparison of the mean perceived tension in the relaxation group at the four consecutive assessments after delivery

Table 3: The comparison of mean success for solutions offered in problem-solving group at weeks 3 to 8 after delivery

Time	Success of solutions (mean±SD)
3rd week	83.44 ± 27.71
4th week	92.36 ± 23.25
5th week	87.30 ± 24.23
6th week	92.38 ± 23.22
7th week	88.47 ± 26.14
8th week	96.12 ± 19.60
P (repeated measures)	0.479

SD: Standard deviation

accompanied with feelings of respect and acceptance by the professionals, can decrease the depressive symptoms.[29]

The present study showed that both interventions were effective in reducing the depressive symptoms in women with PPD and the difference between the two interventions was not statistically significant. Although the mean decrease in depression was somewhat greater after PST than that of relaxation, PST needs further visits, more time, and more helps from the side of health professionals, while relaxation do not need repeated visits or special facilities, and after initial training, it can be implemented at home and at any time. Borkovec and Sides also conducted a review on the effects of progressive muscle relaxation and concluded that seven sessions of relaxation can rapidly reduce the tension, but its therapeutic effects lasted for at least 5 months.[30]

This study had a short follow-up. Moreover, the participants' mental status when filling the questionnaire and their access to other sources of data during the study could not be controlled, and this might affect the generalizing of the results.

CONCLUSIONS

Both interventions were effective in reduction of depressive symptoms in women with PPD. The interventions used in the present study had no adverse effects and can be used in routine care of women with PPD as easy, inexpensive, and applicable methods. Because of usability of PST and relaxation in primary care, midwives are recommended to implement these methods in women at risk of PPD both pre- and post-partum. Although we did not assess the effect of a combination of PST and relaxation, this combination might be more effective; further, such a hypothesis need to be tested in the future studies.

Conflicts of interest

There are no conflicts of interest.

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