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Impact of Prenatal Cognitive-Behavioral Stress Management Intervention on Maternal Anxiety and Depression and Newborns' Apgar Scores

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ABSTRACT

Background: Motherhood is a transformative and pleasing experience in a woman's life. However, given the physical and psychological changes, it can induce a degree of stress and anxiety in mothers. The aim of the present study was to evaluate the effects of cognitive-behavioral stress management (CBSM) on maternal anxiety and depression during pregnancy and newborns' Apgar scores.

Methods: This semi-experimental study was performed by applying a pretest-posttest control-group design. Overall, 30 primiparous mothers were selected among women referring to health clinics of Kerman, Iran, using convenience sampling. Subjects were randomly allocated to experimental and control groups. Data were collected, using Pregnancy-Related Anxiety Questionnaire and Edinburgh Postnatal Depression Questionnaire. After completing the pretest, the experimental group was subjected to 12 sessions of CBSM training; posttest data were collected after the intervention. Multivariate analysis of covariance was performed, using SPSS version 16. P-value < 0.05 was considered statistically significant.

Results: The obtained results revealed a significant decrement in the average posttest scores of anxiety and depression in the experimental group, compared to pretest scores and the control group. Moreover, differences in 1- and 5-minute Apgar scores between the two groups were statistically significant. These findings indicated the effectiveness of CBSM during pregnancy in reducing maternal anxiety and depression.

Conclusion: Pregnant women can benefit from psychological interventions such as CBSM in medical and health care centers.

Keywords: Anxiety, Apgar score, Cognitive-Behavior Stress Management, Depression, Pregnancy

Introduction

Although stress is generally an adaptive reaction to environmental challenges, stressors during pregnancy may have negative impacts on the health of pregnant women and infants (1). Pregnancy is associated with physical and psychological changes in pregnant women. These changes are intensified in primiparous women, who are having their first childbirth experience. Pregnant women feel anxious given their concerns about the status of the fetus, fear of childbirth, reduced daily activities, prenatal care, and apparent physical changes (2).

As different studies have indicated, anxiety is a psychological problem in pregnant women, described as a U-shaped curve (3). The hypothesis that fetal environment can have long-term or even life-long effects on child development is becoming increasingly accepted in scientific communities. In fact, intrauterine experiences can have significant impacts on the infant, and these effects may persist into developmental stages after birth and even adulthood (4).

According to World Health Organization (WHO), mental disorders are among major diseases in 15- to 44-year-old women, with probable impacts on newborns (5). More than 54% of pregnant women present with some symptoms of anxiety, and more than 37% experience depression during pregnancy (6). In a study on the prevalence of anxiety before childbirth, it was shown that anxiety disorders are developed in women during pregnancy, with a gradual increase until the third semester (7). In addition, the prevalence of mental disorders in pregnant Iranian women has been reported to be more than average (8).

Mother's mental health during pregnancy and after labor affects the process of childbirth and

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has impacts on newborns' mental health (9). Anxiety during pregnancy and childbirth makes the newborn susceptible to schizophrenia (10), emotional disorders (11), autism (12), hyperactivity (13), and asthma during the neonatal period (14). In fact, maternal anxiety is directly associated with abnormal brain development (15) and distress in infants (16).

Moreover, maternal anxiety is associated with reduced mental development within the first two years (17). As previous studies have indicated, maternal anxiety during pregnancy has great impacts on the newborn's sleep pattern (18) and leads to behavioral problems in early childhood (19). Additionally, poor parent-child attachment due to postpartum depression is related to maternal status during pregnancy (20). Overall, anxiety disorders may have adverse effects on the future of mothers and infants (21). Mental problems during pregnancy have been evaluated in more than 90% of high-income countries, while information is available in only 10% of low- and middle-income countries (22).

Depression during pregnancy can lead to disregard for maternal health and as a result, give rise to inadequate nutrition, smoking habits, increased medication use, and inadequate care during pregnancy. It also increases the risk of postpartum depression and may lead to suicide in rare cases (23).

Previous research shows that the rate of depression during pregnancy alters from 10% to 30% (24). In a study, prevalence of depression during pregnancy was estimated at 45% (25). The prevalence of depression was reported as 30.6% in a previous study performed in Iran. It should be noted that in none of the abovementioned studies, subjects were treated for these disorders (26). Overall, since the prevalence of anxiety disorders during pregnancy is higher than 30.6% in Iran (27), it seems that mental problems are important factors for the health of pregnant women (28).

Apgar score is a suitable criterion for identifying neonates in need of care (29). Recent research shows that low 5-minute Apgar score can predict the incidence of mortality and future neurological disorders in infants. Five-minute Apgar score of 0-3 indicates an increased risk of mortality, central nervous system injuries (e.g., paroxysm and coma), and reduced body temperature in premature and especially mature newborns (30). Therefore, suitable and immediate treatment suggested by Apgar score increases the chance of preventing brain damage and obtaining promising results (31). It should be noted that

infants with poor conditions at birth and low Apgar scores may show a weak performance in cognitive tasks in future (32).

The importance of pregnancy period is well recognized, given the direct effects of maternal health on the newborn's life. Moreover, fetus is sensitive and vulnerable to various factors. In order to eliminate these factors, different methods including educational and supportive programs could be applied during pregnancy (33). In fact, researchers have applied different forms of psychological intervention for treating disorders during pregnancy. For instance, one of these studies has demonstrated the effectiveness of eclectic counseling in decreasing depression during pregnancy (34).

The results of a study by Guido and colleagues showed that cognitive-behavioral stress management (CBSM) intervention before childbirth affects the salivary cortisol level (as a sign of stress) in mothers and babies; as a result, this intervention could reduce the risk of future mental health disorders in mothers and infants (35).

In this regard, Fatehizadeh et al. showed that behavioral couple therapy significantly reduces the risk of depression during pregnancy (36). Additionally, a study by Austin and colleagues showed that group cognitive-behavioral therapy during pregnancy is effective in the prevention of anxiety and postpartum depression (37). Moreover, Hossieni Nassab et al. showed that training mothers on theoretical contents and practical techniques would increase their self-confidence, decrease their fear and anxiety, and provide them with a relaxing and supportive environment during pregnancy and childbirth.

According to previous studies, anxiety is the most important factor for mothers' perception of pain and pain-coping mechanisms. Therefore, reducing anxiety leads to the increased compatibility and cooperation of mothers and reduces the pain and duration of childbirth in trained women (38). In a previous study, Mosaviasl et al. (2009) studied the impact of muscle relaxation therapy for pregnant mothers on infants' health indices. The results showed that muscle relaxation training increases the infants' health indices during and after birth (39).

Another study demonstrated that reduced anxiety in pregnant women, especially during the final weeks of pregnancy, affects the health of the fetus and leads to relaxation in mothers and infants; it also contributes to reduced anxiety level. In this regard, we can point to a study in which a group of pregnant mothers were asked to

listen to music in bed during the last 5 weeks of pregnancy. The obtained results showed that mothers and infants were more relaxed at birth (40). Moreover, Joanna and colleagues revealed the safety of cognitive and behavioral therapies during pregnancy (41).

Fears and concerns of mothers during pregnancy have been previously surveyed in Iran, using quantitative methods. Researchers have utilized various scales such as State-Trait Anxiety Inventory (STAI) by Spielberger (42) and Manifest Anxiety Scale (MAS) by Taylor for evaluating anxiety as the most common mental problem during pregnancy.

However, the main problem is that these scales have not been developed for the evaluation of anxiety during pregnancy (43). Previous studies have shown that pregnant women may have grave concerns about embryonic developmental failure, pain during childbirth, and changes in personal life due to pregnancy and childbirth (44). Therefore, defects in methods of evaluation can underestimate the real status of these mothers (45).

As previous studies have indicated, evaluation of mothers' fears and concerns during pregnancy and changes in their personal lives during pregnancy (especially anxiety and the related clinical factors) seems necessary. Therefore, in order to reduce maternal anxiety and depression and increase newborns' Apgar scores, we applied the CBSM intervention, which includes an introduction to stressors and stress responses, the relationship between emotions and thoughts, negative thinking, relaxation training, correction of cognitive distortions, training of effective coping responses, and anger management (46).

Material and Method

In this semi-experimental study, a pretest-posttest control-group design was applied, and the effects of CBSM intervention on maternal anxiety and depression during pregnancy and newborns' Apgar scores were evaluated. The target population included pregnant women with anxiety and depression, referring to health clinics (Resalat, Sajadiyeh, and Malayeri clinics) of Kerman, Iran.

In the current study, convenience sampling was applied, and each group comprised of 15 subjects (47). After providing an index for patients, referring to these clinics, 30 women were selected from 147 candidates, referring to the mentioned health clinics. The subjects were randomly allocated to experimental and control groups.

All the subjects voluntarily participated in this study and were assured that the collected data were exclusively used for research purposes. Participants were free to leave the study at any time.

The inclusion criteria were as follows: 1) primiparity; 2) low-risk pregnancy; 3) high school education (minimum level); 4) depression, based on Edinburgh Postnatal Depression Scale (EPDS) with a cut-off score of 12; 5) anxiety [the highest anxiety score, based on Pregnancy-Related Anxiety Questionnaire (PRAQ)]; and 6) being in the fourth or fifth month of pregnancy.

The exclusion criteria were as follows: 1) prior history of chronic physical or mental diseases such as diabetes, cardiac diseases, and psychotic disorders (e.g., schizophrenia and paranoia), requiring treatment; and 2) undergoing treatment for depression or anxiety disorders. These cases were diagnosed, using medical records, which had been previously completed. Moreover, subjects, who missed more than 2 sessions of intervention, were excluded from the study.

PRAQ and EPDS were completed by the subjects before commencing the sessions. The experimental group was trained by CBSM intervention during 12 weekly sessions (for three months), with each session taking 90 minutes. During the intervention, one participant from the experimental group was excluded due to change of residence. The questionnaires were refilled by the subjects in the experimental group during the last treatment session.

The members of the control group were contacted and asked to complete the questionnaires in the setting. Both experimental and control groups received prenatal care at health clinics, although only the experimental group underwent CBSM intervention. In order to adjust the intervention design, CBSM, revised by Antoni and colleagues, was applied (46); in this intervention, participants were trained on stress-coping techniques. A short description of therapy sessions is presented in Table 1.

In this study, the research tools comprised of three questionnaires, which are introduced in the following sections.

1- PRAQ

PRAQ was first introduced by B. Vandenberg in 1989 (48) for assessing pregnancy-related fears and concerns. This questionnaire consists of 55 items, covering 5 factors (based on exploratory factor analysis): fear of giving birth (14 items), fear of bearing a physically or mentally

Table 1. The content of therapy sessions

Session	Training topics	The content of therapy sessions
1	Early evaluation, clinical interview, and relaxation	Invitation to cooperation, giving assurance, an introduction to therapy methods, the impact of psychological factors on maternal and fetal health, and gradual muscle relaxation for 16 muscle groups
2-4	Stressors, stress responses, and relaxation	Physical effects of stress, the relationship between thoughts and emotions, negative thinking, cognitive distortions, and gradual muscle relaxation for 8 muscle groups
5-6	Replacement of negative thinking with rational thoughts and relaxation	The difference between logical and illogical self-talk and gradual muscle relaxation for 4 muscle groups
7-8	Efficient coping techniques and relaxation	The concept of efficient coping, different types of problem-focused and emotion-focused coping techniques, problem-focused and emotion-focused coping combined, inefficient coping, and progressive muscle relaxation
9-10	Effective coping responses and relaxation	Use of coping strategies in face of stress and Mantra meditation
11	Anger management, expressiveness training, and relaxation	Anger definition, effective styles of communication, training on anger management, interpersonal communication skills, barriers to expressive behaviors, components of expressive communication, and diaphragmatic breathing
12	Summarization	The survey of subjects' achievements, a review of trained skills in previous sessions, and further thoughts

handicapped baby (5 items), concerns about oneself and marital life during pregnancy (13 items), fear of change (16 items), and concerns about future mother-child relationship and marital life (7 items).

It should be mentioned that the last three items of PRAQ, which are general statements describing pregnancy, were excluded from our analysis. The final score of this questionnaire is calculated by summing the scores of each statement. Each item is scored from 0 to 7, with the total score ranging from 0 to 385 (49).

Huizink and colleagues showed an acceptable correlation for B. Vandenberg's PRAQ in the survey of psychometric properties with STAI by Spielberger. A Cronbach's alpha of 0.76 was reported for all the subscales during pregnancy (50).

Considering the properties of PRAQ, content validity of this questionnaire has been confirmed by B. Vandenberg (48). Moreover, in a report by Babanazari, the face validity of PRAQ was confirmed by five psychologists. In the mentioned study, Cronbach's alpha coefficients for each component and the total scale during pregnancy were as follows: fear of giving birth (0.47), concerns for oneself and marital life during pregnancy (0.65), fear of bearing a handicapped baby (0.41), fear of change (0.66), concerns about future mother-child relationship and marital life (0.51), and the total scale (0.81) (49).

In the present research, Cronbach's alpha coefficients for each component and the total scale during pregnancy were as follows: fear of giving birth (0.74), fear of bearing a handicapped baby (0.71), concerns for oneself and marital life during

pregnancy (0.76), fear of change (0.70), concerns about future mother-child relationship and marital life (0.75), and the total scale (0.70).

2- EPDS

This questionnaire was developed by Cox and colleagues in 1987 and was reviewed in 1994 to identify depression during pregnancy (51). This questionnaire has been used in clinical research to evaluate depression during pregnancy and after childbirth (34).

This tool comprises of ten sections with four-option items; in some items, the options range from low to high (1-2-4) and in some, from high to low (3-5-6-7-8-9-10). The options are scored from 0 to 3, according to the severity of symptoms. The obtained score is calculated by rating the items, ranging from 0 to 30. Mothers with a threshold score higher than 12.5 suffer from depression with different intensity. By using Edinburgh's test and depression test of Beck the validity of questionnaire was determined, considering 0.78 as the correlation coefficient. The reliability of this test has been reported at 0.75, according to Cronbach´s alpha and split-half method (38). In the present research, a Cronbach´s alpha of 0.72 was reported.

3- Apgar scale

In 1953, Virginia Apgar introduced a test which allowed obstetricians and midwives to record newborns' physical status. This test is known as the first standard tool for the initial assessment of an infant. Apgar score is used to evaluate newborns' vital signs and body functions

Table 2. Descriptive indicators in pretest and posttest evaluations

Variables	Groups	Pretest			Posttest			Levene's test	
		N	M	SD	N	M	SD	f	P-value
Concerns for oneself and marital life during pregnancy	Experimental	14	70.57	18.1	14	85.43	16.63	3.08	0.09
	Control	15	67.33	13.41	15	72.92	14.31		
Fear of giving birth	Experimental	14	40.07	9.15	14	32.85	12.22	1.42	0.24
	Control	15	39.06	12.3	15	45.4	7.65		
Fear of bearing a handicapped baby	Experimental	14	35.78	6.17	14	15.71	5.83	1.05	0.31
	Control	15	23.00	12.14	15	23.66	10.09		
Fear of change	Experimental	14	36.14	13.5	14	34.71	13.86	0.472	0.49
	Control	15	38.6	15.15	15	40.26	15.39		
Concerns about future mother-child relationship and marital life	Experimental	14	60.8	15.13	14	44.5	14.9	2.73	0.11
	Control	15	57.33	20.39	15	68.93	23.68		
Total anxiety	Experimental	14	233.2	36.34	14	171.6	46.3	0.636	0.43
	Control	15	225.33	58.66	15	251.2	54.96		
Depression	Experimental	14	18.57	4.48	14	14.42	3.93	2.38	0.13
	Control	15	12.66	3.75	15	14.20	3.62		

Table 3- Pretest effects on different variables

Pretest groups *	F-value	P-value
Concerns for oneself and marital life during pregnancy	0.854	0.524
Fear of giving birth	2.68	0.16
Fear of bearing a handicapped baby	0.40	0.16
Fear of change	0.97	0.33
concern about future mother-child, father-child relationship and partner relationship	1.17	0.29
Total anxiety	2.03	0.14
Depression	0.519	0.47

at one and five minutes after birth. This scale focuses on five physiological factors including heartbeat, respiration, muscle tone, response to a mildly painful stimulus, and skin color.

The newborn receives a score from 0 to 2 on each of the items; therefore, the total score ranges from 0 to 10. Apgar score ≥ 7 indicates the good physical status of the newborn. If this score ranges between 4 and 6, the infant needs to be stabilized for breathing (or other vital signs). If this score is ≤ 3, the newborn is at high risk and requires special medical care (31).

Results

Of 14 subjects in the experimental group, 11 and 3 mothers had planned and unplanned pregnancies, respectively. Among 15 subjects of the control group, 9 had planned pregnancies and 6 had unplanned pregnancies.

In terms of gender-specific preferences, 10 subjects in the experimental group had infants of the preferred gender, and 4 had infants of the non-preferred gender. In the control group, 9 and 6 subjects had infants of preferred and non-preferred gender, respectively. For evaluating the homogeneity of variance, Levene's test was utilized.

The results in Table 2 show that Levene's test results were insignificant regarding the evaluated variables. Therefore, the homogeneity of variance for both experimental and control groups was confirmed. Homogeneity of regression slopes is another basic assumption in covariance analysis. Pretest effects were applied for assessing this assumption, and the final results are presented in Table 3.

According to the results presented in Table 3, the interactive effect between pretest and groups was insignificant in all variables (P>0.05). According to the obtained results, it can be said that regression slopes were insignificant, and as a result, regression coefficients for the groups were equal. Also, for evaluating the intervention effect, multivariate covariance analysis (MANCOVA) was performed on score of posttest with control of pretest. The obtained results are presented in Table 4.

Table 4 shows a significant difference between the experimental and control groups regarding at least one of the dependent variables (fear of giving birth or fear of bearing a handicapped baby) (P<0.01).

For checking the reference point, one-way MANCOVA was performed on dependent variables. In Table 5, a brief description of

Table 4. The results of MANCOVA for fear of bearing a handicapped baby and fear of giving birth

Effect	Test	Value	F	df	df error	P-value
Intraction	Pillai's trace	0.54	14.42	2	24	0.01
	Wilks' lambda	0.45	14.42	2	24	0.01
	Hotelling's trace	1.20	14.42	2	24	0.01
	Roy's largest root	1.20	14.42	2	24	0.01

Table 5. MANCOVA results related to various components (concerns for oneself and marital life during pregnancy, fear of change, and concerns about future mother-child relationship and marital life)

Effect	Test	Value	F	df	df error	P-value
Group	Pillai's trace	0.61	11.90	2	27	0.01
	Wilks' lambda	0.38	11.90	2	27	0.01
	Hotelling's trace	1.62	11.90	2	27	0.01
	Roy's largest root	1.62	11.90	2	27	0.01

Table 6. MANCOVA results of the comparison between posttest results after control pretest

Effect	Dependent variables	Total square	df	Mean square	F	P-value
Group	Fear of bearing a handicapped baby	652.63	1	652.63	16.77	0.01
	Fear of giving birth	1270.86	1	1270.86	16.67	0.01
	Concerns for oneself and marital life during pregnancy	6317.54	1	6317.54	25.58	0.01
	Fear of change	69.88	1	69.88	0.84	0.36
	Concerns about future mother-child relationship and marital life	4372.63	1	4372.63	21.44	0.01

MANCOVA results is presented for comparison between the average pretest and posttest scores of concerns for oneself and marital life during pregnancy, fear of change, and concern about future mother-child, father-child relationship and partner relationship in experimental and control groups.

The MANCOVA results are presented in Table 6 for comparison between pretest and posttest scores of two dependent variables (fear of bearing a handicapped baby and fear of giving birth) in the experimental and control groups. Also, the results of comparison between the pretest and posttest scores of three variables (concerns for oneself and marital life during pregnancy, fear of change, and concerns about future mother-child relationship, father-child relationship, and marital life) in the experimental and control groups are presented in Table 6.

The results presented in Table 6 show that one-way covariance analysis results were significant regarding fear of bearing a handicapped baby (P=0.01, f=16.77) and fear of giving birth (P=0.01, f=16.67). The comparison of average posttest scores in each of the dependent variables showed a significant difference between the experimental (SD: 46.3, M: 171.6) and control (SD:251.2, M:54.96) groups. In total, the average posttest scores in the experimental group showed a more significant reduction, compared to the control group. The results of covariance analysis

regarding the effect of CBSM on total anxiety and depression are presented in Table 7.

Table 7 shows a significant difference in the adjusted average scores of total anxiety between the experimental and control groups. The effect of pretest was significant with n^2_p=0.57, P<0.01, and f=34.83. As a result, it can be said that CBSM significantly reduced the total anxiety in the experimental group.

Also, there was a significant difference in the adjusted average score of depression between the experimental and control groups. The pretest effects were significant with P<0.01 and f=9.21. Therefore, CBSM led to reduced depression in the experimental group; the effect size was estimated at 0.51, which shows the high accuracy of the statistically test

For comparison of newborns' Apgar scores, t-test was applied for independent groups. Table 8 shows the results of independent t-test for comparison of 1-minute Apgar scores between the newborns in experimental and control groups.

As shown in Table 8, the results of independent t-test were statistically significant [t (27) =3.49, *P*<0.01]. It can be said that there is a significant difference in 1-minute Apgar score between the newborns of experimental and control groups. Table 9 shows the results of independent t-test for the comparison of 5-minute Apgar score between the newborns in experimental and control groups.

Table 7. The training effect of CBSM on anxiety and depression

Indicator		Df	Mean square	F	P	Effect size
Anxiety	Pretest	1	3133.72	20.98	0.01	0.57
	Groups	1	52033.58	34.83	0.01	
Depression	Pretest	1	197.18	27.46	0.01	0.51
	Groups	1	66.15	9.21	0.01	

Table 8. Independent t-test for comparison of 1-minute Apgar score among newborns in the experimental and control groups

Mood	Group	N	M	SD	Df	T	P
One-minute Apgar score	Experimental	14	8.93	0.26	27	3.49	0.01
	Control	15	8.07	0.81			

Table 9. Independent t-test for the comparison of 5-minute Apgar scores between the newborns in experimental and control groups

Position	Group	N	M	SD	df	T	P
5-minute Apgar score	Experimental	14	9.71	0.46	27	2.00	0.05
	Control	15	9.27	0.70			

As indicated in Table 9, the results of independent t-test were significant [*t* (27) =2.00, *P*< 0.05]. Therefore, there was a significant difference in 5-minute Apgar score between the newborns of experimental and control groups.

Discussion

The obtained results showed that CBSM training was effective in reducing anxiety and depression during pregnancy and increasing newborns' Apgar scores. On the other hand, the impact of increased stress management on psychological factors during pregnancy was directly correlated with the mental health of pregnant women and the physical and mental health of newborns.

It should be noted that CBSM training is directly associated with maternal conditions during pregnancy and childbirth, as well as mothers' thoughts, fears, and concerns during these periods; i.e., mental image visualization for reducing anxiety is related to pregnancy and childbirth outcomes. Also, for reducing depression, cognitive distortions during pregnancy and childbirth are often discussed. Therefore, the content of discussions in therapy training sessions should be adjusted with the condition of pregnancy.

As many researchers have indicated, pregnancy is accompanied by anxiety and depression (6, 7, 25-27). In this regard, Guido and colleagues showed that salivary cortisol level, as an indicator of stress, is reduced via CBSM training before delivery (35). Also, Hossieni Nasab et al. showed that teaching theoretical contents and practical techniques to pregnant mothers significantly reduces their fear and anxiety (35).

In fact, the effect of CBSM on reducing anxiety or maybe other psychological disorders during pregnancy is highly expected (38). The results of the current study indicated that CBSM reduces depression during pregnancy, which is consistent with the results of previous studies by Tabrizi and Lorestani (34). The impact of CBSM on reducing anxiety and depression (or maybe other psychological disorders) indicated the importance of anxiety and depression signs during pregnancy. This is consistent with the results of previous studies, which consider cognitive changes and training to be effective in the improvement of anxiety and depression symptoms during pregnancy (34-38).

In this study, during 12 training sessions, participants were informed about the physiological and emotional symptoms of stress so that they could identify their habitual pattern in response to stress; then, subjects were trained to implement one of the relaxation techniques by observing the first symptoms of stress.

Replacement of negative thoughts can be another reason for the reduction of anxiety and depression in the experimental group. Therefore, inhibition and reduction of stress by using relaxation and cognitive techniques led to a decrement in anxiety in the experimental group, since learning meditation, relaxation, and also cognitive methods could help subjects cope with anxiety effectively. By practicing meditation, pregnant women could diverge from habitual patterns and excitements and develop new feelings of visual and mental control. Also, the mothers felt less challenged by their thoughts and excitements; as a result, such practices reduced the fear of giving birth in these women (46).

Cognitive and behavioral contact seems logical due to the depression which could be the result of extreme generalization, grandiosity, personalization, thinking absolutism and arbitrary conclusions; these cognitive patterns would give rise to one's understanding based on primary experiences (52).

Generally, the results of this research and other related studies have shown that psychological therapy plays an important role in the improvement of anxiety and depression during pregnancy and increases newborns' Apgar score. Stress management can balance one's feelings, inner emotions, and social support, and reduce mental problems. Therefore, cooperation between gynecologists, midwifes, and psychologists can help with the treatment of anxiety and depression and lead to favorable conditions for pregnant women during pregnancy.

Given the correlation between maternal mental health and the health status of infants as the future generation, more attention should be paid to depression and anxiety during pregnancy. According to the results of this study, it is suggested that: considering the limited sample size of this study, we suggest that further similar research be performed with a larger population. In addition, the effectiveness of other

psychological treatments in treating mental disorders during pregnancy should be assessed.

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