

# The Effect of A Cognitive-Behavioral Counseling Approach on Primipara Mothers' Maternal-Fetal Attachment

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## Abstract

**Background:** Pregnancy and delivery are among the most sensitive periods of a woman's life, which is considered the most vital crisis in her life. A mother who is attached to her fetus during pregnancy is ready to establish a pleasant relationship with the newborn after childbirth, and prenatal cognitive-behavioral counseling can improve the emotional maternal-neonatal connection. This study aimed to investigate the effect of counseling with a cognitive-behavioral approach on maternal-fetal attachment (MFA) behaviors in primipara mothers.

**Method:** In this quasi-experimental study with two test and control groups, 40 primipara women in 22-24 weeks of gestation participated in eight 90-minute weekly sessions as a group counseling session with a cognitive-behavioral approach. A demographic questionnaire and Cranley's maternal-fetal attachment scale (MFAS) were completed by the participants before the study, immediately after the intervention, and 4 weeks after the intervention. Data were analyzed using SPSS 26 software at the 95% confidence level ( $P \leq 0.05$ ).

**Results:** The results of the research indicated that the highest average scores of the MFAS in the test and control groups belonged to the test group after 4 weeks of the intervention.

**Conclusions:** The high average scores of the MFAS after 4 weeks of the intervention indicate the effectiveness and positive effect of cognitive-behavioral counseling on primipara mothers in improving and increasing MFA.

**Keywords:** Maternal-fetal attachment, primipara mothers, cognitive-behavioral approach

## Abbreviation

MFA: Maternal-Fetal Attachment

## 1. Background

Pregnancy is considered a period of greater emotional vulnerability in women's lives, when internal representation of the future child begins. This representation makes the pregnant women manifest, in most cases, behaviors and feelings of care, protection, and integration with the fetus [1]. Pregnancy and delivery are one of the most sensitive periods of a woman's life, which is regarded as the most vital crisis in her life. Pregnancy is basically a physiological event, but neuroendocrine, psychophysical, and social changes are also important components of this experience [2]. Despite creating a pleasant feeling, this period is often deemed a stressful period [3]. Mothers need to adapt to their new role, but changing and adapting to pregnancy-related responsibilities are challenging for some women [4].

In addition to daily tensions, pregnant women are worried about the newborn's health, gender, perception of the newborn's appearance, fear of transferring hereditary diseases to the fetus, and the unknown delivery process [2,5]. Therefore, these factors increase the possibility of neurotic states, such as stress, anxiety, depression, morbid fear, and obsessive-compulsive disorder, and these symptoms may start with very mild mental disorders and then lead to severe mental disorders and even psychosis [5].

Maternal-Fetal Attachment (MFA) describes the cognitive-representational, emotional, and behavioral aspects of the mother-fetus relationship that develops during pregnancy [6]. Attachment to the fetus is one of the important issues in the pregnancy experience so that maternal feelings and sensitivity toward the fetus increase during pregnancy following psychological and physiological changes. The establishment of an emotional

connection with the fetus is part of the adaptation stages to the maternal role in pregnant women [7,8]. Maternal attachment increases the interaction with the fetus, such as proper nutrition, positive ideas about the fetus, talking to the fetus, paying attention to fetal movements, and other interactive behaviors with the fetus [9]. Consequently, maternal-fetal attachment (MFA) is one of the factors reducing stress and anxiety during pregnancy and predicts the performance and attitude of the maternal role after delivery, maternal-infant interaction, and postnatal attachment patterns, leading to improved mother and newborn's health [10,11]. Prenatal attachment helps pregnant women as the parent to create a healthy family environment by improving parent-child interactions [12]. Based on this, the gestational period may contribute to the re-elaboration of her perceived relationship with her parents and to the new bonding with the fetus, which, in turn, may significantly affect the mother-child relationship and the child's development [13].

The child's mental health is closely associated with maternal health status, and improving maternal mental health can play an effective role in maintaining the health of society. Therefore, various methods, such as support, education, and intervention programs, can be used to adjust and deal with the problems during pregnancy until the psychological safety of the mother and child is improved in the postpartum period [14,15].

Counseling is a simple, easy-to-learn method that can be used as a non-pharmacological method to treat psychological disorders of pregnancy and delivery [15]. Counseling is a relationship between two people in which one tries to understand the other and helps to solve compatibility and adaptation issues(4). Among various counseling methods, cognitive behavioral counseling (CBC) is one of the most successful fields in the counseling context [14,15]. Meanwhile, CBC changes people's thoughts and communication with their world through counseling components such as facing anxiety-provoking stimuli and situations. Thus, people can cope with their anxious feelings in any situation by creating new associations [16]. Relative to other therapeutic options, CBT can be provided in a wide variety of formats such as in-person group (women alone) format, in-person group (women and partners) format, in-person individual (women alone) format, in-person individual (women and partners) format, internet-based (women alone) format, telephone-based (women alone) format and workbook-based (women alone) format [17].

Identifying the needs of pregnant women, providing services and care tailored to these needs, and finally improving the care system are considered a requirement(7). On the other hand, midwives, as the largest professional group of women's health, have the most contact with pregnant women in medical environments. This contact has resulted in a more complete understanding of their educational and counseling needs. They can improve and promote mental health and reduce anxiety as the most common psychological problem of pregnant women by understanding their educational

and counseling needs and implementing effective interventions in MFA counseling.

In our society, the main services during pregnancy are devoted to maternal physical care, and less attention is paid to the psychological needs of pregnant women. Receiving high-quality pregnancy care and allocating enough time for counseling by midwives are highly effective in maternal-fetal compatibility and MFA behaviors, particularly in primipara women.

Effective interventions should obviously be used, especially by midwives as effective people in the pregnancy process. Therefore, the present study aimed to investigate the effect of counseling with a cognitive-behavioral approach on mental health and MFA behaviors of primipara mothers referring to comprehensive health service centers in Shahrekord city.

## 2. Aim of the study

This study aimed to conduct with the aim of attracting the participation of pregnant women for the first time in order to improve attachment behaviors and mental health during pregnancy.

## 3. Methods

### 3.1. Procedure and participants

The present quasi-experimental research was conducted on primipara women referring to comprehensive health service centers in Shahrekord city who were eligible for the study. Four comprehensive health service centers were selected in different urban areas. According to the inclusion criteria, the samples were selected in each center and included in the study after receiving oral and written consent.

Exclusion criteria were complications during pregnancy (hemorrhage, diabetes, hypertension, and premature birth) and other factors of the mother's inability to complete the questionnaire. Dropout criteria included emigration, absence in more than two sessions, dissatisfaction with continuing cooperation for any reason at any stage of the research, mental damage or stress during the intervention, and failure in doing homework for more than two sessions.

### 3.2. Sample size

The household files were examined in terms of the inclusion criteria. They were then invited to cooperate by phone calls and the first face-to-face meeting in these centers. Then, 40 people were selected and divided randomly into two equal groups. The sample size formula was  $N = (2s^2 p[z_{1-\alpha/2} + z_{1-\beta}]^2 / (\mu^2 d))$  where  $s^2 = (s_1^2 + s_2^2) / 2$  with %95 confidence interval, %5 alpha, and %20 chance of falling). The contributors were assured that the study results were confidential and would be published without names. They could leave the research at any stage.

The inclusion criteria were as follows: age 18-35 years, first pregnancy, no history of abortion, literacy, unwanted pregnancy, no

history of psychological diseases, and gestational ages of 22-24 weeks.

### 3.3. Sampling

The sampling was done after obtaining the permission from the ethics committee of the Shahid Sadoughi University of Medical Sciences (code: IR.SSU.MEDICINE.REC.1397.177.2018/12/26). The researcher was introduced to the subjects in an in-person visit, and they were explained the research objectives after showing their tendency to participate in the research. After sufficient explanations about the confidentiality of the information and anonymity of the subjects to gain their trust, written consent was obtained from them. Then, questionnaire questions were answered by both test and control groups in a calm environment before the start of the educational program. After sufficient explanations about the confidentiality of the information and anonymity of the subjects to gain their trust, written consent was obtained from them. Then, questionnaire questions were answered by both test and control groups in a calm environment before the start of the educational program.

Questionnaires were completed by pregnant mothers in both study groups three times before the intervention, immediately after the intervention completion, and again four weeks after the intervention completion.

To determine the effect of counseling with a cognitive-behavioral approach on mental health and MFA behaviors of primipara mothers, the difference between the average MFA scores between the

two test and control groups was measured before the intervention, immediately after the intervention, and 4 weeks after the counseling program intervention.

### 3.4. Data Collection Instruments

The research tools included a questionnaire of demographic characteristics (including age, level of education, employment status, place of residence, duration of the marriage, and age of pregnancy) and the maternal-fetal attachment scale (MFAS) (Cranley 1981). The MFAS includes 24 questions under five dimensions of interaction with the fetus, differentiation between self and fetus, maternal role-taking, attributing characteristics to the fetus, and giving of self, which are all answered on a 5-point Likert scale from definitely no (1) to definitely yes (5). The scores of this questionnaire range from 24 to 120, with a higher score indicating a greater MFA.

### 3.5. Interventions

This study was accomplished in fall and winter 2020. The intervention program started in the 22nd-24th weeks of pregnancy and was held during eight face-to-face counseling sessions including the structural dimensions of CBC, and one 90-minute session per week, including two blocks of 10 people, in comprehensive health service centers of Shahrekord city. This counseling program was implemented to attract the participation of primipara women to improve their mental health and attachment behaviors during pregnancy.

Table 1 shows the topics discussed and CBC sessions on maternal-fetal attachment in each meeting.

Sessions	Counseling program and process during sessions	Overview of each session content
First	Pretest introduction, presentation of plans, counseling, assignments, and introducing detailed and general goals	1) Familiarity of members with each other 2) Establishing a positive relationship between group members 3) Creating a sense of mutual trust and motivation to continue the sessions 4) Explanation of mental health
Second	A summary of the fetal development process and the evolution course until birth, questions and answers, creating empathy, group activity, drawing of the fetus, homework	1) Self-awareness as a strategy to increase mental health A summary of the fetal development process and the evolution course until birth. Creating empathy Drawing of the fetus aiming at creating interest and curiosity toward the fetus
Third	Examining homework, explaining MFA (the nature of attachment, the importance of attachment, its effect on the postnatal mother-newborn relationship, and the formation of safe and healthy attachment), consulting techniques for increasing MFA and its implementation in the session, touching and recording the number of movements, recognizing the fetal position at home, and recording in a designed chart, homework	1) Introducing the fear of childbirth 2) Identifying mental errors and ways to reduce them 3) Explanation and description of MFA (the nature of attachment, the importance of attachment, its effect on the postnatal mother-newborn relationship, and the formation of safe and healthy attachment), 4) Techniques to increase MFA

Fourth	Examining homework, explaining and examining the expectations, expectations of mothers' physical/emotional changes during pregnancy and after, training to maintain affective/emotional and physical health of mothers and fathers during and after pregnancy, homework	1) Explaining mothers' physical changes during pregnancy 2) Explaining mothers' emotional changes during pregnancy 3) Teaching to maintain mothers' and fathers' emotional and physical health during and after pregnancy
Fifth	Examining homework, group discussion about mothers' expectations of their husbands' role in pregnancy, performing techniques to increase MFA, training correct breathing	Group discussion about mothers' expectations of their husbands' role in pregnancy Performing techniques to increase MFA
Sixth	Examining homework, explaining tension, discussing and counseling on ways to cope with tension, such as relaxation, deep breathing, mental imagery, counseling, and doing relaxation in class, during and after pregnancy.	Description of tension Discussing and counseling on ways to cope with stress during and after pregnancy Teaching relaxation with mental imagery, Training deep breathing
Seventh	Examining homework, counseling about the maternal role and role-playing, doing techniques to increase MFA, couple's attendance at the session, and counseling on parenting techniques	Counseling about the maternal role and role-playing Performing techniques to increase mother-fetus attachments Couple's attendance at the session and counseling on parenting techniques
Eighth	Counseling on the importance of the paternal role during pregnancy, couple's presence, explaining depression and the coping ways during pregnancy, counseling on problem-solving skills, performing techniques to increase MFA, completing the questionnaire	Explanation of depression and the coping ways during pregnancy, counseling on problem-solving skills Performing techniques to increase MFA

**Table 1: Subjects of discussions in each counseling session; CBC sessions on maternal-fetal attachment**

### 3.6. Sample Assignments:

- drawing of the fetus, homework (As homework, mothers are asked to touch their stomachs, pay attention to the fetal movements, and write them down in a notebook).
- Education techniques to increase MFA and Performing techniques to increase MFA.
- Teaching to maintain mothers' and fathers' emotional and physical health during and after pregnancy.
- Teaching relaxation with mental imagery, training deep breathing

### 3.7. Data Analysis

The data were coded, entered into SPSS 26 software, and summarized using descriptive and analytical statistical methods. Comparisons of the changes made after the intervention in each group and between the two test and control groups were reported at a confidence level of 95% ( $P \leq 0.05$ ).

The intervention consisted of the "CBC Program" for which educational materials were prepared by the researcher through library study and educational scientific resources, as well as using experts' opinions in the fields of clinical psychology, counseling, obstetrics and gynecology, and midwifery education. The CBC intervention was provided by the researcher (an M.Sc. student of counseling in

midwifery) with expertise in clinical experience and was supervised by a doctor with a counseling specialty.

### 4. Results

This study was conducted by the random sampling method on 40 primipara mothers who fully completed the questionnaire three times before the intervention initiation, after the intervention completion, and finally 4 weeks after the intervention in the test and control groups.

In this study, the age of the primipara mothers averaged 24.5 years. Moreover, 50% of the primipara mothers were graduates with a bachelor's degree or higher, and 71.9% were satisfied with their pregnancy. The average standard deviations of Cranley's (1981) MFAS in the test group were 73.75, 86.30, and 100.15 in the three stages before the test, after the test, and 4 weeks after the end of the classes, respectively. The results showed that counseling with a cognitive-behavioral approach led to MFA relationships in primipara women so that the average scores of the test group were significantly higher than the control group ( $P < 0.05$ ). Table 2 demonstrates the frequency distribution of demographic characteristics. Also, Table 3 depicts determination and comparison of average attachment scores in the test and control groups before, after, and 4 weeks after the intervention.

Group Variable		Test		Control		P-value*
		distribution	percentage	distribution	percentage	
Child's gender	Boy	11	55	9	45	0.25
	Girl	9	45	11	40	
Spouse's education	Drop out	9	45	5	25	0.12
	Diploma and Associate	7	35	12	60	
	MSc and higher	4	20	3	15	
Primipara mother's education	Drop out	2	10	6	30	0.27
	Diploma and Associate	8	40	6	30	
	MSc and higher	10	50	8	40	
Place of residence	City	18	90	19	95	0.39
	Village	2	10	1	5	
Primipara mother's occupation	Self-employed	5	25	9	45	0.48
	Housewife	6	30	6	30	
	Employee	9	45	5	25	
Variable		Average $\pm$ SD		Average $\pm$ SD		P-value#
Age (year)		3.8 $\pm$ 19.8		7.8 $\pm$ 21.8		0.21
Gestational age (week)		1.02 $\pm$ 23.02		2.09 $\pm$ 23.09		0.76
Spouse's age		2.02 $\pm$ 27.02		6.13 $\pm$ 29.13		0.44
Duration of marriage (month)		09.19 $\pm$ 29.19		1.01 $\pm$ 30.01		0.16

**Table 2: The frequency distribution of demographic characteristics**

Test	Group	Average	SD	Average difference	t	P-value
Pretest	Test	73.75	6.72	0.50	0.022-	0.097
	Control	73.80	9.07			
Immediate post-test	Test	86.30	7.84	11.45	4.85	0.558
	Control	74.85	8.95			
Follow-up	Test	100.15	7.32	20.95	7.92	0.041
	Control	79.20	10.60			

**Table 3: Determination and comparison of average attachment scores in the test and control groups before, after, and 4 weeks after the intervention**

## 5. Discussion

Prenatal education provides a good opportunity to evaluate the MFA and carry out interventions to improve this component. The hypotheses of the research were confirmed by our findings, indicating that MFA counseling and training techniques and behaviors could increase MFA, thereby increasing mothers' mental health levels.

Although the pregnancy period and maternal-fetal physical health are nowadays important to families, psychological and emotional issues have not yet found their proper position. Teaching concepts such as MFA, formation of infant attachment styles, tension and coping strategies, newborn growth, correct parenting methods, and

mental health during pregnancy and improving its level during the stressful pregnancy period significantly change women's behavior and attitude toward the pregnancy period and the fetus. The findings showed that the intervention could improve the MFA level and the primipara mothers' mental health. This research is in line with those of Jackson et al. and Ballard et al. concerning the effect of teaching attachment techniques on increasing MFA and reducing anxiety and tension during pregnancy [18,19].

Jackson et al. presented evidence that prenatal CBC could positively affect depression, anxiety disorders, quality of life, and MFA [18]. After the intervention, the MFA score increased in the intervention group. Since MFA strengthens maternal role-taking,



it causes an increase in mothers' mental health levels (especially primipara mothers) after delivery. Hence, the results of this research correspond to those of Jackson et al.

Ballard et al. investigated the role of CBC in mothers' anxiety and found that mental health was higher in mothers with good interactions with their fetuses. Their results also showed that educational packages and home-based care did not affect the reduction of anxiety and depression levels, but it affected increasing the MFA level in pregnant women following stillbirth [19]. The results of Ballard et al. on the MFA component are in line with those of our study, but the results of the anxiety and depression level component do not agree with those of this research.

Akhlaghi, Abbasi, and Abbaspour also showed that learning and performing some attachment behaviors could increase the MFA level [20-22]. In line with the present study, studies conducted on primipara women also found similar findings. Shariat et al. also reported that psychological interventions were effective in creating and strengthening maternal-newborn emotional bonds, which is in agreement with the present study [23]. Contrary to the current research, maternal-newborn attachment behavior questionnaires were used in the study of Shariat et al.

According to the results of the research, it can be argued that pregnant women with a history of non-pregnancy (primipara) need to discourse in a supportive and impartial atmosphere. Communication skills, such as eye contact, therapeutic touch, and effective listening, are important for such women. These skills facilitate fulfilling mothers' needs as they obtain better information about pregnancy in relaxation.

In the analysis of the influence mechanism of psychological counseling on the increase of MFA behaviors in the present study, it can be argued that the psychological training provided in the group sessions of this study established trust and empathy-based communication with mothers. This intervention also encouraged them to review, express, and touch their memories of pregnancy and their relationships with the fetus, express positive and negative emotions and thoughts, accept emotions from the teacher and other group members, and encourage them to ask questions, which enabled the women to feel more attached to their fetuses. The group counseling led to mothers' use of each other's experiences, which was a feature of the present study.

The present study is also consistent with those of Mousavinejad, Nasiri, and Karami [9,24,25]. Zelkowitz et al. showed that learning attachment behaviors positively influenced mothers' attachment [7].

Additionally, the research results showed that CBC could improve pregnant mothers' psychological health, which corresponds to previous investigations [15,16,19,20,22,26-30]. Counseling probably

causes objectification of the fetus for the mother and strengthens both the relationship with the fetus and their mental images of the fetus, thereby increasing attachment.

The present study focused on establishing an affective and emotional maternal-fetal connection, hence it has a positive effect on the increase of maternal attachment during pregnancy. Studies show that mothers who experience attachment-related CBC show more maternal behaviors, which in turn can affect mothers' mental health [26].

As a feature of the present study, group counseling resulted in sharing mothers' feelings with each other, which in turn increased self-efficacy and improved mental health. Therefore, teaching and group CBC seem to be appropriate for use as an easy, inexpensive, and non-invasive method to increase attachment, especially in primipara women. This approach encourages pregnant women to perform these behaviors and have an untroubled pregnancy with more enjoyable experiences.

## 6. Limitations

Mothers were initially unfamiliar with attachment to their fetuses and sometimes were very indifferent to its beneficial effect on pregnancy. Thus, they should have been acquainted with this issue before counseling sessions, which led to delays in the starting process of group counseling sessions for mothers.

No suitable place and space was allocated to counseling, which was another limitation of this research. During this research, it was not possible to control small tensions in mothers' daily life as a limitation of the present study.

To mention other limitations of the current study, all the counseling sessions tried to enable mothers to create attachment relationships with their fetuses in different ways. However, a stronger relationship in terms of attachment might have been created by using ultrasound facilities and watching the fetus by the mother. Unfortunately, this was not feasible for most mothers due to financial limitations.

## 7. Conclusion

The results of the research demonstrate that counseling can increase MFA in primipara mothers, which was influenced by CBC. According to the results of this study, it seems that paying attention to CBC in pregnant mothers' health, especially mothers who will experience their first pregnancy, can redouble its effectiveness in improving MFA. Therefore, teaching these consultations to health workers, especially midwives and parents, before childbirth can help perform basic measures to improve parental-newborn relationships. The establishment of such behaviors in mothers can promise that pregnant mothers (especially primipara ones) will have better mental health in the future.

## Declarations

### Ethics Approval and Consent to Participate

The study was performed under the Declaration of Helsinki and approved by the Ethics Committee of the Research Deputy of the Shahid Sadoughi University of Medical Sciences (code: IR.SSU.MEDICINE.REC.1397.177.2018/12/26). After introducing the research and the objectives of the research, the pregnant mothers were assured that they are free to participate or not participate in this research and that failure to participate in this research will not cause any problems in the continuation of care, and they were also assured that all the information related to them remain confidential. Informed consent was obtained from all the participants in the study.

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