

# The effect of cognitive-behavioral counseling on maternal-fetal attachment among pregnant women with unwanted pregnancy in Iran: A randomized clinical Trial

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## Keywords

Cognitive-behavioral • Counseling • Maternal-fetal • Attachment • Unwanted Pregnancy

## Summary

**Background.** Unwanted pregnancy is an important public health concern that can have significant health, social, and economic effects on the mother, the baby and her family. The establishment and enhancement of maternal-fetal attachment (MFA) play a role in the promotion of emotional communication between the mother and the child in the future. This study aimed at investigating the effect of cognitive-behavioral counseling on maternal-fetal attachment among pregnant women with unwanted pregnancy.

**Methods.** In this randomized clinical trial, 60 eligible pregnant women with unwanted pregnancy and gestational age of 22-28 weeks who had referred to health centers in Mashhad, a city in the northeast of Iran, were selected and they were through random block assignment divided into two groups of counseling with the cognitive-behavioral approach ( $n = 30$ ) and the control group ( $n = 30$ ). In addition to the routine pregnancy care, the cognitive-behavioral counseling group received four group counseling sessions on a weekly basis, while the control group only received the routine pregnancy care from healthcare providers. Maternal-fetal

attachment before and after intervention in the two groups was assessed through Cranley's Maternal-Fetal Attachment Scale. Comparison of mean scores within and between the two groups was performed using SPSS 21 through independent and paired *t*-tests.

**Results.** At the end of the study and after the intervention, the mean scores of maternal-fetal attachment in the intervention and control groups were  $94.06 \pm 11.73$  and  $80.16 \pm 10.09$ , respectively, and the difference between the groups was significant. Although the difference between the mean scores of each group at the beginning and the end of the study was significant, this difference between the two groups was also noticeable ( $21.56 \pm 12.16$  vs  $7.40 \pm 12.39$ ) and statistically significant.

**Conclusions.** Cognitive-behavioral counseling can be effective in enhancing the maternal-fetal attachment in unwanted pregnancies; therefore, it is recommended to be integrated into pregnant women's healthcare programs.

## Introduction

While a wanted pregnancy is a happy and enjoyable event for the family [1], unwanted pregnancy is an important public health concern in low- and middle-income countries that can have significant health, social, and economic effects on the mother, the baby and her family [2].

About 121 million unplanned pregnancies occur annually, accounting for about 48% of all pregnancies among women aged 15-49 years worldwide [3]. The prevalence of unwanted pregnancy in Iranian women was 27.9% until 2017 [4]. Unwanted pregnancy is considered as a high-risk pregnancy [5]. Unwanted pregnancy is associated with dangerous consequences for the mother including physical, emotional and financial problems, depression during pregnancy and postpartum, suicidal thoughts, exposed to physical violence, unsuccessfulness in breastfeeding, mother's low self-esteem, reduced the

receipt of adequate antenatal care, pregnancy-related problems, increases maternal deaths [6-8]. Moreover, unwanted pregnancy increases the likelihood of low birth weight, premature birth [9, 10], small for gestational age, neonatal mortality [10], mortality of infants and children, delay in growth and social character, and behavioral and psychological disorders of children [8]. The anger of mothers during unwanted pregnancies is suppressed and hidden and has impacts on the baby and the mother, and mothers with unwanted pregnancies attend less to their babies compared to mothers who are happy and joyful during their wanted pregnancies [11].

Maternal-fetal attachment (MFA) is a term used to describe the emotional bond between the mother and the fetus [12]. Emotional attachment to the unborn baby is created from the beginning of pregnancy, reaching its peak in the second trimester, when the mother perceives the first movements of the fetus [13], and continuing until postpartum. MFA is promoted through eye contact,

olfactory and touch sense of the mother and the baby [14, 15]. The emergence of maternal-fetal attachment plays a significant role in mother's engagement in prenatal health practices and behaviors [16], as well as in the acceptance of parental identity [17]. Maternal-fetal attachment can be a predictor of the attitude and mother's performance after delivery, mother and baby interaction, and postpartum attachment patterns [18]. The maternal-fetal attachment has a close relationship with the mother's emotional state and the relationship between mother and child in the future. A mother who is attached to her fetus during pregnancy is ready to make a happy connection with the baby after childbirth [19, 20]. Maternal-fetal attachment is an effective factor in the motor development and physical growth of infants during pregnancy and after birth [17, 21].

With higher maternal-fetal attachment, the mother tends more to apply health behaviors during pregnancy, such as abandoning smoking and alcohol, proper nutrition, exercise, continuing prenatal care, desire to know the fetus and participating in childbirth preparation classes, increasing maternal-neonatal attachment and neonatal nutrition with breastfeeding. All these behaviors lead to a satisfactory outcome of pregnancy and to the promotion of maternal and neonatal health [22]. Maternal-fetal attachment can be affected by issues such as social support, mental status, gestational age, maternal age, number of births, income, education, family ties, support and acceptance of pregnancy, unwanted pregnancy, high-risk pregnancy, abortion history, and fetal or neonatal death [18]. Brockington and colleagues (2006) reported that in unwanted pregnancies, mother-baby bonding is delayed due to feelings of fear, anxiety, and depression [23].

Since in Iran abortion is illegal and religiously banned, unwanted pregnancies are more likely to continue compared to other countries. Considering the adverse effects of unwanted pregnancy complications on maternal adaptation during pregnancy and maternal-fetal attachment, and since such adaptation can predict postpartum adjustment and, as a result, maternal and neonatal relationships, it is essential to provide supportive and counseling services to mothers with unwanted pregnancies.

Cognitive-behavioral counseling is a psychological approach and it is one of the highly effective short-term treatments that purpose of which is to identify and challenge irrational behaviors and thoughts so as to bring the individual to general mental health [24]. Cognitive-behavioral approach, which is a combination of cognitive and behavioral approach, helps a person to recognize and change his distorted thinking pattern and ineffective behaviors. In order to change these distorted and ineffective thoughts, targeted sentences are used, as well as the presentation of detailed and organized behavioral assignments [25].

Therefore, considering the importance of unwanted pregnancies and the need for intervention to help improve the health of women who choose to continue pregnancy, and since little attention has so far been

paid to implementing counseling programs to increase maternal and fetal attachment in unwanted pregnancies, the aim of this study was to determine the effectiveness of midwifery counseling with a cognitive-behavioral approach on maternal-fetal attachment in unwanted pregnancies.

## Methods

### STUDY DESIGN

This is a randomized, double-blind clinical trial with two groups of intervention and control. It was conducted from September 2016 to March 2017 in Mashhad, Iran. The study protocol was approved by the Ethics Committee in Shahrood University of Medical Sciences, Shahrood, Iran (IR.SHMU.REC.1395.22) and registered in the Iranian Clinical Trial Center on 1 August 2017 (IRCT2016092930048N1). This clinical trial has been reported based on the CONSORT 2010 checklist [26].

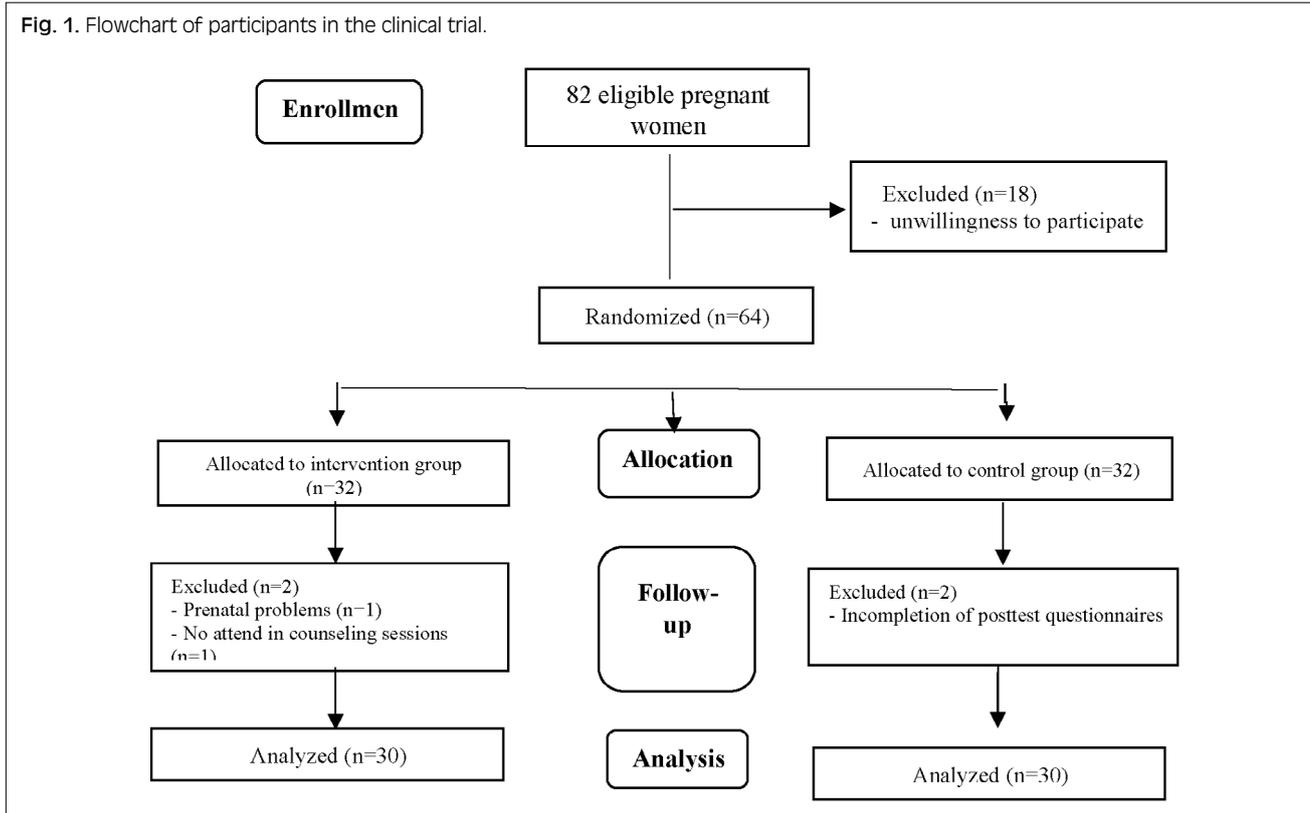
### PARTICIPANTS AND SETTING

Pregnant women referring to health centers in Mashhad, Iran, were selected for this study. Inclusion criteria for the study were: unwanted pregnancy; low-risk pregnancy; reading and writing literacy at least; gestational age of 22-28 weeks; singleton pregnancy; and no history of stillbirth, abortion, or mental illness. Exclusion criteria also were: lack of constant presence in counseling sessions; mothers' unavailability when completing the post-test questionnaire; occurrence of pregnancy problems; and severe stress.

### SAMPLE SIZE AND RANDOMIZATION

Sample size was calculated based on the formula of difference of means in two independent groups and according to the mean and standard deviation of post-intervention attachment score ( $64.6 \pm 3.6$  and  $61.1 \pm 5.1$ ) in a similar study (27) and considering a confidence level of 95% ( $\alpha = 0.05$ ) and a test power of 80% ( $\beta = 0.20$ ); 25 people were calculated in each group, that considering 25% drop, the size of each group was determined to be 32. Among the five health centers of Mashhad city, three centers were selected through cluster sampling. Each of these health centers includes several comprehensive health service centers. From each of these centers, three comprehensive health service centers were selected through cluster sampling. Subsequently, using the registry notebook of mothers, 112 women with unwanted pregnancies were listed, from whom 82 women were eligible to enter the study. These women were contacted, and 64 pregnant women were willing to participate in the study. Then, based on randomized block of four, 32 women were assigned to the intervention group and 32 were assigned to the control group. Of these, two women in the intervention group (one due to prenatal problems and one because of reluctance to attend the counseling sessions for personal reasons) and two women in the control group (due to the lack of completion of post-test questionnaires) were excluded from the study (Fig. 1).

Fig. 1. Flowchart of participants in the clinical trial.



## MEASURES

The instrument for collecting information was a questionnaire consisting of two parts. The first part included demographic characteristics and the second part included the Cranley's Maternal-Fetal Attachment Scale (MFAS). The Cranley's Maternal-Fetal Attachment Scale has 24 Likert items on a five-point scale ranging from 1 to 5 (Definitely yes: 5, Yes: 4, Not sure: 3, No: 2, Definitely no: 1), and only in the item 22, the scoring is done in reverse. The total score on the scale can range from the minimum 24 to the maximum 120. A higher score indicates more attachment [28]. The reliability of its English [28] and Persian [29] version has been confirmed in previous studies. The scale was administered to the participants in the two groups prior to the intervention and two weeks after it.

## INTERVENTION

The participants who were eligible based on the inclusion criteria entered the study. Upon entry, participants in both groups completed the Cranley's Maternal-Fetal Attachment Scale. Then, the intervention group, in addition to routine healthcare, received attachment counseling sessions. Along these lines, based on their convenience for attendance, the intervention group members were divided into 3 groups of group counseling (one 10 and two 11 member groups) based on the proposed time to attend counseling sessions. Four weekly one-hour cognitive-behavioral counseling sessions were held for each group in health care centers by one of the researchers (a master's student) who was

a trained midwife in counseling, while the control group received only routine health care in these centers. It should be noted in order to prevent the transmission of information in the intervention group and the control group, it was planned that the control and intervention group were invited on different days to avoid contact. Two weeks after the intervention, the Cranley's Maternal-Fetal Attachment Scale was completed again for the two groups. To maintain the blindness in the study, the outcome (maternal-fetal attachment) on two weeks after the intervention, was measured by another midwife who was unaware of the allocation. The content of cognitive-behavioral counseling sessions is presented in Table I.

## DATA ANALYSIS

The collected data were analyzed using SPSS 21. To determine the homogeneity of quantitative and qualitative variables between two groups, respectively t-test and Chi-square were used. Paired t-test and independent t-test were used to compare the maternal-fetal attachment changes between and within the groups. The significance level of the tests was set at less than 5%.

## Results

In this study, the age range of the of participants was between 15 and 42 years, and no significant difference was observed between the groups. Other characteristics of the participants are shown in Table II. According to the results of Table II, there was no significant difference

**Tab. I.** Content of cognitive-behavioral counseling sessions.

<b>First session</b>
1. Welcoming
2. Knowing the group members and introducing the counselor, and the purpose, length, and number of sessions
3. Emphasizing the importance of participation in counseling sessions and of doing the homework assignments
4. Briefly describing the developed counseling program
5. Presenting the discussion on thoughts, and feelings
6. Discussing unwanted pregnancy and its complications
7. Knowing the reasons for considering a pregnancy as unwanted and providing appropriate counseling
8. Discussing the maternal-fetal attachment and its benefits
9. Determining homework assignments
<b>Second session</b>
1. Reviewing the previous session's main points and checking and discussing homework assignments
2. Introducing cognitive-behavioral counseling approach
3. Introducing cognitive and behavioral concepts
4. Group training based on previous homework assignments
5. Talking about misconceptions about pregnancy and fetus and correcting them
6. Teaching how to focus on the fetus and recognizing it as an independent entity, touching the abdomen by the pregnant mother, and recognizing and guessing the position of the fetus, counting the movements of the fetus from the abdomen, imagining a positive shape of the fetus, calling the fetus with a nickname, talking with the fetus, looking at the abdomen and paying attention to fetal movements, imagining hugging and breastfeeding the baby and giving a checklist for recording daily attachment behaviors
<b>Third session</b>
1. Reviewing the main points of the previous session and checking homework assignments
2. Introducing the relaxation technique
3. Problem-solving training
<b>Fourth Session</b>
1. Reviewing previous sessions and checking homework assignments
2. Summarizing

between the intervention and control groups in terms of age, occupation, education, number of pregnancies, sexual preferences and the use of contraceptive methods. In beginning of the study and before the intervention, mean scores of maternal-fetal attachment in cognitive-behavioral counseling and control groups were  $72.58 \pm 8.63$  and  $72.76 \pm 9.13$ , respectively, and there was no significant difference between the two groups ( $p = 0.91$ ). At the end of the study and after the intervention, the mean maternal-fetal attachment scores in the intervention and control groups were  $94.06 \pm 11.73$  and  $80.16 \pm 10.09$ , respectively, and results of the independent t-test showed a significant difference between the two groups ( $p < 0.0001$ ). Results of the paired t-tests also indicated that there was a significant difference between the mean maternal-fetal attachment scores of each group at the beginning and at the end of the study ( $p < 0.0001$  for the intervention group, and  $p = 0.003$  for the control group). In other words, the mean maternal-fetal attachment score of the intervention group after the counseling, and the control group at the end of the study, increased significantly. Although the difference between the mean scores of

each group at the beginning and the end of the study was significant, this difference between the two groups was also noticeable ( $21.56 \pm 12.16$  vs  $7.40 \pm 12.39$ ) and statistically significant ( $p < 0.0001$ ) (Tab. III).

## Discussion

The purpose of this study was to assess the effect of cognitive-behavioral midwifery counseling on maternal-fetal attachment among women with unwanted pregnancy. Since, based on previous studies, the maternal-fetal attachment in unwanted pregnancies was significantly lower than that in wanted pregnancies, so these pregnancies need more counselling and intervention [19, 30].

The findings of this study showed that the maternal-fetal attachment in the intervention group was significantly higher than that in the control group. This could be due to the effect of cognitive-behavioral counseling techniques on maternal-fetal attachment in unwanted pregnancies. Cognitive approach helps a woman to change the way she thinks about herself, her baby, and her pregnancy, and in turn increases her ability to be emotionally responsible

**Tab. II.** Comparison of demographic and midwifery characteristics of the participants in two groups.

Variable		Intervention group (n = 30) Number (%)	Control group (n = 30) Number (%)	p-value <sup>a</sup>
Age (years)	Under 25	8 (26.6%)	11 (36.6%)	0.53
	25-30	11 (36.6%)	9 (30%)	
	Over 25	11 (36.6%)	10 (33.4%)	
Education	Below diploma	13 (43.3%)	13 (43.3%)	0.69
	Diploma	13 (43.3%)	15 (50%)	
	Higher than diploma	4 (13.4%)	2 (6.67%)	
Job	Housewife	20 (66.6%)	19 (63.4%)	0.99
	Employed	10 (33.4%)	11 (36.6%)	
Number of pregnancies	1	9 (30%)	8 (26.7%)	0.88
	2	7 (23.4%)	8 (26.7%)	
	≥ 3	14 (46.6%)	14 (46.6%)	
Sex preference	Girl	7 (30%)	11 (36.6%)	0.06
	Boy	14 (23.4%)	17 (56.7%)	
	No difference	9 (46.6%)	2 (6.67%)	
Use of contraceptive methods	Yes	13 (43.3%)	18 (60%)	0.15
	No	17 (56.7%)	12 (40%)	

<sup>a</sup> Significance level:  $p < 0.05$ .

**Tab. III.** Comparison of maternal-fetal attachment scores before and after intervention in two groups.

Groups	N	Beginning of the study	End of the study	Difference	Paired T- test <sup>a</sup>	
Intervention	30	72.50 ± 8.43	94.06 ± 11.73	21.5 ± 12.16	T = 9.7	P < 0.0001
Control	30	72.76 ± 9.13	80.16 ± 10.09	7.40 ± 12.25	T = 3.28	P = 0.003
T-test <sup>a</sup>		T = 0.11	T = 4.92	T = 4.47		
		P = 0.91	P < 0.0001	P < 0.0001		

<sup>a</sup> Significance level:  $p < 0.05$ .

for her baby [31]. Pregnancy training programs can be a good way to resolve pregnancy problems by teaching pregnant women about the issues they need, such as teaching attachment behaviors.

Studies on the effect of education and different methods of counseling on attachment style of pregnant women have produced controversial results.

Some studies showed that after various psychological interventions, there is a significant increase in maternal-fetal attachment [13, 15, 27, 29, 31]. Abbasi et al. (2008) [32] and Toosi et al. (2011) [27] concluded that training and performing some attachment behaviors increased maternal-fetal attachment. Increase in the maternal-fetal attachment in their studies is in line with the results of the present study. A study by Kim et al. (2004), showed that teaching maternal-fetal attachment behaviors, such as speaking and touching the fetus from the abdomen, in primiparous mothers can increase maternal attachment in the intervention group compared with the control group, which is consistent with the our findings [33]. In this study, the reasons that this psychological counseling significantly improved the MFA score were the training of the following behaviors: teaching how to focus on the fetus and recognizing it as an independent entity, touching the abdomen by the pregnant mother, recognizing and guessing the position of the fetus, counting the movements of the fetus from the abdomen, imagining a positive shape of the fetus, calling the fetus with a nickname, talking with the fetus,

looking at the abdomen and paying attention to fetal movements, imagining hugging and breastfeeding the baby.

Azogh et al. (2018) also stated that cognitive-behavioral training increases maternal-fetal attachment in pregnant women with a history of stillbirth, which is in line with the result of this study [34].

As the results of the current study indicate, although the mean maternal-fetal attachment score after the counseling showed a noticeable increase in the intervention group, the control group also gained an increase in the mean attachment score, although this increase in the control group is much lower than the intervention group. The increase in the score in the control group could be due to the increase in the gestational age. This finding is consistent with the studies of Salibury et al. (2003) and Ustunsoz et al. (2010), who mentioned that with the increase in the gestational age, the maternal-fetal attachment also increases [12, 19].

In the study of Sastad et al. (2011), educational intervention among mothers did not increase maternal attachment to the fetus, which is not consistent with the results of the present study [35]. Ahern & Ronald (2003), who studied the effect of fetal touching on mother attachment behaviors found that there was no significant difference between the two groups after the intervention [36].

Therefore, it can be seen that there are different results regarding the effect of training and a variety of counseling

methods on attachment style in pregnant women. Salisbury et al. (2003) also mentioned that the amount of maternal-fetal attachment might be different in different training programs, which could be due to differences in counseling and training procedures, location, length or the onset time of the training in pregnancy [12].

One of the strengths of this study was that group counseling encouraged mothers to share experiences. Since the pregnancy was unwanted, the participants were less inclined to attend counseling sessions and to reduce this limitation, it was tried to emphasize the importance of maternal-fetal attachment and the possible benefits of counseling for women, and to encourage them to take part in the following sessions. Another limitation was the lack of follow up of mothers to postpartum and the lack of investigation of the effect of intervention on the attachment of mother and child after birth due to time constraints.

## Conclusions

The results of the present study showed that midwifery group counseling with a cognitive-behavioral approach at the end of the second trimester of pregnancy increases the maternal-fetal attachment. Since, based on previous studies, maternal-fetal attachment is a very important and influential indicator in the physical growth and motor development of children during pregnancy and after birth [21, 37]; therefore, it is recommended that midwifery group counseling with a cognitive-behavioral approach is used as an easy, inexpensive and non-invasive method to increase maternal-fetal attachment especially among women with unwanted pregnancies.

## Ethics Approval

Before embarking upon the study, approval was obtained from the Ethics Committee of Shahroud University of Medical Sciences (IR.SHMU.REC.1395.22); the study was registered in the Iranian Registry of Clinical Trials (Code IRCT2016092930048N1), and finally, a written permit was obtained from the concerned authorities to produce it to the research environments. Then, written informed consents were obtained from all participants and they were briefed on stages of the study and the procedures for their admission and participation in counseling sessions.

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## Informed consent statement

Informed consent was obtained from all participants.

## Conflict of interest statement

There is no conflict of interest in this study.

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