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Effect of Training Maternal-fetal Attachment Behaviors Based on Iranian-Islamic Culture on the Anxiety in Pregnant Women

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ABSTRACT

Background and Objectives: The emotional relationship between a mother and her fetus is considered one of the stages of the mother's adaptation to facing pregnancy anxiety. It seems that maternal-fetal attachment behaviors are different in various cultures and religions. This study aimed to examine the effect of training maternal-fetal attachment behaviors based on Iranian-Islamic culture on anxiety in pregnant women referred to health centers in Qom City, Iran.

Methods: This quasi-experimental research included 84 singleton primigravida pregnant mothers aged 30 to 34 years who were selected by convenience sampling method and randomly assigned to the experimental and control groups. The Spielberger state-trait anxiety inventory (STAI) and Cranley's maternal-fetal attachment scale (MFAS) were administered at both pre- and post-intervention weeks in both groups. In addition to the usual care, the experimental group received training on maternal-fetal attachment behaviors based on Iranian-Islamic culture in eight 30-minute sessions over four weeks. Data were analyzed by SPSS software version 26 using the independent t-test and paired t-test.

Results: No statistically significant difference was observed between the two groups' average anxiety scores before the intervention (P=0.67). After the intervention, a statistically significant difference was observed between the two groups' mean anxiety scores (P=0.002).

Conclusion: Training in maternal-fetal attachment behaviors based on Islamic-Iranian culture reduced the anxiety of pregnant mothers. This training serves as a foundation for strengthening trust and hope in God, leading to a calmer mental and spiritual state for the mother. Healthcare providers are encouraged to recommend these training sessions.

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Introduction

One of the most attractive stages of a woman's life that leads to her growth is motherhood. Changes in the mother's body and mind can cause stress and worry. If these changes become abnormal, psychological pressures appear in the long term, creating a stressful period [1]. The World Health Organization (WHO) has estimated that more than 80% of women with low-risk pregnancies experience some degree of anxiety during their pregnancy. Among three to five pregnant women in developing countries, one has anxiety problems [2]. In different parts of Iran, the prevalence of anxiety in pregnant women ranges from 26% to 43% [3]. Anxiety increases muscle contraction and decreases oxygen supply to the brain; as a result, the mother may feel more tired, sensitive, and stressed, making it difficult for her to cope with pain [4]. In addition, it leads to physical and mental disorders in the mother, heart rate and fetal movement disorders, adverse outcomes during birth and infancy, and inappropriate responses of the mother to the fetus [1]. Due to restrictions on prescribing medications during pregnancy and breastfeeding, non-pharmacological methods are employed to prevent and alleviate anxiety and depression associated with pregnancy. One such intervention is training aimed at enhancing maternal-fetal attachment skills [5]. Maternal-fetal attachment is a stable relationship based on the intimacy of mother and fetus, which leads to satisfaction and relief and facilitates maternal-fetal interaction [6]. The concept of attachment in this category refers to a positive and mutual emotional relationship between the mother and her fetus/infant [7]. The primary relationship between the mother and her fetus before birth is described as maternal-fetal attachment [8].

As observed in the literature, the fetus reacts to the mother's physical and mental environment by kicking and moving, allowing the mother to bond with her child long before birth [9]. Various methods of increasing maternal-fetal attachment help mothers find ways to cope with stress and anxiety [10].

Mothers' attachment begins in the 10th week of pregnancy and expands rapidly by the 16th week [11]. Several studies have been conducted regarding various factors related to maternal-fetal attachment. Some of these studies indicate that mothers' age at the time of pregnancy, education level, employment status, economic conditions, marital satisfaction, number of births, stage of pregnancy, satisfaction with the sex of the fetus, and maternal stress are factors related to maternal-fetal attachment [12]. Perceived social support (having someone to talk to and access practical help if needed) is a vital determinant [13]. In addition, high levels of maternal-fetal attachment are reported when mothers and fathers have a positive relationship [10]. When the mother perceives her health as interconnected with that of the fetus, her interaction with the fetus is strengthened [8] and this interaction can help reduce anxiety [9]. However, anxiety disorders experienced during pregnancy can negatively impact the health of both the mother and fetus and weaken attachment during pregnancy. Research has shown a relationship between panic disorders and premature birth, as well as low birth weight [7]. To reduce the stress, the mother's focus and attention should be shifted to daily activities and challenges. Thinking about the fetus and performing attachment behaviors, such as talking to and touching the fetus, can provide conditions that help calm the mother [8].

Considering the adverse consequences of maternal anxiety and depression during pregnancy and after delivery, it is essential to find a safe, low-cost and convenient technique to improve the mental health of mothers [1]. Research has shown that some interventions increase the relationship between mother and fetus, one of which is training in attachment behaviors. These behaviors include talking to the fetus, touching the fetus through the abdomen, paying attention to the fetus's movements, positively imagining the fetus's appearance, guessing the positions of its limbs, counting the fetus's movements, calming the fetus by touching the abdomen and imagining hugging and breastfeeding. All of these activities promote attachment behaviors and reduce anxiety [14]. In studies involving pregnant women, training in attachment behaviors related to active communication with the fetus—such as listening to the recitation of the Holy Quran, counting fetal movements, touching the abdomen, and positively imagining the fetus—demonstrated a higher degree of maternal-fetal attachment [7]. Evidence shows that maternal-fetal attachment can predict the mother's feedback and performance after childbirth, her interaction with the infant and attachment patterns after the birth of the child [15].

Considering the mental health of pregnant mothers and reducing stress and anxiety in primigravida women—who may experience these feelings due to a lack of previous pregnancy experience—it is essential to recognize that this situation is one of the fundamental aspects of modern midwifery care. Training in attachment behaviors is a suitable non-invasive and non-pharmacological treatment method to improve the attachment status of the mother and her fetus. Preparing pregnant women to

accept their maternal role is one of the crucial responsibilities of midwives; however, vital prenatal services in our country are primarily focused on the physical care of mothers, with less attention given to the psychological needs of pregnant women. Prenatal care provides a valuable opportunity to evaluate maternal-fetal attachment behavior, and midwives have the greatest opportunity to communicate with pregnant women throughout their pregnancy [16].

Few studies have been conducted on maternal-fetal attachment behaviors, which are mainly related to Western societies. It seems that attachment behaviors differ across cultures because each culture has its own belief system regarding crucial life events, such as pregnancy and childbirth, which must be understood to provide effective healthcare. Sometimes, beliefs and cultural backgrounds significantly influence people's roles during different stages of life [17]. Over the past decade, the positive effects of spirituality and religion on psychological factors have been studied; spiritual experiences are directly related to perceived stress, depression and anxiety, pain, positive and negative mood, mental health, physical health, and quality of life [18]. Accordingly, in Iranian culture, which is based on the teachings of Islam, pregnancy and the factors affecting it are frequently emphasized, as outlined in reliable religious sources such as Bahar al-Anwar, Osul Kafi, and various books, including Reyhaneh Beheshti, which thoroughly addresses pregnancy. Many women believe in and follow these teachings [19]. Based on this understanding and considering this cultural and religious framework to promote mental health and reduce anxiety among pregnant mothers, the present study was conducted to determine the effect of training in attachment behaviors based on Iranian-Islamic culture on anxiety and maternal-fetal attachment.

Methods

This quasi-experimental research included 84 singleton primigravida pregnant mothers with a gestational age of 30 to 34 years, who were referred to two medical training centers, Khayyering Salamat and Shohada, and provided informed consent. Participants were selected by convenience sampling method and randomly assigned to the experimental and control groups. To determine the sample size, considering α=0.05, β=0.2, d=2, and power = 95%, 42 participants were determined for each group. A lottery was conducted to select the first group, with the first participant placed in the Iranian-Islamic attachment behavior training group and the subsequent participant placed in the control group; thus, all samples for both groups were completed.

Inclusion criteria included being Iranian, Muslim, in their first pregnancy, experiencing a desired pregnancy, having a singleton pregnancy, being at a gestational age of 30-34 weeks, being satisfied with the fetal sex (either male or female), having no obstetric problems, experiencing no stressful and emotional events during pregnancy, having no history of underlying mental illness, being a non-smoker, and scoring between 20 and 60 on the Spielberger's state-trait anxiety inventory (STAI). The exclusion criteria included pregnancy complications, intrauterine death, premature birth, and the occurrence of an unfortunate event (divorce and death of relatives) during the recent pregnancy.

The training of attachment behaviors based on Iranian Islamic culture includes a brief description of the anatomical and physiological changes that occur in the mother during pregnancy and their effects on the mother's body and mind. It also involves familiarization with the stages of fetal development and how maternal-fetal attachment is formed, the concept of maternal dignity and the preservation of fetal life as taught in the Quran and the hadiths of the innocents, and the effect of prayer, trust, hope, and patience in creating peace for the pregnant mother. Additionally, the training includes teaching spiritual self-care during pregnancy, providing guidance on Islamic nutrition and proper sleep, recommending the recitation of the Holy Quran, encouraging the repetition of recommended phrases during pregnancy, sharing popular local Iranian lullabies, and reviewing exercises requested from mothers in each training session.

The data collection tools included an interview form (including personal and pregnancy information), STAI, and Cranley's maternal-fetal attachment scale (MFAS).

The STAI consists of two parts that measure situational and personality anxiety, featuring 40 short questions arranged both positively and negatively, with each question offering four response options. The anxiety score ranges from 20 to 80. It is used in most research articles and Khodayarifard et al. calculated its validity and reliability for women, determining the situational part to be 94% and the personality part to be 74% [20].

Another tool was the MFAS. This questionnaire has been translated into Persian, and its validity has been confirmed by content validity and reliability by the retest method, with a correlation coefficient of r=0.85 [21].

Table 1. Comparing individual characteristics of the research samples in the two experimental and control groups

Demographic Variables		Mean±SD/ No. (%)		P
		Experimental Group	Control Group	
Age (years)		23.0±4.3	22.0±3.5	0.1
Sex	Male	19(45.23)	20(47.61)	0.76
	Female	20(47.61)	18(42.85)	
	Unclear	3(7.14)	4(9.52)	
Marital satisfaction	Yes	38(90.47)	39(92.85)	0.07
	No	4(9.52)	3(7.14)	
Occupation	Employed	5(11.90)	7(16.66)	0.35
	Housewife	37(88.09)	35(83.33)	
Education level	Secondary school	6(14.28)	4(9.52)	0.08
	High school and diploma	29(69.04)	32(76.19)	
	Academic	7(16.66)	6(14.28)	

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The STAI and MFAS were administered to the samples twice: Once before the intervention and again four weeks after the intervention. In the experimental group, in addition to the usual pregnancy care, training in maternal-fetal attachment behaviors based on the teachings of Iranian-Islamic culture was provided by the researcher in eight 30-minute sessions over four weeks (two sessions per week) in an individual and face-to-face manner. To describe the characteristics of the research samples, descriptive statistics were employed, including frequency tables and Mean±SD. To compare the two groups, an independent t-test was used and to compare each group at the two stages (before and after the intervention), a paired t-test was utilized. In all tests, a significance level of less than 0.05 was considered, and data were analyzed using SPSS software, version 23.

Results

In the present study, no statistically significant difference was observed between the two groups regarding age, sex of the fetus, marital satisfaction, occupation, and level of education (Table 1).

The mean anxiety score before the intervention in the experimental group was 45.3±4.9; while in the control group, it was 46.2±2.7. The results of the independent t-test did not show a significant difference between the two groups in terms of the mean anxiety score before the intervention (P=0.67).

The mean anxiety score after the intervention in the experimental group was 41.3±4.5, while in the control group, it was 45.9±4.9. This difference between the two groups was significant (P=0.002) (Table 2).

The results of the paired t-test showed that the mean scores for both aspects of situational and personality anxiety in the experimental group significantly decreased after the intervention, while no significant change was observed in the control group (Table 3).

Discussion

Anxiety is one of the most common symptoms of pregnancy with adverse effects, such as spontaneous abortion, low-weight fetus, increased levels of stress hormones, chronic high blood pressure, premature birth, and infant mortality [22].

The results of this research showed that the anxiety level of pregnant mothers was average. By using maternal-fetal attachment behavior training based on Iranian-Islamic culture, pregnant women's anxiety was reduced in both situational and personality aspects in the experimental group. Currently, various interventions are performed by midwifery staff in the form of various train-

Table 2. Comparing the mean anxiety score in the two experimental and control groups before and after the intervention

Stages / Groups	Mean±SD		P*
	Pre-intervention	Post-intervention	
Experimental	45.3±4.9	41.3±4.5	0.003
Control	46.2±2.7	45.9±4.9	0.56
P**	0.67	0.002	-

*Paired t-test, **Independent samples t-test.

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ing to control the anxiety of pregnant mothers, which have been effective in preventing anxiety disorders [23]. The results of this study are consistent with those of Mokhtaryan et al. [22], Rezaie et al. [24] and Maasoumi et al. [25]. In quasi-experimental evidence, educational interventions centered on Islamic teachings, especially for primigravida mothers [22], as well as spiritual self-care training provided in a combined way to pregnant mothers experiencing premature labor pain have reduced the level of anxiety in the experimental group [24, 25]. This could be due to the educational content based on Iranian Islamic culture, which has increased the mother's awareness and recognition of their position and dignity, fostered a stronger sense of God's presence, and increased trust and hope toward Him, thereby creating a positive attitude regarding the mothers' ability to care for themselves and their fetus [24].

In a longitudinal study in Latin America in 2010, 69 mothers over 18 years of age, at 28-40 weeks of pregnancy, were examined to determine the relationship between spirituality and psychological, social, and maternal outcomes. In this study, 65% of the participants exhibited high and moderate religious tendencies, while 71.4% demonstrated high spiritual tendencies with moral adherence. The results showed that the level of anxiety, the average weight of the baby at birth, and the mental health of the mother in the mothers showed a statistically significant difference between the groups based on their levels of spirituality (P=0.05). Mothers with high and moderate spiritual tendencies reported lower levels of anxiety [26].

In the present study, a significant difference was observed in both aspects of situational anxiety (P=0.012) and personality anxiety (P=0.014) between the experimental and control groups. Mental health studies have reported that women experience anxiety disorders almost twice as often as men. One of the critical periods in women's lives during which they may encounter common anxiety disorders, such as anxiety and depression, is pregnancy; the prevalence of these disorders in various studies ranges from 18.2% to 24.6%, and sometimes even higher [27]. Mirzaee et al. [28] observed a significant inverse relationship between engaging in religious acts, participating in charitable activities, and employing positive and active religious coping strategies among pregnant mothers and both situational and personality anxiety. Meanwhile, a significant direct relationship was observed between negative and passive religious coping and both situational and personality anxiety. In addition, the average scores of situational anxiety had a significant relationship with women's education, spouses' education and occupation, economic status, and housing sta-

Table 3. Comparing the mean score of anxiety aspects (situational and personality) in the two groups before and after the intervention

Groups / Variables		Mean±SD		P*
		Experimental	Control	
Situational anxiety	Pre-intervention	24.4±2.5	23.4±2.3	0.645
	Post-intervention	21.3±2.3	22.8±2.9	0.012
Personality anxiety	Pre-intervention	23.8±2.4	23.1±2.6	0.457
	Post-intervention	21.7±2.5	22.3±2.4	0.014

* Independent samples t-test.

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tus. No relationship was observed between state anxiety variables and fertility. Based on multiple linear regression analysis, negative and active religious coping predicted 27% of situational anxiety and 15% of personality anxiety [28]. In Iranian-Islamic society, religion is one of the most effective psychological supports for people, providing meaning in life throughout one's existence, especially during difficult and critical times. Many psycho-emotional disorders are interconnected with spiritual issues, and without addressing these aspects, diagnosis, care, and treatment may not be successful. In the research conducted, the implementation of spiritual care based on Islamic teachings successfully highlighted the reduction of anxiety in different groups studied [29].

Conclusion

This study showed that training in maternal-fetal attachment behaviors based on Iranian-Islamic culture reduced the anxiety of pregnant mothers.

In Iranian society, the Islamic religion and its teachings serve as some of the most effective psychological supports for individuals, providing a foundation for strengthening trust and hope in God. According to Islamic teachings, spiritual health is nurtured at all stages of life, including pregnancy, helping to calm pregnant mothers both mentally and emotionally. Some experiences and research evidence show that Quranic teachings encourage patience and rational responses to various psychological and emotional disorders and conflicts.

Training in maternal-fetal attachment behaviors based on Iranian-Islamic culture is an effective intervention method. This method has advantages, such as compatibility with the culture of Iranian society, being less time-consuming, easy access, and low cost, which ultimately improve the mental health of pregnant mothers. Therefore, healthcare workers and midwives working in health centers should incorporate these rich teachings to improve the mental health of pregnant mothers.

Ethical Considerations

Compliance with ethical guidelines

This research project was approved by the Ethics Committee of Qom University of Medical Sciences (Code: IR.MUQ.REC.1402.041). In terms of intellectual rights, it was conducted with the support of the Spiritual Health Research Center of Qom University of Medical Sciences.

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Authors' contributions

Study design, intervention and editing: Hoda Ahmari Tehran and Nahid Mehran; Investigation: Sara Bakoui.

Conflict of interest

The authors declared no conflict of interest.

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