

The effect of maternal–fetal attachment education on maternal mental health

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Aim: A mother's mental health during pregnancy has a considerable effect on her infant's wellbeing. Therefore, various methods have been studied to improve maternal mental health with the purpose of reducing problems for mothers and babies. The aim of this study was to determine the effect of maternal–fetal attachment (MFA) education during the third trimester on the mother's mental health.

Materials and methods: This interventional study was conducted on 83 pregnant women attending 6 healthcare centers in Sari, Iran, for routine antenatal check-ups. Data collection tools included interview checklists, the Cranley MFA Scale, and the General Health Questionnaire 28. The treatment group received education on MFA behavior, but the control group received only the routine antenatal care. The scores of mental health and MFA before and after training were compared across the 2 groups.

Results: The results indicated that the mean difference between mental health scores before and after treatment due to group division was significant ($t = 9.7, P < 0.001$). The mean difference between MFA scores before and after treatment due to group division was also significant ($t = 9.3, P < 0.001$).

Conclusion: The results indicate that educating mothers on MFA behavior can enhance the mother's mental health and attachment to the infant.

Key words: Maternal education, maternal–fetal attachment, behavior, mental health

1. Introduction

Despite creating a pleasing sense, pregnancy is a physical and psychological stressor (1). Abiodun et al. reported the prevalence of depressive disorders in pregnancy to range between 4% and 20% (2). Cury and Menezes showed that the prevalence of antenatal anxiety states and traits in a private setting sample were 59.5% and 45.3%, respectively (3). In the study by Karmaliari et al., 18% of women were anxious or depressed (4).

The anxiety level of the mother, exposure to stress, and ways of handling stress affect an unborn child and predict developmental problems in infants (5,6). Recent studies have highlighted the negative impact of antenatal mental health problems during pregnancy on fetal and neonatal outcomes, (7) including risks of preterm delivery, low birth weight, operative delivery, miscarriage, elective termination of pregnancy, and unwanted effects on mother and infant (8–11). It is believed that two-thirds of premature contractions are psychosomatic, caused by

psychosocial stressors. During the past several decades, great strides have been made in improving the outcomes of pregnant women and their babies. Many intervention programs were designed and instituted to promote the best outcomes. One of these interventional methods that can help mothers is to improve maternal–fetal attachment (MFA) so that the mother can better cope with stress (5). Mental health problems during the transitional period to parenthood can be caused by various factors, and parental distress about the child's wellbeing is found to be an important determinant of parental mental health (12).

The first connection of a mother with her child generally begins during pregnancy (5). This connection is referred to as MFA (13). The results of the study by Schmidt et al. demonstrated that mothers with strong bonding showed higher MFA and less anxiety (14), and the degree of anxiety is related to the quality of MFA (15). There is also a relationship between depressive symptoms in pregnancy and MFA (16). Lindgren showed that mothers with higher

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attachment have healthier behaviors that cause their health to improve (17). MFA has been previously identified as a pregnancy-related factor that may alter the behavior of pregnant women and may serve to increase the mother's level of participation in positive health practices (18), and it can influence neonatal outcomes (19).

One way to improve MFA is through education, where we motivate mothers to engage in certain activities. As in recent years there has been special attention focused on mothers' mental health and its relation with MFA, this study seeks to investigate the effect of education about MFA behaviors on primigravid mothers' mental health.

2. Materials and methods

In this interventional study, we explored the effect of MFA behavior education on mothers' mental health during the third trimester of pregnancy. We studied 83 primigravid mothers. Our inclusion criteria were: age range of 18–35, having finished at least primary school education (which is equivalent to school attainment of a 14-year-old person), primigravid, gestational age of 28–32 weeks, and having no obstetric or psychological problems. The tools utilized in this research included an interview form, General Health Questionnaire 28 (GHQ-28) to determine mental health scores, Cranley's MFA questionnaire to assess attachment scores, and a social support form to determine social support degrees.

2.1. MFA scales

This scale was used to measure the mother's attachment to the expected child (20). The MFA Scale is a self-administered instrument with 24 items asking women questions about behavior or thoughts indicative of MFA during pregnancy. Questions have 5 choices ranging from 1 (definitely no) to 5 (definitely yes). Higher total scores indicate higher levels of MFA. Permission was obtained from Cranley to adapt the scales for Iranian culture. We translated this scale into Farsi. The instrument was pilot-tested on 10 pregnant women to assess the clarity of the items. The reliability of the Cranley MFA Scale was approved by the content reliability. The internal consistency of MFA was approved by Cronbach's alpha (0.80). The GHQ-28 consists of 4 subscales of 7 items: somatic signs, anxiety, social dysfunction, and depression. It provides mental health assessment on 4 dimensions corresponding with these 4 subscales. The patient was asked to assess changes in her mood, feelings, and behaviors during the past 4 weeks. The questions used a 4-point response scale. This scale has been widely used on pregnant women in our society and is known to have high reliability and validity (21).

The reliability of interview forms was approved by test-retest ($r = 0.9$) and equivalent form reliability was used to assess social support forms by cross-stability ($r = 0.9$, $P = 0.00$).

Three healthcare centers were devoted to the control group and 3 to the treatment group randomly. For the treatment group, 4 sessions of 2 h were held weekly. They received education about MFA. In the first session, concepts such as attachment, MFA, benefits of attachment, and methods of performing attachment behavior were taught. These behaviors included counting fetus movements and recording them, positive imagination of fetus appearance, speaking to the fetus, imagining breastfeeding the baby, and touching the abdomen.

Meanwhile, mothers were given forms to record these behaviors and were asked to complete them weekly. In the following sessions, how to practice these behaviors was discussed.

For the control group, no interventions were done, and the mothers attended the healthcare centers every 2 weeks for usual antenatal care. After finishing the interventions, the 2 groups completed the MFA and GHQ-28 questionnaires again. Data analysis was accomplished with SPSS 12. To show the subjects' characteristics, the researcher utilized descriptive statistics including frequency, mean, and standard deviation. To measure the 2 groups' heterogeneity, the researcher utilized tests such as chi-square, Fisher, and Mann–Whitney. To compare the 2 groups in various stages, an independent t-test was used, and to compare among each group in 2 various stages, the t-test was used. In all the tests, a confidence interval of 95% and a P-value of 0.05 was considered. This study was approved by the Mashhad University of Medical Sciences (MUMS) Research Council with 83016 code number.

3. Results

Research findings indicated that the average age in the treatment group was 24.13 ± 3.7 years, and in the control group it was 24.1 ± 4.4 . The 2 groups were homogeneous in terms of some demographic variables (Table 1).

The mean gestational age in the treatment and control groups was 29.6 ± 1.5 and 29.5 ± 1.6 weeks, respectively. The subjects were homogeneous regarding pregnancy-related factors (Table 1). The mean of the mental health score before and after intervention in the 2 groups is reported in Table 2.

According to t-test results, there was a significant difference between the mean scores of mental health in the control group at the beginning and at the end of the study, and their mental health deteriorated ($P = 0.001$).

Also according to the t-test results, there was a significant difference between the mean mental health score in the treatment group at the beginning and at end of the study, and their mental health score improved ($P < 0.001$). There was a significant difference in the mental health score mean between the 2 groups ($P < 0.001$) after the intervention. (Table 2). The mean difference between

Table 1. Study of case and control groups' homogeneity based on some variables.

Variables	Case N(%)	Control N(%)	test	P value
Education				
High school	33(82.5)	31(72.1)	$X^2 = 1.27$	0.25
University graduate	7(17.5)	12(27.9)		
Accommodation situation				
Landlady	11(27.5)	11(25.6)	$X^2 = 0.039$	0.84
Tenant	29(72.5)	32(74.4)		
Income average				
Insufficient	5(12.5)	6(14)	$Z = 0.19$	0.84
Sufficient	34(77.5)	36(83.7)		
Abundant	1(2.5)	1(2.3)		
Marital satisfaction				
Good	31(82.5)	32(74.4)	$Z = 0.31$	0.75
Moderate	8(20)	10(23.3)		
Low	1(2.5)	1(2.3)		
Planned pregnancy	33(82.5)	36(83.7)	$X^2 = 0.02$	0.88
Ultrasound performance	36(90)	34(79.1)	$X^2 = 1.87$	0.17
Know fetal sex	21(52.5)	28(65.1)	$X^2 = 1.36$	0.24
Forecasted sex				
Boy	13(61.9)	14(50)	$X^2 = 0.51$	0.47
Girl	8(38.1)	14(50)		

Table 2. Comparison of the mean of mothers' mental health scores before and after intervention, and the difference due to group division.

Time	Before intervention	After intervention	Difference before & after	t-test
Statistical index	M ± SD	M ± SD	M ± SD	
Control	17.8 ± 3.6	18.3 ± 3	0.41 ± 0.76	t = 3.59, P = 0.001
Case	17.6 ± 4.2	14.8 ± 4	-2.8 ± 2.2	t = 8.05, P < 0.001
Independent	P = 0.78	P < 0.001	P < 0.001	
t-test	t = 0.26	t = 4.2	t = 9.3	

mental health scores before and after treatment due to group division was significant ($t = 9.7, P < 0.001$).

The mean attachment scores before and after the intervention in the 2 groups are shown in Table 3. According to the results of the t-test, there was no significant difference between the mean of the attachment scores in both groups at the beginning of the research ($P = 0.51$), but it was significant after intervention ($P < 0.001$).

The t-test showed no significant difference in the attachment mean scores in the control group at the beginning and end of the study, while this difference in the treatment group was significant (Table 3). The mean difference between MFA scores before and after treatment due to group division was significant ($t = 9.3, P < 0.001$).

4. Discussion

Research findings indicated that there was a statistically significant difference in the attachment score between the 2 groups after the intervention. In our study, the mean score of MFA was 3.48, but in studies by Cranley and Levine et al., they were 3.78 and 3.7 (20,22). This difference can be related to our culture.

There was a significant difference between MFA in the treatment group before and after the intervention. In the research of Koniak-Griffin and Verzemnieks, the difference in attachment scores between the 2 groups before and after the intervention was significant (23). Likewise, in the research of Mikhail et al., the attachment scores after the intervention (counting of the fetus movements by the mother for 1 month) in both groups (each group used a different counting method) were significantly different ($P < 0.0001, f = 46.47$) (24). Bellini et al. demonstrated that prenatal education courses positively influenced prenatal attachment (25). In Hee’s research, the degree of anxiety in unmarried mothers showed a negative correlation with the degree of MFA ($r = -0.25$) (26). Kim and Cho’s research indicated that an intervention program (mother-fetus interaction promotion program of talking and tactile stimulation) was effective in improving MFA (27). Chang et al. also demonstrated that Taekyo perspective prenatal education was effective in increasing MFA (28).

In these studies, like in our study, the maternal attachment score increased after intervention. It has been previously reported that this outcome is related to behaviors such as the counting of fetus movements, namely behaviors that involve the mother in interaction with the fetus (24).

Condon and Corkindale reported that mothers with less attachment were more prone to depression and anxiety (29). Gaffney’s research also showed that the attachment has a protective effect against anxiety (30). Mikulincer and Florian demonstrated that there is a significant relation between MFA with maternal mental health in the first trimester of pregnancy. The mothers with more attachment to their fetuses in the first trimester of pregnancy have better mental health and experience less pressure (31).

The findings of this research indicated that there were significant differences between the mental health mean scores in both groups after the intervention ($P < 0.001$).

Mental health scores in the treatment group improved, and this resulted from the increase in MFA. The increased attachment can lead to a positive and consistent excitement, which improves mental health. According to the John Bowlby theory, attachment to a person can increase one’s mental security. According to Solchany, one can decrease stress by changing his or her attention from daily activities and problems. Attachment behavior can provide such a condition and therefore comfort mothers (5). Moreover, the attachment behaviors not only help the mother to be distracted from worrisome thoughts, but also help her to focus more on the fetus. This can be viewed as a kind of meditation, which can stop intrusive unwanted daily thoughts and decrease autonomic organ activities. Most of the studies about attachment have shown that there is a relation between MFA and anxiety, stress, depression, and physical problems. Higher levels of maternal attachment resulted in less anxiety, stress, and depression, and hence in better maternal mental health.

Other studies showed, as described, that attachment behaviors during pregnancy will increase the MFA score. Therefore, we can conclude that increasing MFA can enhance mothers’ mental health in various ways, which is consistent with the results of this research.

Table 3. Comparison of the mean MFA score, before and after intervention, and the difference due to group division.

Time	Before intervention	After intervention	Difference before & after	t-test
Statistical index	M ± SD	M ± SD	M ± SD	
Control	3.45 ± 0.43	3.42 ± 0.41	-0.028 ± 0.13	t = 1.4, P = 0.14
Case	3.52 ± 0.5	3.96 ± 0.38	0.44 ± 0.28	t = 10, P < 0.001
Independent t-test	P = 0.152	P < 0.001	P < 0.001	
	t = 0.65	t = 6.1	t = 9.7	

Research findings indicate that MFA behavior education can improve MFA, and this will result in enhancing mothers' mental health. Subsequently, mothers' mental health affects fetus health, and finally the children's health. The results of this research can improve social health by improving mothers' mental health.

Since health care providers play an important role in improving social health and providing pregnancy services

for mothers in public health centers, it is proposed that MFA behaviors be taught and practiced in public health centers and in physicians' and midwives' offices, and that mothers be encouraged to apply these behaviors to increase their mental and physical health. This will result in enhancing children's health in the future, and the cost of treatment will decrease.

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