



# A Paternal-fetal Attachment Pilot Intervention on Mental Health for Pregnant Mothers

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## ABSTRACT

Pregnancy and post-pregnancy periods are associated with very important psychological and physiological changes, sometimes associated with pathological changes. Spouses' participation is one of the effective factors in promoting the mental health of pregnant women. The purpose of this study was to examine the effects of paternal-fetal attachment pilot intervention on perceived mental health and perceived attachment to fetus. We implemented a paternal-fetal attachment pilot intervention designed to promote the mental health of pregnant women. We used an experimental pretest/posttest study design to evaluate the impact of paternal-fetal attachment that resulted in a hospital-affiliated prenatal centre, before and after pilot implementation. As hypothesised, perceived mental health and perceived attachment to fetus increased in the intervention group, but not in the control group. The pilot intervention that we set up in this study was effective for promoting mental health in pregnant mothers.

**Key Words:** Paternal-Fetal Attachment, Mental Health, Pregnant Mothers, Intervention

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## Introduction

During the life of each woman, there are steps that have a profound effect on his life including pregnancy period, and after that, there is a very important physiological and psychological change that, in spite of the pleasure of motherhood, is sometimes accompanied by pathological changes (Vesga-López *et al.*, 2008). Pregnancy is a stressful period in the life of a woman, and the severity of this stress is higher in the third quarter (Rodrigues and Schiavo, 2011). Even stress caused by the birth of first child is classified as severe stress in psychosocial stress tables (Lanes *et al.*, 2011). Therefore, in this period there is the possibility of occurrence of high levels in Nevrose, depression, anxiety, Phobia and obsessive-compulsive.

Some researchers believe pregnancy is an important spiritual experience that can lead to a lot of psychological changes in women (Bjelica and Kapor-Stanulović, 2004; Bas *et al.*, 2013). Most women notice changes in their mood and

patterns of sleep and have a twofold feeling about birth and child maintenance, and they fear of childbirth, giving birth an abnormal child and that cannot be a good mother. These fears will be increased or exaggerated and lead to depression and anxiety (Harris *et al.*, 1996). During pregnancy, depression is more common and has a higher risk for mother and embryo, and its symptoms include depressed mood, loss of interest or pleasure, disappointment, nullity, and worthlessness (Wichman and Stern, 2015). Sometimes the depression becomes so deep that the patient feels helpless and considers his future dark and desperate, and in such a crisis it may lead to the death of a mother or a child (Sadock and Sadock, 2011). Anxiety also appears as worry diffused, unpleasant and vague feeling, which often comes with symptoms of stimulation of the autonomic nervous system (Javedani *et al.*, 2017).

Various studies of mental disorders during pregnancy have reported a different prevalence of depression, anxiety and other

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mental disorders (Rubertsson *et al.*, 2014; Kang *et al.*, 2016; Faisal-Cury and Menezes, 2007; Madhavanprabhakaran *et al.*, 2015; Silva *et al.*, 2017). Some studies reported the prevalence of mental disorders 17% in the first trimester of pregnancy and 13% in the third trimester and the prevalence of depression and anxiety 13.5-42% during pregnancy by the General Health Questionnaire (GHQ) (Evans *et al.*, 2001; Villanueva *et al.*, 2000). Abiodun *et al.* (1993) showed the significant relationship between mental disorders prevalence, low age of mother in first pregnancy, marriage less than one year, having a spouse without support and history of abortion.

Chaaya *et al.*, (2002) argue that spouse social support is an important factor in preventing and treating depression in women during pregnancy and postpartum. The presence of fathers in prenatal care leads to anxiety reduction (Correia and Linhares, 2007), mothers' acceptance of the pregnancy (Alio *et al.*, 2013), maternal-fetal attachment (Akbarzade *et al.*, 2014), and reducing the hospitalization length of mothers with mental problem during pregnancy and postpartum (Burgess, 2011). According to the study of Condon (1985), paternal-fetal attachment is a feeling of fetal interest that results from the experience of becoming a parent. Fathers who have more attachment to the fetus are more sensitive than timely start and continue their wife's pregnancy care, proper nourishment and adequate sleep and exercise and also have a better relationship with their child after birth (Lindgren, 2001).

Several studies indicated that fathers' educational needs to increase participation in prenatal care have a positive impact on maternal and child health (Simbar *et al.*, 2011; Boskabadi, 2013). The World Health Organization considers group education and discussion as the most effective way to change behavior (WHO, 2007). Matthey *et al.*, (2004), for example, reported that holding parenthood classes separately and focusing on psychological issues in couples awaiting the birth of the first child reduces mothers' distress in 6 weeks postpartum. In the intervention study of Mullany (2006), the presence of husband in pregnancy classes increased mothers' mental health and awareness scores compared to those in the control group who only participated in these classes. The results of a Canadian study (clinical trial) on women who suffered from depression during pregnancy also

showed that the presence of fathers in the 4 sessions training psychological problems, of the total 7 sessions, significantly reduced the symptoms of depression and other psychological symptoms of these women than women who only had this training (Misri *et al.*, 2000), while Seimyr *et al.*, (2009) found no association between paternal-fetal attachment and mother's depression. All in all, evidence concerning direct relationships between paternal-fetal attachment and perceived mental health is weak.

To improve the effectiveness and efficiency of mental health for pregnant mothers, we tested a paternal-fetal attachment intervention to increase perceived mental health. We used the variables somatic symptoms, anxiety and sleep disorder, social function and depression symptom as indicators of perceived mental health (Goldberg & Hillier, 1979). Also, we used the scale perceived attachment to fetus as an important attachment-related outcome variable (Cranley, 1981).

## Methods

### *Setting and pregnant mothers*

Our study setting is a hospital-affiliated prenatal centre in China that provides services for pregnant women. The centre has a 40-bed facility with sufficient number of approximately 40-45 residents. The target population for our study included mothers under prenatal care at the hospital-affiliated prenatal centre, as the sample is at increased risk for mental health and has established access to follow-up. The participants randomly assigned to an intervention group and a control group. The inclusion criteria for the mothers participated in the study were: being pregnant, a mental health score of at least one standard deviation below the population mean on any subscale of the General Health Questionnaire (GHQ) (Goldberg & Hillier, 1979); age above 20 years, an experience of being in the first pregnancy, and gestational age 28-32 weeks. The inclusion criteria for the fathers participated in our intervention were: at least reading and writing literacy, single wife and first parenting experience. Mothers with intellectual disability or dementia, a history of mental problems or infertility or other acute or chronic illness that would limit our study and fathers who had a history of drug and alcohol use or mental problems were excluded. Participants in the intervention group received a 3-week paternal-



fetal attachment pilot intervention, but no in the control group.

### *Intervention*

We developed a 3-week paternal-fetal attachment pilot intervention, 1 session each week, with respect to another paternal-fetal attachment intervention, which has been shown to have positive effects in the occupational context (Akbarzade *et al.*, 2014). The intervention was based on Cranley's fetal attachment theory (Cranley, 1981). The intervention was carried out using the method of group discussion, lecture, question and answer, screening movie and educational booklet, and homework. The contents of the training intervention program include getting to know the fetal growth stages, common problems and physical and psychological changes in pregnant women, spouse's duties and father's role, the concept of attachment and paternal-fetal attachment and ways of communication with the fetus and attachment behaviors. All paternal-fetal attachment techniques taught in our intervention concentrated on 3-session range planning, focusing in particular on the following weeks.

### *Evaluation*

The paternal-fetal attachment pilot intervention was evaluated using an experimental before (Time 1)/after (Time 2) the intervention design. Directly before and 1 week after our training program all the mothers and fathers filled in questionnaires measuring the variables of the study: somatic symptoms, anxiety and sleep disorder, social function, depression symptom and perceived attachment to fetus.

We used the variables somatic symptoms, anxiety and sleep disorder, social function and depression symptom of the General Health Questionnaire (GHQ-28) (Goldberg & Hillier, 1979). The scale sifts healthy and sick people. The scale consisted of 28 items (questions 1-7 for somatic symptoms, 8-14 for anxiety and sleep disorder, 15-21 for social function, 22-28 for depression symptom). Empirical evidence supported the reliability and validity of GHQ-28 (Javanmard and Mamaghani, 2013; Kashyap and Singh, 2017; Winefield *et al.*, 1989; Kihç *et al.*, 1997; Cheung and Spears, 1994; Pariente *et al.*, 1992). The scale covers negative aspects of perceived mental health and ranged from zero (score 0) to 3 (score 3). In this tool, getting a score of 23 and above represents a mental health disorder. At before the paternal-fetal attachment

pilot intervention, we obtained an alpha coefficient of 0.88. At after the intervention, the alpha coefficient obtained was 0.84.

We used the scale perceived attachment to fetus, as an important attachment-related outcome variable, of the paternal-fetal attachment (PFA) scale (Cranley, 1981). The scale consisted of 24 items and covers fetal attachment behaviors of fathers or mothers from five aspects: paternal role acceptance (4 items), interacting with the fetus (5 items), attributing some features to the fetus (6 items), distinction between herself and the fetus (4 items), and sacrifice. The scale covers positive aspects of perceived attachment to fetus and ranged from 1 (definitely no) to 5 (definitely yes). Empirical evidence supported the reliability and validity of PFA scale (Beck, 1999; Noh and Yeom, 2017). The alpha coefficient of PFA scale was acceptable with 0.79 at before the intervention and 0.78 at after the intervention.

For both the primary and secondary outcomes, we used a two-way MANOVA to compare both groups. This study was reviewed and approved by the centre in China.

## **Results**

### *Descriptive findings*

For the implementation the paternal-fetal attachment intervention in April 2016, we identified 89 pregnant mothers in the hospital-affiliated prenatal centre between January 15 and February 24. There were 29 eligible mothers with husbands (32.6% of all pregnant mothers), for a mean of 2.5 pregnant women visits per day. Characteristics of pregnant mothers with fetal are shown in Table 1. Most of fetal sex were female (about 65.5%), with a mean age of 8 months. There were no differences concerning education, family income level, residence status, residence status, gestational age and fetal sex between groups. The distribution of fetus gender in the intervention and control did not differ from the distribution of fetus gender in the general sample.

### *Association of the intervention with key outcomes*

Among all the pregnant mothers, we found association between the paternal-fetal attachment intervention and the primary outcome in the pre-intervention period. Similarly, we found changes in the control group that participants received no the intervention. The variables somatic symptoms, anxiety and sleep disorder, social function, depression symptom and perceived

**Table 1.** Pregnancy and individual characteristics of participants

Characteristic		All participants (n = 29)		Intervention group (n = 15)		Control group (n = 14)	
		n	%	n	%	n	%
Age, mean (SD)		10.2	1.14	10.7	1.11	10.5	1.08
Education	High school/ Vocational	7	24.1	4	26.7	3	21.4
	College, University/ Graduate school	19	65.5	11	73.3	11	78.6
Family income level	High	4	13.8	2	13.3	2	14.3
	Medium	22	75.9	12	80	10	71.4
	Low	2	6.9	1	6.6	2	14.3
Residence status	Tenant	12	41.4	7	46.7	5	35.7
	Homeowner	11	37.9	8	53.3	9	64.3
Gestational age	First three months	6	20.7	3	20	3	21.4
	Second three months	10	34.5	5	33.3	5	35.7
	Third three months	13	44.8	7	46.7	6	42.9
Fetal sex	Male	10	34.5	5	33.3	5	35.7
	Female	19	65.5	10	66.7	9	64.3

**Table 2.** Means (and SD) of outcome measures for the intervention and control groups

Assessment measure	Group	Pre-intervention period	Intervention period
Somatic symptoms	Intervention	5.14 (2.26)	3.79 (2.11)
	Control	5.11 (2.01)	6.15 (2.16)
Anxiety and sleep disorder	Intervention	2.31 (0.38)	1.66 (0.22)
	Control	2.35 (0.11)	2.82 (0.67)
Social function	Intervention	3.44 (1.02)	5.15 (1.56)
	Control	3.51 (1.23)	2.22 (1.49)
Depression symptom	Intervention	4.16 (1.83)	3.46 (1.32)
	Control	4.13 (1.51)	5.17 (1.61)
Perceived attachment to fetus	Intervention	2.10 (2.03)	4.51 (2.92)
	Control	2.12 (2.33)	2.18 (2.62)

As can be seen, somatic symptoms decreased in the intervention group (M = 5.14, SD = 2.26 at the pre-intervention period, and M = 3.79, SD = 2.11 at the intervention period) but increased in the control group (M = 5.11, SD = 2.01 at the pre-intervention period, and M = 6.15, SD = 2.16 at the intervention period). Anxiety and sleep disorder decreased in the intervention group (M = 2.31, SD = 0.38 at the pre-intervention period, and M = 1.66, SD = 0.22 at the intervention period) but increased in the control group (M = 2.35, SD = 0.11 at the pre-intervention period, and M = 2.82, SD = 0.67 at the intervention period). Social function increased in the intervention group (M = 3.44, SD = 1.02 at the pre-intervention period, and M = 5.15, SD = 1.56 at the intervention period) but decreased in the control group (M = 3.51, SD = 1.23 at the pre-intervention period, and M = 2.22, SD = 1.49 at the intervention period). Depression symptom decreased in the intervention group (M = 4.16, SD = 1.83 at the pre-intervention period, and M = 3.46, SD = 1.32 at the intervention period) but increased in the control group (M = 4.13, SD = 1.51 at the pre-intervention period, and M = 5.17, SD = 1.61 at the intervention period). For perceived attachment to fetus, we observed an increase in the intervention group (M = 2.10,

SD = 2.03 at the pre-intervention period, and M = 4.51, SD = 2.92 at the intervention period) and remained stable in the control group (M = 2.12, SD = 2.33 at before the program, and M = 2.18, SD = 2.62 at after the program).

### Discussion

Based on prior research indicating that wives' support during pregnancy is an effective factor in mother's better care of herself and embryo and low-risk pregnancy (Martin *et al.*, 2007), we created and pilot tested a pragmatic intervention to promote mental health among pregnant mothers. We hypothesized that a paternal-fetal attachment training program protects pregnant mothers from a decrease of mental health during the prenatal care. Furthermore, paternal-fetal attachment is expected to have a positive impact on perceived attachment to fetus.

Diemer (1997) reported that fathers participating in pregnancy care training classes are more involved than other fathers in the activities of pregnancy and baby care and have a stronger relationship with their spouse. In this regard, Field *et al.*, (2009) conducted a study aimed at the effect of massage therapy on pregnancy and postpartum depression. The



statistical population in this study was pregnant American depressed mothers aged 16 to 20 weeks and their wives. The results of this study showed that 2 times a week massage therapy by spouses reduces mood depression, anxiety, anger, and improves mental health of pregnant women.

Studies on the factors affecting parent-fetal attachment indicate that parent-fetal attachment can be trained and training programs increase it and ultimately improves the mental health of couples. In addition, the parent-fetal attachment, in addition to being educable, is transferable and also improves the mental health of mothers. In order to influence the father-fetal attachment to mothers' mental health, Seimyr *et al.*, (2009) in a study, aimed to determine the relationship between parent-fetal attachment and maternal depression at the end of pregnancy, showed that increasing parent-fetal attachment was accompanied by increased maternal-fetal attachment, but there was not a significant relationship between parent-fetal attachment and pregnant mother's depression, which is not consistent with the results of our study. In summary, our intervention consisting of a training program embedded in the paternal-fetal attachment to participant fathers in pregnancy care demonstrated effectiveness in promoting the mental health of pregnant mothers.

Our study had several limitations attached, despite the strengths including implementing a training program on fathers using a clinical trial and having a powered sample size. The most important of these limitations was that there was no male supervisor psychologist, because with the presence of a psychologist of the same sex, the fathers could easily ask their questions, and on the other hand, this presence could increase their confidence and abilities.

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