

# The effect of maternal-fetal attachment education on pregnant women's mental health

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## ABSTRACT

Physiological and psychological changes in pregnancy have a considerable effect on mother's wellbeing. Hence, in this period pregnant women are vulnerable to develop mental health difficulties due to hormonal alterations and other external factors. Mental health problems during pregnancy may impact to child's growth and psychological development. The aim of this study was to determine the effect of maternal-fetal attachment (MFA) education on the scores of mental health disorders among pregnant women.

This study was quasy-experimental. The sample were 55 pregnant women (28=control group, 27=experimental group) who registered in Community Health Centers. Participants were selected by consecutive sampling technique. Data collection tools were EPDS, SRQ, SSQ-6, and demographic questionnaire. These questionnaires were filled out by both groups as pre-test and two weeks later. The data were analyzed by paired and independent t-test in SPSS/20 with significant levels  $p < 0.05$ . The experimental group members received MFA education and whatsapp reminder once in a day, but the control group only received standard antenatal care.

The mean score of EPDS and SRQ decreased in experimental group but increased in control group. However, the mean difference of EPDS score in independent t-test analysis was not significant with  $p = 0,321$  ( $p > 0,05$ ). This study indicated that maternal-fetal attachment education might contribute in improving pregnant women's mental health. The future study should be tested in larger sample sizes with more than two weeks follow up to confirm these results.

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## 1. Introduction

The transition period becoming mother is challenging stage that involves the significant alterations in psychological, biological, and social aspects. Changes in these several aspects may lead to both positive and negative effects on women's life throughout pregnancy. Hence, this period has more vulnerability in developing mental health difficulties. Depression is known as the most occurring symptoms among pregnant women (Howard et al., 2014). Accordingly, preventing the risk of postnatal depression could be carried out by screening in early stage of pregnancy (Nagandla et al., 2016).

World Health Organization (WHO) state that major depression affected as many 10% of pregnant women and 13% after birth. However, this occurrence is higher in developing countries as many 15.6% during pregnancy and 19.8% in postnatal period (WHO, 2019). The prevalence of mental health disorders in pregnant women in Malaysia reported 23.6% in the second semester and increased in the third trimester to 24.7% (Nagandla et al., 2016). The most common mental disorders were anxiety, depression, and stress. Depressive symptoms occurred 15% among pregnant women living in Jakarta in which the capital city of Indonesia (Anindyajati et al., 2017). In Indonesia, the prevalence of the most severe mental disorders is found in Yogyakarta Special Region. It is also one of five provinces with the highest prevalence of mental emotional disorders. According to gender, the prevalence in women is higher than that men. Therefore, the finding concludes that women have a greater vulnerability to experience mental emotional disorders (Riskseddas, 2013).

The occurrence of depression during pregnancy has negative consequences on pregnancy outcome and fetus such as high risk of premature birth, low birth weight (LBW), intrauterine growth restriction (IUGR), emotional and behavioral problems in children, cognitive impairment, and ongoing depression. Therefore, it is concluded that depression during pregnancy has high potential for the problems of fetal growth and development (Stein et al., 2014). The most common appearance of depressive symptoms are irritability, sadness, and feeling useless. Psychosocial difficulties have a negative impact on maternal mental health that lead to negative influence on the mother and fetus relationship. These problems may affect on mother and baby health, family health, and even public health. Appropriate interventions are useful for identifying pregnant women with inadequate attachments and improving preparation for motherhood (Karakoça and Ozkanb, 2017). The recent studies consider about the possible effort to improve maternal health by enhancing the attachment between mother and fetus which is known as maternal-fetal attachment (MFA). One of mental health promotion goals is encouraging mother to have stress management abilities. Brandon (2011) revealed that MFA is found as aspect which can motivate mothers to improve health during pregnancy, help them in adjusting roles as parent, and have protective factor against perinatal depression (Brandon, 2011). Thus, intervention based on MFA education is able to improve maternal mental health and attachment to the fetus (Abasi et al., 2013). Accordingly, this study aimed to determine the effect of maternal-fetal attachment education on the mental health of pregnant women in third trimester.

## 2. Method

This study was quasy experiment which conducted at the two Community Health Centers in Yogyakarta Indonesia. Total 60 pregnant women were recruited and divided into experimental (n=30) and control (n=30) group. However, we excluded 5 pregnant women who met exclusion criteria then the sample analyzed in the study were 27 in experimental and 28 in control group. Samples were selected using consecutive sampling technique with inclusion and exclusion criteria. Inclusion criteria were: being in third trimester with gestational ages 28-37 weeks, having access to play videos, having the ability to read and write, being consent to participate in this study. Exclusion criteria were: giving birth during the study, moving to another city, withdrawal from the study for any reasons such as having complication in pregnancy, inability to participate in post-test. Data were collected using Self-Reported Questionnaire 20 (SRQ-20) developed by World Health Organization (WHO) (WHO, 1994), Indonesian version of Edinburgh Postnatal Depression Scale (EPDS) which has been validated in Indonesia (Hutauruk, 2011) from the original version by Cox 1987 (Cox, 1987), Social Support Questionnaire (SSQ-6) (Sarason, 1987) which has been tested among pregnant women sample in Indonesia (Wibowo, 2013), and demographic form. Data were analyzed using SPSS version 20. The bivariate analysis was tested by paired t-test and independent t-test. The level of significant was considered to be  $<0.05$ .

Pre-test was conducted before the experimental group received maternal-fetal attachment health education. The one session of education was delivered by discussion and lecture methods in the class with video as the media of education. The video contains maternal-fetal attachment (MFA) material based on Cranley's theory with the following aspects: the concept of maternal-fetal attachments, the benefits of maternal fetal attachments, maternal-fetal attachment behavior, psychological changes in the third trimester of pregnancy, symptoms of mental health problems. After obtaining health education, participants in experimental group received a reminder via whatsapp once a day for two weeks to remind pregnant women in practicing MFA behavior. However, the control group only received standard antenatal care in the period of study. Post test was carried out two weeks after the

pre test by doing home visits and contacting pregnant women via telephone. Ethics clearance was granted by Health Research Ethics Committee at the 'Aisyiyah University of Yogyakarta No.819/KEP-UNISA/I/2019.

### 3. Results and Discussion

Table 1 shows the characteristic of participants. The mean age of the participants was 28,04 and 30,67 years, and gestational age 32,14 and 30,48 in the control and experimental group, respectively.

**Table 1.** Characteristic of participants and homogeneity test

No.	Variables	Control Group (n=28) F (%)	Experimental Group (n=27) F (%)	Total F (%)	P Value
1.	Age				
	Min-max (median:mean)	19-41 (28:28,04)	24-40 (30:30,67)		
	<20/>35	3 (10,7)	5 (18,5)	8 (14,5)	0,105*
	20-35	25 (89,3)	22 (81,5)	47 (85,5)	
2.	Parity				
	Multipara	15 (53,6)	18 (66,7)	33 (60)	0,094*
	Primipara	13 (46,4)	9 (33,3)	22 (40)	
3.	Family Income				
	<UMK Jogja	14 (50)	18 (66,7)	32 (58,2)	0,072*
	>UMK Jogja	14 (50)	9 (33,3)	23 (41,8)	
4.	Social Support				
	Low	15 (53,6)	18 (66,7)	33 (60)	0,094*
	High	13 (46,4)	9 (33,3)	22 (40)	
5.	Gestational Age				
	Min-max (median:mean)	28-37 (32:32,14)	28-36 (30:30,48)		0,650*
6.	Pretest SRQ				
	Min-max (median:mean)	0-9 (2:3,25)	0-7 (3:3,04)		0,072*
7.	Pretest EPDS				
	Min-max (median:mean)	1-12 (6:5,86)	1-12 (8:6,85)		0,451*
8.	Pretest MFA				
	Min-max (median:mean)	49-81 (64:64,07)	43-80 (64:63,70)		0,166*

\*P-value >0.05

Homogeneity test did not show any significant difference in age, parity, family income, social support, gestational age and pre test scores of SRQ and EPDS between two groups ( $P > 0.05$ ). Therefore, the participants in the two groups were matched for demographic variables.

Table 2 shows Paired t-test in the experimental group. It showed that there was no significant difference in the mean scores of mental health disorders measured with SRQ between before and after intervention ( $P>0.05$ ). However, it appeared a significant difference in the mean scores of EPDS before and after intervention ( $P<0.001$ ) (Table 2).

**Table 2.** Comparison of mean different of SRQ and EPDS scores in the experimental group and control group before and after intervention based on paired t-test

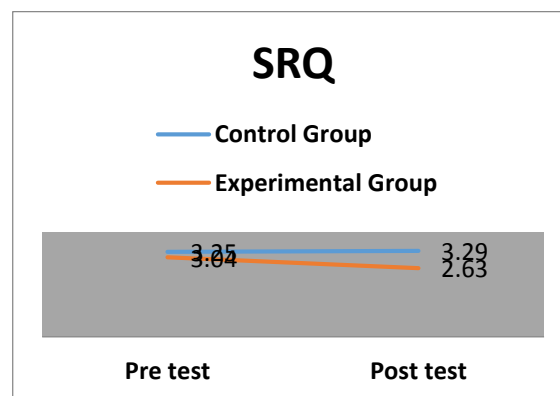
Measurement	Group	Pre test	Post test	(CI 95%)	t-test	p-value
		Mean (SD)	Mean (SD)			
SRQ	Control	3,25 (2,61)	3,29 (2,66)	0,04 (-0,25-0,18)	-0,31	0,757
	Experimental	3,04 (2,12)	2,63 (2,58)	-0,41 (-0,03-0,49)	1,76	0,090
EPDS	Control	5,86 (3,12)	6,43 (3,69)	0,57 (-1,43-0,29)	-1,35	0,187
	Experimental	6,85 (3,29)	5,48 (3,41)	-1,37 (-4,58- (-1,75))	-4,59	<0,001

Accordingly, the table 3 shows the comparison mean different of EPDS scores in the experimental group and control group before and after intervention based on independent t-test. It appeared that only EPDS score was analyzed using independent t-test and measured using cohen's d effect size. The analysis showed no significant difference in terms of the mean score of EPDS before and after the intervention ( $P>0.05$ ). The effect size was 0.3 that defined as small effect.

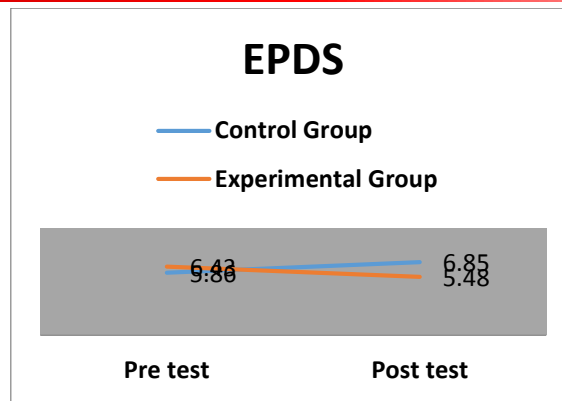
**Table 3.** Comparison of mean different of EPDS scores in the experimental group and control group before and after intervention based on independent t-test

Variabel	Group	Mean (SD)	difference	t-test	CI 95%	p-value	Effect Size (Cohen's d)
(EPDS)	Control	6,43 (3,59)	0,95	-1,00	-0,95-2,85	0,321	0,3
	Experimental	5,48 (3,41)					

Whilst, Figure 1 and 2 explains the pattern of mental health disorders scores measured SRQ and EPDS were illustrated in graphic.



**Figure 1.** Comparison of mean scores SRQ



**Figure 2.** Comparison of mean scores EPDS

This study revealed the differences of mean scores EPDS and SRQ in both the control and intervention groups. The mean in the control group showed an increasing score, however it was less than one point. Thus, this alteration indicated that the pregnant women who did not receive intervention of maternal-fetal attachment education were more likely to develop their mental disorders after two weeks measurement (Suryaningsih, et al, 2019). This can be supported by the gestational ages among participants in control group. Those in control group had higher mean of gestational ages compare to experimental group. Accordingly, it is assumed that the increase of mental health disorders in the control group was caused by the appearance of anxiety of delivering the baby.

In addition, based on characteristic of parity, the control group had a larger number of primiparous women than experimental group. This parity factor triggered the psychological unpreparedness of pregnant women in undergoing of childbirth. Prior studies reported that antenatal depression developed along with the increase of gestational age throughout pregnancy, the prevalence even higher in the third trimester (Ayano et al., 2019) (Lavanya and Poongundran, 2019). This problem is caused by advanced hormonal changes, thus pregnant women feel anxious about the process of giving birth (Okagbue et al., 2019).

The experimental group measured with SRQ had difference mean score after and before intervention. However, the decreasing scores was not statistically significant. Whilst, the group measured with EPDS significantly decreased. This value indicated a significant difference in scores after the intervention received by the experimental group. Finding revealed that the provision of maternal-fetal attachment education might reduce the symptoms of mental health disorders, thus this intervention contributed in improving the pregnant women's mental health. Maternal-fetal attachment is known as health behavior that give positive thoughts and pleasure to pregnant women. This behavior is not only shifting the worry thoughts, but also helping the mother to focus more on the fetus. This behavior categorized as a meditation behavior which enable to stop negative thoughts that interfere the daily activities, therefore this behavior can contribute to improve the physical and mental health of the mother (Abasi et al., 2013).

However, data analysis using independent t-test showed no significant difference in EPDS mean scores between the control and intervention groups. The post test was carried out two weeks after pre test. Thus, it is assumed that the mean core was not significant due to short time follow up. We examined the score in two weeks after giving intervention, but the scores alterations in the following weeks was not investigated. In addition, the mean of EPDS in pre test between control and experimental group were 5.86 and 6.85 respectively. This showed that the majority of participants were in normal range of EPDS ( $\leq 12$ ), which was cut off value in this study. Australian Government Policy regarding to perinatal anxiety and depression screening state that pregnant women with EPDS scores 10, 11 and 12 should be followed up within one (Government of South Australia, 2015). This effort aims at identifying the changes of mental health disorders scores among affected women thus the appropriate treatment can be given.

It is indicated that pregnant women with EPDS scores less than 12 require more than two weeks follow up to examine the changes on mental health disorders. This statement is supported by study of Boryry et al (2017) which undertaken 6 weeks follow up after the intervention. There was significant differences in stress scores on the independent t-test analysis (Boryri and Navidian, 2017). The study

of Yuan et al (2018) was consistent with this study. There was an increase in aspects of mental health and attachment to the fetus in the intervention group after two weeks, but there was no increase in the control group (Yuan et al., 2018).

One possibly factor that might cause no significant decrease in the EPDS score was the small number of sample size which result in less power of this study. Other studies investigated more than 30 samples for each group (Toosi, 2011) (Boryri and Navidian, 2017). In this study, the obstetric factors and psychological problems were not controlled, so it was unknown whether the women in normal or risk pregnancy. Previous study controlling obstetric variables reported significant difference in scores between the two groups after intervention (Abasi et al., 2013). The results of a systematic review reported that the complication status of pregnancy was one of obstetric factors to identify the presence of antenatal depression and anxiety (Biaggi et al., 2016). Another study about maternal-fetal attachment education on normal pregnant women reported an increase in neonatal psychological health indicators (Akbarzadeh et al., 2017). Pregnancy depression was also found 9.18% in women who had obstetric risk factors such as parity, unwanted pregnancy, history of miscarriage, history of obstetric complications and current complications (Ajinkya et al., 2013) (Bisetegn et al., 2016).

Although obstetric factors were not controlled in this study, we assumed that all participants in both groups had high awareness to access health services. Pregnant women who have pregnancy complications experience less worried because the availability of adequate health facilities, national health insurance that help their birth-related financial, and skilled health workers. This is supported by WHO statement that in order to prevent maternal health problems, particularly in risk pregnancy, require continuum care, quality care, and access to health personnel support. These availability enable pregnant women to access health information thus the help seeking behavior increases (World Health Organization, 2016).

Studies investigated the relationship between maternal-fetal attachment (MFA) and psychological health aspects have inconsistent results, whereas many studies founded the high MFA scores in women with low psychological stress (Edozien and P.M Shaughn, 2017). The previous study reported no relationship between MFA and psychological health in Brazil (Diniz et al., 2015). Nevertheless, review study found that depression and anxiety as predictors of MFA with little effect (Yarcheski et al., 2009). Inconsistency in the relationship of MFA with psychological aspects is caused by three potential issues (1) formation and naturalism and measurement of maternal-fetal attachment (2) factors that mediate and moderate the relationship of MFA with psychological health and other outcomes in pregnancy (3) acceptance and importance of concepts MFA for women (Walsh et al., 2013). According to these explanations, it is concluded that although the EPDS scores decreased, this pattern was not statistically significant due to cultural factors that possibly influenced mother acceptance of the MFA.

The limitations of this study were the time follow up was only two weeks and small sample size. These might result in insufficiently time in observing the changes of mental health disorders symptoms. The strength of this study was the two different questionnaires to measure mental health disorders among pregnant women, which can imply the specific pattern alterations in both groups after receiving the intervention.

#### 4. Conclusion

This study concluded that pregnant women in the control group experienced the increase in EPDS and SRQ score identified from the mean score difference of the pretest and posttest. In the other hand, pregnant women in experimental group experienced the decrease in EPDS and SRQ scores after receiving intervention. These pattern alterations indicate that maternal-fetal attachment education contribute in improving the pregnant women's mental health. The EDPS questionnaire is found more appropriate for detecting perinatal mental health disorders based on the comparison of mean scores between EPDS and SRQ.

This promising finding point out the possibility of maternal-fetal attachment education as promotion effort in enhancing maternal physical and psychological health. Therefore, the intervention related to maternal-fetal attachment may contribute to prevent negative long term effects due to psychological problems in perinatal period. However, the future studies should identify further about the impact of maternal-fetal attachment on psychological changes of pregnant women in different

cultures using qualitative methods, thus it can be investigated if the perspective and acceptance of mothers about maternal-fetal attachments affect mother's mental health. In addition, further studies with the same intervention need larger sample sizes and a longer duration of follow-up to confirm these results.

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