Assessment on effective factors of maternal-fetal attachment in pregnant women

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Abstract: Knowing about prenatal attachment is very important, because it plays an important role in the health of pregnant women, their babies and positive adaptation to motherhood. The purpose of the present study is to define the effective variables influence on maternal fetal attachment (MFA). This is a cross-sectional study that was conducted on 386 pregnant women in 9 Health Center. The instrument used for data collection are: Cranley MFA scale, Beck depression scale, Spielberger state anxiety inventory, Rosenberg self-esteem scale and social support form. The data was analyzed statistically using SPSS version 14. Effective factors were, planning of pregnancy, marital satisfaction and interest in the partner. Mothers with lower depression and anxiety, had higher MFA scores. This information will guide the midwives and obstetrics to identify MFA during pregnancy and help promote MFA by engaging mothers in positive health practice.
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1. Introduction

At the centre of motherhood is the experience of an unequalled connection between two that begins with maternal-child attachment during pregnancy. Motherhood is a special chance for both the mother and child to participate in a relationship that is unique in importance and worth (Coleman,2007).

The connection between mother to be and her unborn baby is perhaps the most important and mysterious relationship (Dipietro, 2010). In pregnancy, the expectant mother develops a loving relationship with her fetus, which Muller defines as prenatal attachment (Muller, 1993). It is described as a mother engagement in behaviors that demonstrate care and commitment to the fetus (Salisbury, Law, Ladasse, Lester, 2003). Salisbury demonstrated " Qualitative descriptions of maternal attitudes and adaptation to pregnancy indicate that MFA is based on cognitive representations of fetus. These may include imagined scenarios between mother and child, as well as a mother ´s attribution of physical and emotional characteristics to the fetus". Attachment is an essential component of pregnancy experience (Muller, 1993) This connection is a normal and helpful part of pregnancy. It is thought to pave the way for the future relationship between mother and baby (Solchany, 2001). Sandbrook and Adamson-Macedo(2004) proposed that " MFA begins as an instinctive emotion, not based on the abstract concept of love, but in the need to protect the fetus. Protection is the overpowering emotion, the foetus is perceived as belonging exclusively to the woman, dependent on her for life itself". According to Condon & Corkindale, the concept prenatal attachment contain five component; desiring for information about the unborn baby, pleasure for the interaction with the baby, desiring for caring the baby and serving its need, concerning about losing the baby or that something will be wrong with the baby and that the baby ´s requisite have preceding over the own requisite (Condon &Corkindale, 1997; Ohman,2011).

Maternal attachment towards the expectant child is a great predictor of the early mother-infant relationship (Siddiqui, Hägglöf, 2000). Studies demonstrated that prenatal maternal illustrations of a child and attachment are predictive of postnatal maternal behavior, postnatal maternal attachment to the infant, and mother-infant interactions and attachment styles after birth (Muller, 1993, Siddiqui, 2000, Leifer 1977, Lawson Turriff-Jonasson,2006, Fuller, 1990). Leifer (1977) mentioned that women who represented more affection towards their fetus showed more self-confidence in their maternal role, and revealed better postpartum adjustment than those who were less attached. MFA plays an important role in the health of pregnant women and expectant child and is a key element of maternal identity and is necessary in adaptation to motherhood (Ustunsoz, Guvenc, Akyus, Oflaz, 2010, Mercer, 2004). Kelly (2001) reported MFA has a positive relationship with positive health practices. It means MFA is a pregnancy-related factor that may change the pregnant mother´s behavior and may enhance mother´s involvement in positive health practices (Reading,

Campbell,Cox, Sledmere, 1982). The attachment felt with the baby has an notable influence on mother´s decisions to maintain healthy behaviours during pregnancy (Ross, 2012).

Some factors are known as such which facilitate or disrupt the attachment. It is important to recognize the factors influencing MFA because of their effects on the future health and development of the infant. Data shows that demographic, pregnancy-related and psychological variables may correlate with attachment. Demographic variables such as age, have been examined in relation to MFA. Mercer et al (1988) and Lindgren (2001) have reported an inverse correlation between maternal age and MFA, but Kemp&Page (1987), Grace (1989) have reported no such correlation. In Mercer and Lindgren study, maternal education has been correlated inversely with prenatal attachment but Ustunsoz et al found positive relationship among them. Income and socioeconomic status has been examined with conflicting results (Cannella,2005).

Maternal fetal interaction is closely correlated with maternal psychological and physical wellbeing. Psychological health of mother to be might influence not only on her relation with the fetus but also on her health behavior (Ji , Han , 2010). Women who were more ambivalent about the pregnancy had a lower attachment to their fetus compared with women who were less ambivalent (Hjelmstedt, widstrÖm, Collins, 2006). Expectant mothers experience anxiety over their baby´s health and forthcoming lifestyle change (Chang, Chen, Huang, 2008). One in two women will experience significant anxiety symptoms during the course of pregnancy(Kent,2009).In one study no associations were found between prenatal attachment and trait anxiety, state anxiety or depression (Hjelmstedt etal,2006). Gaffney (1986) did find an inverse correlation between state anxiety and MFA. One in three women experience significant symptoms of depression at some stage of pregnancy. It may be more common during pregnancy than postnatal (Kent, 2009). Mercer et al (1988) did find a weak inverse correlation between depression and MFA in low, but not high-risk women.

Self-esteem attribute to the degree a person feels capable, worthy and valued (Feldman, 2007). Self-esteem has been studied in relation to MFA. In Koniak-Griffin study (1988) no correlation was found between two variables in adolescents but Curry (1987) reported a positive correlation between them in hospitalized women. Prenatal care is a good time to assess MFA. Mothers are taught procedures that may increase MFA during prenatal care such as training maternal-fetal interaction, talking and writing to the baby (Chang, Kim,kim, 2001) tactile stimulation (Kim, Cho, 2004), recording of fetal movements (Mikhail etal,1991) and maintaining maternal diaries (Koniak-Griffin&Inese verzemnieks, 1991). As studies demonstrated, MFA can influence maternal health, maternal child relationship and also social, emotional and cognitive improvement in child. Therefore it is important to increase our understanding of prenatal attachment and factors that influence it. The purpose of this study is to examine some effective variables influencing maternal-fetal attachment.

2. Material and Methods

The present study was an analysis of data collected from pregnant women and their husband who participated in a study examining the effective factors that influence MFA during prenatal care. A cross-sectional, descriptive survey design was used, with sample drawn from health centers in Sari, Iran. After gaining ethics approval, the participants were informed about the purpose of the study and also they were told that their responses would be kept confidential. Written consent was obtained from them. Participants in nine centers of east, west and center of town (each of them three centers) were selected randomly. The sample consisted of 386 pregnant women and their partners receiving prenatal care in these health centers. Inclusion criteria were mother's age 18 years or older, literacy Persian and married couples. Pregnant women who had any risk factors (such as preterm labor, diabetes, pre-eclampsia, etc) were evaluated as high risk pregnancies.

Tools used for data collection were: *Demographic interview forms*: A demographic and pregnancy information instrument was developed to be used in this study. Items assessed personal characteristics and pregnancy history. The content validity test is utilized to evaluate the reliability of this form.

MFA and PFA Scales: These two scales were used to measure the parent's attachment to the expected child. The original maternal and paternal fetal attachment scale, developed by Cranley (Cranley 1981). The MFA/PFA scales has 24 items, self-administered instrument that asks women and their partners to respond to questions describing behavior or thoughts indicative of MFA and PFA during the pregnancy. MFA scale measures to what extent the mother –to-be is engaged in behaviour which is expressing a sense of belonging and interaction with the development as the pregnancy means. The 24 items were divided into five subscales; differentiation of self from fetus, interaction with the fetus, attributing characteristics to the fetus, giving of self and role taking. Items have five choices ranging from 1(definitely no) to 5(definitely yes) (Ohman,2011). Higher total scores indicate higher levels of maternal-fetal attachment. Permission was obtained from

Cranley to adapt the scales for Iranian culture. The researcher translated these scales. The reliability of Cranley MFA and PFA was approved concerning the content reliability. The consistency of MFA and PFA were approved by Cronbach's alpha (0.80 and 0.82).

The Spielberger state anxiety Inventory: Spielberger's State Anxiety Inventory consists of 20 items that ask how a person feels now, and reflects situational factors that may influence anxiety levels. Scores range from 20 to 80 and the higher the score the greater the level of anxiety. This scale has been widely used previously in pregnant women in our society is and known to have high reliability and validity (Bastani, Haidarnia, Vafaie, Kazem-nejad, Kashanian, 2006). It consists of 20 items rated on a 4 point likert-scale, where high values indicate high state anxiety.

The Beck Depression Inventory: The Beck Depression Inventory, is a 21-question multiple-choice self-report inventory, one of the most widely used instruments for measuring the severity of depression. Its development marked a shift among health care professionals, who had until then viewed depression from a psychodynamic perspective, instead of it being rooted in the patient's own thoughts. High values indicate high depression. This scale has been used previously during pregnancy on an Iranian national sample (Golparvar, Kamkar, Rismanchian, 2007).

The Rosenberg self-Esteem Scale (RSE): This scale measured the independent variable of self-esteem. The Rosenberg Self-Esteem Scale is perhaps the most widely-used self-esteem measure in social science research. It consist of 10 items, higher scores indicating higher self-esteem. Test –retest reliability of this scale showed correlations of 0.84 (Rajabi, Bohlole,2008).

The Social Support Form: Social support is the physical and emotional comfort given to us by our family, friends, coworkers and others to determine social support degrees. This scale also has been used previously during pregnancy in Iranian women (Karke Abadi, Latifnejad, Sahebi, 2001).

A set of questionnaires were given to pregnant women and their partners. These questionnaires were completed by 386 women and men in prenatal care units. Informed consent was obtained during data collection.

The data was analyzed statistically using SPSS version 14. Descriptive statistics (frequency, mean, standard deviation, etc) were used to describe samples. To determine MFA and PFA scores we used one sample T-test. Two independent sample T-tests were used to asses difference between MFA and PFA scores. One –way ANOVA was used to determine effective demographic and psychological factors influencing MFA. A p-value less than 0.05 was accepted as statistically significant for all analyses.

3. Finding

The average age of the participants in this study was 25.15±3.99 years. Of the 386 women, 38(9.8%) were employed,most,202(52.3%) were graduated from high school, and 232(60.1%) were primiparas. 85% of the pregnant women were low risk and 14.9% were high risk. 10.5% of women were in the first trimester, 47.7% in second trimester and 41.8% in third trimester. Other characteristics were shown in table (1). Psychological characteristics of the study population were shown in table (2). The mean scores of MFA and PFA were 3.56±0.55 and 3.36±0.55. A comparison of MFA and PFA scores by using t Test revealed that the MFA scores of pregnant women were significantly higher than the PFA scores of their partners (p=0.00, t=4.77). There was significant relationship among satisfaction with the marital relationship (p=0.00, t=10.58), planned pregnancy (p=0.00, F=17.3) and MFA. Women that had higher satisfaction with the marital relationship, planned pregnancy, had higher MFA scores. Women whose fetal gender was male had higher MFA scores. On the other hand Anova analysis revealed there was not significant relationship among mother s age (p=0.527, F=0.63), income (p=0.60, F=0.5), mother education (p=0.231, F=1.44), and MFA. Also t Test showed that there was not significant correlation between prior pregnancy loss (p=0.104, t=1.62) and MFA. Multiparous more than three had lower MFA scores. As demonstrated in table 3, one-way analyses of variance (ANOVA) computed between prenatal attachment and psychological variables found the variables achieving significance with MFA to be: anxiety, depression, social support, self-esteem. Mothers had lower anxiety, depression and higher social support, self-steem had higher MFA scores.

4. Discussions

A great scientific literature has confirmed the existence of maternal-fetal attachment. MFA has been discussed as developmental task of pregnancy and index of adaptation to motherhood. It is our duty to work industriously to delete embarrassment in pregnancy and help expectant mother to have a healthy pregnancy and healthy child (Salisbury, 2003). The purpose of this study was to investigate effective variables influencing MFA. The mean score of MFA in our study was 3.56±0.55. MFA score in Koniak´s study in control group was 4.33 and in Lewis´s study was 3.97±0.40. The MFA score in our study was lower than other studies. It can be related to the culture of our society and also may be related to the age of pregnancy. Pregnancy age mean in our study was 25.94±0.42 and in Lewis´ study was 33.4 week and in Koniak´study was 24-34 week (Lewis; 2003,

Koniak; 1991). In current study mothers had higher attachment scores than fathers. It may have been a result of direct engagement of the mother in pregnancy, because mothers feel fetal movement and connect with the baby easier and it can increase MFA. Similar to our study Ustunsoz (2010), Mercer et al (1988) and Lorensen et al (2004) reported that MFA scores were higher than the PFA. But one study showed that PFA is higher than MFA (White et al, 1999). In our study we analysed some demographic, pregnancy-related and psychological factors in relation to MFA. In this study there was not a correlation between MFA and mother´s age. Ustunsoz et al (2010) found MFA decreased with increasing age of the pregnant women. Berryman & Windridge (1996) found that women aged 35 years or older showed significantly lower MFA scores on two of the five subscales than those in their 20s. However most researchers have reported no such correlation (Cannella,2005). Also in this study no significant correlation was found between the attachment score and mother´s education. Kwon & Bung (2011) reported women who have low educational level, showed low MFA. Ustunsoz et al also showed that education was associated positively with MFA. But Mercer et al (1988) & Lindgren (2001) found inverse correlation between these two variables. Our study found no correlation between income and MFA. Similar to our study, Lindgren (2001) and Curry found no correlation between them. But Mercer et al (1988) reported an inverse relationship between MFA and socioeconomic situation in high risk mothers. Also we found positive correlation between MFA and satisfying with the marital relationship. Bloom (1998) reported that a close and satisfying relationship with the father of the baby has a positive influence on MFA. Hjelmstedt et al (2006) also found a significant association between attachment scores and marital satisfaction in gestational week 26. Mercer et al (1988) found that MFA scores have positive correlation with mate relationship in low risk women. Condon and Esuvaranathan (1990) looked at the effect of parity on MFA in women in third trimester of pregnancy. No significant differences were found between the groups of primiparous and multiparous women. Berryman and Windridge (1996) also found parity to have no effect on prenatal attachment. In contrast, Ustunsoz´s study revealed that there was a negative relationship between MFA score and parity. We also found that mothers with parity more than three had lower MFA. This difference may relate to less focus on the present pregnancy and fetus, probably because of responsibility regarding toward their other children. We found that in planned pregnancies, mothers had higher MFA than unplanned pregnancies. In Damato´s study planning of pregnancy was not a predictive factor of MFA (Damato,E.G; 2004). The findings of Ustunsoz´s research showed that MFA scores were higher in planned pregnancies. In an unplanned pregnancy it may be more likely that the baby is unwanted and lower rates of prenatal attachment would be observed (Laxton &Slade,2002). Previous fetal loss is a painful event that may affect subsequent pregnancy (Alhusen, 2008). At least 25% of women who experience a voluntary or a nonvoluntary perinatal loss will suffer from clinically significant psychological distress (Coleman). Perinatal loss may disrupt maternal fetal attachment (Alhusen, 2008). In present study prior perinatal loss was not effective on MFA. But Armstrong & Hulti (1998) found that women who had prior perinatal loss were significantly less attached to their fetuses. The relationship between MFA and psychological variables is essential to consider such as if women are isolated or distressed in pregnancy, may affect prenatal attachment negatively (Laxton& slade; 2002). Our research indicated that levels of prenatal attachment were associated with level of social support, anxiety and depression. Mothers with higher social support had high MFA scores. It could be proposed that, for acceptable attachment, mother to be needs sufficient support. Possibly mothers with higher social support are more likely to establish emotionally in their fetus (Hjelmstedt, 2006) Condon and Corkindale (1997) in a non-adolescent group, found that increased levels of social support were significantly correlated with higher scores on intensity of prenatal attachment subscale. Conversely Koniak-Griffin (1993) did not find significant relationship between these two variables in adolescents. We found mothers had higher anxiety and depression had lower MFA scores. In one study Honjo found that no direct association was observed between depression in mothers and MFA before fetal movement was perceived (Honjo et al;2003). In another study the pregnant women who presented strong bonding showed a high level of MFA and fewer anxious and depressive symptoms (Schmidt et al; 2009). Also Hart found that higher symptom levels of trait and state anxiety were related to lower quality of MFA and higher maternal worries (Hart; 2006). In Kelly´s study depression was a significant predictor of maternal fetal attachment (Kelly, 2001). Our results showed that feelings of anxiety or depression may interfere with a woman´s ability to attach to the fetus. May be pregnancy in depressive women is uncertain and they are not able to cope with this condition, involved with the fetus lessly, therefore have a lower MFA scores. Therefore, depression in pregnancy can influence the women´s response to being pregnant. We found self-esteem significantly enhanced MFA as opposed Cranley(1981) and Koniak-Griffin´s studies (1988)

who found no connection. Attention to the pregnant women´s self-image is necessary because it can influence outcomes of pregnancy and help her take pride in herself to decrease unlike feeling about pregnancy (Feldman, 2007).

Table 1. Baseline characteristic of the study population

Variables	N	%	variables	N	%
Age(yr)			**Planning of pregnancy**		
<20	28	7.3	**In mother**		
20-30	319	82.6	Planned	348	90.2
>30	39	10.1	Unplanned	38	9.8
Parity			**Planning of pregnancy in father**		
Primipara	232	60.1	Planned	356	92.2
Multipara	144	39.9	Unplanned	30	7.8
			Fetus gender forecasting		
Prior prenatal loss			Yes	312	80.8
Yes	56	14.5	No	74	19.2
No	330	85.5	**Forecasted fetal gender**		
Income average			Male	153	39.6
Insufficient	62	16.1	Female	159	41.2
Sufficient	315	81.6	**Satisfying with marital relationship**		
Abundant	9	2.3	Too much	254	65.8
Mother Education			To some extent	128	33.1
Primary school	19	4.9	little	4	1.1
Guidance school	40	10.4			
High school	202	52.3			
university	125	32.4			

Table 2. Baseline psychological characteristics of the study population

Variables	N	%	Variables	N	%
State anxiety			**Depression**		
Minimum	115	29.8	Without	266	68.9
Mild	137	35.5	Mild	84	21.8
Moderate	93	24.1	Moderate	36	9.3
Severe	41	10.6			
Self-esteem			**Social support**		
Little	35	9.1	Little	38	9.8
Moderate	98	25.4	Moderate	177	45.9
Much	253	65.5	Much	171	44.3

Table 3.Analyses of variance (ANOVA) of significant psychological variables effecting MFA

Variables		df	MS	F	sig
anxiety	Between groups	3	19.3	0.000	
	W/in groups	382	0.16	119.74	
	Groups	385			
Depression	Between groups	2	12.8		
	W/in groups	383	0.24	52.22	0.000
	Groups	385			
Self-esteem	Between groups	2	13.56		
	W/in groups	383	0.24	56.20	0.000
	Groups	385			
Social support	Between groups	2	10.97		
	W/in groups	383	0.25	43.09	0.000
	Groups	385			

Conclusion

Evaluate of relevant studies obviously indicate maternal-fetal attachment is real, powerful, and begin early in pregnancy. When this connection is severed through death of the fetus women are at risk for many negative mental health outcomes (Coleman). The aim of this study was to determine the significant variables effect on maternal fetal attachment. The predictive variables were: a) marital relationship, planned pregnancy**,** forecasted fetal gender b) anxiety, depression, social support, self-esteem.

Effective factors influencing MFA could be defined, which can promote or disrupt the prenatal attachment. In the prenatal care the care givers can try to identify mother with poor maternal fetal attachment and help them improve their health practices trying to improve women´s health and pregnancy outcome (Ohman, 2011). Therefore preventative programs and interventions to increase MFA could be developed. It is believable that increasing MFA score may enhance patient compliance with prenatal health care, ease maternal adaptation in pregnancy and have positive effects on mother-child interaction. Thus it is essential to know these parameters to help mothers for enhancing their and their child health. It should be noted that more studies are needed to establish relationship between these factors and MFA.

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