

# The Relationships between Prenatal Attachment, Basic Personality Traits, Styles of Coping with Stress, Depression, and Anxiety, and Marital Adjustment Among Women in the Third Trimester of Pregnancy

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**Cite this article as:** Ozcan H, Ustundag MF, Yilmaz M, Aydinoglu U, Ersoy AO, Yapar Eyi EG. The Relationships between Prenatal Attachment, Basic Personality Traits, Styles of Coping with Stress, Depression, and Anxiety, and Marital Adjustment Among Women in the Third Trimester of Pregnancy. *Eurasian J Med* 2019; 51(3): 232-6.

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Received: December 21, 2015  
Accepted: March 29, 2019

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DOI 10.5152/eurasianjmed.2019.15302



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## ABSTRACT

**Objective:** The importance of prenatal attachment, probably as the initial attachment of a pregnant woman to the fetus and which turn into the maternal–baby attachment after birth, for the well-being of the newborn and mother is well known. The aim of the present study was to explore the possible socio-demographic and clinical factors (personality features, styles used in coping with stress, depression, and situational anxiety levels, and marital adjustment) affecting maternal–fetal attachment.

**Materials and Methods:** Eighty women on their third trimesters of pregnancy were included in the study. After examination by a psychiatrist, a detailed socio-demographic form and scales including Prenatal Attachment Inventory, Basic Personality Traits Scale, Coping with Stress Attitudes Inventory, State-Trait Anxiety Inventory-I, Beck Depression Inventory (BDI), and Marital Adjustment Scale were applied.

**Results:** Educational level, marital adjustment, social support, and turning to religion as a coping mechanism with stress were found to be positively correlated with prenatal attachment scores. The duration of marriage and number of giving births and the avoidance/disengagement subscale of Coping with Stress Scale and BDI scores were negatively correlated with prenatal attachment scores. A BDI score of  $\geq 17$  (this score suggests moderate and/or severe symptoms of depression) was found to be an independent and a negative variable on prenatal attachment.

**Conclusion:** We suggest that the detection of symptoms of depression and other factors that may affect prenatal attachment, may help shed light to the interventions to be performed to improve the quality of maternal–fetal attachment by society and governments.

**Keywords:** Prenatal attachment, depression, anxiety, marital adjustment

## Introduction

Mother–baby bound is the first relationship of a baby with a human as being his/her mother; also it is one of the most important relationship in life with respect to theoretical, clinical, and social aspects [1]. The bonding/attachment type, which is established early in life and considered to have continuity, also affects the relationship pattern of the individual with other people [2]. The bonding theory related to the mother–baby bonding and probably beginning with pregnancy has been defined in 1969 by Bowlby and has been the subject of interest thereafter [3, 4].

In a meta-analysis including 14 studies on the factors affecting mother–baby bonding, the authors have evaluated the biological and environmental factors, such as social support, anxiety, self-esteem, and depression, the pregnancy-related factors, such as gestational age, planned/unplanned pregnancy, pregnancy number, high risk pregnancy, and gestational follow-up visits, and the socio-demographic data, such as age, race, married/unmarried pregnant women, income level, and educational status. The authors have found that although social support is the most effective biological factor, anxiety, self-esteem, and depression are also effective [5]. Of the pregnancy-related factors, gestational age of the mother was the most effective factor. Planned and desired pregnancies, regular gestational follow-up visits, and particularly establishment of the pregnancy by ultrasound had moderate positive effects, and planned pregnancies had a weak positive effect on mother–baby bonding. On the other hand, age, race, marital status, income level, and educational status had

only weak effects on mother–baby bonding [5]. In the literature, maternal depression has been reported as a negative factor with regard to the quality of mother–baby bonding [6]. Moreover, depression and anxiety during pregnancy have been suggested to have negative effects on the course of pregnancy (preterm birth risk and obstetric complications), as well as on the development and behaviors of the baby in the postnatal period [7]. Mother–baby bonding of good quality has been suggested to be important with regard to the preparation of the mother for motherhood, the care and interest of the mother to the baby, and thus the development of the baby [8, 9]. As mentioned above, most of the studies in the literature included mothers and babies after birth and investigated mother–baby bonding. In our study, we aimed to explore the very first bonding situation (the prenatal attachment) of a pregnant woman to the fetus.

The aim of the present study was to investigate the possible socio-demographic and important clinical variables that might be associated with the quality of bonding of the mother to the fetus and those that might also play a major role in the health of both the newborn baby and the mother. We also aimed to provide an insight for future studies and initiatives to governments and social policy makers for improving this bonding/attachment.

## Materials and Methods

A total of 80 randomly selected pregnant women at the third trimester of their pregnancy who were followed up at Dr. Zekeriya Tahir Burak Women's Health Training and Research Hospital and Ataturk University Medical Faculty, Department of Obstetrics and Gynecology between May 2012 and September 2012 were included in the study. Only participants with major organic or psychiatric diseases, such as acute psychosis and emergent medical situations, were excluded from the study. Participants who cooperated for the examination and filled out the scales were included in the study. The scale questions were read and asked to two illiterate participants by one of the researchers. After obtaining verbal and written informed consent, each participant was examined by a psychiatrist (H.O., who has been working in both hospitals), and a socio-demographic form, Prenatal Attachment Inventory (PAI), Basic Personality Traits Scale (BPTS), Coping with Stress Attitudes Inventory (CSAI), State-Trait Anxiety Inventory-I (STAI-I), Beck Depression Inventory (BDI), and Marital Adjustment Scale (MAS) were administered. The study was approved by Dr. Zekeriya Tahir Burak Women's Health Training and Research Hospital Ethics Committee.

**PAI:** This scale has been developed to describe the thoughts, emotions, and situations of pregnant women and to determine the bonding level of the women to their baby in the prenatal period [10]. The scale consists of 21 items with each item scored from 1 to 4. Increased scores indicate an increasing level of bonding. The validity and reliability of the Turkish version of the scale have been established [11].

**BPTS:** This scale has been developed by establishing 226 adjectives usually used to define the different personality traits in Turkish culture on a sample including 100 participants [12]. These adjectives have been scored on a 5-point Likert scale by 510 participants. A total of 45 items loaded with the highest coefficient for BPTS subdimension were selected. Then, the scale consisting of 45 items has been administered to a sample including 454 university students to determine the factor structure and psychometric properties of the scale. Basic personality traits in the scale are defined as extroversion, responsibility (self-discipline), compatibility/adaptability, emotional inconsistency, openness to development (being open to new experiences), and negative valence (attributing negative values to one's self).

**CSAI:** This scale has been originally developed in the US for the evaluation of coping with stress strategies among foreign students studying at universities [13]. The reliability and validity of the Turkish version of the inventory have been established previously [14]. The inventory measures the coping with stress attitudes in different stress situations. It is scored on a 5-point Likert scale. Each participant is asked to read each item and score as "never," "sometimes," "often," or "always." Six factors have been identified in the following factor analysis: "active planning" (active fighting to overcome the stress factor), "seeking an external help" (asking for help from others for a concrete solution for the stress-related problem), "taking refuge in religion" (taking refuge in the divine power and get strength from beliefs to overcome stress), "avoidance–abstraction (emotional–operational)" (passive abstraction by avoiding the stress factor), "avoidance–abstraction (biochemical)" (making physiological changes in metabolism as a passive avoidance strategy, i.e., drug or substance abuse), and "acceptance–cognitive restructuring" (accepting the problem and seeking cognitive solutions). The inventory indicates that the individuals more frequently use the coping with stress strategies with higher scores.

**STAI-I:** This scale is the first part of the STAI that can be used in individuals over the age of 14

years [15]. The adaptation of the scale into the Turkish language and the validity and reliability of the Turkish version of the scale have been established [16]. The situational anxiety scale used in the present study measures how an individual feels at a certain moment and in a certain situation. It is a self-administered scale and consists of 20 items. The total score varies from 20 (lower anxiety) to 80 (higher anxiety), with a score of  $\leq 36$  indicating no anxiety, 37–42 indicating mild anxiety, and  $\geq 43$  indicating high level of anxiety. Individuals with a score of  $>60$  are considered to need help.

**BDI:** This is a self-administered inventory and consists of 21 items measuring the emotional, cognitive, and motivational symptoms of depression [17]. Each item identifies a behavioral characteristic related to depression. Items are scored according to the severity of depression from 0 to 3. The purpose of the inventory is to measure the symptom severity objectively rather than to diagnose the depression. A score of  $\geq 17$  has been suggested as a significant cut-off value for the diagnosis of depression. The reliability and validity of the scale have been established [18, 19].

**MAS:** This scale has been developed to measure marital adaptation and consists of 15 items [20]. Higher scores on the scale indicate a good adaptation to marriage. The reliability and validity of the scale have been established for measuring marital adaptation in the Turkish society [21].

In the present study, some socio-demographic data frequencies, as well as average and standard deviations for socio-demographic data and scale scores, were calculated. Pearson correlation analysis was used to determine the relationship between the scale scores and the socio-demographic data. Logistic regression analysis was used to determine the effects of depression symptoms, number of births, and marital adjustment on prenatal attachment.

## Statistical Analysis

Statistical analysis was performed by using The Statistical Package for the Social Sciences (SPSS) 20.0 program (IBM Corp.; Armonk, NY, USA). A p value of  $<0.05$  was considered as significant.

## Results

Socio-demographic data and the scale scores of 80 pregnant women are shown in Table 1.

PAI scores were evaluated by correlation analysis according to socio-demographic variables, basic personality traits, subscores of coping with stress attitudes, and total scores on STAI-I, BDI,

and MAS with the representation of the associated variables in Table 2. Only variables that were found to be statistically significantly associated with PAI score are shown.

The other variables clinically considered to be associated with prenatal bonding in previous

clinical studies were evaluated by logistic regression analysis to identify the independent factor or factors associated with prenatal attachment.

### Logistic Regression Analysis

First, the parameters found to be significantly associated with PAI score were analyzed in the form of triplet or quadruplet groups. The mean PAI score of the group was >60, and 60 may also be accepted as a high score according to the scores obtained from the inventory (0-84). Therefore, the score 60 was obtained for further analysis.

When a PAI score of >60 was considered as high, the parameters affecting the prenatal attachment independently were BDI score (odds ratio (OR) 0.906, 95% confidence interval (CI) 0.825–0.994,  $p=0.037$ ) and number of births (OR 0.561, 95% CI 0.327–0.962,  $p=0.036$ ). The parameters were applied in the model in chronological order of BDI score, number of births, and MAS score using the enter method. When other parameters found to be associated with prenatal attachment in the correlation analysis were evaluated by logistic regression analysis, they were not found to be independent variables. Although the groups were not similar with respect to the two independent variables, the BDI scores and number of births, the results of the analyses, and the variables associated with BDI score are shown below.

The PAI scores were  $55.7 \pm 11.9$  in 15 participants with a BDI score of  $\geq 17$  and  $61.3 \pm 8.7$  in 65 participants with a BDI score of  $< 17$ , and there was a significant difference between these two groups ( $p < 0.05$ ). In addition, a negative value score was significantly positively associated with BDI score ( $r = 0.309$ ;  $p < 0.05$ ).

The PAI scores were  $63.3 \pm 9$  in nulliparous women ( $n = 28$ ) and  $58.6 \pm 9.5$  in multiparous women ( $n = 52$ ), and there was a significant difference between these two groups ( $p < 0.05$ ).

The score on the subdimension of seeking an external help for CSAI was significantly negatively associated with BDI score ( $r = -0.305$ ;  $p < 0.05$ ).

No correlation was found between PAI scores and basic personality trait subgroups.

In the psychiatric examination, 24 pregnant participants were found to have a psychiatric disorder according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR) criteria. Of these 24 women, few had been already previously diagnosed, and others were diagnosed for the first time. Eight (10% of the study group) were diagnosed with depression similar to the findings of the previous studies [7]. Other diagnoses included anxiety disorder in five, schizophrenia or any psychotic disorder in one, personality disorder in two, acute stress disorder in one, obsessive compulsive disorder in two, adjustment disorder in five, trichotillomania in one, impulse control disorder in two, sleep disorder in two, sexual function disorder in five, and nicotine addiction in six participants. Some of the participants had more than one diagnosis. All these participants were then followed up by a psychiatrist (H.O.) for a while.

PAI score was significantly higher in participants with no psychiatric disorder ( $n = 56$ ) than in those with an existing psychiatric disorder ( $n = 24$ ) ( $61.6 \pm 8.9$  vs.  $57.6 \pm 10.7$ , respectively). However, there was no significant difference between these two groups ( $p > 0.05$ ).

### Discussion

In the present study including 80 pregnant women in the third trimester of their pregnancy, educational years, self-reported social support level, marital adaptation, and taking refuge in religion among the coping with stress attitudes were found to be positively associated with the level of prenatal bonding.

Similar to our findings, a previous study has also found that educational level has a mild positive effect on mother–fetus bonding/attachment [5]. In practice, in our country, generally, well-educated couples read books about baby care and have lesser numbers of children than less educated or illiterate couples. We think that being well-educated and also reading books about baby care might be a positive factor leading to think about and looking forward to the coming baby and might have a positive effect on prenatal bonding. In addition, well-educated couples have lesser numbers of children, and this might have

**Table 1. Socio-demographic and scale data of the participants**

	Mean (N=80)	Standard deviation
Age (years)	27.3	5.9
Gestational week	36.6	3.3
Educational years	9.9	3.4
Marriage duration (years)	5.6	4.3
Income level (TL)	1782.6	519.5
No. of births	1.1	1
No. of abortions	0.3	0.5
Fear from giving birth (0-4) (0: none, 4: very severe)	2.6	0.9
Social support (0-4) (0: none, 4: full)	2.9	0.9
PAI score	60.4	9.5
Extroversion	29.9	5.2
Responsibility	34	3.9
Adaptation	34.9	3.4
Emotional inconsistency	23.2	6.4
Openness for improvement	22.7	3.9
Negative valence	9.2	2.5
Take refuge in religion	15.8	6.4
Seeking for external help	21.8	6.5
Active planning	26	5.8
Avoidance–abstraction (emotional–operational)	14.3	5.4
Avoidance–abstraction (biochemical)	1.7	2.8
Acceptance–cognitive restructuring	15.4	4.8
STAI-I	40.1	5.8
BDI	10.5	8.1
MAS	44.6	7.7

PAI: Prenatal Attachment Inventory; STAI-I: State-Trait Anxiety Inventory-I; BDI: Beck Depression Inventory; MAS: Marital Adjustment Scale

**Table 2. The relationship between the scales for participants**

	Educational status	Marriage duration	No. of births	Getting help	Take refuge in religion	Avoidance–abstraction (biochemical)	BDI	MAS
PAI	0.226*	-0.23*	-0.233*	0.282*	0.346**	-0.441**	0.26*	0.268*

\* $p < 0.05$ .

\*\* $p < 0.01$ .

Variables with a positive and negative relationship between each other were marked with the plus and minus signs, respectively.

BDI: Beck Depression Inventory; MAS: Marital Adjustment Scale; PAI: Prenatal Attachment Inventory

a positive effect on prenatal bonding, which will be discussed below.

We found that PAI score was higher among women in their first pregnancy than among those who had experienced a pregnancy previously. In a previous study, PAI score has been also found to be higher in women in their first pregnancy and having no children than in those who had experienced a pregnancy and having at least one child. Similar to our study, the authors have suggested that the women who will be mothers for the first time might have more excitement and anticipation, which might be applicable to our findings [22].

Beck Depression Inventory score was found as a predictive factor for the level of prenatal bonding similar with studies exploring the relationship between depression and maternal attachment [5-7]. In our study, with a cut-off value of 17 for BDI score, 15 women were found to be at risk of having depression. Of these pregnant women, after psychiatric examination, eight were diagnosed with depression (e.g., major and minor). However, the number of women with depression ( $n=8$ ) was relatively low, and comparisons were made between women with any psychiatric disease ( $n=24$ ) and those without ( $n=56$ ). Although PAI score was slightly higher in women without a psychiatric disorder than in those with a psychiatric disorder, there was no statistical difference. This might have resulted from the insufficient number of participants or from the possibility that different psychiatric disorders have different effects on mother-fetus bonding.

In the literature, there are some studies showing that marital adaptation and social support to pregnant women/mother have a positive effect on both prenatal and postnatal mother-baby bonding [22, 23]. Although MAS score was found to be associated with PAI score, it was not an independent factor in the logistic regression analysis. However, MAS score was significantly negatively associated with BDI score. Although the harmony between married couples might have no direct effect, it is considered to affect the mother-fetus bonding by impairing the mental health of a pregnant woman. Previous studies about the association of marital adaptation with depression and emotional expression have found less depression symptoms in couples with a better marital adaptation [21, 24].

The subscore of taking refuge in religion for CSAI was positively associated with PAI score. People usually feel more comfortable in both physical and spiritual aspects when they believe in a divine power superior than themselves, as

well as when they believe in destiny, which might lead to higher PAI scores. This finding should be investigated on larger groups of people.

In the present study, the duration of marriage and the number of births were negatively associated with the avoidance-abstractation "biochemical" subscore of CSAI, and the depression symptoms (BDI score) were negatively associated with PAI score. The negative association between the time of marriage and the number of births and the PAI score might be related to the above-mentioned factors resulting in higher PAI scores in women in their first pregnancy. With the increasing duration of marriage, women might somewhat adapt the thought of having a child even if they might be tired of the pregnancy course and transfer a fair amount of bonding investment to other children with the increasing number of births, all of which might result in decreased PAI scores. The negative association of PAI scores with the avoidance-abstractation (biochemical) subscores might be related to the facts that this attitude is commonly found as physical symptoms (i.e., hypertension) in anxious and depressed people or that this attitude might affect the emotional life of the pregnant women, as well as social support and marital adaptation. Many reports exist on the prevalence of depression during pregnancy and the adverse effects of depression on mother-fetus attachment, as well as on mother-baby bonding during pregnancy, birth, and the postnatal period [7, 25-27]. Moreover, as mentioned above, by considering the fact that getting social support and help was positively associated with PAI scores, the negative association between BDI score and "seeking external help" subscore of CSAI can be explained as follows: If the people seeking help find sufficient support, their problems can be solved, and depressive symptoms might decrease or people with depressive symptoms might less commonly seek help due to the symptoms including reluctance, loss of self-respect, and thoughts that nobody can help them. In a previous study including the mothers of children with disability, the depression score of the mothers was negatively associated with the scores for seeking social support [28]. In the present study, negative valence score was positively associated with BDI score. Previous studies have also reported an association between depression symptoms and negative valence and automatic thoughts about themselves and life of depressed people [29-31]. Another study has found that increased anxiety, as well as decreased self-respect, induced by depression affects the mother-fetus bonding negatively [5].

We could not find any relationships between basic personality trait subgroups and STAI-I and

PAI scores. In addition, mild anxiety level was found among participants. We think that the small sample size and mild effect of situational anxiety and personality traits might lead to this finding. A study found no significant effect of anxiety on prenatal attachment [32]. Contradictory to our results, a study found some basic personality traits, such as dependent and self-critical characteristics related with maternal attachment features [33].

We suggest in our study that in substantially representing real-life situations, including randomly selecting 80 participants with a minimal exclusion criteria, 8 (10% of the study group) were diagnosed with depression, a common psychiatric disorder during pregnancy, similar to the findings of the previous studies [7, 26]. In addition, 24 (30%) pregnant women were diagnosed with a psychiatric disorder according to the DSM-IV-TR criteria. Pregnancy is a process in the reproductive age of women, and psychiatric disorders can be seen at any age in life; all these findings are inevitable. Moreover, it is still debated if pregnancy is a risk factor or not for psychiatric disorders [34]. Regular follow-up, determining the risk groups, consultancy and treatment of pregnant women or mothers with a psychiatric disorder, regard to the quality of life, and healthy mother-baby bonding have been underlined [35, 36].

The present study aimed to investigate the possible factors that are associated with the bonding of the mother to her baby and to provide an insight for future studies and initiatives for improving mother-fetus bonding as a pioneer of mother-baby bonding. We made a psychiatric examination of all participants. In most of the studies, the participants did not have a proper medical examination, and the diagnosis was made by using scales. A limited number of participants and not evaluating other possible factors that may affect mother-fetus attachment are limitations of the present study. We evaluated the bonding/attachment to the fetus at the present pregnancy.

**Ethics Committee Approval:** Ethics committee approval was received for this study from the ethics committee of Dr. Zekeriya Tahir Burak Women's Health Training and Research Hospital.

**Informed Consent:** Written informed consent was taken from all participants.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Concept - H.O., A.O.E.; Design - H.O., M.F.U., M.Y.; Supervision - H.O., E.G.Y.E.; Funding - H.O., A.O.E.; Materials - M.F.U., U.A., A.O.E.; Data

Collection and/or Processing - H.O., U.A., M.Y., A.O.E.; Analysis and/or Interpretation - H.O.; Literature Search - H.O., M.F.U.; Writing the Manuscript -H.O., M.F.U., M.Y.; Critical Review - M.F.U., A.O.E., E.G.Y.E.

**Conflict of Interest:** The authors have no conflict of interest to declare.

**Financial Disclosure:** The authors declared that this study has received no financial support.

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