# Investigation of Variables Related to Prenatal Bonding Levels in Pregnant Women*

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**ABSTRACT**

**Objective:** This study aims to investigate the relationship between prenatal bonding levels, self-perception, marital satisfaction, and psychological symptoms in pregnancy. It also examines whether prenatal bonding levels differ according to sociodemographic and pregnancy-related variables.

**Method:** The sample comprised a total of 200 women in their 2nd and 3rd trimester of pregnancy who were admitted to the outpatient polyclinics of obstetrics and perinatology at Kanuni Sultan Süleyman Hospital in Istanbul. The sample was created by convenience sampling method. The data collection tools included 'Personal Information Form' designed to collect information about the demographics and pregnancy of the participants, 'Prenatal Attachment Inventory' designed to determine prenatal bonding levels, 'Marital Life Scale' designed to investigate the overall satisfaction levels in marriage, 'Social Comparison Scale' used to measure the self-schema that reflects impressions about the self, and the 'Brief Symptom Inventory' designed to evaluate general symptoms of psychological distress and psychiatric disorders.

**Results:** The results indicated that prenatal bonding levels differed according to certain variables such as educational background, gestational week, number of children women already had, number of pregnancies, and relationship with the partner. A weak positive correlation was found between prenatal bonding levels and marital satisfaction, while there was no significant relationship between self-perception and psychological symptoms.

**Conclusions:** Higher levels of marital satisfaction lead to a corresponding increase in prenatal bonding in pregnant women. Therefore, to ensure a healthy mother-child relationship, educational or social programs should be designed to improve women's satisfaction with their married life.

**Key words:** Prenatal bonding, maternal-fetal bonding, marital satisfaction, self-perception, psychological symptoms

**ÖZ**

**Gebe Kadınlarda Prenatal Bağlanma Düzeyi ile İlişkili Değişkenlerin İncelenmesi**

**Amaç:** Bu araştırmanın temel amacı gebelerde prenatal bağlanma düzeyleri ile kendilik algısı, evlilik doyumu ve psikolojik belirtiler arasındaki ilişkiyi incelemektir. Ayrıca çalışmada prenatal bağlanma düzeylerinin sosyo-demografik değişkenler ve hamilelikle ilgili değişkenlere göre farklılaşıp farklılaşmadığı da araştırılmıştır.

**Yöntem:** Çalışmanın katılımcı grubunu, İstanbul ilinde yer alan Kanuni Sultan Süleyman Hastanesi Gebe Polikliniğine ve Perinatoloji Polikliniği ve Servisine başvuruda bulunmuş 2. ve 3. trimesterde olan toplam 200 gebe kadın oluşturmaktadır. Araştırma ilişkisel tarama modeline uygun olarak yürütülmüş ve kolayda örnekleme yöntemi ile oluşturulmuştur. Araştırmada katılımcıların demografik ve gebelikleri ile ilgili bilgilerine ulaşabilmek amacıyla oluşturulmuş 'Kişisel Bilgi Formu'; prenatal bağlanma düzeylerini belirlemek için 'Prenatal Bağlanma Envanteri'; evlilikteki genel doyum düzeylerini araştırmak için 'Evlilik Yaşamı Ölçeği'; kişilerin kendilerini algıladıkları benlik şemasını ölçmek amacıyla 'Sosyal Karşılaştırma Ölçeği' ve genel ruhsal belirtileri taramak için 'Kısa Semptom Envanteri' kullanılmıştır.

**Bulgular:** Araştırmanın bulgularına göre gebelerin prenatal bağlanma düzeyleri, eğitim, gebelik haftası, sahip olunan çocuk sayısı, hamilelik sayısı, eş ile olan ilişki gibi değişkenlere göre farklılık gösterdiği görülmüştür. Gebelerin prenatal bağlanma düzeyleri ile evlilik doyumu arasında pozitif yönde zayıf bir ilişki bulunurken, kendilik algısı ve psikolojik belirtiler arasında anlamlı bir ilişki bulunmadığı belirlenmiştir.

**Sonuçlar:** Gebelerin evliliklerinden aldıkları doyum arttıkça prenatal bağlanma düzeylerinde de artış görülmektedir. Sağlıklı anne-bebek ilişkisi için evlilik ilişkisinden alınan tatmini arttırıcı planlamalar yapılmalıdır.

**Anahtar Kelimeler:** Prenatal bağlanma, maternal-fetal bağlanma, evlilik doyumu, kendilik algısı, ruhsal belirtiler

## INTRODUCTION

The underlying causes of many pathologies and crimes seem to be closely associated with the quality of the mother-infant relationship.[1,2] To gain a deeper insight into this relationship, we need to focus on the bonding that develops between the mother and her unborn child.

The bonding developing between the mother and fetus before birth, or the prenatal bonding, can be described as the feelings, expectations and behaviors of the parents regarding the unborn child. This relationship represents the most fundamental and primitive form of intimacy and an internalized expression of early fetal representation. Maternal bonding is an important component of maternal identity, constituting the basis of the mother's adaptation to the role of motherhood. This growing bond between mother and fetus during pregnancy acts on the daily interactions with the child after birth, as well as on the quality of parent-infant relationship. The quality of the relationship between parents and a child is an important factor influencing the child's subsequent well-being. When children enjoy a secure relationship with their parents in their first years of life, such a healthy relationship generally produces better outcomes and social interactions.[3]

Most of the studies into prenatal bonding are aimed at showing whether there is an association between this bonding and certain variables. These include demographic variables, variables related to pregnancy, social support, perceived stress, depression, anxiety, spouse relationship, economic status, age, self-perception, ethnic group, intergenerational bonding style, etc.[4-9] The investigation of mother-infant bonding appears to be of vital importance for a deeper insight into this phenomenon and clarification of its factors.

According to this importance, the following questions were asked.

1. Do prenatal bonding levels change depending on socio-demographic and characteristics of pregnancy variables?

2. Is there a significant relationship between total scores for prenatal bonding levels of pregnant women with their self-perception, marital satisfaction and psychological symptoms?

3. Do self-perception, marital satisfaction and psychological symptoms have a separately predictive effect on prenatal bonding levels?

## MATERIAL AND METHODS
### Sample

The study sample included 200 women in their 2nd and 3rd trimester of pregnancy admitted to the polyclinics of obstetrics and perinatology at a Hospital in Istanbul between August 2014 and October 2014, who were chosen by convenience sampling method. The participants were divided into two main groups: those enjoying a healthy pregnancy and those having a risky pregnancy. Additional groups were also designed according to the trimesters. Pregnancies between 14 and 26 weeks were considered to be in the 2nd trimester, while those at week 27 and over were accepted to be in the 3rd trimester. Overall, there were four groups: normal pregnancies in the second trimester, normal pregnancies in the third trimester, risky pregnancies in the second trimester, and risky pregnancies in the third trimester. The number of participants was equal in each group, standing at 50 pregnant women. All participants completed and signed informed consent forms. The demographic characteristics of the participants are presented in Table 1.

## Data Collection Tools

The data collection tools included 'Personal Information Form' designed to collect information about the demographics and pregnancy characteristics of the participants, 'Prenatal Attachment Inventory' designed to determine prenatal bonding levels, 'Marital Life Scale' designed to investigate the overall satisfaction levels in marriage, 'Social Comparison Scale' used to measure the self-schema that reflects impressions about the self, and the 'Brief Symptom Inventory' designed to evaluate general symptoms of psychological distress and psychiatric disorders.

### Personal Information Form

It consists of 20 questions designed to collect information about the age, educational level, job status, economic status, place of residence, obstetric history (number of children, history of perinatal loss, gender, gestational week, and risk status), information about pregnancy characteristics, and relationship between the spouse and the mother.

### Prenatal Attachment Inventory (PAI)

The Prenatal Attachment Inventory was developed by Mary Muller in 1990.[8] Designed to determine the thoughts, feelings and situations that women experience during pregnancy, as well as to measure the level of mother's bonding to her unborn child, the scale consists of 21 items. In order to determine the validity of the scale, it was administered in a sample of 210 women with a healthy fetus with a gestational age over 20 weeks. All findings indicate that the Turkish language version of the scale can be used in future research on pregnant women in our country.[10] In another validity and reliability study, the Turkish

**Table 1.** Number and Percentages of Demographics of Participants

| Tables | Groups | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Age | Age 15 to 20 years | 19 | 9.5 |
| | Age 21 to 25 years | 50 | 25.0 |
| | Age 26 to 30 years | 56 | 28.0 |
| | Age 31-35 | 59 | 29.5 |
| | Age 36 and over | 16 | 8.0 |
| | Total | 200 | 100.0 |
| Marital Status | Single | 2 | 1.0 |
| | Married | 198 | 99.0 |
| | Total | 200 | 100.0 |
| Educational Background | Primary school | 45 | 22.5 |
| | Secondary School | 39 | 19.5 |
| | High school | 59 | 29.5 |
| | College degree | 21 | 10.5 |
| | Bachelor's degree or higher | 36 | 18.0 |
| | Total | 200 | 100.0 |
| Work Status | Not employed | 136 | 68 |
| | Working | 64 | 32 |
| | Total | 200 | 100.0 |
| Income | Poor | 8 | 4.0 |
| | Medium | 126 | 63.0 |
| | Good | 66 | 33 |
| | Total | 200 | 100.0 |
| Usual Place of Residence | Village | 18 | 9.0 |
| | District | 29 | 14.5 |
| | Province | 29 | 14.5 |
| | Metropolis | 124 | 62.0 |
| | Total | 200 | 100.0 |

version of the scale was administered in 295 pregnancies, and the Cronbach's alpha coefficient was found to be 0.90, which indicates good internal consistency.[11]

### Marital Life Scale (MLS)

The scale was developed by Tezer (1996)[12] in order to measure the level of general satisfaction achieved in marriage. The scale consists of 10 items rated on a 5-point Likert system. The highest score for the scale is 50 and the lowest 10.

### Social Comparison Scale (SCS)

The Social Comparison Scale, originally designed by Gilbert and Trent with 5 items and then developed by Şahin et al.by increasing the number of items to first 6 and then to 18, attempts to evaluate how people perceive themselves in various dimensions when compared to others. The final version of the scale was developed and adapted to Turkish by Nesrin and Nail Şahin.[13]

### Brief Symptom Inventory (BSI)

Brief Symptom Inventory was developed by Derogatis (1992).[14] It is the short version of the Symptom Checklist 90-R (SCL-90-R). The adaptation of the inventory for administration in Turkish society was conducted by Şahin and Durak (1994).[15]

### Analysis of Research Data

The data collected during the study were analyzed on SPSS (Statistical Package for Social Sciences) for Windows version 21.0. In the evaluation of the research data, descriptive statistical methods, such as number, percentage, mean values, standard deviation, were used. In the comparison of the quantitative data, the Mann–Whitney-U test was used for the difference between two groups, while the Kruskal–Wallis test was used for the comparison of parameters between more than two groups and Mann–Whitney-U test for the detection of the group causing the difference. The correlations between the dependent and independent variables of the study were tested by correlation analysis, and the effect was tested by regression analysis. The findings were evaluated in a 95% confidence interval and in a 5% significance level.

### RESULTS

This section mainly deals with the findings reached after the analyses of the research data collected by the data collection tools mentioned above, providing some explanations and interpretations based on these findings. In Table 2, Table 3.

The average level "prenatal bonding" level, "marital life", "somatization" while the mean level of "obsessive compulsive disorder" was very low at. On the other

hand, the mean level of "interpersonal sensitivity" was 0.832 ± 0.626; "depression" 0.763 ± 0.685,"anxiety disorder" 0.973 ± 0.645,"hostility"0.896 ± 0.672; "phobic anxiety" (0.569 ± 0.553), with very low levels of "paranoid ideation" at 1.094 ± 0.721. The mean level of "psychoticism" was found to be 0.627 ± 0.573; "supplementary items" 0.974 ± 0.697,while the mean scores of other factors were as follows: "global severity index 0.168 ± 0.098; "positive symptom total" 28.500 ± 11.172, "positive symptom distress index"0.298 ± 0.086, and the level of "social comparison" at 83.805 ± 15.380 (Table 3).

**Table 2.** Distribution of Pregnancies by Obstetric Variables

| Tables | Groups | Frequency | Percentage (%) |
|---|---|---|---|
| The Number of Current Pregnancy | 1st child | 101 | 50.5 |
| | 2nd child | 74 | 37.0 |
| | 3rd child or more | 25 | 12.5 |
| | Total | 200 | 100.0 |
| Pregnancy History | 0 | 142 | 71.0 |
| | 1 | 39 | 19.5 |
| | 2 and more | 19 | 9.5 |
| | Total | 200 | 100.0 |
| Desired Gender of the Child | Does not matter | 70 | 35.0 |
| | Girl | 78 | 39.0 |
| | Boy | 52 | 26.0 |
| | Total | 200 | 100.0 |
| Intended Pregnancy | No | 22 | 11.0 |
| | Yes | 178 | 89.0 |
| | Total | 200 | 100.0 |
| Thoughts on Termination of Pregnancy | No | 190 | 95.0 |
| | Yes | 10 | 5.0 |
| | Total | 200 | 100.0 |
| Planned Pregnancy | No | 55 | 27.5 |
| | Yes | 145 | 72.5 |
| | Total | 200 | 100.0 |
| Risky Pregnancy | Normal | 100 | 50.0 |
| | Risky | 100 | 50.0 |
| | Total | 200 | 100.0 |
| The Source of Risk in Pregnancy | Mother | 52 | 53.1 |
| | Baby | 48 | 46.9 |
| | Total | 98 | 100.0 |
| Gestational Week | Second Trimester | 100 | 50.0 |
| | Third Trimester | 100 | 50.0 |
| | Total | 200 | 100.0 |
| Conception Method | Natural | 190 | 95.0 |
| | Medical | 10 | 5.0 |
| | Total | 200 | 100.0 |
| Presence of Chronic Disease | None | 174 | 87.0 |
| | Yes | 26 | 13.0 |
| | Total | 200 | 100.0 |
| Participants' Relationship with their Own Mother | Moderate | 20 | 10.0 |
| | Poor | 54 | 27.0 |
| | Very bad | 126 | 63.0 |
| | Total | 200 | 100.0 |
| Participants' Relationship with Their Spouse | Moderate | 13 | 6.5 |
| | Poor | 49 | 24.5 |
| | Very bad | 138 | 69.0 |
| | Total | 200 | 100.0 |

**Table 3.** Levels of Prenatal Bonding, Marital Life, Psychological Symptoms and Social Comparison

| | N | Avg. | SD | Min. | Max. |
|---|---|---|---|---|---|
| **Prenatal Bonding** | 200 | 59.740 | 10.775 | 30.000 | 83.000 |
| **Marital Life** | 200 | 38.640 | 8.492 | 13.000 | 50.000 |
| **Somatization** | 200 | 1.001 | 0.640 | 0.000 | 3.140 |
| **Obsessive Compulsive Disorder** | 200 | 1.167 | 0.733 | 0.000 | 3.500 |
| **Interpersonal Sensitivity** | 200 | 0.832 | 0.626 | 0.000 | 3.000 |
| **Depression** | 200 | 0.763 | 0.685 | 0.000 | 3.330 |
| **Anxiety Disorder** | 200 | 0.973 | 0.645 | 0.000 | 3.670 |
| **Hostility** | 200 | 0.896 | 0.672 | 0.000 | 3.800 |
| **Phobic Anxiety** | 200 | 0.569 | 0.553 | 0.000 | 3.600 |
| **Paranoid Ideation** | 200 | 1.094 | 0.721 | 0.000 | 3.600 |
| **Psychoticism** | 200 | 0.627 | 0.573 | 0.000 | 3.400 |
| **Supplementary Items** | 200 | 0.974 | 0.697 | 0.000 | 3.000 |
| **Global Severity Index** | 200 | 0.168 | 0.098 | 0.000 | 0.580 |
| **Positive Symptom Total** | 200 | 28.500 | 11.172 | 1.000 | 53.000 |
| **Positive Symptom Distress Index** | 200 | 0.298 | 0.086 | 0.170 | 0.600 |
| **Social Comparison** | 200 | 83.805 | 15.380 | 26.000 | 108.000 |

According to the results of the Kruskal Wallis H-Test, performed to see whether the mean of prenatal bonding scores would show a significant difference by educational background, the difference between the groups was significant (KW = 9.683, p=0.046). The Mann Whitney-U test was carried out to determine from which group the difference stemmed. Accordingly, the mean prenatal bonding level was higher in secondary school graduates (62.718 ± 10.901) than in primary school graduates (55.578 ± 11.303). The prenatal bonding scores of high school graduates (61.441 ± 10.915) were higher than those of primary school graduates (55.578 ± 11.303) (Table 4).

According to the results of the Kruskal Wallis H-Test, conducted to determine whether the mean prenatal bonding scores would show a significant difference according to the quality of the relationship of the participants with their partner, the difference between the groups was significant (KW = 8.449, p=0.015). The Mann Whitney-U test was performed to determine which group this difference stemmed from, and it was found that the prenatal bonding scores of those who rated their relationship with their partner as very bad were found to be higher (61.225 ± 10.131) than those of the participants reporting poor relationships with their partners (55.633 ± 11.595) (Table 5).

The results of the Mann Whitney-U test showed that the prenatal bonding levels differed significantly according to the gestational week (Mann Whitney U=3 955.000; p=0.011). The mean prenatal bonding score in the second trimester (x=58.010) were found to be lower than that in the third trimester (x=61.470) (Table 6).

The Kruskal Wallis H-Test found a significant difference between the mean prenatal bonding scores of the groups designated according to the number of their current pregnancy (KW = 10.567; p=0.005). The Mann Whitney-U test was performed to determine which group this difference stemmed from, and it was found that the prenatal bonding score of the women expecting their first child (62.139 ± 10.454) was higher than the prenatal bonding score of those expecting their second child (57.703 ± 10.663). Similarly, the mean prenatal bonding score was higher in the women expecting their first child (62.139 ± 10.454) than in those pregnant with their third child or above (56.080 ± 10.512) (Table 7).

According to the results of the Kruskal Wallis H-Test, conducted to determine whether the mean prenatal bonding scores of the women participating in the research showed a significant difference in terms of the number of children they already had, the difference between the groups was significant (KW = 12.251, p = 0.002). The Mann Whitney-U test was performed to determine which group this difference stemmed from, and it was found that the mean prenatal bonding score of the women with no children (62.233 ± 10.444) was higher than that of women with one child (57.603 ± 10.608). The mean bonding score was higher in those with no children (62.233 ± 10.444) than in those who already had two or more children (55.542 ± 10.380) (Table 8).

The results of the Kruskal Wallis H-Test and the Mann Whitney-U test conducted to determine whether the mean prenatal bonding scores would show a difference according to; income status of the participants, pregnancy history, quality of relationship with the participants and their own mothers, the mean values of the four age groups,

**Table 4.** Prenatal Bonding by Educational Status

| | Group | N | Avg. | SD | KW | p | Difference |
|---|---|---|---|---|---|---|---|
| **Prenatal Bonding** | Primary school | 45 | 55.578 | 11.303 | | | |
| | Secondary School | 39 | 62.718 | 10.901 | | | 2>1 |
| | High school | 59 | 61.441 | 10.915 | 9.683 | **0.046** | 3>1 |
| | College degree | 21 | 59.476 | 11.316 | | | |
| | Bachelor's degree or higher | 36 | 59.083 | 7.893 | | | |

**Table 5.** Prenatal Bonding by Relationship with Spouse

| | Group | N | Avg. | SD | KW | p | Difference |
|---|---|---|---|---|---|---|---|
| **Prenatal Bonding** | Moderate | 13 | 59.462 | 11.012 | | | |
| | Poor | 49 | 55.633 | 11.595 | 8.449 | **0.015** | 3> 2 |
| | Very Bad | 138 | 61.225 | 10.131 | | | |

**Table 6.** Prenatal Bonding by Gestational Week

| | Group | N | Avg. | SD | MW | p |
|---|---|---|---|---|---|---|
| **Prenatal Bonding** | Second Trimester | 100 | 58.010 | 10.855 | 3.955.000 | **0.011** |
| | Third Trimester | 100 | 61.470 | 10.463 | | |

**Table 7.** Prenatal Bonding by the Number of Current Pregnancy

| | Group | N | Avg. | SD | KW | p | Difference |
|---|---|---|---|---|---|---|---|
| **Prenatal Bonding** | 1st child | 101 | 62.139 | 10.454 | | | 1 > 2 |
| | 2nd child | 74 | 57.703 | 10.663 | 10.567 | **0.005** | |
| | 3rd child or more | 25 | 56.080 | 10.512 | | | 1 > 3 |

**Table 8.** Prenatal Bonding by Number of Children

| | Group | N | Avg. | SD | KW | p | Difference |
|---|---|---|---|---|---|---|---|
| **Prenatal Bonding** | 0 | 103 | 62.233 | 10.444 | | | 1> 2 |
| | 1 | 73 | 57.603 | 10.608 | 12.251 | **0.002** | |
| | 2 and more | 24 | 55.542 | 10.380 | | | 1> 3 |

participants' usual place of residence, to their desired gender of the child, to risky nature of the pregnancy, source of the risk in pregnancy, group conceived through natural course and the group conceived with medical assistance, those reporting that their pregnancy was planned and those reporting that it was unplanned, those reporting that their pregnancy was intended and those reporting that it was unintended, participants who were working and those not working, participants with a chronic disease and those healthy ones, the mean prenatal bonding scores of married and single participants, pregnant women who had thoughts of terminating their pregnancy and those who had no such thoughts showed that these variables did not differ significantly.

There is a very weak positive correlation between prenatal bonding and the mean score for MLS (r=0.182; p=0.01). There was no correlation between the symptoms and prenatal bonding (p>0.05). Likewise, no relationship was found between social comparison and prenatal bonding (p>0.05) (Table 9).

Table 9. Correlation between Prenatal Bonding and Marital Life, Symptoms and Social Comparison

|  |  | Prenatal Bonding |
| --- | --- | --- |
| Prenatal Bonding | r | 1.000 |
|  | p | 0.000 |
| Marital Life | r | 0.182** |
|  | p | 0.010 |
| Somatization | r | 0.121 |
|  | p | 0.088 |
| Obsessive Compulsive Disorder | r | 0.049 |
|  | p | 0.495 |
| Interpersonal Sensitivity | r | 0.043 |
|  | p | 0.547 |
| Depression | r | -0.035 |
|  | p | 0.625 |
| Anxiety Disorder | r | 0.125 |
|  | p | 0.078 |
| Hostility | r | 0.064 |
|  | p | 0.368 |
| Phobic Anxiety | r | -0.047 |
|  | p | 0.510 |
| Paranoid Ideation | r | 0.090 |
|  | p | 0.203 |
| Psychoticism | r | -0.015 |
|  | p | 0.834 |
| Supplementary Items | r | 0.041 |
|  | p | 0.562 |
| Global Severity Index | r | 0.058 |
|  | p | 0.416 |
| Positive Symptom Total | r | 0.036 |
|  | p | 0.612 |
| Positive Symptom Distress Index | r | 0.050 |
|  | p | 0.484 |
| Social Comparison | r | 0.113 |
|  | p | 0.112 |

The regression analysis performed to determine the relationship between marital satisfaction and prenatal bonding yielded statistically significant results (F = 6.780; p=0.01). We found that the relationship (explanatory power) of prenatal bonding with marital life variables was poor as a determinant of bonding levels ($R^2$=0.028). A mother's higher satisfaction with marriage increases the level of prenatal bonding (ß=0.231) (Table 10).

The regression analysis showed no statistically significant rela-tionship between somatization, obsessive-compulsive disorder, in-terpersonal sensitivity, depression, anxiety disorder, hostility, phobic anxiety, paranoid ideation, and psychoticism(F=1.801; p=0.063) (Table 11).

The regression analysis showed no statistically significant relationship between social comparison and prenatal bonding (F=2.555; p=0.112) (Table 12).

## DISCUSSION

Pregnancy is a period in which women undergo substantial phy-sical and psychological changes. The most important element of this special period is the relationship between mother and fetus. Based on the theoretical research into pregnancy, it is thought that pregnant women develop a gradually growing relationship with and interest in their unborn children during pregnancy.[16] The purpose of this study is to contribute to our understanding of prenatal bonding, about which varying results and findings have been reported in the relevant litera-ture.

We also found that prenatal bonding levels varied significantly ac-cording to educational background of the mother. The bonding scores of secondary school and high school graduates were found to be hig-her than those of primary school graduates, though no significant dif-ference was observed between mothers with high school diploma and those with bachelor's degree or higher. Similarly, another study also found that primary school graduates had lower scores for PAI than did pregnant women with higher educational background.[10] Conversely, there are studies in the literature reporting that the level of educati-on was inversely related to prenatal bonding or not related at all.[17-19] Educational background could be suggested to raise awareness about how to experience a healthy pregnancy and its impact on the baby, or to improve the mother's knowledge about the pregnancy and her compliance with the medical advice.

The support of the partner during pregnancy appears to play a key role to ensure a healthy pregnancy and a better coping with the issues encountered during pregnancy. In our study, women who ra-ted their relationship with their partner as very bad were found to show lower levels of prenatal bonding than those reporting poor re-lationship with their partner. However, another study found higher prenatal bonding scores in the group reporting a very good partner relationship.[4] The perception of an unhappy spousal relationship will lead to an unhappy marriage and thus a negative impact on mental and physical health.[12] In this respect, our research revealed that mari-tal satisfaction could have a low-level effect on prenatal bonding, but the relevant literature contains widely varying results in this aspect. For instance, Muller (1990)[8] reported that there was a strong corre-lation between prenatal bonding and marital satisfaction, attitudes toward marriage, and loneliness, emphasizing the importance of the partner during pregnancy. Cranley (1984)[20] also found a positive re-lationship between prenatal bonding and marital relationship for both men and women. The presence of both supporting and contra-dicting results suggests that more research is needed on this subject.[21] In cases where spouse or partner was the main source of support, prenatal bonding levels were reported to increase, while bonding was negatively affected if the partner relationship contained high levels of control, domination and criticism.[22]

In the process of pregnancy, a woman's channeling of thoughts to her child affects all aspects of her self-system, such as the body image, sense of self, and world of ideas. These three elements show differen-ces in line with each other during the second trimester. These changes continue in the final trimester, but the same pace of change cannot be achieved. As the time of birth approaches, the mother may begin to

**Table 10.** Impact of Marital Satisfaction on Prenatal Bonding

| Dependent Variable | Independent Variable | B | t | p | F | Model (p) | R² |
|---|---|---|---|---|---|---|---|
| **Prenatal Bonding** | Fixed | 50.820 | 14.490 | 0.000 | 6.780 | 0.010 | 0.028 |
| | Marital Satisfaction | 0.231 | 2.604 | 0.010 | | | |

**Table 11.** Impact of Symptoms on Prenatal Bonding

| Dependent Variable | Independent Variable | B | t | p | F | Model (p) | R² |
|---|---|---|---|---|---|---|---|
| **Prenatal Bonding** | Fixed | 56.465 | 34.425 | 0.000 | 1.801 | 0.063 | 0.039 |
| | Somatization | 1.607 | 0.979 | 0.329 | | | |
| | Obsessive Compulsive Disorder | 0.617 | 0.349 | 0.727 | | | |
| | Interpersonal Sensitivity | 1.179 | 0.659 | 0.511 | | | |
| | Depression | -3.844 | -2.079 | 0.039 | | | |
| | Anxiety Disorder | 5.879 | 2.643 | 0.009 | | | |
| | Hostility | 0.442 | 0.276 | 0.783 | | | |
| | Phobic Anxiety | -4.293 | -2.215 | 0.028 | | | |
| | Paranoid Ideation | 1.920 | 1.286 | 0.200 | | | |
| | Psychoticism | -1.393 | -0.662 | 0.509 | | | |
| | Supplementary Items | -1.243 | -0.745 | 0.457 | | | |

**Table 12.** The Impact of Social Comparison on Prenatal Bonding

| Dependent Variable | Independent Variable | B | t | p | F | Model (p) | R² |
|---|---|---|---|---|---|---|---|
| **Prenatal Bonding** | Fixed | 53.114 | 12.602 | 0.000 | 2.555 | 0.112 | 0.008 |
| | Social Comparison | 0.079 | 1.598 | 0.112 | | | |

feel tired of the changes in her body image, sense of self, and world of ideas caused by the prospect of a child. Many women believe that maternal feelings create personal happiness and satisfaction despite many challenges brought about by maternal role.[23] Leifer (1977),[16] who conducted a study looking into the third trimester and the first two months postpartum in first-time pregnant women, observed that feeling of motherhood improved self-esteem in women. The experience of bringing a child into the world appears to bring women closer to their ideal self. Another study found a low level of relationship between self-perception and prenatal bonding.[5] Other studies in the literature concluded that there was no correlation between prenatal bonding and self-perception.[9,24] In a meta-analysis, while one in six studies found a meaningful relationship, the other five indicated that there was no significant correlation.[25] Overall, we can say that our results seem to corroborate the conclusions found in the relevant literature.

Pregnancy is a time when various mental states are experienced or may be experienced at the same time. In particular, depression and anxiety symptoms have been reported to be more prevalent in pregnancy.[26-29] The mental health of a woman in this period also plays a vital role in the quality of her relationship with the fetus. For example, higher depression scores were shown to cause lower levels of prenatal attachment.[4,10,17,30,31] In this study, however, no significant increases were observed in the scores for any of the subscales of the BSI. The participants in our study were having a relatively healthy pregnancy in terms of mental health, therefore no significant difference was found in their prenatal bonding scores.

## CONCLUSION

Based on the findings of this study, we suggest that the scope and content of the educational programs for the pregnant women and their husbands should be improved by including information about the impacts of the emotional and cognitive investment in the unborn child on the future of the mother-child relationship. Future longitudinal studies are needed to gain a deeper insight into the developmental process during pregnancy.

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