Clinical and Experimental Health Sciences

Evaluation of Mother-Infant Bonding Status of High-Risk Pregnant Women and Related Factors

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ABSTRACT

Objective: This descriptive study was conducted to determine the prenatal mother-infant bonding levels of high-risk pregnant women and related factors.

Method: A questionnaire was applied to 351 risky pregnant women in a public hospital between 1st August-1st October 2015. Socio-demographic features and Prenatal Bonding Inventory (PBI) scale were included in this form. Data were analyzed with SPSS 16.0 statistical program.

Results: There was no significant relationship between the number of pregnancies and PBI scores. It was found that PBI scores of women who willingly got pregnant and became happy when they learned that they were pregnant were statistically significantly high. It was ascertained that mean PBI scores of pregnant women having a planned pregnancy, not intending to terminate, feeling baby movements, and having the desire to see a doctor except for routine controls were significantly high.

Conclusion: The number of pregnancies, the willingness of pregnancy, planned pregnancy, thought of termination of pregnancy, the feeling of baby movements, and desire to see a doctor except for routine controls affected the mother-baby bonding.

Keywords: Prenatal Bonding, pregnancy, relevant factors

1. INTRODUCTION

Although pregnancy is a physiological process, it is a process that requires bio-psychosocial adaptation for the pregnant woman and her family due to the deterioration of physiological and psychosocial balance, changing roles in family and work life, and trying to adapt to the parental role (1,2). The prenatal period involves the period from the onset of pregnancy to the moment of delivery. Pregnancy, considered a developmental crisis or a critical period, has a very important place in women's life (3). It is known that especially high-risk pregnancy is a factor that increases the stress level. Pregnancy period time for women at risk due to increased emotional distress and difficulties in interpersonal relationships. The risk population of pregnant women would report more difficulty bonding with the fetus than would a population is drawn from the community at large (4). A high-risk pregnancy is defined as a physiological and psychosocial condition that endangers the life and health of the mother, fetus, or newborn, and increases the risk of disease and death. Pregnancies with systemic diseases before pregnancy and pregnancies with complications such as placental anomalies developing during pregnancy, Rh incompatibility, premature rupture of membranes, preeclampsia, intrauterine growth retardation, and cervical insufficiency are included in the high-risk pregnancy group (1,5). In high-risk pregnancies, stress due to problems related to the mother or the baby is higher than in normal pregnancies (2). Studies suggest that experienced stress may have a negative effect on the maternal-infant bonding process (6,7).

Bonding is a concept that has an important role in the development process of humans. This process, which develops between mother and baby with birth, affects her development, relationships with other people, and psychological adjustment. The baby is dependent on the person who cares for him/her depending on the fact that his/her skills have not been sufficiently developed yet (8). Bonding theory is based on the fact that the baby sends a signal for its needs and that a safe baby-parent bonding occurs as a result of the appropriate response of the

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caregiver (3). Bowlby (1983), who suggested the bonding theory, defined the word 'bonding' as a strong bond between the two people. The bonding theory focuses on the bonding of the baby to the mother in the early period as a result of the baby's need for biological trust, whether the mother can be reached on condition that the baby needs her and how reactions and behaviors of the mother are interpreted by the baby. The theory alleges that bonding behavior established during infancy has an important function in forming and sustaining the individual's life in the future and argues that it affects close relationships with others (9,10).

Prenatal bonding is an emotional bond that expresses the unique relationship established between parents and their unborn child. Mother-infant bonding begins when the mother positively reacts to the pregnancy. A pregnant woman who develops strong bonds with her baby knows that her unborn baby contacts with her, that it is a separate individual, and that it is dependent on her to develop (9,11). Thinking about what her baby will look like, how it will act, what developments it will show throughout its life, and having such feelings about bonding help the pregnant woman be sensitive to the development and protection needs of her baby (7,10,12).

Maternal-fetal bonding involving at-risk groups is a small number of research. A few comparative studies that high and low-risk groups of pregnant women have shown conflicting results. The aim of the study is to determine prenatal mother-infant bonding levels of high-risk pregnant women and related factors.

2. METHODS

This descriptive study was conducted to determine the prenatal mother-infant bonding levels of high-risk pregnant women and related factors. The study was conducted on pregnant women in a public hospital gynecology and high-risk pregnancy service between 1st August-1st October 2015. The universe of the study was comprised of 3864 pregnant women hospitalized at a public hospital in Ankara. The sample size of the study was calculated with the formula used in cases where the frequency of the universe was unknown and it was determined as 351. 351 pregnant women in the high-risk pregnancy service and meeting the study criteria were included in the study. This risk of pregnancy situation is placental anomalies, Rh incompatibility, premature rupture of membranes, preeclampsia, intrauterine growth retardation, and cervical insufficiency. The women who were literate, with pregnancies of 20 weeks and over, and agreed to participate in the study were included in the study. Data were collected with a "questionnaire form" and "Prenatal Bonding Inventory (PBI)".

Questionnaire Form (Pregnant Diagnosis Form): A questionnaire form prepared by receiving an expert opinion and consisting of a total of 23 questions with open-ended and multiple-choice questions was used.

Prenatal Bonding Inventory (PBI); Prenatal Bonding Inventory is used for measuring the bonding level of pregnant women to their baby in the womb. There are a total of 21 items in the PBIaimed at measuring emotional bonding to the fetus. Each item is a four-point Likert type and the total scale score is between 21 and 84. The participants are asked to respond to the statement in each item choosing options such as "Almost never (1 point)", "Sometimes (2 points)", "Mostly (3 points)" and "Almost always (4 points)''. None of the statements in the inventory are scored reversely. High scores received from the inventory mean that the prenatal bonding is high, low scores mean that the prenatal bonding level is low. The validity and reliability of the scale were performed by Duyan et al. (2013). The Cronbach Alpha test value of the Prenatal Attachment Inventory was reported to be 0.789 (12). In our study, this value was found to be 0.791.

2.1. Collection of Data

The necessary ethics committee (Decree no: 2014/08-13). Approval and permission from the institution were obtained to conduct the study. Written and verbal consent was obtained from pregnant women who agreed to participate in the study. The data were collected by face-to-face interview technique. Each interview took approximately 10 minutes.

2.2. Data Evaluation

SPSS 16.0 program was used in statistical evaluation. The suitability of numerical variables to normal distribution was examined with the Shapiro-Wilk test. In descriptive statistics, numerical data were expressed as mean ± standard deviation and minimum-maximum values, categorical data as numbers and percentages. Mann-Whitney U test was used in the comparison of the two groups since parametric test assumptions were provided in terms of numerical variables and Kruskal-Wallis analysis of variance was performed in comparison of the three groups. The mean score of the scale was analyzed using t test and ANOVA test in independent groups according to sociodemographic characteristics. The results were evaluated within the 95% confidence interval and $p < 0.05$ was considered to be significant.

2.3. Ethic

Ethics committee approval was obtained from Zonguldak Bülent Ecevit Unıversıty Human Studıes Ethics Committee to conduct the research (Decree no: 2014/08-13).

3. RESULTS

The mean age of the pregnant women was 28.6±6.4 (min.: 17, max.: 49) years, 33% were high school graduates and 80.6% were housewives. It was determined that 68.4% of them lived in a nuclear family and the income of 57.5% was equal to their expenses. In addition, they were married for an average of 7.4±5.83 (min.: 1, max.: 32) years (Table 1). It was found that

25.1% of pregnant women had a chronic disease and used medication continuously, 81.8% got pregnant willingly, 27.1% had a planned pregnancy, 5.4% thought to terminate. 98% of pregnant women stated that they felt the movements of the baby, 29.3% felt the need to call their doctor in examinations other than routine examinations, and 50.1% wanted to see a doctor before the control date (Table 2).

Table 1. *Socio-demographic features of the study group (n=351)*

Socio-demographic Features	Number	%
Marital Status		
Single	1	0.3
Married	348	99.1
Other	2	0.6
Family Structure		
Nuclear Family	240	68.4
Large Family	111	31.6
Educational Background		
Illiterate	6	1.7
Primary School	82	23.4
Secondary School	98	27.9
High School	116	33.0
University	49	14.0
Employment Status		
Employed	68	19.4
Unemployed (Housewife)	283	80.6
Economic Situation		
My income is lower than my expenses.	115	32.8
My income is equal to my expenses.	202	57.5
My income is higher than my expenses.	34	9.7
Total	351	100.0

It was found that there was no statistically significant relationship between the mean PBI score of the pregnant women and their ages (p>0.05). It was determined that there was no significant difference in the mean PBI score according to the pregnant women's type of family, educational background, employment status, and levels of income (p>0.05) (Table 3).

The mean number of pregnancies of the participant was 2.4±1.45 (min.: 1, max.: 8) and it was determined that there was no significant relationship between the number of pregnancies and PBI score (p>0.05). It was detected that the mean PBI scores of women who became happy when they learned that they were pregnant and those who willingly got pregnant were statistically significantly higher (p=0.001). It was determined that the mean PBI scores of the pregnant women who had a planned pregnancy and those who did not intend to terminate their pregnancy were significantly higher (p=0.002). The mean PBI scores of women feeling the baby's movements (p=0.005) and those having the desire to see a doctor except for their routine controls (p=0.002) were found to be statistically significantly higher (Table 4).

Table 2. *Distribution of health and pregnancy features of women (n=351)*

Health and Pregnancy Features	Number	%
Chronic Disease		
No	263	74.9
Yes	88	25.1
Constant Drug Use		
No	263	74.9
Yes	88	25.1
Desire to Get Pregnant		
No	64	18.2
Yes	287	81.8
Termination of Pregnancy		
No	332	94.6
Yes	19	5.4
Planned Pregnancy		
No	256	72.9
Yes	95	27.1
Feeling Baby's Movements		
No	7	2.0
Yes	344	98.0
Desire to Have Testsexcept for Routine Tests		
No	306	87.2
Yes	45	12.8
Need to call the doctor		
No	248	70.7
Yes	103	29.3
Desire to see a doctor more often than once a month	175	49.9
No	176	50.1
Yes		
Total	351	100.0

Table 3. *Comparison of prenatal mother-infant bonding status according to the socio-demographic features of pregnant women*

Socio-demographic Features	Prenatal Bonding Scale ($\bar{x}$ ±SD)	Test Values; p
Age	28.6±6.4 (min17, max 49)	0.978[a]; 0.501
Family Structure		
Nuclear Family	63.1042±10.5 (33-84)	1.391[b]; 0.164
Large Family	64.9369±10.0 (21-84)	
Educational Background		
Literate	58.5000±17.0 (36-78)	1.159[c]; 0.329
Primary School	62.3537±10.7 (34-84)	
Secondary School	64.1633±10.2 (33-84)	
High School	63.6897±10.8 (21-84)	
University	65.5714±7.9 (40-78)	
Employment Status		
Employed	63.5588±10.2 (33-82)	0.123[b]; 0.902
Unemployed	63.7138±10.4 (21-84)	
Economic Situation		
My income is lower than my expenses.	63.4087±11.5 (33-84)	0.033[d]; 0.983
My income is equal to my expenses.	63.8564±9.7 (36-84)	
My income is higher than my expenses.	63.5882±11.0 (21-84)	

[a] Pearson Korelasyon, [b] Man Whitney U Testi, [c]Anova Testi , [d] Kruskall Whallis Testi

Table 4. *Comparison of prenatal mother-infant bonding status according to pregnancy features of women*

Pregnancy Features	Prenatal Bonding Scale ($\bar{x}$ ±SD)	Test Values; p
Number of Pregnancy	2.4±1.45 (min.: 1, max.: 8)	**2.602[a]; 0.13**
The number of Child Alive		
Pregnancy Continues	65.2761±8.8 (33-84)	**7.772[c]; 0.0001**
No Child Alive	64.4105±10.2 (39-84)	
1	61.7083±11.2 (33-84)	
2	54.8095±10.4 (21-76)	
Feelings When They Learnt That They were Pregnant		
Worried	51.9615±13.8 (21-70)	**11.219[c]; 0.0001**
Afraid	63.3750±10.3 (40-78)	
Surprised	61.9778±9.2 (42-81)	
Excited	63.6750±10.8 (42-84)	
Happy	65.4107±9.2 (38-84)	
Desire to Get Pregnant		
No	57.0625±12.6 (21-84)	**-4.975[b]; 0.0001**
Yes	65.1603±9.2 (40-84)	
Thought of Termination of Pregnancy		
No	64.0241±10.1 (33-84)	**-2.070[b]; 0.003**
Yes	57.7368±13.7 (21-80)	
Loss of Pregnancy		
No loss of Pregnancy	63.5622±10.7(33-84)	0.336[c]; 0.800
1	64.6438±9.7 (21-82)	
2	62.6400±10.2(39-84)	
3 and over	62.9000±10.1 (36-81)	
Current Week of Pregnancy	32.3±4.45 (min 20, max 40)	0.869[a]; 0.627
Is the current pregnancy a planned one?		
Yes	60.4211±12.4 (21-84)	**-3.108[b]; 0.002**
No	64.8945±9.3 (40-84)	
Feeling the Baby's Movements		
No	58.1429±19.6 (21-77)	**-1.422[d]; 0.005**
Yes	63.7965±10.1(33-84)	
Desire to Have Tests		
No	63.5654±10.5 (21-84)	-0.554[d]; 0.801
Yes	64.4889±9.8 (40-84)	
Desire to See a Doctor Frequently		
No	62.0971±10.8 (21-84)	**3.079[b]; 0.002**
Yes	65.2614±9.7 (33-84)	

[a] *Pearson Correlation,* [b] *Man Whitney U test,* [c]*Anova Test, d t-test*

4. DISCUSSION

In our study, the mean age of pregnant women was 28.6±6.4. A similar mean age was found in studies related to pregnant women in our country. Pisoni et al. (2016) stated that the mean age of the high-risk pregnant women was 32.5, Kartal and Taraman (2018) stated that the mean age of the majority of the pregnant women was 26.2, and Havutçu (2019) to be above the age of 25 (13,14,15). In our study, no statistically significant relationship was found between the ages of pregnant women and the mean PBI scores. Similarly, Akarsu and Oskay (2017), Lingesvaran and Bindu (2012) also stated that age did not affect the prenatal bonding status (16,17). Barone et al. (2014) reported that prenatal bonding increased with increasing age; however, Massey et al. (2015) stated that prenatal bonding decreased with increasing age (18,19). The reason for this difference may be due to the fact that the studies were conducted in different regions and cultures.

The majority of the pregnant women (33%) were high school graduates in the study. According to data from Turkey Demographic and Health Survey, 26% of women in our country have an education of high school or higher (20). It was determined that the education level of pregnant women participating in the study was higher. This may be due to the fact that the study was conducted in Ankara city center. In our study, there was no statistically significant difference between the educational background and the mean PBI score of pregnant women. Similar results were found in some studies conducted (17,21). However, when other studies in the literature were examined, it was stated that prenatal bonding increased the level of education increased (16,22,23,24). These differences may be due to the fact that the studies were conducted in different places, age groups, and different cultures. These differences were thought to be due to the fact that the studies were conducted in different places, age groups, and different cultures, as well as previous pregnancies, number of pregnancies and complications due to pregnancy, and chronic diseases present in the pregnant woman.

The majority of pregnant women participating in the study (57.5%) earned as much as their expenses and there was no statistical difference between PBI scores according to economic groups. Similarly, in Akarsu and Oskay's (2017) study, it was found that the economic situation did not affect the prenatal bonding level (16).

It was determined that more than half (80.6%) of the pregnant women who participated in the study were unemployed and there was no statistical difference in PBI scores in terms of employment status. However, in some studies, it was found that prenatal bonding was high in employed pregnant women (14,16,24,25). No statistical difference was found between the type of family and prenatal bonding level in this study. However, Alan stated that mothers with large families had higher maternal bonding scores than those with nuclear families, while Kartal and Taraman stated that pregnant women with nuclear families had higher prenatal bonding levels (14,26). These differences between employment status and the family type and prenatal bonding can be explained by the fact that individuals have different environmental and social support systems.

In our study, it was found that 72.9% of the pregnant women had an unplanned pregnancy, and the mean PBI score was significantly higher in those who had planned pregnancies. Similarly, in most studies, it was found that women with planned pregnancies had higher bonding levels (14,22,27,28,29). However, in some studies, it was found

that there was no relationship between prenatal bonding and the fact that whether the pregnancy was planned or not (23,24,25). Prenatal bonding in planned pregnancies is an expected result as the pregnancy is desired and the readiness of the mother exists.

A statistically significant difference was found between the PBI scores of the women included in the study when they learned that they were pregnant and the PBI scores and the idea of terminating their pregnancy and the PBI scores. It was determined that the PBI values of pregnant women who felt sad when they found out that they were pregnant and who thought to terminate their pregnancy were lower than the others. Therefore, it is thought that pregnancies of pregnant women who are sad and who are planning to terminate their pregnancy are not planned. When the literature is examined in this context; it was indicated that an unplanned pregnancy or an unwanted baby negatively affected mother-to-infant bonding (32,33). In the study performed by Top et al. in 2005 about the attitudes of pregnant women regarding their changing body image, they found that voluntariness for pregnancy had an effect on the adaptation to motherhood (33). The results of our study are in accordance with the other studies in the literature in this aspect. According to Brockington (2006), there was a strong correlation between bonding disorder and unwanted pregnancies and a lack of establishing a connection with the fetus during pregnancy (34). It can be thought that upset or unwanted pregnancies when they learn about their pregnancy negatively affect the mother-infant bonding and may pose a risk of attachment.

The majority of the pregnant women (81.8%) had a desire to become pregnant and it was determined that the mean PBI score was statistically very high. The studies conducted also supported our findings (26,35,36). There was a statistically significant difference between the states of maternal bonding and the desire to get pregnant (26,35,36). However, Dağlı did not find any difference in prenatal bonding despite the fact that more than half of the women desired the pregnancy (24). In families where pregnancy is desired, the arrival of the baby is met with love and attention. Therefore, prenatal bonding is expected to increase with the development of positive health behaviors.

In our study, the meanPBI score was higher and more significant in women who were primiparous and had no child alive. In similar studies, it was stated that prenatal bonding was higher in primiparous women and women who had never given birth (16,22,23,24,37). In addition, it was found that mothers giving birth more than three times had low bonding levels (22,27). These findings are in line with our research findings.

98% of the pregnant women felt the movements of the baby after the 20th week of pregnancy and the mean PBI score was found to be statistically significant. In addition, the means of bonding of mothers expressing their happiness for their current pregnancy were found to be very significant. In national and international studies, it was stated that as the gestation week increased, the bonding increased, too (38,39). These findings are in line with the literature. It can be thought that since the movements of the baby are felt more clearly with the progress of pregnancy, the feeling of the movements of the baby increases bonding in the prenatal period.

Limitations

The limitations of the study are that the study was conducted in a single center and that women with a pregnancy of 20 weeks or more were included in the study.

5. CONCLUSION

Prenatal bonding is the most unique sample of the communication between mother and baby in the prenatal period. There are a lot of factors affecting prenatal bonding (age, family structure, education, employment status, economic status, the health status of the person, features of marriage, number of children alive, gender of the baby to be born, planning of pregnancy, the status of desiring pregnancy, culture, attitude, and behaviors, etc.). Pre-identification and analysis of these factors are important to improve the nasty results of prenatal health. Especially in pregnant women with a weak bonding risk, appropriate interventions can be provided and prenatal bonding can be increased with training and consultancy. In this context, proper and on-time nursing care is required to ensure/increase prenatal bonding.

It was found that the mean PBI score of women willing to get pregnant and become happy when they learned that they were pregnant was statistically significantly higher. It was determined that the mean PBI score of the pregnant women having a planned pregnancy, not intending to terminate their pregnancy, feeling baby movements, and having a desire to see the doctor except for their routine controls was found to be significantly higher.

Longitudinal and experimental studies are required for the evaluation of bonding levels of pregnant women by midwives and nurses attentively during pregnancy and the postpartum period, the determination of the factors affecting bonding, and determination of the effects of bonding disorders on mother and baby.

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