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Evaluation of Prenatal Attachment Level of Pregnant Women and Affecting Factors

Gebelerin Prenatal Bağlanma Düzeyinin ve Etkileyen Faktörlerin Değerlendirilmesi

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Öz

Amaç: Bu çalışma ile gebelerin prenatal bağlanma düzeyleri ve etkileyen faktörlerin belirlenmesi amaçlanmıştır. **Yöntem:** Kesitsel tanımlayıcı nitelikteki çalışmanın örneklemini 223 gebe oluşturmuştur. Veriler, obstetrik ve jinekolojik özellikleri belirlemek amacıyla birey tanıtım formu ve prenatal bağlanma envanteri aracılığıyla toplanmıştır. **Bulgular:** Örneklem grubundaki gebelerin prenatal bağlanma envanteri toplam puan ortalaması 54.42±17.23 olarak bulunmuştur. Doğum öncesi bağlanma envanteri puan ortalaması, gebe ve partneri lise ve üzeri eğitim düzeyinde, 0-3 yıl arası evlilik süresi olan, çekirdek ailede yaşayan, 3. trimesterde, gebeliği planlı olan, gebelikte eğitim alan, bebeğini ilk altı ay sadece anne sütüyle beslemeyi planlayan gebelerin prenatal bağlanma envanteri ölçek puan ortalamaları anlamlı düzeyde yüksek bulunmuştur ($p<0.05$). Geliri giderinden düşük olan, sigara kullanan, son doğumdan sonra bir yıl geçen gebelerin PBE ölçek puan ortalamalarının anlamlı düzeyde düşük olduğu görülmüştür ($p<0.05$). **Sonuç:** Gebelerin prenatal bağlanma düzeyleri orta seviyede bulunmuş ve eğitim, evlilik süresi, gelir düzeyi, aile tipi gibi sosyodemografik faktörlerden etkilendiği saptanmıştır. Prenatal bağlanma düzeyini olumsuz etkileyen faktörlerin göz ardı edilmemesi, gebelik ve postpartum süreçte anne ve bebek bağlanmasının güçlenmesi açısından önemlidir.

Anahtar kelimeler: Gebelik, bağlanma, prenatal bağlanma, fetüs

Abstract

Aim: This study aims to assess the prenatal attachment of pregnant women together with the effective factors. The sample of this cross-sectional descriptive study consisted of 223 pregnant women. **Method**: Data were collected through a Personal Identification Form which aims to determine obstetric and gynecological characteristics of the pregnant women and the Prenatal Attachment Inventory. **Results**: Mean total score of the pregnant women included in the sample group in the prenatal attachment inventory was found to be 54.42±17.23. Mean Prenatal Attachment Inventory scores of pregnant women who graduated from a high school or a higher academic institution together with their partners, who have been married for 0-3 years, who live in a nuclear family, who are in the third trimester of their pregnancy, who experience a planned pregnancy, who received training during pregnancy and who plan to feed their baby only with breast milk for the first six months were found to be significantly higher ($p<0.05$). On the other hand, it was observed that mean Prenatal Attachment Inventory scores of pregnant women whose income was below their expenses, who smoked, and who had only one year since their last delivery were significantly lower ($p<0.05$). **Conclusion**: Prenatal attachment levels of pregnant women were found to be moderate and were found to be affected by sociodemographic factors such as education, duration of marriage, income level, and family type. It is important not to ignore the factors that

negatively affect the level of prenatal attachment to strengthen the mother and infant attachment during pregnancy and postpartum period.

Keywords: Pregnancy, attachment, prenatal attachment, fetus

1. Introduction

The prenatal phase is a period in which women prepare themselves for motherhood, where both physical and emotional changes are observed, and the foundations of attachment are laid. The physical and hormonal changes experienced throughout this phase prepare the woman for the role of motherhood [1]. Prenatal attachment is defined as the emotional bond developed between mother and the unborn baby. Prenatal attachment between mother and fetus is proposed as bi-directional relationship in which there is continuous feedback and dynamic influences between mothers and fetuses [2]. John Bowlby was the first to define attachment theory. The theory in Bowlby's work was defined as 'permanent psychological bond between people' and his theory was based on the Object Relations Theory [3].

Prenatal attachment usually begins with the 18th week of pregnancy, when the mother feels the presence of the baby, and continues throughout pregnancy. Maternal-fetal attachment improves significantly as the week of pregnancy progresses, particularly in the third trimester [4]. Positive prenatal attachment facilitates women's adaptation to the role of motherhood and provides psychological adjustment during pregnancy. A high level of fetal attachment may increase the readiness for the birth of babies and positively affect the perception of self-efficacy in the perinatal period [5].

In addition, perinatal attachment significantly affects postpartum attachment. The bond between mother and baby, which begins in the prenatal phase, develops and strengthens in the postpartum period. Strong prenatal attachment may enable mothers to have more and higher quality interactions with their infants after birth. In addition, it may also reduce postnatal insecure attachment [6,7] Arguz et all., (2020) examined the relationships between prenatal attachment and child development, socio-emotional behavioral problems, and competence in early childhood and found that prenatal attachment was associated with skills such as sustained attention, adaptation, motivation, empathy, imitation/play skills and social relationship building [8].

Various factors may affect mother-baby attachment during pregnancy. Parents' feelings, perceptions, expectations, and behaviors regarding the fetus during the prenatal period may affect prenatal attachment [9,10]. Further studies in the literature reveal that there are various factors such as the mother's health status during pregnancy, whether the pregnancy is planned or not, first pregnancy experience, economic status, and educational background that affect attachment [4, 11,12]. Öztürk found a positive correlation between educational status and prenatal attachment in her study on the determination of prenatal attachment and state anxiety levels in pregnant women, and Öncü and Aktaş found that pregnant women with high socioeconomic status had high levels of prenatal attachment in their study [13,14].

Therefore, determining the level of prenatal attachment is an important issue which helps the expecting mother to adapt successfully to her pregnancy, to establish a secure attachment with prevailing effects on both the mother and baby in the postpartum period. Routine assessment of prenatal attachment by nurses and midwives can help to identify pregnant women with low prenatal attachment level as well as to identify factors that negatively affect prenatal attachment [15,16]. However, there is no routine practice in our country yet. Although there are different studies on prenatal attachment, demonstrating the importance of the subject with more studies and different sample groups may increase the awareness of prenatal attachment. For this purpose, this study aimed to determine the prenatal attachment levels of pregnant women and the affecting factors and sought answers to the following questions:

1-What is the level of prenatal attachment in pregnancy?

2-What factors affect the levels of prenatal attachment in pregnancy?

2. Materials and Method

2.1. Study Design

This is a cross-sectional descriptive study.

2.2. Data Collection

Study data were collected between 08.01.2024 and 29.03.2024 at the Obstetrics polyclinic of a district state hospital. It took approximately 15-20 minutes to answer the questions filled out by the author during a face-to-face interview. Participants were invited to the study by explaining the purpose of the study and those who volunteered were included in the study.

2.3. Study Population and Sample Selection

The population of the study consisted of pregnant women who applied to the obstetric clinic of a state hospital. The results of the study conducted by Badem and Zeyneloğlu were taken as basis in determining the number of samples to be included in the research [17]. The effect size was calculated

using the mean and standard deviation values of the Prenatal Attachment Inventory total scores of the participants in that study. The probability of type 1 error was accepted as (α)=0.05 and the power of the test (1-β)=0.80 and the sample size was determined as a minimum of 220 people. Thus, 223 pregnant women over the age of 18 who volunteered to participate in the study constituted the sample of the study.

2.4. Data Collection Tools

Study data were collected through a Personal Identification Form and the Prenatal Attachment Inventory (PAI).

2.5. Personal Identification Form

The form, consisting of 23 questions developed by the author by reviewing the literature, aimed to determine the sociodemographic characteristics, obstetric and gynecological characteristics of the participants [4,5,9] The first 12 questions of this form, which constitute sociodemographic characteristics, consist of questions such as age, educational status, income level, and family type. The 10 questions aiming to determine obstetric characteristics included questions such as gestational week, number of pregnancies, planned pregnancy, and pregnancy loss.

2.6. Prenatal Attachment Inventory (PAI)

It was developed by Mary Muller (1993) to explain the emotional states experienced by pregnant women and to determine their level of attachment to their babies in the prenatal period [18] The Cronbach alpha value calculated in Muller's study, conducted to develop the inventory, was 0.86. The inventory was further adapted to Turkish and its validity and reliability were confirmed in Turkish by Yılmaz and Beji [19] and the Cronbach's alpha value was calculated as 0.84. The inventory consists of 21 items. Each item is scored between 1 and 4 (1: Never, 2: Sometimes, 3: Often, 4: Always). Minimum and maximum score that can be obtained from the inventory is 21 and 84, respectively. Higher score in the inventory indicates that the level of prenatal attachment of pregnant women to their babies increases. The Cronbach alpha coefficient of the PAI used in our study was calculated as 0.83.

2.7. Statistical Analysis of Data

SPSS 26.0 program was used for statistical analysis of data collected in our study and descriptive characteristics were presented in numbers, percentages and mean values. Since the data were normally distributed,

Independent Samples t-test was used to determine the difference between two groups when comparing inventory scores between independent groups, and One Way Anova test was used for comparisons between more than two groups. Dunn's test was further used as a multiple comparison method to determine the different group. Significance was evaluated at $p<0.05$ level.

3. Results

The socio-demographic characteristics of the pregnant women participating in the study revealed that 42.1% were under the age of 25 and 39% were between the ages of 26-30. It was determined that 23.3% of the pregnant women participating in the study were primary school graduates, 55.7% were high school graduates or had a higher academic degree, 89.6% lived within a nuclear family, more than half of them (65.9%) were not working and 26.4% of them had an income lower than their expenses (Table 1).

The obstetric characteristics of the pregnant women revealed that 76.6% of them were experiencing a planned pregnancy, 21.5% stated that a year had passed over their previous delivery and 30.4% told that they received training during their pregnancy. Mean total PAI score of pregnant women was calculated as 54.42±17.23 (Table 2).

The assessment of prenatal attachment levels of pregnant women in terms of their socio-demographic characteristics (Table 3) revealed that there was a significant relationship between education and PAI score, thus mean PAI score of women who were high school graduates or had a higher academic degree were higher ($p=0.003$). Mean PAI scores of women whose income were below their expenses were found to be statistically significantly lower ($p=0.012$).

The difference was attributed to those whose income was lower than their expenses, hence mean PAI scores of women who stated that their income was lower than their expenses were significantly lower. It was further determined that the duration of marriage affected the prenatal attachment level of women and the prenatal attachment levels of women whose marriage was between 0-3 years were significantly higher ($p=0.039$).

A statistically significant difference was found between PAI scores and the education of pregnant women's partners ($p<0.05$). The results of thPost-hoc test conducted to determine the source of the difference revealed that the difference was attributed to women whose partners were high school graduates or had a higher academic degree and that mean PAI scores were higher for the women in these groups ($p<0.05$).

Table 1. Sociodemographic Characteristics of Pregnant Women (n=223)

Sociodemographic Characteristics	n	%
Age 24.38±2.67 (min:18 max:34)		
25 years and below	94	42.1
26-30 years of age	87	39
31 years and older	42	18.8
Education		
Primary School	52	23.3
Secondary School	47	21.0
High School	55	24.6
Bachelor's or Post Graduate Degree	69	31.1
Income Level		
Income lower than expenses	59	26.4
Income meets expenses	164	73.5
Income higher than expenses	21	9.4
Employment Status		
Yes	76	34
No	147	65.9
Duration of Marriage		
0-3 Yrs	87	37.3
4-7 Yrs	65	29.1
8-10 Yrs	35	15.6
More than 11 years	36	16.1
Education of the Partner		
Primary School	33	14.7
Secondary School	37	16.5
High School	70	31.3
Bachelor's or Post Graduate Degree	75	33.6
Family Type		
Nuclear family	200	89.6
Extended family	23	10.3
Chronic Disease		
Yes	25	11.3
No	198	89.7
Smoking		
Yes	28	12.5
No	194	86.9

Table 2. Obstetric Characteristics of Pregnant Women (n=223)

Obstetric Characteristics	n	%
Pregnancy Week		
Between 0-19 weeks (1st trimester)	12	5.1
Between 20-27 weeks (2nd trimester)	118	52.9
Between 28-40 weeks (3rd trimester)	193	86.5
Number of Pregnancy		
1	78	34.9
2	70	31.3
3	37	16.5
4	38	17
Number of Children		
1	67	30
2	39	17.4
3	18	8
4	12	5.3
Time since last delivery (n=145)		
1 Yrs	48	21.5
2 Yrs	63	28.2

3 yrs and more	34	15.2
Planned Pregnancy		
Yes	171	76.6
No	52	23.3
Pregnancy Loss		
Yes	49	21.9
No	174	78
Training Received in Pregnancy		
Yes	68	30.4
No	155	69.5
Method planned to feed the baby after birth		
Breast Milk	182	81.6
Infant formula	9	4
Breast Milk & Infant formula	32	14.3
Mean PAI Score ± SD (min-max)	54.42±17.23 (23-81)	

Table 3. Comparison of Prenatal Attachment Levels of Pregnant Women with their Socio-Demographic Characteristics (n=223)

	n (%)	**Mean±SD**	**F/t**	**p**
Age				
25 years and below[a]	87	56.48±23.36	2.032**	0.098
26-30 years of age[b]	94	57.92±11.27		
31 years and older[c]	42	57.02±41.08		
Education				
Primary School[a]	52	57.12±8.16		
Secondary School[b]	47	59.10±9.13		**0.003**
High School[c]	55	61.23±3.11	4.812**	
Bachelor's or Post Graduate Degree[d]	69	62.35±12.7	(a,b<c,d)	
Income Level				
Income lower than expenses[a]	59	58.12±4.12		
Income meets expenses[b]	164	59.19±8.06	3.687**	**0.012**
Income higher than expenses[c]	21	59.87±5.61	(a<b,c)	
Employment Status				
Yes	76	59.21±12.3	1,642*	0.124
No	147	59.38±6.19		
Duration of Marriage				
0-3 Yrs[a]	87	59.17±13.90		
4-7 Yrs[b]	65	57.54±10.91	3.125**	**0.039**
8-10 Yrs[c]	35	56.42±32.11	(a>b,c,d)	
More than 11 years[d]	36	56.28±17.61		
Education of the Partner				
Primary School[a]	33	54.42±13.28		
Secondary School[b]	37	56.74±13.91	5.228**	**0.001**
High School[c]	70	59.49±27.11	(a,b<c,d)	
Bachelor's or Post Graduate Degree[d]	75	61.38±11.82		
Family Type				
Nuclear family	200	57.44±12.63	2,343*	**0.023**
Extended family	23	59.79±16.52		
Chronic Disease				
Yes	25	57.28±10.12	1,472	0.214
No	198	57.18±14.61		

Smoking				
Yes	28	53.04±21.34	4.327*	**0.001**
No	194	60.27±14.18		
Independent Samples t-test*; Oneway Anova Test**; SD:standard deviation; p<0.05				

The assessment of prenatal attachment levels of pregnant women in terms of their obstetric characteristics revealed that there was a significant relationship between pregnancy week and mean PAI score, thus mean PAI score of women who were within the 28 (Table 4) week or older of their pregnancy were higher (0.028). Mean PAI scores of pregnant women who had four or more pregnancies (0.006) and who had lived one year following their last birth were found to be significantly lower (0.012). It was found that the mean PAI scores of women who had a planned pregnancy (0.001) and who received training during pregnancy were significantly higher (0.026). It was further concluded that mean PAI scores of mothers who planned to feed their babies exclusively with breast milk after birth was significantly higher (0.004).

4. Discussion

The prenatal phase is a period in which women prepare themselves for the motherhood, where both physical and emotional changes are observed and the foundations of attachment are laid. In this study, which was conducted to determine the prenatal attachment levels of pregnant women and the affecting factors, mean prenatal attachment level was calculated as 54.42±17.23. It was observed that the prenatal attachment level of pregnant women was moderate. Similar to our study, the mean PAI score of pregnant women in the study conducted by Badem and Zeyneloğlu [17] was found to be 59.31±11.06 and the mean attachment score of pregnant women in the study conducted by

Table 4. Comparison of Prenatal Attachment Levels of Pregnant Women with their Obstetric Characteristics (n=223)

	n (%)	**Mean±SD**	**F/t**	**p**
Pregnancy Week				
Between 0-19 weeks (1st trimester)[a]	12	55.42±12.25	2.824**	**0.028**
Between 20-27 weeks (2nd trimester)[b]	118	58.38 ±17.11	(a,b<c)	
Between 28-40 weeks (3rd trimester)[c]	193	59.42 ±21.04		
Number of Pregnancy				
1[a]	78	59.13±06.25		
2[b]	70	58.56±18.46	4.218**	**0.006**
3[c]	37	56.65±21.19	(a,b,c>d)	
4 and more[d]	38	55.35±30.63		
Time since last delivery				
1 yrs[a]	48	53.22±28.11	3.937**	**0.012**
2 yrs[b]	63	58.47±17.28	(a<b,c)	
3 yrs and more[c]	34	61.33±19.08		
Planned Pregnancy				
Yes	171	59.52±07.23	4.217*	**0.001**
No	52	55.04±34.55		
Pregnancy Loss				
Yes	49	60.71±23.23	1.098*	0.342
No	174	58.04±17.42		
Training Received in Pregnancy				
Yes	117	60.57 ±13.23	2.412*	**0.026**
No	106	54.39±21.36		
Method Planned to Feed the Baby After Birth				
Breast Milk[a]	182	60.62±30.52	4.693**	**0.004**
Infant formula[b]	9	57.25 ±31.17	(a>b,c)	
Breast Milk & Infant formula[c]	32	54.52 ±35.04		
Independent Samples t-test*; Oneway Anova Test**; SD:standard deviation; p<0.05				

Potur and,at.all. was found to be 62,21±10,66. [4].[When the studies conducted in 2024 were evaluated, Koç et al. found the level of prenatal attachment in pregnancy to be 69.00±7.32, Akça et al. found it as 64.75±9.54. Gürol et al. 39.10±9.65, Şenol and Pekyiğit found the level of prenatal attachment of pregnant women to be 42.03±5.25 and it was observed that the levels of prenatal attachment in these studies were lower than our study results [10,11,20,21]. Many socio-demographic and obstetric factors affect the prenatal attachment levels of pregnant women. These factors may be the reason attributable to the similarities and differences in further articles studying prenatal attachment levels.

For the purpose of this study, it was determined that education affected the prenatal attachment levels of pregnant women, and the prenatal attachment levels of pregnant women who were high school graduates or had a higher academic degree were higher. The results of different studies also support our findings [17]. It was further concluded that the education of the partner, as well as the education of the pregnant women, affects the attachment process of pregnant women, and the attachment levels of pregnant women whose partners had higher levels of education were higher.

Another factor that makes a difference in the prenatal attachment levels of pregnant women is concluded to be their income level. Accordingly prenatal attachment levels of pregnant women who stated that they had lower income levels were found to be low. Karabulutlu et al. evaluated the prenatal attachment levels of pregnant women living in İstanbul and Kars, and similar to the results of this study, they found that the perinatal attachment levels of pregnant women with higher economic levels were higher [22]. Similar results were obtained in another study evaluating the effect of distress experienced during pregnancy on prenatal attachment [10]. Poor economic status is thought to prevent pregnant women from prioritizing their own care and needs, the pregnancy process, and the fetus.

In many other studies evaluating the level of prenatal attachment, duration of marriage and family type were considered as related factors. In this study, it was determined that the prenatal attachment levels of pregnant women who were married between 0-3 years were higher. Dikmen and Çankaya [23] argued that the level of prenatal attachment decreases as the year of marriage increases. Increasing number of years of marriage, advancing age, and increasing the number of pregnancies may negatively affect prenatal attachment.

Study results indicated that women living in nuclear families had higher prenatal attachment levels. There were different results in the literature on this subject. Dikmen and Çankaya found that pregnant women living in nuclear families had higher prenatal attachment levels however no difference was found in this respect by Şenol and Pekyiğit [10,23]. The educational background of family members is also thought to be the reason for the difference in studies.

12.5% of the pregnant women in the sample stated that they smoked. The prenatal attachment levels of pregnant women who smoke were found to be lower. Similar results were reached in many other studies [17,24]. It was demonstrated that women with higher prenatal attachment levels prefer healthy behaviors such as following a healthy diet and avoiding harmful habits [25].

In this study, prenatal attachment levels of pregnant women in the first trimester were found to be lower than those in the second and third trimesters. Küçükkaya et al. also reported that the attachment level was higher in the third trimester of pregnancy [26]. Similarly, different studies discussed that the level of prenatal attachment increases as the week of pregnancy progresses. It was further determined that following fetal movements and increased frequency and intensity of felt fetal movements improve the level of prenatal attachment [27,28].

The findings of the study show that prenatal attachment levels were higher in women who had just experienced their first pregnancy, had a planned pregnancy, and had three years or more since their last birth. In different studies, as in our study, it was concluded that the level of prenatal attachment was higher in the first pregnancy [13,29] Some studies concluded that prenatal attachment is higher in those who have had three or more pregnancies [30]. However, authors argue that the level of prenatal attachment may be higher in the first pregnancy due to reasons such as the excitement of giving birth to a baby for the first time and the absence of another child to care for. It was observed that the level of prenatal attachment is higher in planned pregnancies [31]. A woman's feeling of being ready for pregnancy will improve her level of prenatal attachment by strengthening her physiological and psychological adaptation to the pregnancy process. It was further concluded that the level of prenatal attachment is higher in pregnant women who want to feed their babies only with breast milk after birth. Breastfeeding strongly affects the bond between the mother and the baby [32] It is concluded that raising awareness about the significance of breast milk and breastfeeding is related to the trainings received during pregnancy and the educational background of the pregnant woman.

Conclusion

It was found that the pregnant women included in this study were moderately attached to their babies in the prenatal period. The results indicated a significant relationship between the education of the

pregnant woman and her partner, income level, number of pregnancies, year of marriage, family type, smoking habit and prenatal attachment. In addition, a significant relationship was found between whether the pregnancy was planned or not, gestational week, number of pregnancies, time elapsed the last delivery, training received during pregnancy and the mother's plan regarding method for feeding her baby after birth and prenatal attachment levels. The fact that the effects of prenatal attachment are observed not only during pregnancy but also in the post-pregnancy period increases the significance of the subject. This information shows that prenatal attachment levels of pregnant women should be evaluated from their first check-up until birth. Considering factors such as pregnancy trainings that positively affect the level of prenatal attachment, it is necessary to ensure all pregnant women to receive trainings throughout their pregnancy. The partner should also be included in the trainings for to improve the support for the pregnant woman, and collaboration should be ensured with other family members in extended families to make sure that they are aware of the pregnant woman's needs. Informing the pregnant woman about harmful habits such as smoking and ensuring that the pregnant woman receives professional help to keep her away from these habits will be a supportive approach to prenatal attachment. The information provided about the significance of exclusively breastfeeding the baby for the first six months after birth and the effects of breastfeeding on strengthening the bond between mother and baby will strengthen prenatal attachment.

Ethics Committee Approval: This study was approved by University Institutional Review Board (2023/34). The consent of all participants was obtained before administering the inventory, the study was conducted in accordance with the ethical principles of the Declaration of Helsinki and the confidentiality of personal information was ensured.

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