

ORIGINAL RESEARCH ARTICLE

The relationship between prenatal attachment and death anxiety in high-risk pregnancies

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Abstract

This study aims to examine the relationship between prenatal attachment and death anxiety in high-risk pregnancies. The study, a descriptive and correlational design, was conducted with 158 women with high-risk pregnancies in eastern Türkiye between May and December 2024. Data were collected using a socio-demographic form, the Prenatal Attachment Inventory, and the Templer Death Anxiety Scale. The mean score on the Prenatal Attachment Inventory (PAI) was 62.1 ± 10.84 , while the mean score on the Templer Death Anxiety Scale was 6.9 ± 2.99 . A positive correlation was found between PAI and Death Anxiety scores ($r = .169$, $p < .005$). Death anxiety was predicted by maternal age and the level of prenatal attachment (*Afr J Reprod Health* 2026; 30 [15]:108-116).

Keywords : Attachment, Death Anxiety, High-Risk Pregnancy, Maternal Health, Child Health

Résumé

Cette étude vise à examiner la relation entre l'attachement prénatal et l'anxiété face à la mort chez les femmes ayant une grossesse à haut risque. L'étude, de type descriptif et corrélationnel, a été menée auprès de 158 femmes enceintes à haut risque dans l'est de la Turquie, entre mai et décembre 2024. Les données ont été recueillies à l'aide d'un formulaire socio-démographique, de l'Inventaire de l'Attachement Prénatal (Prenatal Attachment Inventory - PAI) et de l'Échelle d'Anxiété de la Mort de Templer. Le score moyen à l'Inventaire de l'Attachement Prénatal était de $62,1 \pm 10,84$, tandis que le score moyen à l'Échelle d'Anxiété de la Mort était de $6,9 \pm 2,99$. Une corrélation positive a été observée entre les scores du PAI et de l'anxiété face à la mort ($r = 0,169$, $p < 0,005$). L'anxiété de la mort était prédite par l'âge maternel et le niveau d'attachement prénatal. (*Afr J Reprod Health* 2026; 30 [15]: 108-116).

Keywords: Attachement, Anxiété de la mort, Grossesse à haut risque, Santé maternelle, Santé infantile

Introduction

Pregnancy is a period characterized by physiological changes that affect a woman's bodily systems and result in physical, psychological, and social consequences.¹ It is also a time when women require increased care and protection.² During pregnancy, physiological changes occur in the mother's body to sustain the life of the growing fetus.³ Although every woman desires a healthy pregnancy and a healthy baby, pregnancy can also bring significant risks.^{4,5}

A "risk" refers to the likelihood of undesirable outcomes arising from one or more factors, and a high-risk pregnancy is defined as the likelihood of complications either due to pre-

existing conditions or those arising during pregnancy. High-risk pregnancies may result from a woman's existing health problems or pregnancy-related factors.⁴ A high-risk pregnancy not only threatens the health of the fetus but can also cause the mother to experience intense stress and anxiety.⁶ Women with high-risk pregnancies often report emotional and psychological responses such as shock, fear, disappointment, grief, isolation and loneliness, anger, sadness, and guilt.^{7,8} These experiences may significantly impact prenatal attachment.

Prenatal attachment is defined as the emotional bond that parents establish with the fetus.⁹ Prenatal attachment plays an important role in the acquisition of the parental role, the well-being

of the family and the development of the child. Establishing an emotional bond with the fetus during this period is an important factor that can have an impact on the child's health and psychological development.¹⁰ Mother-infant bonding has been found to increase throughout pregnancy, especially when women feel the first movements of the fetus. Strong mother-infant bonding is associated with positive effects on maternal mental health and depressive symptoms. Insecure attachment has been shown to be associated with higher anxiety in children, while secure attachment is associated with better emotion regulation skills.¹¹

Prenatal attachment (PA) refers to the emotional bond that develops between a pregnant woman and her fetus during pregnancy. This attachment is considered a crucial aspect of maternal adaptation to pregnancy and plays a significant role in both maternal and fetal health. In high-risk pregnancies, where uncertainty and medical complications are more prevalent, this attachment process may be disrupted or altered. Factors such as anxiety about fetal outcomes, fear of loss, and perceived lack of control can influence the strength and quality of prenatal attachment.

Psychological and emotional disorders are more frequently observed in women diagnosed with high-risk pregnancies. Compared to women experiencing low-risk pregnancies, those with high-risk conditions tend to report more severe symptoms of depression, anxiety, and stress.¹² These emotional responses often stem from concerns about potential risks during pregnancy, including fear of losing the baby and threats to the mother's own life.¹³ According to data from the World Health Organization, high-risk pregnancies account for more than half of maternal and neonatal deaths worldwide.¹⁴ Therefore, providing optimal care is essential to prevent or mitigate the negative impacts of high-risk pregnancies on both the mother and the fetus.¹⁵ The aim of this study is to examine the relationship between prenatal attachment and death anxiety in women with high-risk pregnancies.

Methods

Study design

This study utilized a descriptive and correlational research design.

Sampling and recruitment

The study population consisted of pregnant women who were followed at the Obstetrics and Gynecology

Outpatient Clinics and the Non-Stress Test (NST) Clinic of an Education and Research Hospital in eastern Turkey, between May and December 2024. In the study, no sampling was performed from the population. Pregnant women at risk who were accessible during the period of the study and voluntarily agreed to participate were included in the study sample. The study was conducted with 158 pregnant women at risk.

The inclusion criteria were: being 18 years of age or older; being in at least the 20th week of gestation; having a diagnosis of one or more of the following conditions, polyhydramnios, oligohydramnios, fetal presentation anomalies, gestational diabetes mellitus, urinary tract infections, anemia, hyperemesis gravidarum, hypertension, or various forms of abortion; having comorbidities such as epilepsy, liver or kidney disease, or thyroid disorders; being literate; having no communication impairments (e.g., hearing or visual disabilities) and providing informed consent for participation.

Measures

Data were collected using three instruments: the Socio-Demographic Information Form, the Prenatal Attachment Inventory (PAI), and the Templer Death Anxiety Scale.

Socio-demographic information form: This form was developed by the researchers based on relevant literature and consists of 10 items aimed at identifying the socio-demographic and obstetric characteristics of the participants.^{2,4,8}

Prenatal attachment inventory (PAI): The Prenatal Attachment Inventory (PAI) was originally developed by Muller in 1993¹⁶ and was adapted into Turkish by Yılmaz and Beji in 2013. The scale is applicable after the 20th week of gestation and is designed to subjectively assess prenatal attachment. It comprises 21 items that aim to reflect pregnant women's thoughts, emotions, and experiences during pregnancy, as well as their attachment levels to their unborn baby. The scale uses a 4-point Likert-type format, with response options ranging from 1 (Never) to 4 (Always). The total score ranges

from a minimum of 21 to a maximum of 84, with higher scores indicating a higher level of prenatal attachment. The original scale reported a Cronbach's alpha reliability coefficient of 0.84.¹⁷ In this study, the Cronbach's alpha value of the Prenatal Attachment Inventory (PAI) was calculated as 0.74.

Templer death anxiety scale: The Templer Death Anxiety Scale was developed by Templer in 1970 to assess an individual's fear, anxiety, or dread regarding their own death or the dying process.¹⁸ The Turkish validity and reliability of the scale were established by Akça and Köse in 2008. The scale consists of 15 items. For items 1–9, each “No” response is scored as 0 and each “Yes” as 1; for items 10–15, the scoring is reversed: each “Yes” is scored as 0 and each “No” as 1. Based on the total score, death anxiety levels are categorized as follows: 0–4 = mild, 5–9 = moderate, 10–14 = severe, and 15 = panic level. The Cronbach's alpha coefficient for the Turkish version was reported as 0.79.¹⁹ The Cronbach's alpha value for the Templer Death Anxiety Scale was calculated as 0.69 in this study.

Data collection

Before initiating data collection, all necessary legal and institutional approvals were obtained. The data were collected from pregnant women who visited the Obstetrics and Gynecology Outpatient Clinics and the Non-Stress Test (NST) Clinic of an Education and Research Hospital located in eastern Turkey. High-risk pregnancies were identified in collaboration with obstetricians. Participants who met the inclusion criteria were informed about the purpose and scope of the study and provided verbal consent prior to participation. Data collection instruments were administered through face-to-face interviews conducted in the NST room or in the outpatient clinic waiting areas. Each interview took approximately 15–20 minutes to complete.

Data analysis

The data obtained from the study were analyzed using IBM SPSS Statistics for Windows, Version 24.0 (IBM Corp., Armonk, NY). Descriptive statistics, including frequency, mean, standard deviation, and percentage, were used to summarize the data. Normality of data distribution was assessed using skewness and kurtosis coefficients. For

normally distributed data, comparisons between two groups were performed using the Independent Samples t-test, while comparisons among multiple groups were conducted using One-Way ANOVA. The relationships between scale scores and sub-dimensions were analyzed using the Pearson correlation test. Factors affecting the mean scores of the Prenatal Attachment Inventory (PAI) and Templer Death Anxiety Scale were examined using multiple linear regression analysis. The reliability of the total scales was assessed using Cronbach's alpha (α) coefficient. A p-value of less than 0.05 was considered statistically significant.

Ethical considerations

Ethical approval for this study was obtained from the Ethics Committee for Health and Sports Sciences Research Involving Humans at the relevant university (Approval Date: March 1, 2024; Decision No: 02). Institutional permission was also secured from the healthcare facility where the study was conducted. All participants were informed about the aim and procedures of the study, and verbal informed consent was obtained prior to data collection. Interviews were conducted in private settings to ensure participant comfort and openness. All data were treated confidentially, with strict adherence to ethical principles regarding privacy and anonymity. Participants were assured that the information collected would be used exclusively for research purposes.

Results

The mean age of the pregnant participants was 28.3 ± 5.31 years. Among them, 46.2% were high school graduates, 17.1% were employed in income-generating jobs, and 75.3% reported that their monthly income was equal to their expenses. The mean gestational week was 30.2 ± 5.8 , and the mean number of pregnancies was 2.1 ± 1.09 . Additionally, 36.1% of the participants were experiencing their first pregnancy, and 67.1% reported that the pregnancy was planned. Furthermore, 17.7% had a chronic illness and reported experiencing health-related risks during pregnancy such as urinary tract infections, anemia, thyroid disorders, and hypertension (Table 1). The mean score of the participants on the Prenatal Attachment Inventory (PAI) was

Table 1: Characteristics of the pregnant women

Characteristics	N	%
Age	28.37±5.31	(Min=17, Max=43)
Educational level		
Middle school	40	25.3
High school	73	46.2
University degree or higher	45	28.5
Employment Status		
Employed	27	17.1
Unemployed	131	82.9
Perception of monthly income		
Income less than expenses	33	20.9
Income equal to expenses	119	75.3
Income greater than expenses	6	3.8
Gestational age (weeks)	30.20±5.81	(Min=20, Max=40)
Number of pregnancies	2.18±1.09	(Min=1, Max=4)
Pregnancy order		
1st	57	36.1
2nd	39	24.7
3rd	37	23.4
4th or higher	25	15.8
Is the pregnancy planned?		
Yes	106	67.1
No	52	32.9
Presence of chronic disease		
Yes	28	17.7
No	130	82.3
Health issues experienced during pregnancy		
Urinary Tract Infection	31	19.6
Anemia	22	13.9
Thyroid Disorder	20	12.7
Hypertension	19	12.0
Hyperemesis Gravidarum	18	11.4
Gestational Diabetes	13	8.2
Other	35	22.2

Table 2: PAI and TDAS scores of the pregnant women

Scale	M±SD	Min-Max
PAI	62.10±10.84	35-80
TDAS	6.91±2.99	0-14

Table 3: The relationship between pregnant women's prenatal attachment inventory and templer death anxiety scale scores

Factors	PAI	TDAS
PAI	1	.169*
TDAS	.169*	1

* The correlation is significant at the 0.05 level

62.1 ± 10.84, while the mean score on the Templer Death Anxiety Scale (TDAS) was 6.9 ± 2.99. (Table 2). A positive correlation was found between the

mean PAI and TDAS scores of the pregnant women ($r = .169$, $p = .034$) (Table 3).

The mean PAI scores were 65.8 ± 10.50 for pregnant women with a university education, 63.6 ± 9.90 for those with planned pregnancies, 66.3 ± 9.46 for first-time pregnant women, and 62.5 ± 10.68 for those without chronic illnesses. It was observed that pregnant women who had a university education or higher, planned their pregnancy, and were experiencing their first pregnancy had higher mean PAI scores. This difference was statistically significant ($p < .005$) (Table 4).

The mean TDAS scores were 7.5 ± 3.58 for women with primary or middle school education, 7.1 ± 2.48 for those with unplanned pregnancies, 7.8 ± 3.74 for those with a pregnancy order of four

Table 4: PAI and TDAS mean scores by selected participant characteristics

Characteristics	PAI M±SD	TDAS M±SD
Educational level		
Middle School	57.55±10.69	7.55±3.58
High School	62.27±10.33	6.72±3.01
University Degree or Higher	65.88±10.50	6.64±2.26
Test/ p	F=6.728, p=.002	F=1.235, p=.294
Is the pregnancy planned?		
Yes	63.65±9.90	6.77±3.21
No	58.96±12.05	7.19±2.48
Test/ p	t=2.559, p=.010	t=-.826, p=.410
Pregnancy order		
1st	66.35±9.46	6.66±2.85
2nd	62.33±10.62	6.89±2.95
3rd	59.40±9.80	6.70±2.66
4th or higher	56.08±12.01	7.80±3.74
Test/ p	F=6.961 p=.000	F=.922, p=.432
Presence of chronic disease		
Yes	59.96±11.58	7.03±2.87
No	62.54±10.68	6.88±3.02
Test/ p	t=.239, p=.811	t=-1.129, p=.261

Table 5. Multiple analysis of variation in PAI and TDAS

Variables	Variation in PAI			F	Sig.	Adj. R2	DW
	β	T	p				
Fixed (Constant)	61.147	11.589	.000	6.437	.000	.175	1.665
Having education above university level	5.030	2.695	.008				
First pregnancy	13.114	2.545	.012				
Being nulliparous	-8.777	-1.698	.092				
TDAS	.720	2.671	.008				
Gestational age (weeks)	-.243	-1.450	.149				
Variables	Variation in TDAS			F	Sig.	Adj. R2	DW
	β	T	p				
Fixed (Constant)	1.408	.695	.024	3.838	.024	.047	2.149
Maternal age	.078	1.746	.083				
PAI	.053	2.414	.017				

or higher, and 7.0 ± 2.87 for women with chronic illnesses. Statistical analysis revealed that women with primary or middle school education, unplanned pregnancies, a pregnancy order of four or higher, and chronic illnesses had higher death anxiety scores. However, these differences were not statistically significant ($p > .005$) (Table 4). Multiple linear regression analysis was conducted to identify the factors affecting the mean scores of the Prenatal Attachment Inventory (PAI) and the Templer Death Anxiety Scale (TDAS). Dummy variables were used for categorical data. The regression model for PAI was significant

($F = 6.434$, $p < 0.001$), with university education, being in the first pregnancy, and death anxiety identified as significant predictors. The model explained 17.5% of the variance in PAI scores (Adjusted $R^2 = 0.175$). Statistical diagnostics indicated that the findings were reliable (Durbin-Watson = 1.665). For TDAS, the regression model was also significant ($F = 3.838$, $p = 0.024$), with maternal age and prenatal attachment identified as significant predictors. This model explained 4.7% of the variance in TDAS scores (Adjusted $R^2 = 0.047$). The results were statistically reliable (Durbin-Watson = 2.149) (Table 5).

Discussion

High-risk pregnancies have the potential to adversely affect the health of both the mother and the baby.¹³ This study aimed to evaluate the relationship between prenatal attachment levels and death anxiety among women with high-risk pregnancies. The findings are discussed below in the context of the existing literature.

In the present study, it was found that the pregnant women scored 62.1 ± 10.84 on the Prenatal Attachment Inventory, and their death anxiety was at a moderate level. In the study conducted by Yıldırım and Şahin, it was found that high-risk pregnant women scored 61.5 ± 15.44 on the Prenatal Attachment Inventory.²⁰ Öncü and Aktaş (2024) found a mean Prenatal Attachment Inventory (PAI) score of 62.7 ± 14.04 in high-risk pregnancies²¹, while Ataman *et al.* reported a mean score of 63.7 ± 11.0 .²² Similarly, Ketten and Bal and Çelik and Güneri documented mean PAI scores of 64.0 ± 11.31 and 63.7 ± 10.75 , respectively.^{8,23} These studies, along with the present research, suggest that prenatal attachment levels in high-risk pregnancies tend to be comparable. However, the study by Yıldırım and Şahin reported lower-than-average PAI scores.²⁰ In this study, lower PAI scores were also observed among women who had unplanned pregnancies and those with four or more pregnancies.

A high-risk pregnancy is defined as “any pregnancy in which a medical factor (maternal or fetal) is present that may adversely affect the pregnancy outcome”.⁷ It has been emphasized that high-risk pregnancies may lead to increased anxiety and feelings of loss in expectant mothers.¹² In the present study, death anxiety levels among high-risk pregnant women were found to be moderate. Karahan *et al.* similarly reported high levels of death anxiety in pregnant women.²⁴ Moreover, Mohammadi *et al.* highlighted that fear and anxiety related to pregnancy complications and their potential effects on fetal and maternal health constitute significant psychological stressors during pregnancy.²⁵

The literature reveals that women experiencing high-risk pregnancies often face various emotional and psychological challenges. These women may experience intense feelings such as shock, fear, disappointment, grief, loneliness, anger, sadness, and guilt⁷, as well as elevated levels

of anxiety and depression²⁶ and increased prenatal stress.⁶ Consequently, it is crucial for healthcare professionals to provide psychological support to women with high-risk pregnancies, as this can significantly impact the course and outcome of pregnancy.⁶

In this study, it was observed that in high-risk pregnancies, maternal educational level, parity, and being nulliparous were associated with prenatal attachment, whereas having a chronic disease was not found to be associated. Similarly, Koç *et al.* emphasized that pregnant women's prenatal attachment scores were related to maternal education level, gravidity, and parity²⁷. In the study by Canlı & Demiştaş, it was reported that mothers with chronic diseases exhibited higher levels of prenatal attachment.²⁸

In this study, pregnant women with a university-level education or higher demonstrated higher prenatal attachment levels. Similarly, Öncü and Aktaş reported that pregnant women with only a primary school education had lower prenatal attachment scores²¹, and Karabulutlu *et al.* found lower prenatal attachment levels among women with primary education.²⁹ Although many studies in the literature suggest that prenatal attachment increases with higher education levels^{30–32}, there are also studies reporting no significant effect of education level on prenatal attachment.^{33,34}

This study also found that women with planned pregnancies exhibited higher prenatal attachment levels. Numerous studies support these findings, indicating that planned pregnancies are associated with stronger prenatal attachment.^{21,29–32,35} Furthermore, women experiencing their first pregnancy in this study showed higher prenatal attachment levels. Although many studies have similarly found that primigravida women have higher prenatal attachment scores^{29,31,32,35}, Öncü and Aktaş reported no significant difference in prenatal attachment levels according to parity among high-risk pregnancies.²¹

High-risk pregnancy represents a sensitive and critical period for women and their families. It often involves coping with an unexpected diagnosis indicating potential danger to the health and sometimes the life of the mother and/or fetus. Consequently, concerns related to childbirth, stemming from the absence of a healthy pregnancy, frequently arise among patients with high-risk pregnancies.³⁶

In this study, death anxiety among high-risk pregnant women was found to be weakly associated with prenatal attachment level and maternal age. Contrarily, other studies have shown that anxiety during pregnancy³⁷ and stress³³ weaken prenatal attachment, and that prenatal depressive symptoms are negatively associated with prenatal attachment.³⁸ However, the findings of Keten and Bal align with the current study, indicating that higher anxiety levels among high-risk pregnant women are associated with increased prenatal attachment.⁸

Women experiencing high-risk pregnancies may face potential physical, psychological, and socioeconomic consequences due to the nature of treatment and the need for close monitoring during pregnancy and postpartum hospitalization. Therefore, it is crucial for women with high-risk pregnancies to adapt their lifestyles accordingly to promote a healthy pregnancy process. Early and appropriate interventions have the potential to reduce adverse health outcomes for both mother and baby.³⁹

Limitations and strengths

This study offers a unique contribution to the literature as it is one of the few studies examining the relationship between prenatal attachment and death anxiety in high-risk pregnancies. Conducting the study directly with high-risk pregnant women provides meaningful and valuable data for clinical practice by focusing on a vulnerable group. However, the fact that the study was conducted in only one province in Eastern Türkiye and that the sample size was limited may restrict the generalizability of the findings to different regions or cultural contexts. Furthermore, the reliance on self-reported data is another limitation, as factors such as social desirability bias may affect the objectivity of the responses.

Conclusion

This study indicated a low but statistically significant positive correlation between prenatal attachment and death anxiety among high-risk pregnant women. Additionally, higher education (university degree or above), planned pregnancy, primigravidity, and death anxiety were identified as significant predictors of prenatal attachment,

whereas maternal age and prenatal attachment were found to be predictors of death anxiety.

In light of these findings, it is essential to implement comprehensive intervention programs addressing both psychosocial and physical health to enhance prenatal bonding and reduce death anxiety in high-risk pregnancies. Midwives and nurses should develop structured interventions to alleviate pregnancy-related stress and fear of death, while prioritizing practices that promote the well-being of both mother and fetus. Furthermore, it is recommended that individual and environmental factors influencing death anxiety and attachment levels be explored in greater depth through qualitative research, and that future studies be conducted with larger sample sizes.

Contribution of authors

Necla Kasımoğlu and Nazan Gürarslan Baş contributed equally to this study. Both authors conceived and designed the study. Data collection and data analysis were carried out jointly by both authors. The manuscript was prepared collaboratively by Necla Kasımoğlu and Nazan Gürarslan Baş. Both authors critically reviewed the manuscript and approved the final version for publication.

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