Original Article / Araştırma Makalesi

THE RELATIONSHIP BETWEEN PARENTS' PRENATAL FETAL GENDER PREFERENCE AND PRENATAL ATTACHMENT: AN ANALYTICAL AND CROSS-SECTIONAL STUDY

Ebeveynlerin Doğum Öncesi Fetal Cinsiyet Tercihi ile Doğum Öncesi Bağlanma Arasındaki İlişki: Analitik ve Kesitsel Bir Çalışma

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ABSTRACT

This study aimed to determine the relationship between the fetal sex preferences of pregnant women and fathers and their prenatal levels of attachment to the fetus. This analytical and cross-sectional study was carried out with 152 married couples between 07/01/2022 and 02/01/2023. The study data were collected using information forms prepared for pregnant women and prospective fathers, the Maternal-Fetal Attachment Inventory (MFAI) for pregnant women, and the Paternal Antenatal Attachment Scale (PAAS) for prospective fathers. In the study, it was determined that attachment related to some individual and fetal sex characteristics of pregnant women and prospective fathers was correlated and that male fetal sex increased the levels of prenatal attachment in both pregnant women and prospective fathers (p<0.05). This study provides important results in predicting the levels of attachment of pregnant women and prospective fathers according to fetal sex after fetal sex is determined in the prenatal period. Gender training to be given by midwives can be effective in improving the awareness of individuals in the prenatal period.

Keywords: Attachment, Father, Fetal sex, Pregnant, Prenatal period.

ÖZ

Bu çalışma, gebelerin ve babaların fetal cinsiyet tercihleri ile doğum öncesi dönemde fetüs ile bağlanma düzeyleri arasındaki ilişkiyi belirlemek amacıyla gerçekleştirilmiştir. Bu analitik kesitsel türdeki çalışma 01.07.2022-01.02.2023 tarihleri arasında 152 evli çift ile gerçekleştirilmiştir. Çalışma verilerinin elde edilmesinde gebeler ve baba adayları için hazırlanan bilgi formları, gebeler için Doğum Öncesi Bağlanma Envanteri ve baba adayları için Doğum Öncesi Baba Bağlanma Ölçeği kullanılmıştır. Araştırmada gebelerin ve baba adaylarının bazı bireysel ve fetal cinsiyet özelliklerine ilişkin bağlanmanın ilişkili olduğu saptanırken, fetüs cinsiyetinin erkek olmasının ise hem gebelerde hem de baba adaylarında doğum öncesi bağlanma düzeylerini arttırdığı görülmüştür (p<0.05). Doğum öncesi fetal cinsiyet belirlendikten sonra gebeler ve baba adaylarının fetal cinsiyete göre bağlanma düzeylerinin ön görüsünde, çalışmamız önemli sonuçlar sunmaktadır. Doğum öncesi dönemde bireylerin farkındalıklarının geliştirilmesinde ebeler tarafından verilecek toplumsal cinsiyet eğitimleri etkili olabilir.

Anahtar Kelimeler: Baba, Bağlanma, Fetal cinsiyet, Gebe, Prenatal dönem.

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INTRODUCTION

Since the existence of human beings, fetal sex has been an important issue for prospective mothers and fathers. From the past to the present, people have made predictions about fetal sex based on the behaviors of pregnant women, their physical appearances, and the condition of the fetus in mothers' wombs (Erdemoğlu & Derya, 2018). Although families generally want to have a child they do not have, gender-based factors (such as social, cultural, and economic concerns, continuity of lineage, and preservation of heritage) may affect fetal sex preferences (Yağmur, Oltuluoğlu & Ergin, 2019). Although fetal sex expectation during pregnancy seems innocent, pre-implantation sex determination due to gender-based discrimination, early cessation of breastfeeding of female babies, deciding to continue the pregnancy (Demirgöz Bal, 2014), and violence during pregnancy can lead to the devoid of health in the pregnant woman and affect fetal health adversely (Erbil & Sağlam, 2010).

In traditional societies, giving birth to a child, especially a boy, is seen as a source of power for women. For men, on the other hand, male children are generally desired due to expectations such as the continuation of the paternal lineage and providing resources to the family (Koyun & Büken, 2013; Koyun & Demir, 2013). Traditions and expectations in the geography of residence can be effective in fetal sex preferences (Erdemoğlu & Derya, 2018).

Although fetal sex preference varies in Turkey, it has been reported that fetal sex was not important for prospective mothers and fathers (Badem & Zeyneloğlu, 2021; Uçar, Sabancı & Okyay, 2018) or that parents wanted a boy (Engin & Ayyıldız, 2021; Kapısız, Var & Duyan, 2020; Koç Özkan, Şimşek Küçükkelepçe & Aydın Özkan, 2020). However, in a study, it was found that the preference for a female baby was intense in women and that the sex of the fetus did not differ for men (Yağmur et al., 2019). There is different evidence in Iran that male infants were preferred more by expectant mothers (Abazari, Pouraboli, Tavakoli, Aflatoonian & Kohan, 2017; Delavari, Mohammad-Alizadeh-Charandabi, & Mirghafourvand, 2018) and that parents did not prefer particular fetal sex (Nosrati, Mirzakhani, Golmakani, Nekah & Esmaeili, 2018). It was observed that expectant mothers wanted a girl baby more in Saudi Arabia (Abbas et al., 2018). On the other hand, in Egypt, it was observed that the preferred sex of the fetus was male (Hassan N.M.M. & Hassan F.M.A.E., 2017). Regardless of developed and developing countries, it has been observed that prospective mothers and fathers around the world generally prefer the male fetal sex (Erdemoğlu & Derya, 2018).

Some studies have proven that fetal sex, preferred by expectant mothers and fathers, increases maternal and paternal attachment (Abazari et al., 2017; Abbas et al., 2018; Engin &

Ayyıldız, 2021; Hassan N.M.M. & Hassan F.M.A.E., 2017; Kapısız et al., 2020; Uçar et al., 2018). On the other hand, it has been observed that fetal sex did not affect the level of attachment between the mother and the fetus during pregnancy (Badem & Zeyneloğlu, 2021; Koç Özkan et al., 2020). Although there are a limited number of studies reporting different opinions on the subject, we think that more studies should be carried out to provide more reliable evidence. Accordingly, answers were sought to the following research question: Is there a relationship between parents' prenatal fetal gender preference and prenatal attachment?

MATERIALS AND METHODS

Aim and Type of Research

The study aimed to determine the relationship between fetal sex preferences and the levels of prenatal attachment of prospective mothers and fathers. This analytical and cross-sectional study was conducted to determine the relationship between the fetal sex preferences of pregnant women and fathers and their levels of prenatal fetal attachment.

Research Population and Sample

The population of the study consisted of pregnant women who applied to the Obstetrics and Gynecology Outpatient Clinic of a Training and Research Hospital in western Turkey for examination or follow-up between 07/01/2022 and 02/01/2023. Power analysis was performed to determine the minimum number of married couples (pregnant and father) to be included in the study. The study sample included pregnant women with a gestational week of 28-38 weeks (third trimester) and their spouses. To the best of our knowledge, no similar study on the subject has been conducted; therefore, the number of pregnant women and fathers to be invited was calculated as 138 considering a power of (d)=0.30 (moderate), a confidence interval of 95%, and α=0.05 for the correlation test. Considering the possibility of data loss, approximately 10% more, that is, 152 married couples (152 pregnant women and 152 prospective fathers) were invited to the study sample.

Research Variables

The independent variables of the study were the individual, sociodemographic characteristics, and characteristics of pregnant women and fathers regarding fetal sex. The dependent variables were the level of prenatal attachment of pregnant women and prospective fathers.

Inclusion Criteria

The inclusion criteria of the study for the pregnant women and prospective fathers were willing to participate in the research, being in the third trimester, being primiparous, not having any communication problems, not having any obstetric or medical risks, and coming for examination/follow-up with their partners.

Data Collection Tools

Pregnant Information Form

This form was prepared by the researchers based on literature information (Badem & Zeyneloğlu, 2021; Yağmur et al., 2019; Yılmaz, Ören & Kösegil, 2021). The pregnant information form includes 19 questions regarding the sociodemographic and obstetric characteristics of the pregnant woman and characteristics regarding the baby's sex.

Father Information Form

This form was prepared by the researchers based on literature (Badem & Zeyneloğlu, 2021; Yağmur et al., 2019; Yılmaz et al., 2021) and consists of 15 questions regarding the sociodemographic of the father and characteristics regarding the baby's sex.

Maternal-Fetal Attachment Inventory (MFAI)

MFAI was developed by Muller (1993). MFAI consists of 21 items that aim to measure emotional attachment to the fetus. In the inventory, each item is scored as "almost never=1", "sometimes=2", "mostly=3", or "almost always=4" and the participant is asked to choose one of these options for each item. There is no reverse item in the scale. The total score obtainable from the scale varies between 21 and 84. Higher scores indicate high levels of prenatal attachment; lower scores indicate low levels of prenatal attachment. The Cronbach alpha coefficient of the scale was determined to be 0.78. The test-retest reliability and the internal consistency coefficient were both found to be high and therefore MFAI was accepted as reliable (Duyan, Kapısız & Yakut, 2013). In this study, the Cronbach alpha coefficient was found as 0.80.

Paternal Antenatal Attachment Scale (PAAS)

PAAS was developed by Condon (1993). It has a 5-point Likert-type rating scale. Most of the questions are based on measuring the father's feelings and thoughts toward the developing baby in the mother's womb based on his experiences in the last two weeks. The Turkish validity and reliability of the scale were established by Benli and Derya. The scale consists of 16 items, 9 of which are reverse-scored and 2 subscales "quality of attachment (8

items)" and "time spent on attachment (8 items)". Items are scored from 1 to 5. The minimum score obtainable from the scale is 16, and the maximum score is 80. The Cronbach alpha coefficient of the scale was 0.82, and the scale has no cut-off point. As the scale score increases, it is accepted that prenatal attachment is higher (Benli & Derya, 2021). In this study, the Cronbach alpha coefficient was found as 0.85.

Data Collection Process

Data collection tools were applied to the pregnant women who met the inclusion criteria of the study and their spouses in an appropriate room of the clinic where the study was conducted. Before and after the study, all questions of the pregnant women and their spouses were answered. Data collection tools were filled out face to face, and it took approximately 10-15 minutes to fill in the questionnaires.

Statistical Analysis

The research data were analyzed using the IBM SPSS Statistics 22 program. Descriptive analyses (number, percentage, mean, standard deviation, median, minimum, and maximum) and parametric tests including One-Way ANOVA and further analysis Tukey HSD test, and independent samples student t-test were used in the data analysis. Among the non-parametric tests, the Kruskal Wallis test and Mann-Whitney U test were used. The Pearson correlation test was used for the comparison of the mean score.

Strengths and Limitations

To the best of our knowledge, there is a limited number of studies on the relevant subject; however, no study has examined fetal sex and the level of prenatal attachment of pregnant women and fathers in the same couple. The most important strength of our study is that it is the first study to question the levels of prenatal attachment of prospective mothers and fathers in terms of the fetal sex factor and that it reveals the importance of the subject. On the other hand, the limitations of our study were that the research was conducted at a single center and that the answers given to the research questions were the answers given by the pregnant women and fathers.

Ethical Consideration

Helsinki Declaration of Human Rights was adhered to throughout the study. Participants were given detailed information about the study and their rights were read. Participants were read their roles and right to leave. Participants signed the informed consent form. Ethics committee approval was obtained from the ethics committee of the university where the

researcher worked (Number of Documents: E-41997688-050.99-52116). Research data containing participants' information will be kept by the principal investigator for five years.

RESULTS

The findings of this study were analyzed under two separate headings: "individual and fetal sex characteristics of pregnant women and their effect on MFAI score" and "individual and fetal sex characteristics of fathers and their effect on PAAS score".

Individual and Fetal Sex Characteristics of Pregnant Women and Their Effect on MFAI Score

According to Table 1, the mean age of the pregnant women was 26.60±2.87; the mean duration of marriage was 3.05±1.80; the mean week of gestation was 32.08±2.22; the mean week of learning about the baby's sex was 19.04±1.51. The age of the pregnant women affected the prenatal attachment (PA) level (p=0.032) and earlier weeks of learning about the baby's sex increased the PA level (p=0.043) (Table 1).

Of the pregnant women, 44.1% (n=67) had a high school degree; 65.8% (n=100) were not employed; 63.2% (n=96) had an income less than their expenses; 54.6% (n=83) lived in an urban area; 76.3% (n=116) did not have a history of abortion; 71.1% (n=108) had a positive relationship with their spouses; 76.3% (n=116) perceived "family-spouse" support as sufficient; 61.8% (n=94) experienced the feeling of "happiness" when they learned about the baby's sex; marital behaviors of 50.0% (n=76) did not change after learning about the baby's sex; families of 61.7% (n=58) experienced the feeling of "happiness" when they learned about the baby's sex. No significant relationship was determined between these variables and the mean MFAI scores (p>0.05) (Table 1).

The PA levels of pregnant women who saved for the baby were higher than those who made other preparations (p=0.044). The PA levels were higher in pregnant women who experienced "sadness" when they learned about their pregnancy (p=0.028). In addition, the PA levels of pregnant women who answered the question "which sex do you want?" as "all the same" were higher (p=0.040). The PA levels of pregnant women expecting a boy were higher than those expecting a girl and the difference was statistically significant (p=0.000) (Table 1).

Table 1. MFAI Score Distribution According to the Individual Characteristics of the Pregnant Women and the Characteristics of the Fetal Gender (n=152)

Feature		n (%) MFAI Mean±SD or Med (Min.-Max.)	Test value/p
Age (Mean±SD) (Min.-Max.)		26.60±2.87 (21-33)	r= 0.174[þ], **p=0.032**
Duration of marriage (Mean±SD)(Min.-Max.)		3.05±1.80 (1-10)	r= 0.152[þ], p=0.062
Gestational week (Mean±SD) (Min.-Max.)		32.08±2.22 (28-37)	r=0.134[þ], p= 0.084
The week of learning fetal gender (Mean±SD)(Min.-Max.)		19.04±1.51 (17-27)	r= 0.781[þ], **p=0.043**
Age groups	21-24	36 (23.7) 51.27±10.54	F=9.246[ψ]
	25-28	83 (54.6) 47.78±9.58	**p= 0.000**
	29-33	33 (21.7) 56.03±7.50	
Education status	Primary school	36 (23.7) 52.41±9.94	F=1.747[ψ]
	High school	67 (44.1) 48.80±9.61	p=0.178
	University and above	49 (32.2) 51.10±10.17	
Working	Working	52 (34.2) 51.75±9.42	t=1.210[ø]
	Not working	100 (65.8) 49.70±10.14	p=0.228
Income to expense coverage	Enough	56 (36.8) 50.37±9.37	t=-0.025[ø]
	Not enough	96 (63.2) 50.41±10.28	p=0.980
Living place	Rural	69 (45.4) 50.14±10.13	t=-0.290[ø]
	Urban	83 (54.6) 50.61±9.80	p=0.773
Planning of pregnancy	Planned	116 (76.3) 50.07±10.27	t=-0.721[ø]
	Not planned	36 (23.7) 51.44±8.75	p=0.472
Abortion history	None	116 (76.3) 49.00 (29-73)	χ^2=2.185[§]
	One	25 (16.4) 57.00 (37-71)	p=0.139
	Two and more	11 (7.2) 56.00 (32-62)	
Relationship status in general	Positive	108 (71.1) 49.90±9.94	t=-0.961
	Negative	44 (28.9) 51.61±9.87	p=0.338
What preparations are made for the baby	Physical arrangement	55 (36.2) 53.00 (29-68)	χ^2=6.238[§]
	Shopping for baby	84 (55.3) 49.00 (33-71)	**p= 0.044**
	Saving money	13 (8.6) 57.00 (41-73)	
Perception of family and spousal support	Enough	116 (76.3) 49.81±9.68	t=-1.321[ø]
	Not enough	36 (23.7) 52.30±10.57	p=0.189
The feeling when learning about pregnancy	Happiness	97 (63.8) 49.82±10.27	
	Sadness	14 (9.2) 56.85±9.37	χ^2=7.119[§]
	Ambivalence	15 (9.9) 53.26±8.81	**p=0.028**
	Wonder	26 (17.1) 47.42±7.83	
The feeling when the sex of the fetus is learned	Happiness	94 (61.8) 49.00 (32-73)	χ^2=4.601[§]
	Sadness	38 (25.0) 51.00 (30-71)	p= 0.100
	Wonder	20 (13.2) 57.00 (29-68)	
Change in marital behavior after learning the gender	Positive	45 (29.6) 51.86±10.57	F=0.772[ψ]
	Negative	31 (20.4) 49.19±9.94	p=0.464
	No change	76 (50.0) 50.02±9.54	
Desired fetal gender	Female	26 (17.1) 47.03±9.75	F=3.302[ψ]
	Male	42 (27.6) 49.00±9.79	**p=0.040**
	It doesn't matter	84 (55.3) 52.14±9.77	
Fetal gender in pregnancy	Female	82 (53.9) 45.63±8.81	t=-7.487[ø]
	Male	70 (46.1) 55.98±8.09	**p=0.000**
Family's reaction when the baby's gender is reported to the family	Happiness	58 (61.7) 50.36±9.07	F=0.273[ψ]
	Sadness	19 (20.2) 49.06±10.97	p=0.762
	Enthusiasm	17 (18.1) 52.03±11.40	

[þ] Pearson Correlation test, SD: Standard Deviation, Med.: Median, Min.: Minimum, Max.: Maximum, [§]Kruskal Wallis test, [ψ]One-Way ANOVA and Tukey HSD test in further analysis, [ø]Independent Samples t test, MFAI: Maternal-Fetal Attachment Inventory

Individual and Fetal Sex Characteristics of Fathers and Their Effect on PAAS Score

The mean age of the fathers was 30.44±4.76 and there was no significant difference between the age factor and the paternal antenatal attachment (PAA) level (p>0.05). The mean duration of marriage was 3.05±1.80, and there was a statistically significant difference between the duration of marriage and the PAA level (p=0.016) (Table 2).

Of the fathers, 54.6% (n=83) had a high school degree; 89.5% (n=136) were employed; 79% (n=121) wanted the baby to be born; 85.5% (n=130) perceived perceived "family-spouse" support positively; 61.8% (n=94) experienced the feeling of "happiness" when they learned about pregnancy; 75.7% (n=115) had a "positive" perception of the relationship with the spouse; domestic behaviors of 53.3% (n=81) did not change with pregnancy; marital behaviors of 36.8% (n=56) "negatively" changed after learning about the baby's sex; 60.5% (n=92) wanted a boy. There was no statistically significant difference between these variables and the mean PAAS score (p>0.05) (Table 2). Of the fathers, 54.6% (n=83) lived in the urban area and those living in the urban area had higher PAA levels than those living in the rural areas (p=0.007) (Table 2). 30.3% of the fathers (n=46) had an income that met their expenses and the PAA levels of the fathers in this group were higher (p=0.000). 63.2% (n=96) of the fathers did not have any addiction and the PAA levels of the fathers in this group were higher. The difference was statistically significant (p=0.000). In addition, the PAA levels of fathers expecting a boy were greatly affected. The difference was significant (p=0.000) (Table 2).

Table 2. PAAS Score Distribution According to Fathers' Individual Characteristics and Infant Gender Characteristics (N=152)

Feature		n (%)	PAAS Mean±SD or Med.(Min.-Max.)	Test value/p
Age (Mean±SD) (Min.-Max.)		30.44±4.76 (21-46)		r=-0.076^b, p=0.354
Duration of marriage(Mean±SD)(Min.-Max.)		3.05±1.80 (1-10)		r=-0.195^b, **p=0.016**
Education status	Primary school	10 (6.6)	36.00 (26-65)	χ^2=0.825§
	High school	83 (54.6)	41.00 (23-67)	p=0.662
	University and above	59 (38.8)	37.00 (22-69)	
Working	Working	136 (89.5)	40.00 (22-69)	Z=-0.535^æ
	Not working	16 (10.5)	42.00 (26-66)	p=0.593
Living place	Rural	69 (45.4)	38.89±13.15	t=-2.758^ø
	Urban	83 (54.6)	44.92±13.62	**p=0.007**
Income to expense coverage	Enough	46 (30.3)	43.80±13.97	t=-2.228^ø
	Not enough	106 (69.7)	38.47±12.42	**p=0.000**
Addiction status	None	96 (63.2)	46.00 (23-69)	χ^2=23.747§
	Cigarette	49 (32.2)	32.00 (22-62)	**p=0.000**
	Alcohol	7 (4.6)	25.00 (23-31)	
The state of wanting the baby	Yes	121 (79.9)	42.47±13.87	t=0.511^ø
	No	31 (20.4)	41.06±13.20	p=0.610
Perception of support from wife and family	Positive	130 (85.5)	40.50 (22-69)	Z=-0.501^æ
	Negative	22 (14.5)	35.50 (23-65)	p=0.617
	Happiness	94 (61.8)	41.00 (23-69)	χ^2=4.687§

The emotion experienced when learning of his wife's pregnancy	Sadness	24 (15.8)	39.00 (23-67)	p= 0.196
	Wonder	21 (13.8)	32.00 (22-65)	
	Fear	13 (8.6)	31.00 (23-57)	
The perception of the relationship with his wife in general	Positive	115 (75.7)	42.26±13.77	t=0.111º
	Negative	37 (24.3)	41.97±13.68	p=0.912
Changes in domestic behavior with his wife's pregnancy	Positive	35 (23.0)	44.60±13.41	F=0.990$^\Psi$
	Negative	36 (23.7)	40.02±12.64	p= 0.071
	No change	81 (53.3)	42.11±13.86	
Change in marital behavior after fetal gender is learned	Positive	45 (29.6)	41.88±13.95	F= 2.698$^\Psi$
	Negative	56 (36.8)	45.21±12.93	p=0.071
	No change	51 (33.6)	39.13±13.86	
Desired fetal gender	Female	14 (9.2)	30.00 (24-57)	χ^2=5.389§
	Male	92 (60.5)	40.50 (22-67)	p=0.068
	It doesn't matter	46 (30.3)	42.00 (23-69)	
Expected fetal gender	Female	82 (53.9)	32.43±7.48	t=-14.900º
	Male	70 (46.1)	53.61±10.00	**p=0.000**

$^\flat$ Pearson Correlation test, SD:Standard Deviation, Med.:Median, Min.: Minimum, Max.:Maximum, §Kruskal Wallis test, $^\Psi$One-Way ANOVA and Tukey HSD test in further analysis, ºIndependent Samples t test,$^\text{æ}$Mann-Whitney U test, PAAS: Paternal Antenatal Attachment Scale

The difference between the mean MFAI and PAAS scores was not statistically significant (p>0.05) (Table 3).

Table 3. Values and Comparison of MFAI and PAAS Total Scores

Scale	Potential Distribution	Minumum	Maximum	Median	Mean±SD	Test value/ p
PAAS	16-80	22.00	69.00	40.00	42.19±13.70	r=0.092$^\flat$,
MFAI	21-84	29.00	73.00	50.00	50.40±9.92	p=0.260

SD: Standard Deviation, $^\flat$Pearson Korelasyon test, PAAS: Paternal Antenatal Attachment Scale, MFAI: Maternal-Fetal Attachment Inventory

DISCUSSION

In this section, research findings were discussed in terms of the relationship between the characteristics of pregnant women and their PA levels, the relationship between the characteristics of fathers and their PAA levels, and the relationship between the levels of prenatal attachment of pregnant women and fathers.

Discussion on the Relationship Between the Individual and Fetal Sex Characteristics of Pregnant Women and Their PA

In our study, it was observed that the PA level increased as the age of the pregnant women increased. In a similar study conducted with 195 pregnant women, it was found that the PA level increased with increasing age (Koç Özkan et al., 2020). In another study, it was found that the PA level was higher at older ages (Canlı & Demirtaş, 2022). On the other hand, there are studies in which a negative relationship between pregnant women's age and prenatal care was reported (Badem & Zeyneloğlu, 2021; Dikmen & Çankaya, 2018) and studies in which no

relationship was reported (Şanlı & Akbağ, 2022). Although more studies are needed to correlate the age variable with the PA level, the results of this study suggest that an increase in maternal age increases the PA level since mothers are more conscious and planned.

In our study, no significant relationship was determined between the education, employment, and income variables of the pregnant women and their PA levels. Similar to our study results, in a study conducted with 251 pregnant women, it was reported that education level and income status did not affect the PA level; however, contrary to our study, it was found that the PA level of unemployed pregnant women was higher (Sade, Apay, Tedik, Mucuk & Şahin, 2020). In another study conducted with 195 pregnant women, it was determined that economic status did not affect the PA level (Koç Özkan et al., 2020). Likewise, in another study, it was seen that the education level of pregnant women did not affect their PA levels (Şanlı & Akbağ, 2022). In a study conducted with 183 pregnant women, it was found that education level and employment status did not affect the PA levels (Canlı & Demirtaş, 2022). On the other hand, studies have proven that income level (Bakır & Sarızayim, 2020; Dikmen & Çankaya, 2018; Küçükkaya, Süt, Öz & Sarıkaya, 2020; Özkan & Balaban , 2021; Yılmaz & Çoban, 2022), employment status (Dikmen & Çankaya, 2018; Küçükkaya et al., 2020; Özkan & Balaban , 2021; Yılmaz & Çoban, 2022), and educational status (Bakır & Sarızayim, 2020; Dikmen & Çankaya, 2018; Koç Özkan et al., 2020; Küçükkaya et al., 2020; Özkan & Balaban, 2021; Yılmaz & Çoban, 2022) are associated with the PA level.

In our study, there was no significant relationship between the duration of marriage, gestational week, status of a planned pregnancy, and history of abortion and the PA levels of pregnant women. Similar to our study results, some studies have reported that there is no significant relationship between the duration of marriage (Badem & Zeyneloğlu, 2021; Sade et al., 2020; Şanlı & Demirtaş, 2022), gestational week (Koç Özkan et al., 2020; Sade et al., 2020; Badem & Zeyneloğlu, 2021; Şanlı & Demirtaş, 2022), status of a planned pregnancy (Koç Özkan et al., 2020; Sade et al., 2020; Yılmaz & Çoban, 2022; Şanlı & Demirtaş, 2022) and history of abortion (Koç Özkan et al., 2020) and the PA level. On the other hand, studies have also reported a significant relationship between the variables of the duration of marriage, gestational week (Dikmen & Çankaya, 2018), the status of a planned pregnancy (Küçükkaya et al., 2020; Özkan & Balaban, 2021), and history of abortion (Badem & Zeyneloğlu, 2021) and the PA level. In another study, it was found that unplanned pregnancy increased the level of attachment (Robak-Chołubek, Chołubek & Piróg, 2015).

It is known that the level of attachment of pregnant women with high social support levels is higher (Şanlı & Akbağ, 2022). In the current study, no significant relationship was found

between the relationship of pregnant women with their spouses, the perception of spousal-family support, and their PA levels. In a different study, it was seen that the PA level increased when the people around the pregnant women provided more support (Küçükkaya et al., 2020).

In our study, no significant relationship was found between the emotions experienced when the baby's sex was learned, the change in marital behaviors after learning about the baby's sex, and the family's reaction when they learned about the baby's sex, and the PA level. On the other hand, the PA levels of the pregnant women who felt sad when they learned about their pregnancy and who answered "all the same" to the desired fetal sex question were determined to be higher. Contrary to our study, it was found in a study that the PA levels were higher in pregnant women who felt happy when they learned about pregnancy and who experienced positive behavioral changes with pregnancy (Badem & Zeyneloğlu, 2021). In a study, it was determined that the desired sex of the fetus had a positive effect on the PA levels (Uçar et al., 2018). In a study conducted with 200 pregnant women, learning about fetal sex caused positive emotions in pregnant women (Robak-Chołubek et al., 2015). Our study consisted of a single center and a not very large sample. Therefore, new studies on the subject with larger samples and multicenters may be more informative about the differences between our study results and the literature.

Different results have been reported in studies conducted in Turkey. In our study, the PA levels of the pregnant women who stated that the fetal sex in the current pregnancy was "male" were higher. On the other hand, studies have reported that fetal sex did not affect the level of attachment (Koç Özkan et al., 2020; Sade et al., 2020; Özkan & Balaban, 2021; Yılmaz & Çoban, 2022). In a study, it was determined that the expected fetal sex in pregnant women was female, which positively affected the level of attachment (Uçar et al., 2018). In studies conducted in Turkey, regional differences may have been a determining factor between fetal sex and PA levels. Therefore, further studies on the subject in different regions can help with a common estimation.

When international studies were examined, it was seen that there were few studies and that there were different results in terms of the relationship between fetal sex and PA, as in Turkey. In a study conducted with 350 pregnant women in Egypt, it was shown that the level of attachment was stronger in those expecting a boy (Hassan N.M.M. & Hassan F.M.A.E., 2017). In a study conducted in Iran, although it was seen that not knowing the fetal sex increased the PA level, there was a significant difference in the PA level in pregnant women who knew the fetal sex (Abazari et al., 2017). In a study conducted in Saudi Arabia, it was reported that female fetal sex increased the level of attachment in postpartum women (Abbas et al., 2018).

Demographic and cultural structures of countries may affect the attachment in pregnant women in terms of fetal sex. More international evidence on the subject may provide a preliminary insight.

Discussion on the Relationship Between the Individual and Fetal Sex Characteristics of Fathers and PAAS

In this section, the results of the studies on fathers and the findings of the studies in the literature are compared. However, there is a limited number of national and international studies on the factors affecting the PAA level. It is known that fathers develop attachment behaviors starting from the pregnancy period (Çağan, Karaca Saydam, Gülümser Ateş, Ekti Genc & Turfan, 2021). Therefore, to discuss the importance of the subject more comprehensively, the levels of attachment of fathers in the postpartum period are also discussed.

In our study, there was no significant relationship between the variables of age, education, and employment status of the prospective fathers and the PAA level and it was observed that the prospective fathers who had an income covering their expenses, who lived in the urban area, and who did not have any addiction had higher PAA levels. In a study conducted in the Netherlands with 301 prospective fathers, it was determined that the PAA level increased in younger fathers (Vreeswijk, Maas, Rijk & van Bakel, 2014). In a study conducted with 400 prospective fathers in Tehran, it was seen that fathers with a higher education level had a positive effect on the PAA levels (Astaraki, Jamshidimanesh, Moghadam & Haghani, 2014).

In our study, there was no significant relationship between the variables of perception of support received from spouse and family and perception of the relationship with spouse and the PAA level. On the other hand, in a study conducted with 195 first-time fathers in China, it was found that fathers with a positive prenatal marital relationship and sufficient spousal support were more attached to their babies after delivery (Yu, Hung, Chan, Yeh & Lai, 2012). The high level of postpartum paternal attachment suggested that the level of attachment was also high during pregnancy.

In our study, it was found that there was no significant relationship between the variable "desired fetal sex" and the PAA levels. In a study conducted with 93 prospective fathers in Italy, it was determined that the levels of prenatal attachment of fathers who were disappointed with the expected sex were lower (Vedova, Cristini & Bizzi et al., 2019). However, it is thought that more studies are needed, in which the relationship between the preference for the fetal sex and the PAA level is questioned, to reach more precise results.

In our study, it was determined that the male sex of the expected fetus increased the PAA level. To the best of our knowledge, no study in Turkey has questioned the relationship between the PAA level and the fetal sex variable. Contrary to our study, in studies conducted in Turkey in which the relationship between postpartum father-baby attachment level and fetal sex was examined, it was seen that there was no significant relationship between the level of paternal attachment and baby's sex (Çağan et al., 2021; Düdükcü & Aslan, 2020). In a study conducted in Tehran, it was determined that the sex of the baby did not affect the PAA levels (Astaraki et al., 2014). It is also known that the fetal sex generally preferred by expectant mothers and fathers around the world is male (Erdemoğlu & Derya, 2018). However, the contradictory results on the subject make it difficult to make a common estimation. Therefore, it is thought that the relationship between fetal sex and the levels of parental attachment should be examined further.

In this study, it was seen that the fetal sex perceptions of prospective mothers and fathers did not affect their levels of prenatal attachment. In limited studies conducted, differences have been reported regarding the fetal sex preferences of prospective mothers and fathers. In one study, it was suggested that the fetal sex that women desired did not affect their happiness levels due to maternal instincts (Yağmur et al., 2019). Likewise, in a study, it was determined that a baby's sex did not shape parenting behaviors (Koç, Özkan & Bekmezci, 2016). In another study, the majority of women attributed the undesired fetal sex to fate (Koyun & Demir, 2013). Such differences may be due to gender perceptions, acceptance behaviors, and individual characteristics in different cultures.

CONCLUSION

This study was conducted in a city in western Turkey and it was observed that the levels of prenatal attachment of pregnant women and fathers who expected a male fetus were higher than those expecting a female fetus. Our study results can provide evidence that fetal sex may affect the level of attachment. This study can raise awareness of prospective mothers and fathers, their families, and midwives on the relevant subject. However, it is of great importance to conduct studies on the subject in different cultures and in different dimensions to reveal stronger evidence.

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The Relationship Between Parents' Prenatal Fetal Gender Preference and Prenatal Attachment: An Analytical and Cross-Sectional Study.
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