Original Article

Predictors of Fetal Attachment, Anxiety, Stress, and Worry in Unintended Pregnancies in the Primary Care Center in Southern Iran

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Abstract

Background: Despite the prevalence of unintended pregnancies, little is known about the connections between psychosocial and sociodemographic characteristics. This study explored the predictors of fetal attachment, worry, anxiety, and stress in unintended pregnancies. **Materials and Methods:** This descriptive, cross-sectional study was conducted on 229 father and mother pairs from two primary healthcare centers in Fars province in southern Iran. Data were collected in a face-to-face survey using the Parents Fetal Attachment Scale, Spielberger State-Trait Anxiety Inventory (STAI), Cambridge Worry Scale (CWS), Perceived Stress Scale (PSS), and Parental Worry Scale. The participants were selected using the two-stage random cluster sampling method from November 2022 to February 2023. Data were analyzed in SPSS software using binary logistic and multiple linear regression tests. **Results:** According to the findings, education level and previous parenting experience were found to have a statistically significant effect on the attachment levels of mothers ($F_{4,224} = 5.14$; $p < 0.05$). However, there was no statistically significant difference between the perceived stress of mothers and fathers ($p > 0.05$). Previous parenting experience significantly affected mothers' anxiety (odd ratio: 3.20; $p < 0.05$). The age variable had a significant relationship with the mothers' perceived stress ($p < 0.05$). **Conclusions:** According to the results, unwanted pregnancy had a significant relationship with fetal attachment, anxiety, stress, and worry. It is recommended that to enhance the mental health of couples who have experienced unintended pregnancy, a platform should be provided for the development of their psychosocial environment.

Keywords: *Anxiety, attachment, Iran, stress, unwanted pregnancies*

Introduction

A considerable adjustment period is required for both men and women as they prepare to become parents. The family and the child's development depend heavily on the parents' role. Developing an emotional bond with the newborn is the primary objective during this period as it could affect the child's development and well-being.[1] Moreover, feelings of contentment and happiness are frequently experienced during pregnancy. Both parents feel more capable and empowered when the pregnancy is planned; they are also better prepared for a healthy pregnancy, delivery, and child-rearing. Fear, anxiety, and worries about fertility and changes in family and social roles are all brought on by an unplanned pregnancy.[2] An unwanted pregnancy can negatively impact women's Quality of Life (QOL) through elevated stress, high-risk behaviors, delayed prenatal care, and a lack of desire to seek out social support during pregnancy.[3] According to one study, children of unwanted pregnancies may be more likely to experience parental neglect and have strained relationships with their mothers.[4]

In a study conducted in Europe and North America, the number of unplanned pregnancies per 1000 women of reproductive age was 35 (with a range of 32 to 40) between 2015 and 2019.[5] The majority of unplanned pregnancies take place in developing countries, which increases the risk of maternal and newborn mortality in those countries.[6] In Iran, approximately 80,000 abortions are performed annually, and they are mostly performed because of unplanned pregnancies.[7] Prior studies have indicated that 26% of Iranian women become pregnant unintentionally.[3]

Unwanted births have serious effects on public health, especially for women

How to cite this article: Tahmasebi H, Nukpezah Nimota R, Fournier A, Hosseini Marznaki Z, Parviniannasab AM, Keshavarzi F. Predictors of fetal attachment, anxiety, stress, and worry in unintended pregnancies in the primary care center in Southern Iran. Iran J Nurs Midwifery Res 2025;30:97-102.

Submitted: 26-Sep-2023. **Revised:** 30-Jul-2024. **Accepted:** 14-Aug-2024. **Published:** 15-Jan-2025.

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Access this article online

Website: https://journals.lww.com/jnmr

DOI: 10.4103/ijnmr.ijnmr_286_23

Quick Response Code:

in underdeveloped countries. Pregnancy intentions include affective, cognitive, sociocultural, and contextual components, according to ecosocial theory. Pregnancy anxiety, depression, stress, and fetal attachment have been linked to numerous factors, including the mother's age,[8] gestational age and low education levels,[9,10] daily cigarette smoking, drug use, and gravidity.[11] Research conducted in developing nations has demonstrated that cultural factors frequently influence the predictors of depression, anxiety, and attachment levels during pregnancy. However, the impacts of such influencing factors on the father as a partner have not received much attention. Inadequate coordination of these variables may lead to worry, anxiety, stress, and problems with parental–fetal attachment due to unplanned pregnancies.[12] The parental–fetal attachment has received little attention in Iran, so to analyze these problems and pinpoint predictors fully, in this study, we considered aiming at both mothers and father is required. Given the aforementioned points, this study was conducted to explore predictors of fetal attachment, worry, anxiety, and stress in unintended pregnancies.

Materials and Methods

Researchers performed a descriptive, cross-sectional study from November 2022 to February 2023 in two Primary Health Centers (PHCs) affiliated with Larestan University of Medical Sciences, Fars province, Iran. Cochran's formula as per the estimation of proportion rate was used to determine the sample size. Confidence level = 95%. For 95% confidence level, Z was 1.96; p = q = 0.25, and d = 0.05 was used. Based on this formula, the required size was estimated at 229 couples (229 fathers and 229 mothers).

To select the participants in the rural PHCs, the rural PHCs of Larestan were divided into four groups and two PHCs were chosen at random from each group. The inclusion criteria for mothers included (1) the ability to read and write, (2) lack of confirmed psychological problems, (3) Iranian citizenship, (4) experience of an unintended pregnancy, (5) residence a rural area, (6) gestational weeks of 12–40 week, (7) willingness to participate in the study, (8) absence of obstetric problems, and (9) the mother being over the age of 18. Couples who were unwilling to participate were excluded from the study.

This study used sociodemographic characteristics form and five questionnaires to collect data. Sociodemographic characteristics included age (years), education level, smoking status, and previous parenting experience. The Parents Fetal Attachment Questionnaire contains 24 items [24]. The answers range from always (score 5) to never (0). The minimum and maximum scores were 24 and 120. The scale indicates that the higher the score, the stronger the attachment. The original version of this scale had a Cronbach's α value of 0.85.[13] The Persian version of this scale has good reliability and validity.[14] The Cronbach's α for the five questionnaire domains ranged from 0.77 to 0.86, indicating a high level of internal consistency reliability for the scale.[14] Cronbach's α value in this study was 0.87. The Spielberger State-Trait Anxiety Inventory (STAI) includes six items. The possible answers range from none (1) to too many (4). The total score of this test has a wide range from 6 to 24. The original version of this scale showed a Cronbach's α value of 0.82.[15] The Cronbach's α coefficient of the Persian version of the STAI was 0.79,[16] and the Cronbach's α in this study was 0.80. The Perceived Stress Scale (PSS) consists of four items.[17] The items are graded on a 5-point Likert scale ranging from 0 (never) to 4 (very much). The range of its total score is 0–16, and a higher score indicates greater perceived stress. The Persian version of this scale has satisfactory validity and reliability in infertile women.[18] The Cronbach's α coefficient in the Persian version was 0.84.[18] The original version of this scale has shown a Cronbach's α value of 0.85.[17] Cronbach's alpha in this study was 0.70. The Cambridge Worry Scale (CWS) consists of 17 items.[19] The items are scored on a Likert scale ranging from no concern (score 0) to extreme concern (score 5). The total score ranges from 0 to 85, with 0 being the lowest possible result. The original version of this scale had a Cronbach's α value of 0.79.[19] The Cronbach's α coefficient in the Persian version was 0.88.[20] The Cronbach's α in this study was 0.80. Last, the Parental Worry Questionnaire consists of 24 items. The original version of this scale had a Cronbach's α value of 0.85.[13] The Cronbach's α coefficient in the Persian version was 0.93. In the current study, the reliability of this questionnaire was 0.88.

Data were analyzed using SPSS software (version 24; IBM Corp., Armonk, NY, USA). Descriptive statistics (frequency table, mean, and standard deviation) were used to express the characteristics of the subjects studied. The Kolmogorov–Smirnov, Chi-square, and Mann–Whitney tests were used to determine the normality of the quantitative data. The significance level was $p < 0.05$. Predictors were identified using binary logistic and multiple linear regression tests.

Ethical considerations

The Institutional Research Ethics Committee of Larestan University of Medical Sciences, Larestan, Iran (ethical code: IR.LARUMS.REC.1401.008) approved the study. An informed consent form was obtained from every participant, and they were assured that their anonymity and the confidentiality of their data would be protected. The participants were notified that they could withdraw from the study at any time.

Results

This study found that the mean age of the mothers and fathers was 27.19 (5.50) years and 31.57 (4.70) years, respectively. The Chi-square test showed that the difference in the age of the mothers and fathers was statistically

significant ($p < 0.05$). Moreover, 4.40% of mothers had university education, and 4.80% of fathers [see Table 1].

None of the variables had a normal distribution. Mothers' and fathers' average anxiety, worry, and perceived stress scores were compared using the non-parametric Mann–Whitney test. The mean (SD) scores of anxiety for fathers and mothers were 11.32 (1.40) and 10.96 (2.13), respectively, and this difference was significant ($p = 0.018$).

Table 1: Descriptive statistics (n=458)

Variables	Categories	Parents		Total
		Mothers *n* (%)	Fathers *n* (%)	*n* (%)
Age (year)	<24	77 (16.80)	14 (3.10)	91 (19.90)
	25-29	73 (15.90)	70 (15.30)	143 (31.20)
	30-34	55 (12.10)	67 (14.60)	122 (26.60)
	>35	24 (5.20)	78 (17.00)	102 (22.30)
Education	Illiterate	117 (25.50)	131 (28.60)	248 (54.10)
	Pre-diploma	69 (15.10)	57 (12.40)	126 (27.50)
	Diploma	23 (5.00)	19 (4.10)	42 (9.20)
	University	20 (4.40)	22 (4.80)	42 (9.20)
Smoking	Yes	17 (3.70)	222 (48.50)	239 (52.20)
	No	212 (46.30)	7 (1.50)	219 (47.80)
Previous parenting experience	Yes	54 (11.80)	89 (19.40)	143 (31.20)
	No	175 (38.20)	140 (30.60)	315 (68.80)

The mean (SD) score of attachment to the fetus for mothers was significantly higher than for fathers, 40.00 (7.78), compared to 37.76 (6.03) ($p = 0.002$).

The mean (SD) score of worry in fathers [27 (7.92)] was higher than in mothers [15.48 (14.66)]. However, there was no statistically significant difference between the mean (SD) score of perceived stress of mothers and fathers, 8.01 (0.65), compared to 7.96 (0.69) with a ($p > 0.05$).

The binary logistic regression results showed that the previous parenting experience was significant in the incidence of anxiety in mothers ($p < 0.05$). Mothers with previous parenting experience had 3.20 times the chance of moderate anxiety compared to mothers without such experience (OR = 3.20; $p < 0.05$) [see Table 2]. The ordinal logistic test results revealed that the age significantly affected the mothers' perceived stress ($p < 0.05$). For each year of increase in age, the chance of being placed in the lower classes of perceived stress increased by 7% ($p = 0.02$; OR = 1.07) [see Table 3]. The multiple linear regression test results revealed that education and previous parenting experience affected the mothers' attachment ($F_{4,224} = 5.146$; $p < 0.05$). At constant levels of other variables, with an increase in the level of education, the average attachment of mothers to babies decreased by 1.19 [see Table 4].

Table 2: Binary logistic regression of predictors of anxiety and worry in parents

Variable	Categories	B*	SE**	Wald	DF***	*p*	OR****	95% CI*****	
								Lower	Upper
Anxiety Mothers	Age	0.02	0.02	0.96	1	0.34	1.02	0.97	1.08
	Education (Illiterate)	-0.42	0.51	0.68	1	0.40	0.65	0.23	1.79
	Education (Pre-diploma)	-0.44	0.54	0.68	1	0.40	0.64	0.22	1.84
	Education (Diploma)	-0.59	0.63	0.87	1	0.35	0.55	0.15	1.91
	Smoking (Yes)	0.08	0.52	0.02	1	0.87	1.08	0.38	3.03
	Previous parenting experience (Yes)	1.16	0.34	11.32	1	<0.001	3.20	1.62	6.30
Anxiety Fathers	Age	0.38	0.31	1.53	1	0.21	1.03	0.97	1.10
	Education (Illiterate)	-0.58	0.57	1.05	1	0.30	0.55	0.18	1.71
	Education (Pre-diploma)	-0.81	0.59	1.89	1	0.16	0.44	0.13	1.41
	Education (Diploma)	-0.44	0.710	0.39	1	0.52	0.63	0.15	2.58
	Smoking (Yes)	-0.43	0.86	0.25	1	0.61	0.64	0.11	3.53
	Previous parenting experience (Yes)	-0.12	0.30	0.16	1	0.68	0.88	0.49	1.60
Worry Mothers	Age	-0.09	0.07	1.46	1	0.22	0.91	0.79	1.06
	Education (Illiterate)	-0.58	1.21	0.23	1	0.63	0.56	0.06	1.00
	Education (Pre-diploma)	-1.13	0.26	1.13	1	0.97	0.32	0.14	0.94
	Education (Diploma)	0.24	1.30	0.03	1	0.85	1.28	0.09	16.46
	Smoking (Yes)	-0.10	2.38	0.00	1	0.96	0.90	0.07	14.58
	Previous parenting experience (Yes)	-0.27	0.24	1.27	1	0.25	0.76	0.47	1.22
Worry Fathers	Age	0.04	0.04	1.04	1	0.30	1.04	0.96	1.12
	Education (Illiterate)	0.46	0.71	0.43	1	0.51	1.59	0.39	6.43
	Education (Pre-diploma)	1.02	0.71	2.04	1	0.15	2.79	0.68	11.43
	Education (Diploma)	-1.12	1.21	0.86	1	0.35	0.32	0.03	3.47
	Smoking (Yes)	-1.09	0.93	1.38	1	0.23	0.33	0.05	2.07
	Previous parenting experience (Yes)	-0.49	0.40	1.48	1	0.22	0.61	0.27	1.35

*B; Standardized coefficients. **SE; Standard error. *** DF; Degree of Freedom. ****OR; Odd ratio; *****CI; Confidence interval

Table 3: Ordinal logistic test of predictor variables of perceived stress in parents

Variable		B*	SE**	Wald	DF***	*p*	OR****	95% CI*****	
								Lower	Upper
Perceived stress Mothers	Age	0.07	0.03	5.43	1	<0.05	1.07	1.01	1.13
	Education (Illiterate)	0.55	0.58	0.87	1	0.35	1.73	0.54	5.47
	Education (Pre-diploma)	0.46	0.61	0.58	1	0.44	1.58	0.48	5.31
	Education (Diploma)	0.28	0.72	0.15	1	0.69	1.32	0.33	5.47
	Smoking (Yes)	1.22	0.56	4.71	1	<0.05	3.38	1.12	10.27
	Previous parenting experience (Yes)	-0.03	0.37	0.007	1	0.93	0.97	0.47	1.99
Perceived stress Fathers	Age	-0.00	0.032	0.004	1	0.95	0.99	0.36	1.06
	Education (Illiterate)	-0.32	0.537	0.36	1	0.55	0.72	0.25	2.07
	Education (Pre-diploma)	0.10	0.561	0.03	1	0.85	1.11	0.37	3.32
	Education (Diploma)	-2.63	0.67	0.15	1	0.69	0.07	0.2	2.85
	Smoking (Yes)	-1.28	0.80	2.56	1	0.11	0.27	0.05	1.33
	Previous parenting experience (Yes)	0.23	0.31	0.54	1	0.46	1.26	1.25	2.33

*B; Standardized coefficients. **SE; Standard error. ***DF; Degree of Freedom. ****OR; Odd ratio. *****CI; Confidence interval

Table 4: Predictor variables of attachment to the fetus in parents using multiple linear regression

Variable		B*	SE**	Standardized estimate	*t*	*p*	95% CI	
							Lower	Upper
Attachment to the fetus (Mother)	Age	-0.05	0.09	-0.03	-0.56	0.55	-0.23	0.12
	Education	-1.19	0.53	-0.15	-2.22	0.02	-2.25	-0.13
	Smoking	-1.43	1.87	-0.05	-0.76	0.44	-5.12	2.26
	Previous parenting experience	4.62	1.17	0.26	3.95	<0.001	2.32	6.92
Attachment to the fetus (Fathers)	Age	0.09	0.09	0.07	1.01	0.31	-0.08	0.26
	Education	-0.72	0.46	-0.11	-1.60	0.11	-1.62	0.17
	Smoking	2.92	2.33	0.08	1.25	0.21	-1.67	7.51
	Using drugs	0.59	0.88	0.05	0.68	0.50	-1.14	2.31

*B; Standardized coefficients. **SE; Standard error

Discussion

The current study compared anxiety, attachment, worry, and perceived stress as predictors of unintended pregnancy among parents. Fathers had a higher level of anxiety than mothers. Consistent with the current research, several studies have found that when the mother suffers from anxiety or depression, the father is more likely to suffer.[21,22] Maternal mental health neglect can exacerbate future symptoms in the mother and increase the father's psychological distress during the perinatal period.[23] New fathers appear to face more challenges due to changes in the socioeconomic environment, such as increased job demand, rising living expenses, and rising home prices. However, if medical professionals are not aware of the risk factors unique to fathers, they may misdiagnose or underdiagnose fathers who suffer from perinatal depression and anxiety. The results of this study allow for the development of diagnostic and interventional instruments tailored to fathers, which will be essential in the early identification and management of the father's perinatal anxiety and depression.[21]

According to the findings of the current study, the mothers' average score of attachment to the fetus was statistically higher than that of fathers. Consistent with the current study, Mercer and Lorensen demonstrated that mothers were more attached to the fetus than fathers.[24] In another study, the level of attachment to the fetus was reported to be higher in fathers.[25] Based on their regression analysis, Zhang *et al*.[26] estimated that unintended pregnancy was a variable that negatively impacted maternal attachment. According to Nelson and O'Brien, parents with unintended pregnancies created a negative environment under certain conditions that could have long-term effects on the mother and child.[27] This discrepancy could be attributed to differences in sample size and the cultural and social characteristics of the research population.

In the current study, based on the age variable, the results showed that the chance of being placed in the lower classes of perceived stress increased by 7% for a 1-year increase in age. Most studies have shown no relationship between this variable and psychological performance. However, according to several researchers, mothers over 35 years of age exhibited lower levels of attachment than mothers between the ages of 20 and 30 years, and according to another group, there was a negative correlation between age and attachment.[28] A mother's age significantly affects how she adjusts psychologically and emotionally to pregnancy and how her bond with the fetus and baby

develops.[29] Compared to older women, young women might be showing a lower less accepting acceptance of the responsibilities and roles of motherhood. The likelihood of maternal attachment behaviors in young women—such as holding, stroking, and hugging the child—is lower. Such behavior could be because of their immaturity as they may believe the baby has low expectations of them during this time.[29]

The results of the multiple linear regression test revealed that education and previous parenting experience affected the mothers' attachment. Furthermore, the number of years of education had a significant relationship with the mother's attachment to the fetus. Women with less education were more attached to their fetuses. According to the findings of a study on pregnancy, the mothers' attachment to their fetus decreased with the increase in the mother's level of education.[30] This result is not in the same line with the research conducted by Ertuğrul *et al.*; they found a positive relationship between the mother's education and attachment behaviors.[31] The contradiction may stem from people's cultural and professional backgrounds. Another explanation might be that pregnant women with higher levels of education and responsibilities in society have less time for themselves because of their work engagement.

Despite its contributions, this study has some limitations that should be considered when interpreting the results. First, the present study is cross-sectional, and the regression test only shows the associations between the included variables, not causality. Future longitudinal or experimental studies are suggested to identify the causal relationship between the variables. Second, pregnancy-related fetal attachment, anxiety, and worry can be influenced by various factors such as childhood trauma, multiple or primiparous births, marital satisfaction, and social support. Therefore, future research can consider other possible covariates, which may produce even more insightful findings. Finally, this study relied on self-report measures for data collection that can affect the accuracy of the participants' data, and the participants' subjective views might influence the results.

Conclusion

The findings of the study showed that in unintended pregnancies, mothers had a stronger attachment to the fetus than fathers. Fathers experienced higher levels of anxiety and worry regarding unintended pregnancy compared to mothers. The findings suggest that a short educational intervention can enhance the parenting outcomes of fathers. For men who have already had some parenting experience or for whom being a father is already an integral part of their identity, the adjustment to fatherhood might be simpler. Levels of parental experience should be taken into consideration, particularly in cases of unplanned pregnancies where the mother's physical and mental health is at risk. Cognitive and motivational processes like attachment training should be reinforced to improve people's happiness. The predictive factors in this study can assist healthcare providers in identifying pregnant women who are at risk. To diagnose and treat anxiety, stress, worry, and parental attachment to the fetus during pregnancy, healthcare professionals should undergo specialized training. Additionally, by increasing the use of interventions and counseling services for expectant mothers, the psychological burden associated with pregnancy can be reduced.

Acknowledgments

Nil.

Financial support and sponsorship

Vice Chancellor for Research, Larestan University of Medical Sciences

Conflicts of interest

Nothing to declare.

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