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Maternal-Fetal Attachment and its Sociodemographic Determinants in Women With Unplanned Pregnancy

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Abstract

Objectives: Attachment to the fetus is formed before the birth and stronger prenatal maternal-fetal attachment is related to more desirable prenatal and postpartum behaviors and cares as well as better acceptance of the parenting role. Therefore, this study aimed to determine maternal-fetal attachment and its socio-demographic determinants among women with an unplanned pregnancy.

Materials and Methods: This descriptive-analytical and cross-sectional study was conducted on a convenience sample of 200 women with unplanned pregnancies attending the maternity clinic of Alavi hospital (Ardebil, Iran) during 2016-2017. To collect the data, a socio-demographic questionnaire and the maternal-fetal attachment scale (MFAS) were completed through the interviews. Data were analyzed using independent t tests, one-way ANOVA, and the general linear model.

Results: The mean (standard deviation) of maternal-fetal attachment score in women with an unplanned pregnancy was 79.2 (11.2) ranging from 23 to 115. The mean attachment score was significantly higher in women with a mistimed pregnancy [83.5 (9.0)] than in those with an unwanted pregnancy [72.9 (11.0)]. The highest and lowest mean scores were observed in the "interaction with the fetus" [14.2 (3.3)] and the "role-taking" [9.2 (3.0)] sub-domains, respectively. Based on the general linear model, only the type of unplanned pregnancy (mistimed or unwanted) indicated a significant relationship with maternal-fetal attachment ($P < 0.001$).

Conclusions: Based on the results, the type of unplanned pregnancy had a significant association with maternal-fetal attachment. Moreover, mothers with unwanted pregnancies needed greater counseling and support compared to those with mistimed pregnancies.

Keywords: Maternal-fetal attachment, Unplanned, Pregnancy

Introduction

Transition, defined as a change from one state to another, decreases adaptation leading to incompatibility, uncertainty, and changes in perception, feelings, and daily conduct. It thus serves as both a risk and an opportunity for growth. Transition to parenting is a huge change (1). During nine months of pregnancy, in addition to the physical development of the fetus, the mother goes through a transition to parenthood (2). Such a transition is an important and stressful event with several psychological, family-related, and economic risk factors (3-5) which can be a positive or negative experience depending on whether the pregnancy is wanted or unwanted. In fact, couples that unwantedly enter the parenting phase would experience difficult times during and after the pregnancy (6).

Eighty million mothers around the world have to deal with an unplanned pregnancy (3). The rate of an unplanned pregnancy is more in developing countries where 14%-62% of all the childbirths are unplanned. The highest rates of such pregnancies occur in Latin America, as well as South and South-East Asia (4). Moreover, 30.6% of pregnancies are unplanned in Iran (5).

An unplanned pregnancy refers to a pregnancy in a woman who has no intention of having a child either at the time of conception (mistimed) or at all (unwanted) (6-8). Conversely, a wanted pregnancy defines a type of pregnancy that happens exactly as planned (intended) or later (in couples with fertility problems) (8).

Factors contributing to unplanned pregnancies include young age (unplanned pregnancy rate reduces with an age increase), low education level (9, 10), ethnicity (unplanned pregnancy rate is more in black women than in the white ones), low income, religion (high rates of unplanned pregnancy are reported in non-religious women) (10), poor skills during the first intercourse, high frequency of sex (over 5 times in 4 weeks), cigarettes or opioids use, non-scientific sources of sex-related information, and depression (9).

Women's intention of pregnancy is related to health-related behaviors and childbirth outcomes (7,11), that is, unhealthy prenatal behaviors are higher in women with an unplanned pregnancy and may even continue after the confirmation of pregnancy (11,12). These women postpone their first prenatal visit during the first trimester and thus experience more negative feelings about their pregnancy (13-15). Women with unplanned pregnancies are at higher risk (2 times higher) of smoking in the first trimester. Furthermore, despite the medical advice, only

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15% of these women use folic acid. Since postpartum depression is more prevalent in women with unplanned pregnancies compared to those with planned ones, these women are less likely to continue successful breastfeeding (13). Therefore, infants of the unplanned pregnancies are at higher risks of receiving insufficient breast milk (15)and also death during and after the infancy. Other complications of unplanned pregnancies include abortion, fetal abnormalities, preterm childbirth, low birth weight, and low weight for the gestational age (11).

A maternal bond begins before the childbirth (16) after feeling the first fetal movement and encourages the mother to adjust her behaviors and moods to ensure safe fetal development (17). The fetus also senses the behaviors and moods of the mother and gets affected by them (18). The relationship between the mother and the fetus is referred to as prenatal attachment (19). Prenatal attachment is a subjective concept that shows the emotional relationship between the mother and her fetus and depends on the mother's perceptual and emotional ability in imagining the presence of another being inside her (2,20). This attachment begins at the onset of pregnancy and peaks during the second trimester (21). In fact, having a mental picture of the fetus helps the mother to imagine the fetus as a small being inside her. Based on previous studies, 30% of mothers imagine the fetus as a real human being in the first trimester, 63% do so in the second trimester, and 92% of them have such a feeling after the 36th week of pregnancy (22). In these mental images, the mother attributes specific emotional and physical features to the fetus and hence tries to adopt desirable health and care behaviors and avoid factors with potential harm to the fetus. This facilitates the acceptance of the maternal role (2,16,22,23) and the prevention of depression (22). Prenatal attachment is a predictor of attachment after childbirth (24), namely, stronger maternal-fetal attachment is associated with greater emotional, cognitive, and social development of the child (25) and leads to better postpartum adaptation, higher self-esteem in parents, positive reactions to the newborn's gestures (26), cooperation of family members, and reduced envy among the siblings (24).

As mentioned earlier, half of the women experience unplanned pregnancies during the reproductive age (10) and 39% of all the childbirths are unwanted and mistimed (27). Although many studies have evaluated prenatal maternal-fetal attachment, the review of the literature revealed the absence of a study on attachment among women with unplanned pregnancies. One of the main measures for supporting this group of pregnant women and their infants is to assess factors associated with maternal-fetal attachment. Identifying such factors would facilitate the development of appropriate educational and counseling packages to improve the sensitive prenatal attachment among women with unplanned pregnancies. Therefore, this study sought to investigate maternal-fetal attachment and its socio-demographic determinants in women with an unplanned pregnancy.

Materials and Methods

Population

The present descriptive-analytical cross-sectional study was conducted on 200 women with unplanned pregnancies who referred to the Maternity Clinic of Alavi hospital, Ardebil, Iran. The sampling began in May 2017 and ended in September of the same year.

The inclusion criteria were an unplanned pregnancy and a willingness to participate in the study. The sample size was calculated as 171 based on a study by Delavari et al and considering the highest standard deviation of subdomains for the maternal-fetal attachment (SD = 3.4), $\alpha = 0.05$, power = 90%, and precision of 0.04 around the mean value (Mean = 18.2). However, in order to allow for possible withdrawals, a total of 200 women were selected.

Sampling

The sampling began upon the approval of the Ethics Committee of Tabriz University of Medical Sciences. To recruit a convenience sample, the researcher referred to the maternity clinic of Alavi hospital and asked the attended pregnant women if their pregnancy was unplanned. Women with unwanted or mistimed pregnancies were then provided with details about the study, ensured the confidentiality of the collected data, and invited to participate. Women who were willing to participate were asked to sign an informed consent form.

Measures

A socio-demographic questionnaire containing items about the age, type of unplanned pregnancy, mode of previous childbirth, number of pregnancy and parity, occupation, education, history of miscarriage, disease history, and place of residence was used to collect the data.

In addition, the maternal-fetal attachment was assessed through Cranley's maternal-fetal attachment scale (MFAS). The MFAS is a self-report scale containing 23 items. Each item is scored on a 5-point Likert-type scale. The following values were assigned to responses provided for Likert scale items: Definitely Yes = 5, Yes = 4, Not Sure = 3, No = 2, and Definitely No = 1. Meanwhile, one item is reversely scored (Definitely Yes = 1, Yes = 2, Not Sure = 3, No = 4, and Definitely No = 5). The total scores of the scale range between 23 and 115 and higher scores indicate greater attachment. The reliability (internal consistency) of the scale was assessed and reported as $\alpha = 0.85$ by its developer (28). Abbasi et al evaluated the validity and reliability of the Persian version of this tool and calculated Cronbach α coefficient as 80% (29).

Moreover, the content validity of the socio-demographic questionnaire was assessed by distributing the questionnaire among 10 faculty members of the School of Nursing and Midwifery and the required modifications were made according to their comments. Other employed

questionnaires were all standard. In order to assess the reliability of the questionnaire, it was distributed among 20 individuals and Cronbach α (internal consistency) coefficient showed a total estimation of 0.831.

Sample Size and Statistical Methods

All the questionnaires were completed through the interviews. The obtained data were analyzed employing the SPSS (statistical package for the social sciences) software, version 21. The normality of quantitative data was assessed and confirmed using skewness and kurtosis. Descriptive statistics including the mean (SD) and frequency (percent) were used to describe the socio-demographic characteristics and maternal-fetal attachment and its subdomains. In order to determine the relationship between socio-demographic characteristics and maternal-fetal attachment, bivariate tests including independent *t* test and one-way ANOVA were first applied and variables with $P < 0.05$ were then entered into a general linear model.

Results

A total of 200 women with unplanned pregnancies including 81 (40.5%) with unwanted and 119 (59.5%) with mistimed pregnancies were evaluated. The mean (SD) age of the participants was 29.0 (7.5) years. One-third of them (36.5%) were younger than 25 years and more than one-third (41%) were within the age range of 26-35 years old. More than 60% of the participants had their second and third pregnancies and had a history of one to 2 childbirths. Moreover, 39% of the participating women had a history of natural childbirth while 35.5% of them had a history of a cesarean section (C-section). In addition, more than two-thirds of the participants (80%) were housewives and over 50% of them had a high school diploma or higher education. Besides, most participants had no history of abortion (88.5%) or any diseases (90%). And finally, more than half of the studied women (67%) lived in urban areas (Table 1).

Overall, the participants' mean (SD) total score of maternal-fetal attachment was 79.2 (11.2) and the scores ranged between 23 and 115. The highest and lowest mean scores belonged to the "interaction with fetus" [14.2 (3.3)] and "role-taking" [9.2 (3.0)] sub-domains, respectively. The mean (SD) total score of maternal-fetal attachment was 83.5 (9) in participants with mistimed pregnancy and 72.9 (11) in those with unwanted pregnancies. Independent *t*-test showed a significant difference between the scores of women with mistimed and unwanted pregnancies ($P < 0.001$), the results of which are provided in Table 2.

Based on the results of independent *t* test and one-way ANOVA, the total score of maternal-fetal attachment had significant relationships with age, occupation, number of pregnancy and parity, type of pregnancy, and mode of childbirth. Therefore, these variables were included in the general linear model. This model showed a significant association ($P < 0.001$) between the type of unplanned pregnancy and maternal-fetal attachment score (Table 3).

Table 1. The Relationship Between Socio-demographic and Maternal-Fetal Attachment in Women with Unplanned Pregnancy

Variable	Number	Mean (SD*)	*P* Value
Age (y)			< 0.001[a]
< 25	73	83 (9.4)	
25 -35	82	78.1 (12.3)	
< 35	42	75.0 (10.0)	
Kind of delivery			< 0.001[a]
Non	45	84.1 (9.4)	
Normal vaginal delivery	78	82.4 (9.2)	
Caesarean section	71	73.2 (11.3)	
Both	6	70.0 (9.0)	
Gravid			< 0.001[a]
0	45	84.1 (9.5)	
1	61	81.4 (9.5)	
2	61	75.4 (12.5)	
≥3	33	75.3 (10.2)	
Para			< 0.001[a]
0	45	84.1 (9.5)	
1	68	81 (9.2)	
2	64	75.3 (13)	
≥3	23	75.1 (9.7)	
Job			0.041[b]
Housewife	168	78.5 (11.2)	
Employee	32	83 (10)	
Education			0.733[a]
Primary	15	76.6 (12.5)	
Middle school	49	78.0 (13.0)	
High school	21	79 (11.3)	
Diploma	65	80 (9.6)	
Collegiate	50	80.3 (11.0)	
Abortion history			0.076[b]
No	177	79.7 (11.9)	
Disease history			0.972[b]
No	181	79.2 (11.4)	
Place of residence			0.371[b]
City	134	79.7 (11.1)	
Village	66	78.2 (11.4)	
Kind of unplanned pregnancy			< 0.001[b]
Unwanted	81	73.0 (11.0)	
Mistimed	119	83.5 (9.0)	

Abbreviation: SD, standard deviation.
[a] One way ANOVA; [b] Independent *t* test.

Discussion

The total score of maternal-fetal attachment in women with an unplanned pregnancy was in the moderate range. Their highest and lowest mean scores were observed in the "interaction with the fetus" and "role-taking" subdomains, respectively. The maternal-fetal attachment score was significantly lower in women with an unwanted

Table 2. Status of Maternal-Fetal Attachment and its Domains in Women with Unplanned Pregnancy

Variable	Mean (SD)	Obtainable Range	Obtained Range
Maternal–fetal attachment (n=200)	79.2 (11.2)	23-115	37-108
Interaction with the fetus	14.2 (3.3)	5-25	6-24
Role taking	9.2 (3)	4-20	4-20
Attributing characteristics to fetus	14 (3.4)	6-30	6-24
Differentiation of self from fetus	10.2 (2.3)	4-20	4-17
Giving of self	11.2 (2.6)	2-25	5-19
Unwanted Pregnancy (n=81)	72.9 (11)	23-115	37-108
Mistimed Pregnancy (n=119)	83.5 (9)	23-115	60-104

Abbreviation: SD, standard deviation.

Table 3. The Relationship Between Socio-demographic Characteristics with Maternal-fetal Attachment in Women with Unplanned Pregnancy Based on General Linear Model

Variable	B (CI 95%*)	*P*-value
Job (Reference: employee)		
Housewife	-2.4 (-6.7 to 1.9)	0.273
Gravid (Reference: 3 and more)		
1	4.9 (-5.3 to 15.2)	0.340
2	1.1 (-5.6 to 7.8)	0.752
Para (Reference: 3 and more)		
1	-5.8 (-7.2 to 5.5)	0.313
2	-0.5 (-7.9 to 6.8)	0.882
Age (y) (Reference: <35)		
<25	3.7 (-1.4 to 8.8)	0.157
25-35	1.8 (-1.9 to 5.7)	0.344
Type of unplanned pregnancy (Reference: mistimed)		
Unwanted	-7.5 (-11.5 to -3.5)	<0.001
Type of delivery (Reference: both)		
Normal vaginal delivery	7.1 (-1.5 to 15.7)	0.106
Caesarean section	0.12 (-8.3 to 8.6)	0.977

pregnancy than in those with a mistimed pregnancy.

Among the subdomains of maternal-fetal attachment, "interaction with the fetus" and "role-taking" received the highest and lowest scores, respectively. This result is in agreement with those obtained in the other studies and confirms transition to parenthood as a stressful experience in an unplanned pregnancy (30). In fact, compared to couples with planned pregnancies, those with an unplanned pregnancy perform poorly and hesitantly in transition to parenthood and acceptance of the parenting role (31). This justifies the issue of why the transition to parenthood is harder for these couples (32).

In the present study, women with unwanted pregnancies obtained moderate maternal-fetal attachment scores. Moreover, the lower attachment was observed in an unwanted pregnancy than in mistimed pregnancies. While no study was found to exclusively assess maternal-fetal attachment in women with unplanned pregnancies, most previous studies have reported lower maternal-fetal attachment in unplanned pregnancies compared to planned pregnancies (22-33). According to several researchers, considering the fact that psychological disorders and marital satisfaction are closely related to maternal-fetal attachment, high levels of mood disorders such as depression and anxiety, as well as poor marital interactions in women with unplanned pregnancies lead to direct and negative effects on maternal-fetal attachment (30,33,34).

The lower level of attachment in unwanted pregnancies compared to mistimed ones can justify the poorer outcomes in the first group who exhibited high-risk behaviors more frequently (35,36). This result can even explain why women with unwanted pregnancies have more unhealthy prenatal behaviors. Such complications are not limited to the prenatal period and unwanted infants may also receive inadequate and shorter periods of breastfeeding (13). Based on previous studies, one or more years after the birth, children of unwanted pregnancies have a lower chance to develop their capabilities compared to those of mistimed pregnancies. Moreover, comparing children of mistimed pregnancies, unwanted children are subjected to more oppressive and dictatorial behaviors from their parents. Such a difference is generally present in almost all the resources available to children (37).

Since fetal attachment hardly occurs in mothers with anxiety and depression, a possible reason for the lower attachment in unwanted pregnancies than the mistimed pregnancy can be the twice higher risk of depression

and anxiety among women with unwanted pregnancies compared to those with wanted ones, who are not much different from women with mistimed pregnancies (38). Therefore, women with unwanted pregnancies require supportive interventions (39).

Prenatal life has a major and definite effect on the mother-child relationship and the child's development and health (40). However, the midwifery education program merely teaches midwives the normal physiological changes that lead to successful pregnancy outcomes and little attention is paid to prenatal psychological changes in women (24). Since women with unplanned pregnancies are much less motivated to adopt behaviors that lead to a healthy fetal development, specific programs should be designed to help these women improve their adaptation to unplanned pregnancies (12). Considering that one-third of women experience unplanned pregnancies in Iran (5), educational and counseling packages are required to provide these women and their children with psychological, social, and health support.

One limitation of this study was, neglecting the paternal-fetal attachment and merely focusing on maternal-fetal attachment. Since the husband's attachment could affect maternal-fetal attachment, future studies are recommended to investigate such effects. However, the major strength of the present study was evaluating maternal-fetal attachment in women with unplanned pregnancies for the first time in the Iranian context. In fact, since psychological and emotional factors are as important as physical and physiological issues in these women, identifying such factors would facilitate the development of more useful services.

Conclusions

The findings of this study showed moderate levels of maternal-fetal attachment in mothers with unplanned pregnancies. Moreover, the level of attachment was lower in women with an unwanted pregnancy compared to those with mistimed pregnancies. This finding highlights the need for supportive interventions such as education and counseling in order to improve prenatal maternal-fetal attachment and provide physical and psychological support for women and their children not only during pregnancy but also after the childbirth.

Conflict of Interests

Authors declare that they have no conflict of interests.

Ethical Issues

The Ethics Committee of Tabriz University of Medical Sciences approved the study (No: IR.TBZMED.REC.1395.1104).

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