The Relation between Pregnant Women's Self-Efficacy and Their Maternal-Fetal Attachment

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ABSTRACT

Context: Several prenatal and postnatal factors may influence Maternal-Fetal-Attachment (MFA). Few local types of research addressed the relation between MFA and maternal self-efficacy.
Aim: To assess the relation between pregnant women's self-efficacy and their MFA.
Methods: The study was carried out at the Specialized Maternity Hospital in Port-Said, Egypt, using a cross-sectional analytic study design on a sample of 240 pregnant women attending the setting for follow-up singleton normal pregnancy. The data were collected using a structured interview questionnaire with two standard scales, namely the Maternal Self-Efficacy Scale and Maternal-Fetal Attachment (MFA) Scale. The fieldwork lasted from December 2019 to April 2020.
Results: Women ages ranged between 17 and 42 years, and 50% were primigravida. The self-efficacy scores had a wide range (1.3-5.0), with a median of 2.90 from a maximum of 5.00. The median MFA score was 3.59 from a maximum of 5.00. A significant positive correlation was found between self-efficacy and MFA scores (r=0.197). In multivariate analysis, the duration of marriage and income were significant positive predictors of self-efficacy score, while age and previous abortions were significant negative predictors. As an MFA score, the level of education, husband age, planned pregnancy, and self-efficacy score was its positive predictors.
Conclusion: Pregnant women's self-efficacy has a positive influence on their prenatal MFA. Therefore, increasing pregnant women's self-efficacy through training and support is highly recommended during antenatal care (ANC) visits.

Keywords: Maternal-Fetal-Attachment, self-efficacy, pregnant women

1. Introduction

Although pregnancy is a physiological event, it is often associated with radical changes in the pregnant woman's physical and psychological status. During this period, the pregnant woman has mixed feelings of joy and apprehension about labor. Such feelings have an impact on the infant's wellbeing *(Wigert et al., 2020)*. For instance, the feeling of anxiety and worry during pregnancy could negatively affect the attachment or bonding between the mother and her newborn, and it could decrease the chances of successful exclusive breastfeeding *(Atif et al., 2020)*.

Attachment refers to an array of internal behavior, which leads to more closeness between an infant and his/her primary caregiver, mostly the mother. It starts during pregnancy *(Atashi et al., 2018)*. Maternal-Fetal Attachment (MFA) has been defined as the extent to which women engage in behaviors that represent an affiliation and interaction with their unborn child *(Noroozi et al., 2020)*.

It is of extreme importance since it tends to build a unique relationship between mother and infant *(Serçekuş & Başkale, 2016)*. Such a relationship encompasses a gamut of feelings of mother responsibilities to be eager to know more to protect her fetus, avoid any harm to him/her, and fulfill the newborn's needs. Such affective selfless attachment is often pleasing to the mother as she interacts with the fetus *(Massey et al., 2015; Göbel et al., 2019; Rollè et al., 2020)*.

Maternal-Fetal-Attachment may be influenced by several prenatal and postnatal factors such as maternal and fetal outcomes. They also include the extent the mother feels competent in caring for her newborn *(Harrison et al., 2020; Tork Zahrani et al., 2020)*.

This feeling reflects the mother's feeling of self-efficacy, which is defined as the feeling able to perform a certain task effectively *(Azmoude et al., 2015)*, and to be an effective, dependable caregiver *(Sanjuan et al., 2020)*. Such feeling has significant impacts on a woman's self-perception as a mother can efficiently care for her infant *(Brazeau et al., 2018)*.

2. Significance of the Study

Although the literature abounds with studies of MFA, maternal self-efficacy, and inter-relationships, there is a scarcity of research on this subject in Egypt. Given the discrepancy in social and cultural background, Western countries' research findings could not be extrapolated to Egyptian pregnant women.

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3. Aim of the study

To assess the relation between pregnant women's self-efficacy and their Maternal-Fetal Attachment (MFA). The hypothesis to be tested was that the self-efficacy score is positively correlated to the MFA score and positively predicts it.

4. Subjects and Methods

4.1. Research design

A cross-sectional analytic study design was used to test the set hypothesis by measuring both dependent and independent variables simultaneously *(Polit & Beck, 2018).*

4.2. Research setting

It was conducted at the Specialized Maternity Hospital in Port-Said, Egypt. The hospital provides integrated specialized care and emergency services in reproductive health for women and neonates in the Suez Canal region.

4.3. Subjects

The study population consisted of all women attending the study setting for follow-up of their singleton normal pregnancy. Women with severe physical or psychological disorders were excluded. The sample size was calculated to estimate an expected correlation coefficient of 0.20 or higher at a 95% level of confidence and 80% power. Using the Open-Epi software package *(Hulley et al., 2013)*, the required sample size was 194 women. It was increased to 240 to account for a non-response rate of approximately 20%. Women were recruited consecutively according to eligibility criteria using a convenience sampling technique.

4.4. Tools of data collection

The data collection tool consisted of a structured interview questionnaire, maternal self-efficacy scale, and Maternal-Fetal attachment Scale.

4.4.1. A Structured Interview Questionnaire

It was formed of two standard scales, namely the Maternal Self-Efficacy Scale *(Wardani et al., 2017)* and the Maternal-Fetal Attachment (MFA) Scale *(Cranley, 1981; Brockington, 1996)*. The form involved a section for woman's sociodemographic data such as age, education, job status, husband age, education and job, current marital status, marriage duration, residence, and income. It also had a section for the obstetric history as well as the details of the current pregnancy.

4.4.1.1. The Maternal Self-Efficacy Scale

A version of the valid and reliable tool of the young adult maternal confidence scale (YAMCS)**,** was used to measure the self-efficacy of studied women. It consists of 14 items assessing the respondent's confidence in caring for her baby and being a good mother, such as "I am confident that I will know how to care for my baby," and "I feel confident of being able to breastfeed my baby." According to *Wardani et al. (2017)*, four items were excluded due to

their low loading on the overall score. Thus, the 10-item version was used in the present study.
Scoring system

The response to each scale item was on a 5-point Likert scale ranging from "not confident" to "completely confident." These were scored from 1 to 5. Scoring was reversed for negative items. The ten items' scores were summed up and divided by the number of items to yield a standardized score ranging from 1 to 5, with a higher score indicating more confidence.

4.4.2. The Maternal-Fetal Attachment (MFA) Scale

This was adopted from *Cranley (1981)* and *(Brockington 1996)* to measure the construct of maternal-fetal attachment during pregnancy. It consists of 22 items categorized into five dimensions as follows: Attribute characteristics to fetus (6 items), self-differentiation from fetus (3 items), giving of self (5 items), interaction with the fetus (5 items), and role taking (3 items).
Scoring system

The response to each item was on a 5-point Likert scale ranging from "definitely no" to "definitely yes." These are scored from 1 to 5, with reverse scoring for negative items. The scores of each category's items and the total scale were summed up and divided by the number of corresponding items. This scoring system provided easily comparable standardized scores for each of the five categories and the total scale ranging from 1 to 5, with a higher score indicating more MFA.

4.5. Procedures

Tools validity and reliability: The scales used in the study are standardized tools with reported high validity and reliability *(Cranley, 1981; Brockington, 1996; Wardani et al., 2017)*. The two scales were translated into Arabic language using a translate-back-translate process to ensure their validity as recommended by *Sireci et al. (2006)*. Moreover, a panel of five faculty members in obstetric and gynecological nursing revised the other sections of the tool to determine their relevance, clarity, and comprehensiveness. They also assessed the relevance of the two scales to study aim. The reliability of the two scales was assessed by measuring their internal consistency. They demonstrated high reliability levels with Cronbach's Alpha coefficient 0.936 for the self-efficacy scale and 0.777 for the MFA scale.

A pilot study was carried out on a sample of women from the study setting representing about 10% of the sample size. Its purpose was to assess the feasibility of the study and the applicability and clarity of the data collection tool. It also helped to estimate the time required for completing the form through interviewing.

Fieldwork: The researchers secured all necessary official permissions to conduct the study. Pregnant women were recruited in the study sample according to the eligibility criteria. The researchers met with them while waiting to receive the care in the study setting. They explained each one the purpose and procedures of the study

and informed them about their right to accept or refuse participation. Those who gave their verbal informed consent to participate were interviewed using the data collection forms. Some women preferred to set a later appointment for the interview due to lack of time. Given the emergency circumstance and the strict precautionary measures associated with the COVID-19 pandemic, some women were interviewed through cellphones or other electronic communication media. The interviewing time needed for filling the questionnaire form was 20-25 minutes. At the end of the interview, the researchers immediately revised the filled form to ensure its completeness. The fieldwork lasted from December 2019 to April 2020.

All research ethics principles were complied with according to the Helsinki Declaration. Permissions were secured using official channels. Informed verbal consent was obtained from each participant after a brief explanation of the study's aim and procedures. All women joined the study voluntarily and were assured about the anonymity and confidentiality of any obtained information.

4.6. Data analysis

Data entry and statistical analysis were done using SPSS 20.0 statistical software package. Data were presented using descriptive statistics in frequencies and percentages for qualitative variables, means and standard deviations, medians and interquartile ranges for quantitative variables. Cronbach alpha coefficient was calculated to assess the reliability of the developed tools through their internal consistency. Quantitative continuous data were compared using Mann-Whitney or Kruskal-Wallis tests. Spearman rank correlation was used for assessment of the inter-relationships among quantitative variables and ranked ones. In order to identify the independent predictors of the self-efficacy and MFA scores, multiple linear regression analysis was used, and analysis of variance for the full regression models was done. Statistical significance was considered at p-value <0.05.

5. Results

The study sample consisted of 240 pregnant women whose ages ranged between 17 and 42 years, median 26.5, as presented in Table 1. They were mostly housewives (76.2%), and 48.7% had an intermediate level of education. Their husbands' ages ranged between 20 and 45 years, with more than half (54.2%) had intermediate education. The marriage duration ranged from one to 20 years, median 4.0, and approximately two-thirds were living in urban areas (63.3%) and considered their income was sufficient (63.7%).

Regarding their obstetric profile, Table 2 shows that one-half of the women were primigravids, 53.7% were nulliparas, and 22.1% gave a previous abortion history. The current pregnancy was planned 73.3%, and 85.0% had six or more antenatal care visits, mostly from the first trimester (75.4%). Meanwhile, 35.4% had pregnancy-related minor discomfort.

As illustrated in Table 3, the self-efficacy scale scores had a wide range (1.3-5.0), with a median of 2.90 from a maximum of 5.00, i.e., at least one-half of them were having a median score representing 58% of the maximum score. As for the Maternal-Fetal Attachment (MFA) scores, the median was higher (3.59), reaching 71.8% of the maximum score. The dimension of "giving of self" had the highest median score (4.00), whereas the dimension of interaction with the fetus had the lowest median score (3.40). A third percentile score of self-efficacy is 3.4 was also revealed.

Table 4 points to statistically significant relations between women's self-efficacy scores and their age (p=0.003), education (p=0.01), husband education (p=0.03), residence (p<0.001), and income (p=0.02). It is noticed that the self-efficacy scores were lowest in the middle categories of age, education, and husband education, and those women from urban areas and having an insufficient income. The table also demonstrates statistically significant relations between women's MFA scores and their education (p<0.001), husband education (p<0.001), and income (p<0.001). It is evident that the MFA scores were increasing with women's and husband's education levels and with sufficient income.

Concerning the relations between women's self-efficacy and maternal fetal attachment with women's obstetric characteristics, table 5 indicates statistically significant relations between women's self-efficacy scores and their parity (p=0.03), having children (p=0.02), ANC trimester (p=0.02), and ANC visits (p=0.02). It shows that the self-efficacy scores were higher among parous women, having living children, ANC visits, starting in the third trimester and having <6. As regards the MFA scores, statistically significant relations were revealed with women's gravidity (p=0.003), parity (p=0.007), having living children (p=0.001), the planning of pregnancy (p<0.001), and ANC start trimester (p=0.001) and visits <6 (p<0.001). As the table describes, the MFA scores were higher among primigravida and nulliparas, those with living children, and six or more ANC visits starting in the third trimester.

Table 6 demonstrates statistically significant weak to moderate positive correlations among the five MFA dimensions, the strongest between the dimensions of attribute characteristics to fetus and interaction with the fetus (r=0.516). The table also shows statistically significant weak positive correlations between the self-efficacy score and the MFA dimensions of self-differentiation, giving of self, and interaction with the fetus.

As displayed in table 7, a statistically significant weak positive correlation was found between the self-efficacy and total MFA scores (r=0.197). It also shows statistically significant weak positive correlations between the self-efficacy and woman's duration of marriage, income, gravidity, and parity. Meanwhile, the total MFA score shows statistically significant weak positive correlations with women's and husbands' education, income, the number of ANC visits, and negative correlations with the duration of the marriage, gravidity, parity, and ANC trimester.

The multivariate analysis (Table 8) identified a woman's marriage duration and income as statistically significant independent positive predictors of the self-efficacy score, while age and previous abortions were negative predictors. As the standardized coefficients demonstrate, the duration of marriage was the most influencing factor. However, the model explains only 13% of the variation in the self-efficacy score.

As for the MFA score, the same table indicates that a woman's level of education, husband age, planned pregnancy, and self-efficacy score were the statistically significant independent positive predictors of this score, with the level of education being the most influencing factor. The model explains 34% of the variation in the MFA score.

Table (1): Frequency and percentage distribution of sociodemographic characteristics of studied women (n=240).

Sociodemographic variables	Frequency	Percent
Age		
<25	93	38.7
25-	57	23.8
30+	90	37.5
Range	17-42	
Mean±SD	27.0±5.6	
Median	26.5	
Education		
Basic	52	21.7
Intermediate	117	48.7
High	71	29.6
Job-status		
Housewife	183	76.2
Working	57	23.8
Husband age		
<30	95	39.6
30-	69	28.8
35+	76	31.7
Range	20-45	
Mean±SD	32.7±21.1	
Median	31.0	
Husband education		
Basic	49	20.4
Intermediate	130	54.2
High	61	25.4
Husband job		
Unemployed	9	3.8
Working	231	96.2
Current marital status		
Separated/divorced	16	6.7
Married	224	93.3
Marriage duration (years)		
<5	145	60.4
5-	48	20.0
10+	47	19.6
Range	1.0-20.0	
Mean±SD	5.2±4.3	
Median	4.0	
Residence		
Rural	88	36.7
Urban	152	63.3
Income		
Insufficient	87	36.3
Sufficient	153	63.7

Table (2): Frequency and percentage distribution of obstetric history of the studied women (n=240).

Obstetric history	Frequency	Percent
Gravidity		
1	120	50.0
2-3	82	34.2
4+	38	15.8
Range	1-10	
Mean±SD	2.1±1.4	
Median	1.5	
Parity		
Nullipara	129	53.7
Primipara	42	17.5
2	51	21.3
3+	18	7.5
Range	0-5	
Mean±SD	0.8±1.0	
Median	0.0	
Had previous abortions	53	22.1
Have living children	111	46.3
Current pregnancy		
Pregnancy was planned	176	73.3
Antenatal care (ANC) visits		
<6	36	15.0
6+	204	85.0
ANC starting trimester		
First	181	75.4
Second	55	22.9
Third	4	1.7
Have pregnancy-related minor discomfort	85	35.4

Table (3): Self-efficacy and Maternal-Fetal Attachment (MFA) score among the studied women (n=240).

Variables	Scores (max=5)			
	Range	Mean±SD	Median	$1^{st} - 3^{rd}$ quartiles
Self-efficacy	1.3-5.0	2.9±0.9	2.90	2.3-3.4
Maternal-Fetal Attachment (MFA)				
Attribute characteristics to the fetus	2.2-4.5	3.4±0.4	3.50	3.2-3.7
Self-differentiation from fetus	1.5-5.0	3.6±0.7	3.50	3.0-4.0
Giving of self	2.4-5.0	4.0±0.5	4.00	3.6-4.4
Interaction with fetus	2.0-4.8	3.3±0.5	3.40	3.0-3.6
Role taking	1.8-5.0	3.7±0.5	3.75	3.5-4.0
Total MFA	2.2-4.7	3.6±0.4	3.59	3.3-3.8

6. Discussion

The study results indicate generally low score of self-efficacy among pregnant women, with better levels of MFA. The self-efficacy score is significantly positively correlated to the MFA score and was identified as a positive predictor. The findings lead to acceptance of the research hypothesis set that self-efficacy has a positive impact (as it significantly positively correlated and significantly a positive predictor of MFA) on pregnant women's MFA or bonding.

According to the present study findings, pregnant women's self-efficacy scores are predictive of their MFA scores. Thus, a woman's perception of being self-efficacious would foster her MFA and bonding to her fetus. This finding might be through her feeling that she can manage her pregnancy and care for her growing embryo, which would increase the attachment and enhance bonding. In congruence with this, *Parsa et al. (2014)* found a statistically significant positive correlation between mothers' self-efficacy and their bonding or attachment to their fetus. Moreover, a study in Poland demonstrated a strong correlation between pregnant women's feeling of autonomy and confidence in achieving their mother role and maternal-fetal attachment *(Zdolska-Wawrzkiewicz et al., 2018)*. Similar positive effects of self-efficacy on maternal attachment and caregiving roles were reported by *Brazeau et al. (2018)* in a study in the United States.

The present study results revealed that many of the sample women had low self-efficacy scores, as indicated by the median and quartile scores. Thus, a median score of 2.90 indicates that almost half of the sample women had a self-efficacy score equivalent to less than 60% of the maximum attainable score. Moreover, a third quartile score of 3.4 means that only one-fourth of the women reached a self-efficacy score representing 68% of the maximum attainable score.

Table (4): Relations between women's self-efficacy and Maternal-Fetal Attachment (MFA) and their demographic characteristics.

Demographic characteristics	Self-efficacy score (max=5)		Kruskal Wallis test[@]	p-value	MFA score (max=5)		Kruskal Wallis test[@]	p-value
	Mean±SD	Median			Mean±SD	Median		
Age								
<25	3.1±1.0	3.00			3.6±0.4	3.64		
25-	2.6±0.6	2.60			3.6±0.3	3.59		
30+	3.0±0.8	2.90	11.960	0.003	3.6±0.4	3.59	0.220	0.890
Education								
Basic	3.1±0.7	3.00			3.4±0.4	3.39		
Intermediate	2.8±0.9	2.70			3.6±0.3	3.59		
High	3.1±0.9	2.90	9.070	0.01	3.7±0.3	3.77	31.140	<0.001
Job-status								
Housewife	3.0±0.9	3.00			3.6±0.4	3.59		
Working	2.8±0.8	2.70	1.790	0.180	3.7±0.3	3.68	2.750	0.100
Husband age								
<30	2.9±0.9	2.80			3.6±0.3	3.59		
30-	2.9±0.9	2.80			3.6±0.4	3.64		
35+	3.0±0.7	3.00	3.100	0.210	3.6±0.4	3.57	0.650	0.720
Husband education								
Basic	3.1±0.8	3.00			3.3±0.8	3.05		
Intermediate	2.8±0.8	2.70			3.6±0.3	3.59		
High	3.2±0.9	3.00	8.700	0.03	3.7±0.3	3.77	22.740	<0.001
Husband job								
Unemployed	2.6±0.7	2.50			3.4±0.3	3.55		
Working	3.0±0.9	2.90	1.050	0.300	3.6±0.4	3.64	1.670	0.200
Current marital status								
Separated/divorced	2.9±1.0	2.95			3.6±0.5	3.55		
Married	2.9±0.9	2.90	0.000	0.960	3.6±0.3	3.64	0.100	0.750
Marriage duration (years)								
<5	2.9±0.9	2.80			3.6±0.3	3.68		
5-	3.0±0.9	3.05			3.6±0.4	3.57		
10+	3.1±0.7	3.00	4.160	0.130	3.5±0.4	3.50	4.690	0.100
Residence								
Rural	3.3±0.9	3.10			3.6±0.4	3.66		
Urban	2.8±0.8	2.70	20.000	<0.001	3.6±0.3	3.59	0.030	0.870
Income								
Insufficient	2.8±0.8	2.60			3.5±0.4	3.50		
Sufficient	3.0±0.9	3.00	5.33	0.02	3.7±0.3	3.68	15.180	<0.001

(@) Mann Whitney test for dichotomous variables

That might explain such low self-efficacy; about half of the women were nulliparous and primigravida, and who started ANC in their first trimester. The study results revealed significant positive correlations between the self-efficacy scores and gravidity and parity. Similarly, previous studies in Iran *(Delvari et al., 2018)* reported low levels of self-efficacy and *Mirghafourvand et al. (2016)* reported the same findings.

Moreover, according to the present study findings, women's self-efficacy scores were significantly influenced by their socioeconomic characteristics. For instance, the intermediate levels of education of both women and their husbands and the insufficient income had a negative impact on women's self-efficacy scores. On the other hand, the duration of marriage and income had significant positive correlations with woman's self-efficacy scores. This finding was confirmed in multivariate analysis, which also identified age as a negative predictor. The findings are plausible, pointing to that self-efficacy is lower at a younger age and improves with marriage duration and with a better income. In line with this, a study in the United Kingdom reported statistically significant influences of pregnant women's socioeconomic level on their self-efficacy *(Zheng et al., 2018)*.

The multivariate analysis of women's self-efficacy in the current study has also demonstrated that a history of previous abortions was a negative predictor of the self-efficacy score. This finding might be attributed to that the negative experience of abortion significantly lowers a woman's perception of her self-confidence and ability to become a mother. In congruence with this, studies have previously reported a negative impact of bad memory and adverse events such as abortion on women's self-efficacy and attachment *(Baghdari et al., 2016)*.

Concerning women's MFA, the current study showed better scores in comparison with their self-efficacy scores. Thus, their median total reached 71.8% of the maximum attainable score, indicating that at least half of them had such a high score.

Table (5): Relations between women's self-efficacy and Maternal-Fetal Attachment (MFA) and their obstetric characteristics.

Obstetric characteristics	Self-efficacy score (max=5)		Kruskal Wallis test[@]	p-value	MFA score (max=5)		Kruskal Wallis test[@]	p-value
	Mean±SD	Median			Mean±SD	Median		
Gravidity								
1	2.8±0.9	2.75			3.7±0.3	3.68		
2-3	3.1±0.9	3.10			3.6±0.4	3.55		
4+	3.0±0.7	3.00	4.890	0.090	3.4±0.4	3.43	11.970	0.003
Previous abortion								
No	3.0±0.9	2.90			3.6±0.3	3.64		
Yes	2.9±0.8	2.90	0.200	0.650	3.5±0.4	3.55	1.220	0.270
Parity								
Nullipara	2.8±0.9	2.75			3.7±0.3	3.68		
Para	3.1±0.8	3.00	4.890	0.03	3.5±0.4	3.53	7.360	0.007
Have living children								
No	2.8±0.9	2.80			3.7±0.3	3.68		
Yes	3.1±0.8	3.00	5.790	0.02	3.5±0.4	3.50	10.220	0.001
Pregnancy planned								
No	2.9±0.8	2.75			3.4±0.4	3.36		
Yes	3.0±0.9	2.90	0.550	0.460	3.7±0.3	3.68	31.270	<0.001
ANC trimester								
First	3.0±0.9	2.90			3.6±0.4	3.68		
Second	2.7±0.7	2.60			3.4±0.3	3.45		
Third	3.7±0.5	3.65	7.670	0.02	3.7±0.3	3.57	13.620	0.001
Antenatal care visits								
<6	3.2±0.7	3.20			3.3±0.4	3.32		
6+	2.9±0.9	2.80	5.890	0.02	3.6±0.3	3.64	16.490	<0.001
Minor discomfort								
No	3.0±0.9	2.90			3.6±0.4	3.64		
Yes	2.9±0.9	2.80	0.720	0.400	3.6±0.3	3.59	0.060	0.800

(@) Mann Whitney test for dichotomous variables

Table (6): Correlation matrix of women's self-efficacy and Maternal-Fetal Attachment (MFA) dimensions.

Variables	Spearman's rank correlation coefficient					
	Self-Efficacy	MFA dimensions				
		1	2	3	4	5
Self-efficacy	1.000					
MFA dimensions						
Attribute characteristics	0.107	1.000				
Self-differentiation	0.251	0.363	1.000			
Giving of self	0.189	0.509	0.447	1.000		
Interaction with fetus	0.135	0.516	0.463	0.425	1.000	
Role taking	0.043	0.484	0.412	0.396	0.439	1.000

Table (7): Correlations between women's self-efficacy and Maternal-Fetal Attachment (MFA) and their characteristics.

Variables	Spearman's rank correlation coefficient	
	Self-efficacy score	MFA score
MFA score	0.197	
Age	-0.080	-0.008
Education	0.000	0.373
Husband age	0.064	-0.004
Husband education	0.029	0.303
Duration of marriage	0.197	-0.172
Income	0.149	0.252
Gravidity	0.134	-0.182
Parity	0.152	-0.202
No. of children	-0.029	-0.097
ANC trimester	-0.071	-0.220
No. of ANC visits	-0.074	0.278

Table (8): Best fitting multiple linear regression model for the self-efficacy and Maternal-Fetal Attachment (MFA) scores.

	Unstandardized Coefficients		Standardized Coefficients	t-test	p-value	95% Confidence Interval for B	
	B	Std. Error				Lower	Upper
Self-efficacy							
Constant	3.76	0.44		8.499	<0.001	2.89	4.63
Age	-0.06	0.01	-0.37	-4.133	<0.001	-0.08	-0.03
Duration of marriage	0.11	0.02	0.55	5.526	<0.001	0.07	0.15
Income	0.31	0.12	0.18	2.607	0.010	0.08	0.55
Previous abortions	-0.29	0.14	-0.14	-2.060	0.041	-0.57	-0.01

r-square=0.13 Model ANOVA: F=7.296, p<0.001
Variables entered and excluded: education and job, husband age, education, and job, current marital status, residence, having children, gravidity, parity, planned pregnancy, ANC trimester, complications, ANC visits

Maternal-Fetal Attachment (MFA)							
Constant	2.50	0.11		21.811	<0.001	2.27	2.72
Education	0.12	0.02	0.35	6.090	<0.001	0.08	0.16
Husband age	0.00	0.00	0.18	3.219	0.001	0.00	0.00
Planned pregnancy	0.23	0.05	0.29	5.068	<0.001	0.14	0.32
Self-efficacy score	0.09	0.02	0.21	3.721	<0.001	0.04	0.13

r-square=0.34   Model ANOVA: F=23.537, p<0.001
Variables entered and excluded: age and job, husband education, and job, current marital status, marriage duration, income, residence, having children, gravidity, parity, abortions, complications, ANC visits

Moreover, the third interquartile range (3.80) indicates that at least three-fourth of the women reached 76% of the maximum attainable score. In agreement with this, a study at El-Shatby Maternity Hospital in Alexandria, Egypt, reported that most pregnant women had high levels of maternal-fetal attachment *(Hassan & Hassan, 2017)*.

The high scores of MFA revealed among the women in the present study are expected given that one-half of the sample women and primigravida, and this natural feeling could be more ardent among them, given their enthusiasm in their first pregnancy. In confirmation of this, the study results revealed that the MFA scores were significantly higher among primigravida and nulliparas. Moreover, the total MFA scores had significant negative correlations with woman's gravidity and parity.

Although the current study bivariate analyses identified significant relations between women's MFA scores and many of their demographic, socioeconomic, and obstetric characteristics, the multivariate analysis identified only three of these factors as independent positive predictors of this score. These were woman's level of education, husband age, pregnancy is planned, and the self-efficacy score. It is anticipated that these three factors positively impact a woman's MFA score, given that they reflect more maturity and more readiness to become a mother. The findings are in agreement with the results of a study in Portugal, where attachment to the fetus was found to be strongly influenced by parental sociodemographic and socioeconomic characteristics *(Camarneiro & de Miranda Justo, 2017)*. Thus, in a study in Mexico, *Nieto et al. (2017)* emphasized the role of social support in enhancing pregnant women's

MFA. Meanwhile, the negative impact of unplanned pregnancy on MFA was demonstrated in Iran *(Jangjoo et al., 2019)* and Ireland *(O'Malley et al., 2020)*.

7. Conclusion

The findings show that pregnant women's self-efficacy feeling has a positive influence on their prenatal Maternal-Fetal-Attachment or bonding. This finding could have a positive impact on the newborn's physical and psychological status.

8. Recommendations

Increasing pregnant women's self-efficacy through training and support is highly recommended during antenatal care visits.

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146