Original Article

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Maternal Fetal Attachment among Pregnant Women Attending in a Provincial Hospital

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ABSTRACT

Introduction: Maternal-fetal attachment (MFA) refers to the behaviors and emotions exhibited by expectant mothers toward their unborn child including care, commitment, and nurturing actions. The maternal psychological state encompassing thoughts, behaviors, and emotions significantly influences fetal development by promoting healthier self-care and pregnancy-related health practices. The main objective of this study was to assess maternal-fetal attachment among first-time pregnant women attending antenatal care at a provincial hospital in Hetauda, Nepal.

Methods: a descriptive cross-sectional study was conducted among first-time pregnant women attending antenatal care at a provincial hospital in Hetauda, Nepal. Data were collected using a structured two-part questionnaire comprising a socio-demographic and obstetric profile and the validated Cranley Maternal-Fetal Attachment Scale. Descriptive and inferential statistics were performed by using SPSS.

Results: Among 145 participants, 80.7% demonstrated a high level of maternal-fetal attachment, with a mean total score of 85.32. Among the five domains of the Cranley scale, "giving of self" showed the highest mean score (4.31 ± 0.50), while "interaction with fetus" scored the lowest (2.78 ± 0.96). Statistically significant associations were observed between MFA scores and maternal age ($p < 0.003$), educational status of the respondent and her husband ($p < 0.001$), timing of antenatal care initiation, emotional response to ultrasound, and family support ($p < 0.000$).

Conclusion: Most first-time pregnant women in this study exhibited high maternal-fetal attachment. Factors such as education, age, antenatal clinic timing, emotional experiences, and support systems significantly influenced attachment levels. These findings emphasize the importance of integrating psychological support into routine antenatal care to ensure comprehensive maternal well-being.

Keywords: Pregnant women, maternal fetal attachment, cranley maternal fetal attachment scale

INTRODUCTION

Pregnancy involves significant psychological and social changes representing a profound psychological event characterized by various somatic and emotional shifts. Attachment theory introduced by John Bowlby in the 1960s, defines attachment as a set of internal behaviors that enable infants to form close bonds with their primary caregiver typically the mother.[2, 8]

In 1981, Mecca Cranley introduced maternal fetal attachment defining it as the extent to which expectant mothers engage in nurturing behaviors and attitudes that reflect their connection and commitment to their unborn child.[4,29] Muller focused maternal fetal attachment as a unique

bond influenced by a mother's childhood attachment to her own mother emphasizing its role in facilitating the transition to motherhood predicting postpartum behaviors and enhancing mother-infant interactions vital for the health of both mother and fetus.[31, 44]

Inadequate maternal-fetal attachment can negatively impact a child's emotional development and lead to social and behavioral issues while strong attachment fosters better maternal health practices and fetal well-being potentially preventing intergenerational problems such as child abuse and future parenting challenges.[29,35, 42]Maternal fetal attachment is influenced by personal factors, beliefs, past experiences and cultural contexts with lower attachment levels observed in women with unplanned pregnancies.[28, 39,47] Maternal-fetal attachment in developing nations like India and Nepal remains understudied particularly regarding factors influencing this bond during a woman's first pregnancy.

A cross-sectional study in Iran found higher maternal fetal attachment (MFA) scores in mistimed than unwanted pregnancies while a Danish study linked low MFA in 38.6% of women to lack of social support, emphasizing the need for early interventions.[13, 15] A study of 386 pregnant women found that planned pregnancies, marital satisfaction, and lower depression increased maternal-fetal attachment (MFA) while a longitudinal study in Iran highlighted the positive impact of social support on MFA suggesting preparation for motherhood improves bonding and reduces postpartum depression.[1, 11]

A study in Ludhiana found higher maternal-fetal attachment scores than paternal scores emphasizing father involvement in prenatal care while a Tamil scale validation in Pondicherry showed peak maternal attachment between 28-34 weeks with no link to gestational age or trimester.[21, 23]

A study in Nagoya found that employment, pregnancy feelings, and support sources influenced maternal fetal attachment while a Tehran study showed 84.72% had good attachment positively impacted by race and education but negatively by tobacco use and multi parity, underscoring key prenatal care factors.[19, 20, 32]

A study in Nigeria linked low social support and multigravida to postpartum distress and reduced maternal-fetal attachment while a Swedish study found prenatal attachment is multidimensional influenced by age, parity, and partner relationships, with little impact from psychosomatic discomfort [22, 24, 31, 38, 39] An interventional study conducted in Australia, the Netherlands and Germany found that ultrasonography positively affects maternal-fetal attachment among pregnant women in various trimesters. The results indicated a significant increase in attachment levels after ultrasound exposure ($P < 0.001$). [6, 10, 11]

METHODS

A descriptive cross-sectional study design was used to assess maternal-fetal attachment among first-time pregnant women attending the antenatal outpatient department of Hetauda Provincial Hospital, a secondary-level referral hospital located in Makawanpur, Nepal. The study population included primi gravid women in their second and third trimesters (gestational age 18 to 42 weeks) who visited the antenatal clinic during the data collection period.

A non-probability convenience sampling technique was employed where eligible participants were selected directly from the antenatal OPD queue. The sample size was determined using the formula $n = z^2pq/d^2$, with a prevalence (p) of 34% for strong maternal-fetal attachment. The initial calculation yielded a sample size of 344. However, based on hospital records showing an estimated population of 250 pregnant women, the finite population correction formula was applied resulting in a final sample size of 145.

A structured interview schedule was used for data collection. The instrument was divided into two parts: the first section covered socio-demographic details, obstetric characteristics and family support, while the second part

consisted of the validated Cranley's Maternal-Fetal Attachment Scale (1981). This scale includes 24 items rated on a 5-point Likert scale, generating a total score ranging from 24 to 120. A score above 72 was categorized as a high level of maternal-fetal attachment while a score of 72 or below was considered low.

Ethical approval was obtained from the Bir Hospital Nursing Campus and the IRB of NAMS, with permission from Hetauda Hospital. Written informed consent was obtained from all participants ensuring confidentiality and cultural neutrality. Data were collected through 20–25 minute interviews then verified, coded, and analyzed using SPSS version 25. Both descriptive and inferential statistics were applied and maternal-fetal attachment was assessed across five domains using the Cranley Scale.

Table 1 presents the socio-demographic characteristics of the respondents. The mean age was 24.03 years (SD ± 3.8). More than half (61.44%) resided in urban areas. In terms of ethnicity, the majority (53.12%) belonged to the Janajati group. Most respondents (61.42%) were Hindu, and a large proportion (80.72%) lived in joint families. Nearly half (53.12%) had completed secondary education, and half (50.32%) were homemakers.

RESULTS

Table 1: Socio-demographic Charecterstics of the Respondents (n=145)

Variables	Frequency	Percentage
Respondent Age (completed years)		
≤20	31	21.4
21-25	72	49.7
26-30	35	24.1
≥31	7	4.7
Mean±SD 24.03 (SD ± 3.8)		
Residence		
Rural	56	38.5
Urban	89	61.4
Religion		
Hindu	89	61.4
Buddhist	36	24.7
Muslim	3	2.1
Christian	17	11.7
Ethnicity		
Dalit	4	2.7
Janajati	77	53.1
Madhesi	7	4.8
Muslim	2	1.4
Brahmin/ Chhetri	55	37.9
Type of Family		
Single	26	17.8
Joint	117	80.7
Extended	2	1.4
Respondent`s Education		
Illiterate	1	0.7
Basic	33	22.7
Secondary	77	53.1
Higher or above	34	23.4
Respondent's Occupation		
Homemaker	73	50.3
Private service	8	5.5
Government service	14	9.7
Agriculture	11	7.6
Business/trade	39	26.8

Table 2: Summary of Maternal Fetal Attachment in Different Domains (n=145)

Domains	Mean	SD
Giving of self	4.3076	.50278
Differentiation of self from fetus	3.6172	.76301
Role taking	3.7103	1.06027
Attribution of characteristics	3.3563	.68342
Interaction with fetus	2.7834	.95612

Table 2 reveals that among five domains of maternal fetal attachment scale, giving of self had highest mean score (4.3076±.50278) and interaction with fetus had lowest mean score (2.7834 ±.95612).

Table 3: Overall Maternal Fetal Attachment Level of Respondents (n=145)

Maternal fetal attachment	Frequency	Percentage
High	117	80.70
Low	28	19.30

Table 3 shows that the majority of respondents (80.70%) exhibited high maternal-fetal attachment levels while a smaller portion (19.3%) demonstrated low attachment levels.

Table 4 highlights significant associations between maternal-fetal attachment levels and respondents' age (0.03) as well as the education status of both the respondents (<0.01) and their husbands (<0.01).

Table 4: Association of Socio-demographic Characteristics with Maternal Fetal Attachment Level

Variables	Attachment level		χ2	p-value
	Low(n=28)	High(n=117)		
Respondent Age (years)				
≤20	12	19		
21-25	13	59	11.551	0.03*
≥26	3	39		
Residence				
Rural	16	40		
Urban	12	77	5.022	0.25
Respondent`s Education				
Basic	14	20		
Secondary	12	65	17.342	0.01*
Higher or above	2	32		
Respondent`s Husband Education				
Basic	11	15		
Secondary	12	62	10.753	0.01*
Higher or above	5	40		
Respondent's Occupation Status				
Non-service	17	56	1.493	0.22
Service	11	61		
Income Status				
< 30000	19	47	7.622	0.06
≥30001	9	70		

*Chi-square test p-value at <0.05**

Table 5: Association of Obstetric Characteristics with Maternal Fetal Attachment Level

Variables	Attachment level		χ2	p-value
	Low(n=28)	High(n=117)		
Status of Pregnancy				
Planned	19	96		
Unplanned	9	21	2.774	.096
Trimester Pregnancy				
Second	15	46		
Third	13	71	1.884	.170
First ANC Visit				
< 3 months	20	66		
≥ 4 months	8	51	6.343	0.01*
Quickening				
0-4 months	14	53		
5-7 months	14	64	.201	.654
Total USG				
1-4 times	27	91		
5-8 times	1	26	5.186	.023
Emotional Status after USG				
Positive	16	111		
Mix feeling	12	6	34.318	0.01*
Feeling regarding Pregnancy				
Positive	10	99		
Mixed	18	18	31.633	0.01*

Chi-square test p-value at (<0.05)*

Table 5 reveals significant associations (<0.01*) between maternal-fetal attachment levels and the timing of the first ANC visit, emotional status after ultrasound and feelings regarding the current pregnancy.

Table 6: Association of Family Support with Maternal Fetal Attachment Level

Variables	Attachment level		χ2	p-value
	Low(n=28)	High(n=117)		
Spouse Togetherness				
Living with spouse	26	107		
Spouse is in abroad	2	5	1.587	.452
Spouse out of town	0	5		
Satisfaction of Marriage				
Satisfied	24	108		
Mixed	4	9	1.789	.409
Support Person for Pregnancy				
Husband	14	65		
Husband and in laws	5	19	.285	.867
Others	9	33		
Satisfaction with Support				
Satisfied	18	112		
Mixed	10	5	28.728	0.01*

Chi-square test p-value at (<0.05)*

Table 6 indicates that a significant association (<0.01*) was observed between maternal-fetal attachment and satisfaction with support.

DISCUSSION

In this study, the majority of respondents (73.8%) were aged 21-30 years, with 61.44% residing in urban areas and 53.12% identifying as janajati; 61.42% were Hindu and 80.72% came from joint families. Most participants (76.5%) had secondary or higher education, and 50.32% were homemakers with 88.30% conceiving naturally and 79.30% having planned pregnancies. Among the respondents, 42.12% were in their second trimester and 57.84% were in their third trimester; 87% expressed positive feelings about their pregnancies. Additionally, most respondents lived with their husbands, reported satisfaction with their marital status and 90.00% were content with their support system primarily provided by their husbands during pregnancy.

The study found that among the five domains of maternal-fetal attachment, “giving of self” and “role-taking” received the highest scores (4.31 and 3.71) while “interaction with fetus” had a lower mean score (2.78), likely reflecting the mother’s tendency to prioritize sacrifice for her child.

Similar findings have been reported in various studies conducted in Iran, where the highest scores were observed in the “role-taking” domain and the lowest in “interaction with the fetus”.[1, 11, 13, 44] the lower scores in this domain may be due to mothers’ concerns about harming the fetus or feelings of shyness and discomfort in expressing such behaviors.

Maternal role-taking is a developmental stage in a woman’s life results obtained in Canada[32] and USA[24] study. It is interesting to note the subscale of interaction with the fetus was the low in Cranley study.[9] Mothers at an early stage of pregnancy did not perceive the reality of the unborn baby. The primigravida mothers were confused about interaction with the unborn child because they were confusion in fetal movements and activities.[9, 20]

In this study, 80.70% of respondents reported high maternal fetal attachment, while 19.30% reported low attachment with most participants (73.8%) being young and over 76% educated at or above the secondary level. This high attachment level indicates excitement about motherhood and suggests that education plays a crucial role in enhancing maternal-fetal attachment by reducing pregnancy-related stress. The findings align with a similar study in India [21] where 82% reported strong attachment, but contrast with a study in Iran showing 65.6% attachment and another in Denmark with low attachment levels below 72%.[15]

The overall mean score of maternal-fetal attachment in this study was 85.32 (±0.594), which aligns with findings from a similar study in India[23] (87.4 ± 10.1) but is lower than another study reporting a mean score of 90 (±10.3).[1] and 95.9 (± 8.9) was found in a study conducted in Iran.[43]

The study revealed that first-time pregnant Nepali women had lower maternal-fetal attachment scores than reported elsewhere, likely due to younger marriage and pregnancy ages, lower education levels, and cultural hesitance to express maternal roles. This suggests that their limited understanding of pregnancy and motherhood may contribute to the discrepancy compared to women in other countries.[46]

The study identified a significant association ($p < 0.03$) between age and maternal-fetal attachment revealing that most young respondents (73.8%) were excited about motherhood while those over 30 also expressed enthusiasm; it highlighted that higher education levels correlate with stronger attachment supported by studies from Iran [3, 20 42], Sweden [39] and the USA [40] which note that maternal and partner age are critical factors influencing prenatal attachment.

The study revealed a significant association ($p < 0.03$) between education level and maternal-fetal attachment, likely due to the respondents’ higher educational attainment influencing their perceptions of pregnancy. Similar findings were reported in studies from Denmark[15], Iran[43], and

Turkey[44] indicating that higher education positively correlates with maternal fetal attachment levels. On contrary to this study result, conducted in India identified no significant association of age and education level.[21, 23]

The study revealed a significant association between the timing of the first antenatal care (ANC) checkup and maternal-fetal attachment levels, with first-time mothers experiencing heightened emotions and expectations during this visit. This finding is consistently supported by similar studies conducted in Egypt [30] and India. [23]

The study revealed a significant link between maternal-fetal attachment and emotions after an ultrasound with first-time mothers experiencing heightened excitement from seeing and hearing their baby's heartbeat, making the ultrasound experience particularly impactful. Supporting research from Australia[6]the Netherlands[10] and Germany[42] further confirms that ultrasounds positively influence maternal-fetal attachment.

The study found a significant association between family support and maternal fetal attachment levels highlighting social support as a key determinant of maternal health consistent with findings from Denmark[15],[18] India[23],Egypt[30], Iran[1], the USA[16], Australia[7] and Italy[40] which all noted positive correlations between perceived social support and maternal fetal attachment.

CONCLUSION

The study revealed that the majority of respondents (80.7%) exhibited a high level of maternal-fetal attachment, with an overall mean score indicating strong attachment. Among the five domains, "giving of self" had the highest mean score, while "interaction with the fetus" scored the lowest, suggesting variations in how expectant mothers express attachment during pregnancy. Factors like age, education, ANC checkups, and family support were linked to stronger maternal-fetal attachment, though the hospital-based setting and use of convenience sampling limit the generalizability of the findings to the broader population. The study highlights the importance of both maternal mental and physical health, emphasizing the need for midwifery care to place greater focus on the psychological aspects of pregnancy.

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