

## Original Article

# Maternal and Fetal Attachment before Birth: Trends in Pregnant Women of Urban Karachi.

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## Abstract

**Background:** Maternal-fetal attachment is a multidimensional phenomenon and product of diverse physiological, psychological, and socio-emotional factors. The prenatal period is crucial in forming this bond and further predicts postnatal attachment.

**Methodology:** The present research was conducted using a cross-sectional survey design. Sixty-six participants filled out the survey regarding practices, perceptions, and attitudes toward maternal-fetal attachment after attending an online session on "Talking to the Baby in the Womb."

**Results:** Analysis revealed that participants talk to their baby in their tummy. Wondering when the baby starts thinking, feeling, and hearing within also aids in forming a maternal-fetal relationship. A statistically significant difference ( $p=0.013$ ) was found between HCP and PW in terms of attitude towards feeding the baby and perception of a mother giving up on the baby ( $p=0.04$ ).

**Conclusion:** The following research allows us to study the differences in the practices between healthcare providers and pregnant women so that interventions can be designed accordingly.

## Keywords

Maternal-Fetal Attachment, Postnatal Attachment, Health Care Provider, Pregnant Women.

## Introduction

The attachment theory between a mother and her child is well-discussed in literature. It has been described differently; John Bowlby reviewed it as "a set of internal behaviors that would cause the infant to become closely related to his/her main caregiver, who is usually the mother"<sup>1</sup>. Cranley discussed it further as the "extent" of a pregnant woman's behavior that influences her affiliation with the unborn child<sup>2</sup>. Maternal Fetal Attachment (MFA) is a concept that describes how a fetus develops an affiliation with its mother as it grows inside her womb. It further discusses that the gestational period and the transition of a woman to motherhood is a significant time for developing her relationship with the unborn child<sup>3</sup>. The strength of this attachment may vary depending on the care and response shown by the mother throughout her pregnancy. Other factors, such as nationality, culture, mental health, and psychosocial conditions of the mother, have also been shown to play a role in developing this relationship<sup>4</sup>.

Establishing a healthy bond during the prenatal period is critical for strong postnatal attachment<sup>5</sup>. It also contributes to the child's physical and emotional well-being and helps the woman transition to motherhood<sup>6</sup>. The importance of MFA has become a topic of focus, especially for healthcare professionals, in their quest to aid mothers in healthy interactions with their unborn children. This study aims to review the prevailing literature on MFA and the factors influencing it so that evidence-based psychosocial interventions can be introduced to facilitate this bond.

Although an abstract concept, Maternal Fetal Attachment is being studied, and scales have been developed to measure it. Cranley's Maternal-Fetal Attachment Scale (MFAS) is a widely used tool based on five subscales; role taking, differentiation of self from the fetus, interaction with the fetus, attributing characteristics to the fetus, and giving of self<sup>7</sup>. These domains are divided into 24 questions and rated from one to five. The total score ranges from 24 to 120, with a higher number depicting a greater degree of attachment<sup>8</sup>.

Using MFAS, Mina Delavari et al. studied the relationship between postpartum depression (PPD) and maternal-fetal attachment. The participant's scores were high (with a mean score of 90), and the study showed an inverse relation between PPD and MFA<sup>9</sup>. However, some other studies have shown no significant relationship between the two<sup>10</sup>. The participants scored highest in the "role-taking" domain and lowest in "interaction with the fetus," which is consistent with the previous studies<sup>11</sup>.

Another study explored how women respond to their routine antenatal ultrasounds. The women in the intervention arm were assigned ultrasound consultation with detailed counseling on fetal development after their routine antenatal checkup. The results showed a positive increase in MFAS and a reduced state anxiety score<sup>12</sup>. This study is important to highlight the significance of an ultrasound scan on a woman's emotional and intimate connection with the unborn child.

These studies and others significantly add to our knowledge of maternal-fetal attachment. Their findings are important in developing an intervention to help mothers build a strong bond with their fetuses, which can be incorporated into routine antenatal care given by healthcare workers.

## Methodology

The participants registered for the online workshop were asked to participate in the survey. There were 66 participants; 45 returned the survey with completed responses, with 40% (18/45) being healthcare providers and 60% (27/45) pregnant women.

During COVID-19, our hospital offered free online parenting education covering various topics about child development, so we chose these participants because they were easier to reach. The data was collected at the end of the workshop, where participants were requested to take part in the research survey and complete the link provided for the Google form. The maternal-fetal attachment scale was used<sup>13</sup>, containing 24 items exploring how mothers and caregivers perceive maternal and fetal engagement constructs.

The study was conducted with a cross-sectional survey design, and the data was collected using an online survey method. The participants were requested to become part of the survey as the participants attended the one-day online training session designed on the topic "Talking to The Baby in The Womb" on 18<sup>th</sup> July 2020.

The analysis of data was conducted using the SPSS version 19.0. Frequency and percentage were computed for categorical variables and analyzed by chi-square or Fisher exact test. Median and IQR computed for practice, perception, and attitude score and presented in box and whisker plots. The Mann-Whitney U test compared the median scores between health care and pregnant women. Statistical significance was accepted as  $p < 0.05$ .

The Aga Khan University Hospital in Karachi granted the study an ethical review committee (ERC) exemption with the number 2021-5887-15504.

## Results

The following research comprised 66 participants. 45 of 66 participants (68.2%) returned the survey questionnaire with complete responses regarding the practices, perceptions, and attitudes of maternal and fetal attachment before birth. Out of these 45 participants, 18(40%) were healthcare providers (HCP), and 27(60%) were pregnant women (PW).

The practices-related responses of the participants are tabulated in table 1. 80% of the participants responded positively about talking with an unborn baby to increase maternal-fetal bonding, and almost 78% mentioned how they "enjoy watching tummy jiggle as baby kicks." No significant difference in responses was observed between HCP and PW regarding talking to the baby and enjoying watching the tummy jiggle as the baby kicks. Almost 65 to 69% of the participants had already decided on the name and nickname of the unborn baby. The proportion of responses regarding the name and nickname of the unborn baby was not statistically significant between the two HCP and PW.

Additionally, more than 90% of the participants were concerned about the baby's diet and health, so they preferred to eat meat and vegetables as well as walk or work to stay healthy in an attempt to develop a healthy relationship with the fetus. An insignificant difference was seen between HCP and PW regarding adopting a healthy lifestyle. Responses regarding grasping a baby's foot to move it around were infrequent (Apex. 20-22%), whereas 50% to 70% of respondents reported giving up many things to help their newborn baby.

The proportion difference of these concerns was again statistically insignificant between the HCP and PW cohorts.

**Table 1: Comparison of responses of healthcare providers and pregnant women regarding practices.**

Questions Regarding Practices		Healthcare Provider (n=18)	Pregnant Women (n=27)	p-value
<b>Talk to my unborn baby</b>	Definitely No	1(5.60)	-	0.07
	No	2(11.10)	-	
	Uncertain	4(22.20)	2(7.40)	
	Yes	4(22.20)	14(51.90)	
	Definitely Yes	7(38.90)	11(40.70)	
<b>Enjoy watching tummy jiggle as baby kicks</b>	Definitely No	1(5.60)	-	0.64
	No	-	-	
	Uncertain	3(16.70)	6(22.20)	
	Yes	6(33.30)	9(33.30)	
	Definitely Yes	8(44.40)	12(44.40)	

<b>Refer to the baby by the nickname</b>	Definitely No	2(11.10)	-	0.32
	No	1(5.60)	5(18.50)	
	Uncertain	2(11.10)	4(14.80)	
	Yes	7(38.90)	11(40.70)	
	Definitely Yes	6(33.30)	7(25.90)	
<b>Decided on a name</b>	Definitely No	1(5.60)	-	0.09
	No	2(11.10)	6(22.20)	
	Uncertain	1(5.60)	6(22.20)	
	Yes	6(33.30)	11(40.70)	
	Definitely Yes	8(44.40)	4(14.80)	
<b>Do things to stay healthy.</b>	Definitely No	1(5.60)	-	0.34
	No	-	1(3.70)	
	Uncertain	-	2(7.40)	
	Yes	8(44.40)	15(55.60)	
	Definitely Yes	9(50.00)	9(33.30)	
<b>I eat meat and vegetable to be sure my baby gets a good diet</b>	Definitely No	1(5.60)	-	0.36
	No	1(5.60)	-	
	Uncertain	-	1(3.70)	
	Yes	6(33.30)	13(48.10)	
	Definitely Yes	10(55.60)	13(48.10)	
<b>I poke to get him/her to poke back</b>	Definitely No	1(5.60)	3(11.10)	0.61
	No	4(22.20)	2(7.40)	
	Uncertain	4(22.20)	9(33.30)	
	Yes	6(33.30)	8(29.60)	
	Definitely Yes	3(16.70)	5(18.50)	
<b>I stroke my tummy to quiet baby</b>	Definitely No	2(11.10)	3(11.10)	0.64
	No	4(22.20)	5(18.50)	
	Uncertain	5(27.80)	7(25.90)	
	Yes	6(33.30)	6(22.20)	
	Definitely Yes	1(5.60)	6(22.20)	
<b>Give up doing things to help my baby</b>	Definitely No	3(16.70)	-	0.04
	No	4(22.20)	3(11.10)	
	Uncertain	4(22.20)	6(22.20)	
	Yes	4(22.20)	16(59.30)	
	Definitely Yes	3(16.70)	2(7.40)	
<b>I grasp the baby's foot to move it around</b>	Definitely No	2(11.10)	2(7.40)	0.93
	No	7(38.90)	9(33.30)	
	Uncertain	5(27.80)	11(40.70)	
	Yes	3(16.70)	4(14.80)	
	Definitely Yes	1(5.60)	1(3.70)	
<b>I give up a lot of things because I want to help my baby</b>	Definitely No	2(11.10)	-	0.18
	No	2(11.10)	1(3.70)	
	Uncertain	2(11.10)	6(22.20)	
	Yes	8(44.40)	17(63.00)	
	Definitely Yes	4(22.20)	3(11.10)	
	Definitely No	3(16.70)	2(7.40)	0.68

<b>I grasp my baby's foot through my tummy to move it around</b>	No	5(27.80)	11(40.70)
	Uncertain	5(27.80)	9(33.30)
	Yes	2(11.10)	3(11.10)
	Definitely Yes	3(16.70)	2(7.40)

Perceptions of participants regarding fetal-maternal bonding are reported in table 2. More than 90% of the participants responded that they wonder if a baby can hear, think and feel inside the womb. Almost 67% of the participants said they wondered if the baby felt cramped inside. 42% of participants perceived that baby kicking means that he/she wants food. Out of 45 participants, 51% of the participant's perceptions were uncertain regarding the "baby has hiccoughs." Moreover, 53% never perceived their baby as ugly. No statistically significant difference was found between the two cohorts in terms of perceptions regarding maternal-fetal bonding.

**Table 2: Perceptions related to fetal-maternal bonding.**

Perceptions related Questions	Participants Responses (n=45)				
	Definitely No	No	Uncertain	Yes	Definitely Yes
<b>Feel the trouble of being pregnant is worth it</b>	1(2.2)	3(6.7)	7(15.6)	14(31.1)	20(44.4)
<b>Wonder if the baby feels cramped in there</b>	1(2.2)	6(13.3)	8(17.8)	16(35.6)	14(31.1)
<b>Wonder if the baby can hear inside</b>	1(2.2)	1(2.2)	1(2.2)	25(55.6)	17(37.8)
<b>Wonder if the baby thinks and feels inside</b>	1(2.2)	-	1(2.2)	27(60.0)	16(35.6)
<b>Baby kicks to tell me it is eating time</b>	1(2.2)	7(15.6)	18(40)	13(28.9)	6(13.3)
<b>Can tell the baby has hiccoughs</b>	5(11.1)	8(17.8)	23(51)	7(15.6)	2(4.4)
<b>Feel my baby is ugly</b>	10(22.2)	14(31.1)	12(26.7)	7(15.6)	2(4.4)

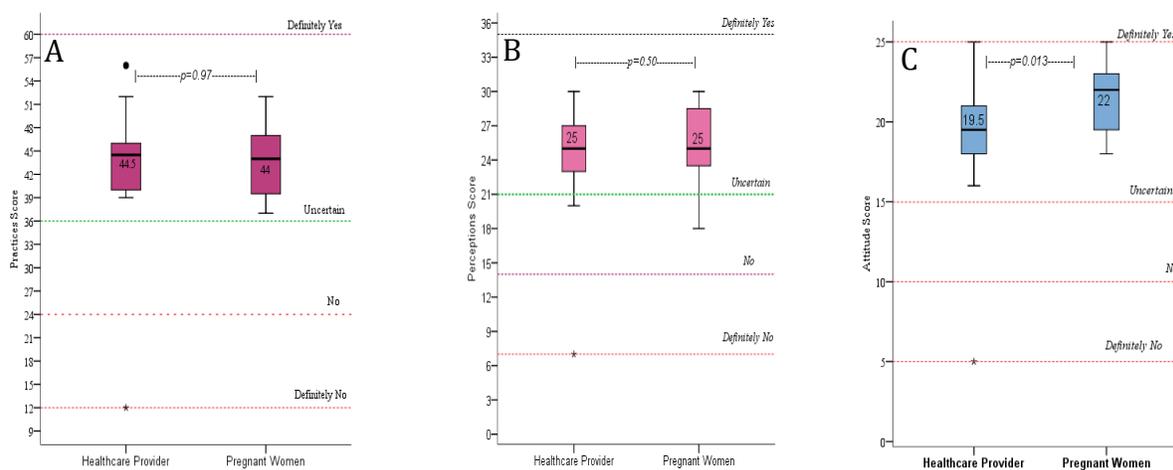
Almost 60% to 95% of the responses elicited positive attitudes regarding feeding the baby, the features of the baby, taking care of the baby, guessing the baby's personality, and showing great enthusiasm when it comes to holding the baby. A comparison of attitude responses between HCP and PW is presented in table 3 to conclude that a statistically significant difference was found between the responses of PW and HCP regarding attitude regarding feeding the baby.

**Table 3: Comparison of responses of healthcare providers and pregnant women regarding the attitude.**

Questions regarding the attitude	Healthcare Provider (n=18)	Pregnant Women (n=27)	p-value	
<b>Picture myself feeding baby</b>	Definitely No	2(11.1)	-	
	No	4(22.2)	-	
	Uncertain	4(22.2)	4(14.8)	0.013
	Yes	6(33.3)	13(48.1)	
	Definitely Yes	2(11.1)	10(37.0)	
<b>Looking forward to seeing how the baby look</b>	Definitely No	1(5.6)	0.15	
	No	-		-

<b>Imagine myself taking care of the baby.</b>	Uncertain	1(5.6)	-	0.18
	Yes	7(38.9)	6(22.2)	
	Definitely Yes	9(50.0)	21(77.8)	
	Definitely No	1(5.6)	-	
	No	2(11.1)	-	
	Uncertain	-	-	
<b>Can you guess what my baby's personality will be</b>	Yes	8(44.4)	15(55.6)	0.07
	Definitely Yes	7(38.9)	12(44.4)	
	Definitely No	1(5.6)	-	
	No	1(5.6)	1(3.7)	
	Uncertain	1(5.6)	11(40.7)	
	Yes	10(55.6)	12(44.4)	
<b>Can hardly wait to hold the baby</b>	Definitely Yes	5(27.8)	3(11.1)	0.21
	Definitely No	1(5.6)	-	
	No	2(11.1)	-	
	Uncertain	2(11.1)	2(7.4)	
	Yes	6(33.3)	8(29.6)	
	Definitely Yes	7(38.9)	17(63.0)	

Comparison of a median score of practice, perception, and attitude between the health provider and pregnant women about fetal-maternal bonding is not statistically significant, as illustrated by box and wicker plots (figure 1 A-C).



**Figure 1: Comparison of the median practice score, perception, and attitude between the health provider and pregnant women about fetal-maternal bonding.**

## Discussion

The current research findings provide directions for evidence-based practices in the future. Analysis revealed that 80% of the participants talk to their unborn baby as a practice to increase the mother-fetal relationship, followed by 78% who enjoy their tummy jiggle as their baby kicks.

This outcome can be backed up by several researchers from different countries who studied pregnant women and found that as the baby develops throughout pregnancy, the bonding quality between mother and child strengthens<sup>14,15</sup>. Furthermore, investigations also revealed that healthy women with uncomplicated pregnancies felt that fetal movement counting improved the mother-fetal bond<sup>16,17</sup>. Pregnant women are particularly interested in how their child develops emotionally and physically inside them, and their bond becomes stronger as soon as they begin to sense this growth<sup>18,19</sup>.

Even though there is no significant difference between the two cohorts, HCP and PW, when it comes to taking initiatives to promote mother-fetal bonding, PW indicated a higher inclination (59.3%) to give up doing things for their babies than HCP (22.2%). A thorough assessment of numerous studies indicated that only a handful of studies identified an association between educational level, occupation/employment, and income. About half of the research indicated that having a higher educational level, working or studying, and higher income level were all linked with better mother-fetal bonding<sup>20,21</sup>. In contrast, the other half found the opposite: unemployment and education level were allied with the better mother-fetal connection. All of the above-mentioned demographic characteristics had poor reported relationships<sup>22,23</sup>.

Additionally, participants' perception regarding fetal-maternal bonding was the second factor tapped. Results showed that 60% of women ponder if their kid can think and feel within, while 55.6% wonder if the baby can hear. The comparison of HCP and PW perception responses and the median perception score on fetus-

maternal bonding appeared to be statistically insignificant. The use of ultrasound in the perception of fetal-maternal attachment is critical<sup>24,25</sup>. According to studies, ultrasonography allows moms to feel and connect with their babies, which positively affects the mothers' perception of their children<sup>26,27</sup>. The strategy allows mothers to manage their curiosity about their baby's thinking, feeling, and hearing abilities, resulting in a stronger mother-fetal attachment<sup>28,29</sup>.

Moreover, 44.4% of our study participants considered the stress of being pregnant worth it. Interview data from moms and one soon-to-be mother, who described pregnancy as a time when they had little control over their bodies, is included in the supporting inquiry. This small jurisdiction was painful for some, while other women cherished their pregnancies for the same reason and deemed it "worth it"<sup>30,31</sup>.

Women's attitudes toward fetal-maternal bonding and pregnancy were also investigated in this study. These constructs elicited a generally good response from participants. Pregnant women exhibited a more optimistic attitude than healthcare workers, as seen by the median ratings. There was a statistically significant difference between the two cohorts when it came to seeing oneself feeding the baby. Only 11% of HCP agreed with this assertion, compared to 37% of PW<sup>32,33</sup>. According to studies, the number of women employed full-time and breastfeeding their infants was lower than that of women who were unemployed<sup>34,35</sup>. Before six months, full-time employment significantly negatively affected the probability of maintaining breastfeeding for 6 months<sup>36</sup>. As a result, when it came to visualizing oneself feeding the baby, there was a statistically significant difference between HCP and PW.

The limitation of this study was that there was very less information available for the young mothers. There is very limited access to the resources that may help them understand the importance of maternal-fetal attachment. Furthermore, traditional malpractices act as a barrier to maternal-fetal attachment. Due to this, this topic is not vitally accepted and discussed by physicians

and obstetrics patients. While conducting the research, the data was gathered through an online survey form, and no particular biases were registered in this study.

## Conclusion

The study showed that maternal-fetal attachment is a product of several factors. Pregnancy is crucial for developing this bond between the mother and her child, and establishing a strong bond has long-term implications that benefit both. Pregnant women employ distinctive practices to strengthen this bond during the prenatal period, which may include talking to the baby, eating a healthy diet, deciding their name and nickname, and thinking about the baby's postnatal care. Our study compares two distinct groups; healthcare providers and pregnant women from Karachi's general population. It allows us to study the differences in the practices between the two groups so that interventions can be designed accordingly.

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