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Andes pediatr. 2022;93(3):336-342
DOI: 10.32641/andespediatr.v93i3.3840

ORIGINAL ARTICLE

Paternal-fetal attachment from the maternal perspective

Vínculo prenatal paterno desde la perspectiva materna

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Received: May 24, 2021; Approved: November 3, 2021

What do we know about the subject matter of this study?

The study of prenatal paternal bonding is a recent area of research, which has become relevant due to its correlation with postnatal paternal bonding and its impact on the cognitive and socioemotional development of boys and girls.

What does this study contribute to what is already known?

This study shows that prenatal paternal bonding, from the maternal perspective, is fundamentally related to aspects of the parental relationship such as duration of the relationship, cohabitation, and early control and pregnancy planning.

Abstract

The study of Paternal-fetal attachment is a recent research area, which has become relevant due to its correlation with the postnatal paternal bond and its impact on the cognitive and socio-emotional development of the child. **Objective:** to characterize Paternal-fetal attachment, based on maternal perspective, in puerperal women treated in a public hospital in the Metropolitan Region. **Subjects and Method:** A cross-sectional observational study was carried out. Hospitalized puerperal women were interviewed by applying a questionnaire with sociodemographic variables of both parents. In addition, the Paternal-fetal attachment Scale from the maternal perspective was applied, previously adapted and validated. A descriptive and association analysis was performed to determine the behavior of the link indicator with respect to the sociodemographic variables. **Results:** The mean Paternal-fetal attachment score from the maternal perspective was 41.5 (range 10-50), which is significantly higher in cases where parents live together, the couple's relationship is longer than two years, and in planned and controlled pregnancies before twelve weeks. There were no differences in the Paternal-fetal attachment score from the maternal perspective in relation to the number of children, nationality, or educational level. **Discussion:** The Paternal-fetal attachment is mainly determined by characteristics of the parental relationship and not by the individual characteristics of the parents, therefore, the attachment must be seen from the triad.

Keywords:
Attachment;
Prenatal Care;
Parental Involvement;
Mental Health

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Edited by:
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How to cite this article: Andes pediatr. 2022;93(3):336-342. DOI: 10.32641/andespediatr.v93i3.3840

Introduction

The active presence of the father favors the development of children in several areas. Research has shown that an adequate father-child bond is associated with fewer behavioral problems in boys and girls, as well as high sociability and adequate cognitive development[1]. These results seem to support the importance of recognizing and studying the father-child bond from early stages.

In 1969, John Bowlby conceptualized attachment as a process of reciprocal behaviors initiated by the newborn to ensure survival[2]. Years later, he added to his position psychological aspects from the developing child and mother[3].

In 1982, Lumley conceptualized prenatal attachment as a "relationship established with the fetus in the imagination", interpreting that the late recognition by mothers of their fetuses as real children was related to unpleasant pregnancy symptoms and lack of interest or support from their partners[4]. From a behavioral perspective, Cranley defined, in 1981 maternal-fetal bonding as "the extent to which women engage in behaviors that represent an affiliation and interaction with their unborn child "[5]. In 1997, Muller and Condón defined prenatal bonding as "the emotional bond that normally develops between the pregnant mother and her unborn child"[6].

The concept of bonding has been extended over the years to the father-child relationship and progressively to the prenatal stage. This development has gone hand in hand with sociological changes, such as the inclusion of the father in parenting, which has been studied by several disciplines and authors[7]. With the growing interest in the male transition to fatherhood, both Cranley and Condón hypothesize that, complementary to the maternal-fetal bond, there is a paternal-fetal bonding process[2]. Cranley expresses his hypothesis through the development of the "Paternal Fetal Attachment Scale"[8]. In the same line, Condón in 2013, demonstrated the continuity of the father-fetal bond during pregnancy with the postnatal paternal bond at 6 and 12 months of the child's life[9], showing the effect of the bond in the antenatal stage on the socioemotional development of children, and highlights that both the paternal-fetal bond and the quality of the couple's relationship are the two most powerful influences on the father-baby bond at 6 and 12 months after birth[9].

Despite that prenatal paternal bonding is a little-studied topic, in our country in Maternity Services, efforts have been made to investigate the prenatal paternal bond. Thus, in 2017, Guzmán published and validated the *Escala de Percepción Materna del Vínculo Prenatal Paterno* (Maternal Perception of Prenatal Paternal Bonding Scale)[10] for the Chilean population. From that study, this research is aimed at characterizing the Prenatal Paternal Bonding, from the maternal perception, in postpartum women seen in a public health hospital, in November 2020.

Subjects and Method

Cross-sectional observational study with 238 postpartum patients hospitalized during the postpartum period at the Puerperium Unit of the *Hospital Dr. Sótero del Río*, corresponding to the total number of deliveries during November 2020. The calculation of the sample of 174 patients selected by convenience, was obtained from the average number of deliveries that occurred in November during the last four years in mothers over 18 years of age, obtaining an estimate with 95% confidence and a 5% margin of error. The exclusion criteria previously established were age less than 18 years, clinical symptoms incompatible with life for the newborn reported by the treating physician, pathology of the mother that prevents her from answering the survey reported by the treating physician, and mother with a current psychiatric disorder diagnosed by a professional, since studies have shown that maternal depression during pregnancy can interfere negatively in the prenatal bond and the assessment of the emotional experience of pregnancy[11-12]. Six underage patients and one patient with a current psychiatric disorder diagnosed by a professional were excluded, as well as 57 patients who did not want to participate in the study due to personal reasons.

The research was approved by the Scientific Ethical Committee of Health Sciences of the Pontifical Catholic University of Chile and the Scientific Ethical Committee of the Southeast Metropolitan Health Service. All the patients participating in the sample signed an informed consent form.

The method of data collection was a questionnaire applied face-to-face by two medical professionals. The questionnaire consists of two parts, the first part on sociodemographic and relational variables and the medical history of the mother and father of the newborn; the second part consists of the modified Maternal Perception of Prenatal Paternal Bonding Scale (PeMViPP)[10], which considers 10 questions on support and/or containment and interaction with the child, with Likert-type response (always, almost always, sometimes, almost never, never), each scored from 5 to 1, respectively. Thus, the score can fluctuate between 10 and 50 points; the higher the score, the greater the perception of paternal bonding.

This scale was adapted from the original validated in Chile[10]; a confirmatory factor analysis was performed to ratify the unidimensionality of the scale, obtai-

ning an RMSEA of 0.07986 (0.05;0.11). This value can be interpreted as a good fit[13], which is consistent with the scale developed by Guzmán[10]. Cronbach's alpha is a measure of internal consistency of the scale, which is also used as a measure of reliability. This study obtained a value of 0.83, indicating that the items constitute a reliable scale and can measure the same construct[14].

A descriptive analysis of the variables under study and of the association was performed to determine the behavior of the bonding indicator regarding the parity of both parents, schooling, length of the couple's relationship, pregnancy planning, accompaniment of the father at delivery, age of the parents, living with the father of the newborn, nationality, and start date of pregnancy control.

Results

Table 1 details the sociodemographic characteristics. The mean age was higher in fathers than in mothers (30.5 years vs 28.1 years); and regarding both parents, most were of Chilean nationality, with similar educational level, and mostly without chronic diseases.

Table 2 shows the characteristics of the pregnancy and recent delivery. It stands out that 95 (54.6%) pregnancies were unplanned out of 174 cases surveyed and 22 (12.6%) of the newborns required hospitalization after delivery.

At the time of the survey, 83.9% (n = 146) of the postpartum patients were living with the father of their child. 53.4% (n = 93) of the women reported a relationship with the father of their child longer than 5 years, and 1.7% (n = 3) reported that there was no relationship with the father of their child. Also, 97.1% (n = 169) of the postpartum patients recognized the father of the newborn as the father figure of their child.

Table 3 shows the responses obtained in the modified Maternal Perception of Prenatal Paternal Bonding Scale and the percentage of responses obtained in each question (always, almost always, sometimes, almost never, never). The mean paternal bonding score from the maternal perspective was 41.5 (SD: 8.9); with a range of 10-50. Figure 1 shows the comparative results. In this study, it is evident that the paternal prenatal bonding score from the maternal perspective is significantly higher in cases where the parents have been in a couple relationship for more than two years versus two or less years of relationship (43.2 vs 35.1). Other variables showing higher bonding scores, in a statistically significant way, were pregnancy planning versus cases of unplanned pregnancy (43.7 vs 39.7), cohabitation of both parents versus parents not living together (43.7 vs 30.3), and pregnancy control before 12 weeks of gestation versus control after 12 weeks (42.2 vs 40.3). In this sample, there were no statistically significant differences in the measurement of total bonding according to the variables age of the parents, maternal or paternal parity, schooling of the parents, nationality of the parents, or father's company during delivery.

Discussion

To our knowledge, this is the first Chilean study that investigates in a sample of postpartum women in the public health system the prenatal bonding of the father from the maternal perception. The sample obtained is similar in its sociodemographic characteristics to the study by Guzmán[10], except for the report of chronic diseases of the mothers which was lower, the percentage of vaginal deliveries which was higher, and the report of unplanned pregnancies which was also higher. Similarly, the instrument applied was shown to be psychometrically robust for its application.

The initiative to investigate paternal bonding from the maternal perspective is supported by several studies that show that the importance given by the father to paternity and prenatal paternal involvement is influenced by the mother's opinion of paternal competence[15]. In addition, prenatal paternal bonding is related to direct interaction with the fetus, but also behaviors of support and containment of the mother because she is the one who holds the fetus. Some scales measure prenatal paternal bonding directly with the father, but they have not been validated in Latin America[8-16].

In Turkey, a study to compare prenatal maternal and paternal bonding, which used Cranley's prenatal paternal bonding scale as a measurement instrument, showed higher scores for both maternal and paternal bonding in planned pregnancies compared with unplanned ones. Also, it noted that scores on paternal prenatal bonding were negatively related to an older age of the father and previous experience of fatherhood[17]. Guzmán's data show that planned pregnancy is a variable associated with prenatal paternal bonding from the maternal perspective, but not with parity, schooling, or length of relationship with the partner[10]. Our study agrees with the above in that planned pregnancy is a variable that has a favorable influence on prenatal paternal bonding[10-17], as does the length of time in a couple's relationship, but not the age, schooling, nationality, or parity of the parents. Also noteworthy is the association observed with the length of time the parents have lived together for more than two years and pregnancy planning.

This is related to the findings of Copin in 1998, who found a significant impact on the paternal and maternal prenatal bonding scores according to the quality of the couple's relationship[18]. These data reflect that

Table 1. Sociodemographic characteristics of the parents (n = 174)

	Mother	Father
Age (years)		
Average	28.1	30.5
Minimum	18	18
Maximum	44	50
Nacionality	n (%)	n (%)
Chilean	151 (86.8)	152 (87.4)
Venezuelan	8 (4.6)	9 (5.2)
Haitian	6 (3.4)	6 (3.4)
Other nationalities	9 (5.1)	7 (4.0)
Parity	n (%)	n (%)
1 delivery	55 (31.6)	62 (35.6)
2 deliveries	59 (33.9)	60 (34.5)
3 deliveries	42 (24.1)	32 (18.4)
4 deliveries or greater	18 (10.3)	20 (11.5)
Educational level	n (%)	n (%)
Basic-level education	26 (14.9)	16 (9.2)
Mid-level education	89 (51.1)	87 (50.0)
Non-professional higher level education	32 (18.4)	46 (26.4)
Higher-level education	27 (15.5)	25 (14.4)
Chronic diseases	n (%)	n (%)
No conditions	159 (91.4)	166 (95.4)
Other conditions	15 (8.6)	8 (4.6)

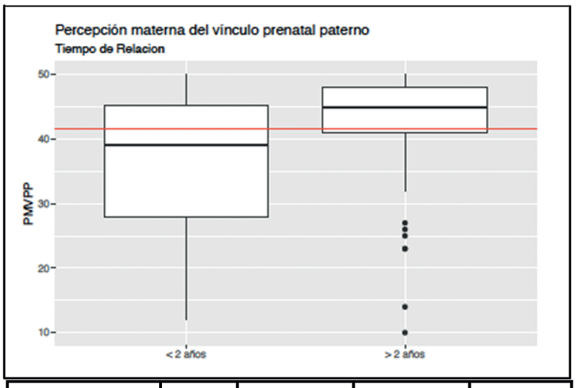
Table 2. Pregnancy and delivery characterization and descriptors (n = 174)

Variables	n (% total sample))
Pregnancy planification	
Non-planned	95 (54.6%)
Planned by both progenitors	75 (43.1%)
By either mother or father	4 (2.3%)
Prenatal visits starting date	
Before 12 weeks	110 (63.2%)
Between 12 and 20 weeks	48 (27.6%)
After 20 weeks	16 (9.2%)
Morbidity during pregnancy	
No morbidity	122 (70.1%)
With morbidity	52 (29.9%)
Mode of delivery	
Vaginal w/o forceps	104 (59.8%)
Urgent cesarean section	49 (28.2%)
Electuve cesarean section	21 (12.1%)
Company during delivery	
Newborn's parent	109 (62.6%)
No company	51 (29.3%)
Another companion	14 (8.0%)
Was hospitalization needed for the newborn?	
No	152 (87.4%)
Yes	22 (12.6%)

Table 3. Percentage of responses on the modified Maternal Perception of Paternal Prenatal Bond Scale

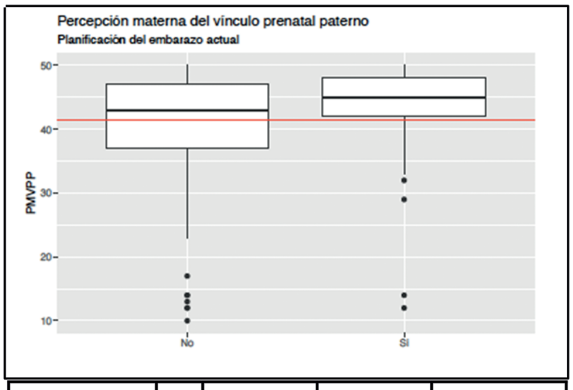
Questionaire	Never	Rarely	Some times	Usually	Siempre
1. During my pregnancy, home duties were distributed between my newborn's parent and I	9.8%	1.1%	10.9%	20.7%	57.5%
2. The newborn´s parent went with me to prenatal appointments and sonographic examination appointments	13.8%	4.6%	12.6%	23.6%	45.4%
3. The newborn's parent researched about our baby's growth and development	13.8%	5.7%	23.0%	12.6%	44.8%
4. The newborn's parent company during my appointments made me feel supported and accompanied	12.1%	0.6%	4.0%	7.5%	75.9%
5. During the pregnancy, my newborn's parent mentioned how they imagined our baby at birth	5.2%	1.1%	9.2%	7.5%	77.0%
6. The newborn's parent researched communication and contact methods we could use with our newborn	5.2%	1.1%	5.2%	15.5%	73.0%
7. During my pregnancy, when I had emotional problems, I felt that the newborn's parent tried to emotionally contain me	6.3%	2.3%	10.9%	14.9%	65.5%
8. I felt anguished and/or stressed during my pregnancy because of issues and problems with the newborn's father	51.7%	20.7%	15.5%	6.9%	5.2%
9. The newborn's parent showed concern during my pregnancy about my assistance to appointments, medication, nutrition, and attendance to healthy and smoke-free places	6.3%	0.6%	3.4%	6.3%	83.3%
10. Along with my partner, we made use of the written materials we received during our prenatal visits	20.1%	3.4%	20.1%	14.9%	41.4%

A. Parent relationship time



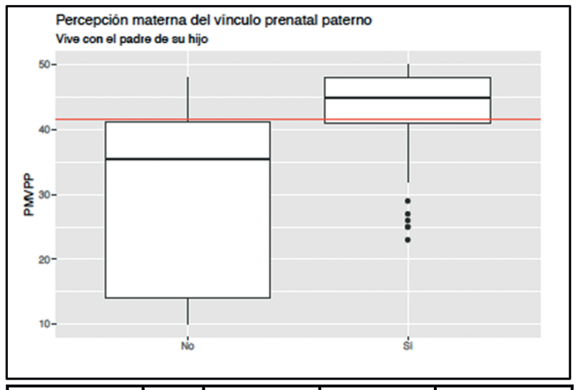
Category	n	Average MPPPB	E.D. MPPPB	P-Value
≤ 2 years	36	35.1	12.6	0.0002 ***
> 2 years	138	43.2	6.83	

B. Pregnancy lanning



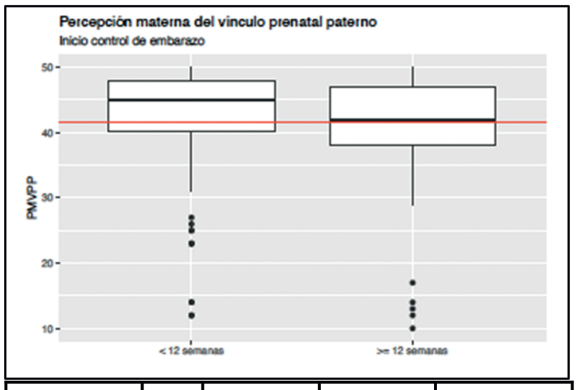
Category	n	Average MPPPB	E.D. MPPPB	P-Value
No	95	39.7	10.1	0.0053***
Yes	79	43.7	6.76	

C. Mother lives with father



Category	n	Average MPPPB	E.D. MPPPB	P-Value
No	28	30.3	13.3	0.0000***
Yes	146	43.7	5.74	

D. Initiation of gestational care



Category	n	Average MPPPB	E.D. MPPPB	P-Value
< 12 weeks	110	42.2	8.66	0.0341***
≥ 12 weeks	64	40.3	9.31	

Figure 1. Descriptive analysis in relation to the "bonding" indicator. MPPPB: Maternal perception of prenatal paternal bonding.

it is necessary to include the mother, the father, and their relationship to study and characterize prenatal bonding since only studying individual variables of the parents would be insufficient. Thus, co-parenting, defined as shared parenting, would require favoring these primary father-mother bonds, in order to include the child in a process of loving collaboration, which promotes a context of secure relationships that favor early child development[19-20]. This is a key protective role during the prenatal stage, although not exclusive to this period, as a moderator of adverse events that may be present or may occur and that favor toxic stress in the mother and fetus[21-22].

In this sample, the PeMViPP showed that the mother in general perceived little stress associated with a poor relationship with the father (72.4%). The mother most frequently perceived indirect support from the father through showing concern about ma-

ternal health care in relation to the fetus (question 9); while those questions that are of direct support, such as sharing household chores or accompanying the mother to check-ups, obtained lower scores. On the other hand, the direct interaction with the fetus by the father, according to the mother through the search for contact, imaginative processes, and search for information on the development of the fetus, was quite favorable. These aspects highlight the existence of cultural differences in relation to direct support for the mother, which, projected to the post-natal stage, should signal an overburden on the mother regarding home and health care, which has already been shown by studies that demonstrate gender aspects that mediate shared care, identifying differences between the care statement (we both take care) and the care actions themselves (overburden on the mothers)[23].

This study has some limitations related to the execution in times of the COVID-19 pandemic, which made it difficult to obtain the required sample size in less time; this is related to the decrease in the birth rate during 2020, being the year with the lowest figure since 1950[24]. Despite the context, it was possible to obtain a satisfactory number of patients surveyed. On the other hand, also related to the pandemic context, there may be information bias given that some questions of the scale that are related to accompaniment in check-ups and during childbirth may have been interfered by health restrictions. In addition, it is necessary to consider that the measurement of prenatal paternal bonding from the maternal perspective is a retrospective approach and that the information provided by the mother may be interfered by the emotional state of the puerperium. In addition, it is important to consider the selection bias in this study due to the voluntary participation of the puerperal mothers and that leads to not including the perception of mothers who did not want to participate (23.9% of the total sample). We can infer that a percentage of these mothers possibly do not maintain a satisfactory relationship with the father of the newborn, which could modify the results obtained in this study.

Prenatal bonding theory postulates that a unique relationship develops between fathers and fetuses long before birth[1]. From the evolution of the concept of prenatal paternal bonding, it is clear that it is a developing area of research, where the focus of the discussion is to understand in greater depth the relationship between both parents and the fetus in order to understand its repercussions and stimulate the development of early interventions that strengthen co-parenting as a protective factor for infant development.

This study, through the characterization of the prenatal paternal bond, calls for further research and intervention that motivates good physical and mental health practices during pregnancy and facilitates adaptation to the role of parenthood as a protective factor in the mental health of the child, and her/his mother and father. This theoretical approach focused on pregnancy is transversal to multiple disciplines and highlights the importance of mental health being analyzed in the social context.

Ethical Responsibilities

Human Beings and animals protection: Disclosure the authors state that the procedures were followed according to the Declaration of Helsinki and the World Medical Association regarding human experimentation developed for the medical community.

Data confidentiality: The authors state that they have followed the protocols of their Center and Local regulations on the publication of patient data.

Rights to privacy and informed consent: The authors have obtained the informed consent of the patients and/or subjects referred to in the article. This document is in the possession of the correspondence author.

Conflicts of Interest

Authors declare no conflict of interest regarding the present study.

Financial Disclosure

Authors state that no economic support has been associated with the present study.

Aknowledgments

To Gonzalo Guzmán Salas, who provided the Scale and his knowledge to advance in this area of research.

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