



Original article

The perception of parental bonding in pregnant adolescents and its association with generalized anxiety disorder

Mariana Bonati de Matos*, Carolina Coelho Scholl, Jéssica Puchalski Trettim, Mariane Lopez Molina, Mariana Carret Soares, Fernanda Teixeira Coelho, Rochele Dias Castelli, Ricardo Azevedo da Silva, Karen Amaral Tavares Pinheiro, Fábio Monteiro da Cunha Coelho, Luciana de Avila Quevedo, Ricardo Tavares Pinheiro

Postgraduate Programme in Health and Behavior, Catholic University of Pelotas (UCPel) - Gonçalves Chaves, 377 - 411 C - CEP: 96015-560 Pelotas, RS Brazil

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ABSTRACT

Background: The parental bonding is influenced by two dimensions: care and control or protection over the child of both parents. The lack of care during childhood may make the individual more susceptible to the onset of psychiatric disorders when adult. These psychiatric disorders when present during pregnancy may have a negative impact on the health of pregnant women and children. The aim of this study was to assess the association between generalized anxiety disorder (GAD) in pregnant adolescents and the perception of parental bonding.

Methods: This is a cross-sectional study with 871 pregnant women under the age of 19, receiving prenatal care in 47 Basic Health Units in the one city, Brazil. The generalized anxiety disorder was measured using the Mini International Neuropsychiatric Interview (MINI) and the perception of parental bonding in childhood using the Parental Bonding Instrument (PBI).

Results: The prevalence of GAD was 8.5%. Among all the parental bonding dimensions, only a perceived lack of maternal care under 16 years was associated with GAD.

Conclusions: The results showed that only the perception of maternal bonding was associated with later GAD. It suggests that an adequate maternal bond is an essential component of psychological health.

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1. Introduction

Adolescents have an elevated risk for medical complications in pregnancy compared to adult women [1]. The rate of neonatal death for adolescent pregnancies, which includes stillbirth as well as infant death up to 28 days old, is roughly 3 times higher than adult pregnancies [2]. Moreover, teenage pregnancy also seems to heighten the risk of psychiatric disorders [3–5]. In this sense, the primary focus of extant literature is on depression, while anxiety disorders remain somewhat neglected.

Anxiety disorders during pregnancy are relatively common, with reported prevalence rates about 15%, and frequently associated with negative outcomes [6]. Specially, generalized anxiety disorder (GAD) is one of the most prevalent anxiety

disorders, only after specific phobia. The disorder is characterized by excessive and persistent anxiety and worry about daily activities. The diagnostic criteria covers physical and psychological symptoms of anxiety, causing significant impairment in social functioning [7]. Furthermore, anxious pregnant women have a higher risk to develop postnatal depressive symptoms [8] and other psychiatric disorders after birth [9]. Antenatal anxiety disorders are also associated to a higher suicide risk (mainly attributed to generalized anxiety disorder) [10] and can bring adverse consequences for the baby [11].

While Faisal-Cury, Menezes [12] reported that worry and anxiety are among the most common psychiatric symptoms during pregnancy, there are virtually no studies on GAD in pregnant adolescents. A cohort study with pregnant adults showed that 9.5% of them have suffered from this disorder at some point during pregnancy, when the highest rate of GAD was 7% in the first trimester [13,14]. Another study reported an 8.5% prevalence rate in the third trimester of pregnancy [15]. Environmental factors such as being single and having lower education level [16] may be important for the development of GAD in women [17]. In addition,

* Corresponding author at: Post graduate Programme in Health and Behavior, Catholic University of Pelotas (UCPel) Gonçalves Chaves, 377 - 411 C - 96015-560 - (53) 2128-8404 Pelotas, RS, Brazil.

E-mail address: marianabonatedematos@gmail.com (M.B. de Matos).

women with lower social support, history of child abuse and a past history of GAD in the family have greater risk of developing GAD in pregnancy [13]. The perception of parenting styles have also been considered as relevant environmental risk factors for the development of psychiatric disorders, such as anxiety disorders [18]. The transition to motherhood can refer to past relationships of parental bonds, especially in teenagers, whose social roles are still to be defined [19]. Although one study has found GAD patients to score both of their parents as uncaring and overprotective, this relationship has not been studied in pregnant adolescents [20].

Therefore, the main goal of this study was to determine if there is an association between the perception of parental bonding and generalized anxiety disorder in pregnant adolescents. Also, we aimed to verify the factors associated with GAD.

2. Materials and methods

2.1. Study type and sampling

This is a cross-sectional study with pregnant teenagers (up to 19 years old) who were using the public services for prenatal care under the Unified National Health System in the urban area of Pelotas, a city in southern Brazil. Data were collected in 47 primary healthcare units and in 3 public obstetric clinics, starting in October 2009 and ending in March 2011. The inclusion criteria were: to be pregnant, up to 19 years old and live in the urban area of Pelotas, RS (Brazil). The exclusion criteria were: present some physical or cognitive disability that did not allow the understanding of the questionnaire.

Table 1
Sample distribution according to socio-demographic characteristics, obstetric and behavioral variables and Generalized Anxiety Disorders in pregnant adolescents in the city of Pelotas.

Variables	N (%)	GAD (%)	p-value
Age (n=870)			0.807
≤16 years	240 (27.6)	19 (7.9)	
≥17 years	630 (72.4)	55 (8.8)	
Education (n=869)			0.102
Less than 5 years	142 (16.3)	11 (7.8)	
Between 5 and 8 years	374 (43.0)	41 (11.0)	
Between 8 and 11 years	277 (31.9)	20 (7.3)	
Between 11 and 14 years	76 (8.7)	02 (2.6)	
Socioeconomic status (n=851)			0.537
A+B	107 (12.6)	11 (10.3)	
C	530 (62.3)	45 (8.5)	
D+E	214 (25.1)	17 (8.0)	
Works (n=867)			0.261
No	755 (87.1)	61 (8.1)	
Yes	112 (12.9)	13 (11.8)	
Lives with partner (n=869)			0.804
No	324 (37.3)	29 (9.0)	
Yes	545 (62.7)	45 (8.3)	
Primiparity (n=859)			0.023
No	185 (21.5)	24 (13.1)	
Yes	674 (78.5)	50 (7.4)	
Previous abortion (n=642)			0.001
No	554 (86.3)	43 (7.8)	
Yes	88 (13.7)	17 (19.5)	
Unplanned pregnancy (n=869)			1.000
No	630 (72.5)	53 (8.5)	
Yes	239 (27.5)	20 (8.4)	
Social support (n=863)			0.041
No	22 (2.5)	05 (22.7)	
Yes	841 (97.5)	68 (8.1)	
Previous or current psychiatric treatment (n=865)			0.061
No	725 (83.8)	55 (7.6)	
Yes	140 (16.2)	18 (12.9)	
Psychiatric family history (n=861)			0.021
No	483 (56.1)	31 (7.6)	
Yes	378 (43.9)	42 (11.1)	
Tobacco use (n=868)			0.932
No	706 (81.3)	61 (8.7)	
Yes	162 (18.7)	13 (8.1)	
Maternal Care (n=802)			<0.001
No	260 (32.4)	30 (11.5)	
Yes	542 (67.6)	38 (7.0)	
Maternal Control (n=809)			0.787
Overprotection	210 (26.0)	17 (8.1)	
Protection	599 (74.0)	54 (9.0)	
Paternal Care (n=707)			0.015
No	251 (35.5)	30 (12.0)	
Yes	456 (64.5)	29 (6.4)	
Paternal Control (n=723)			0.520
Overprotection	197 (27.2)	14 (7.1)	
Protection	526 (72.8)	47 (9.0)	
Total	871 (100)	-	-

We calculated the sample size with the STATCALC tool of the Epi-Info software [21]. With a confidence level of 95% and power of 80%, the prevalence of GAD estimated at 10% with estimated risk of 2.0, the sample size needed was 871.

2.2. Measures

The GAD was assessed by the Mini International Neuropsychiatric Interview (MINI) [22]. The MINI is a short structured interview based on DSM-IV and ICD-10 criteria with adequate validity and reliability [23].

Parental bonding was assessed by the Brazilian validated version of Parental Bonding Instrument (PBI). This instrument is the most used to measure the contribution of parental behavior in the development of an adequate bond between parents and children [24]. The PBI is a self-report likert-type instrument (0–3)

with 25 questions related to the subject's father and mother. The subjects answer how a particular behavior was similar to their parents' behavior until they were 16 years old. The instrument measures the following two dimensions of maternal and paternal bonds: [1] care or lack of care (affection, warmth, availability, care, sensitivity versus coldness and rejection) and [2] control or protection/overprotection (control, intrusion versus encouragement of the autonomy) (25). It brings questions like "He/She spoke to me with a warm and friendly voice" and "He/She did not help me as much as I needed" for the care dimension and questions like "He/She let me do the things I liked doing" and "He/She liked me to make my own decisions" for the control dimension. The Brazilian version of PBI presented satisfactory internal consistency for both dimensions, with Cronbach's alpha of 0.91 for care in the maternal and paternal bonding and 0.87 and 0.85 for control/protection in the maternal and paternal bonding, respectively [26].

Table 2

Crude and adjusted analysis in a sample of pregnant adolescents with Generalized Anxiety Disorder.

Variables	Crude Analysis CI 95%	Ajusted analysis CI 95%
Age (n = 870)		
≤16 years	1.00	
≥17 years	1.11 (0.65; 1.91)	
Education (n = 869)		
Less than 5 years	3.13 (0.67; 14.50)	2.08 (0.45; 9.70)
Between 5 and 8 years	4.56 (1.08; 19.26)	1.90 (0.42; 8.68)
Between 8 and 11 years	2.90 (0.66; 12.70)	1.30 (0.24; 7.10)
Between 11 and 14 years	1.00	1.00
Socioeconomic status (n = 851)		
A + B	1.31 (0.59; 2.91)	
C	1.06 (0.59; 1.90)	
D + E	1.00	
Works (n = 867)		
No	1.00	
Yes	1.52 (0.81; 2.87)	
Lives with partner (n = 869)		
No	1.09 (0.67; 1.79)	
Yes	1.00	
Primiparity (n = 859)		
No	1.88 (1.12; 13.5)	1.45 (0.52; 4.02)
Yes	1.00	1.00
Previous abortion(n=642)		
No	1.00	1.00
Yes	2.87 (1.55; 5.31)	3.71 (1.26; 10.95)
Unplanned pregnancy (n = 869)		
No	1.01 (0.59; 1.73)	
Yes	1.00	
Social support (n = 863)		
No	3.33 (1.19; 9.30)	2.44 (0.64; 9.26)
Yes	1.00	1.00
Previous or current psychiatric treatment (n = 865)		
No	1.00	1.00
Yes	1.78 (1.01; 3.15)	1.51 (0.68; 3.34)
Psychiatric family history (n = 861)		
No	1.00	1.00
Yes	1.81 (1.11; 2.94)	2.27 (1.14; 4.53)
Tobacco use (n = 868)		
No	1.08 (0.57; 2.01)	
Yes	1.00	
Maternal Care (n = 802)		
No	1.00	1.00
Yes	2.91 (1.76; 4.82)	2.08 (1.05; 4.12)
Maternal Control (n = 809)		
Overprotection	1.12 (0.64; 1.99)	
Protection	1.00	
Paternal Care (n = 707)		
No	2.00 (1.16; 3.41)	1.44 (0.74; 2.80)
Yes	1.00	1.00
Paternal Control (n = 723)		
Overprotection	1.00	
Protection	1.28 (0.69; 2.39)	

We used a sociodemographic and economic questionnaire considering the following variables: age, education, socioeconomic status, works and living with a partner. The Brazilian Association of Research Companies criteria was used to assess the socioeconomic status of families [27]. This classification is based on the accumulation of material wealth and schooling of household head, classifying the subjects into five levels (A, B, C, D and E) in which the highest-income level is “A” and the lowest is “E”.

We collected obstetric information regarding parity, previous abortions and if the pregnancy was planned. Regarding the psychiatric history, we questioned about previous or current psychiatric treatment and if any family member have psychiatric history. Tobacco use was evaluated as the actual use.

2.3. Statistical analysis

For statistical analysis, we used SPSS (*Statistical Package for the Social Science*) program, version 13. Chi-square test was used to compare proportions. Logistic regression was employed to control for possible confounding factors.

The variables with p -value <0.20 [28] entered in the logistic regression analysis with a hierarchical multilevel approach, using the GAD as primary outcome. In the first level, sociodemographic and economic variables were included (age; educational years; socioeconomic status; work; lives with partner). In the second level, obstetric variables were included (primiparity; previous abortion; unplanned pregnancy). In the third level, emotional and behavioral variables (social support; previous or current psychiatric treatment; psychiatric family history; tobacco use; perception of maternal care; perception of maternal control; perception of paternal care; perception of paternal control).

2.4. Ethical aspects

The subjects signed a free and informed consent statement for the analysis and anonymous publication of the research findings. This project was approved by the Research Ethics Committee of the University, Brazil (protocol no. 2007/95).

3. Results

In this study, 870 pregnant adolescents were identified excluding 4.3% of losses and refusals. The prevalence of GAD was 8.5%. Regarding PBI maternal bonding styles, the prevalence of lack of care was 32.4% ($n=260$) and overprotected control was 26% ($n=210$). Regarding PBI paternal bonding styles, the prevalence rates were of 72.8% ($n=526$) and 27.2% ($n=197$), respectively.

Table 1 shows the sample's overall distribution. The raw analysis showed that GAD was associated with primiparity ($p=0.023$), previous abortion ($p=0.001$), perception of family support ($p=0.041$), familial history of psychiatric disorders ($p=0.021$), maternal lack of care ($p<0.001$) and paternal lack of care ($p=0.015$).

After adjusting for possible confounding variables, as showed in Table 2, previous abortion ($p=0.018$), familial history of psychiatric disorders ($p=0.019$) and maternal lack of care ($p=0.036$) was associated with GAD. Pregnant women who had previous abortion were 3.71 (CI: 1.26; 10.95) times more likely to present GAD compared to those who had no previous abortion. For the pregnant who had familial history of psychiatric disorders, the chance of presenting GAD was 2.27 (CI: 1.14; 4.53) times higher than those who did not had familial history of psychiatric disorders. Pregnant teenagers who reported maternal lack of care were 2.08 (CI: 1.05; 4.12) times more likely to present GAD compared to those who reported adequate maternal care. In the adjusted analysis, the following variables were not significantly associated with GAD:

education, primiparity, social support, previous or current psychiatric treatment and paternal care ($p>0.05$).

4. Discussion

Parental bonding encompasses the bonding style that both parents have with their children through attitudes related to care and protection. The ‘care’ dimension is composed by attitudes of affection, emotional warmth, availability, care and sensitivity. Thus, parents who demonstrate coldness and rejection characterize lack of care. The ‘protection’ dimension, on the other hand, is composed by attitudes of surveillance and promotion of autonomy. Parents who demonstrate extreme control and intrusion characterize overprotection [26]. The literature has shown that parental bonding styles plays an important role in the developing of psychiatric symptoms in adulthood [29].

For the main purpose of this study, we expected to find an association between generalized anxiety disorder and both maternal and paternal bonding. This relationship was partially found. Only the lack of maternal care in childhood was significantly associated to GAD in pregnancy, after adjusting for potential confounders. The association between parenting style and anxiety disorders was examined in a few studies. A study conducted in six countries found an association between lack of maternal care and the presence of GAD, social phobia, specific phobia and panic disorder. They also found an association between lack of paternal care and anxiety disorders, although this dimension of parental bonding acted differently across the anxiety disorders. Yet, maternal overprotection was not associated with GAD but with the other three disorders [18]. The authors Lima, Mello [29] claim that parental dysfunction are risk factors for the development of anxiety disorders. However, we are not aware of other studies investigating this association within a population of pregnant teenagers.

According to Rubinchik, Kablinger [30] “pregnancy can bring to mind past painful events with their own parents” ($p.100$). It is possible that those GAD pregnant teenagers who perceived their parental bonding as unsatisfactory could be interpreting the memories regarding their parents in an anxious or pessimistic way, notwithstanding the actual childhood experience. Another possible explanation for the association of maternal bonding and GAD is that the way in which the child is raised could be considered a potential factor of vulnerability, whereas the first abstractions of the child's experience with their caregivers become mental representations of attachment relationships that reflect the way how the individual handles emotions [31]. The internalization of this perceived lack of affection in childhood can give adolescents less ability to cope with life's stressful events [25]. Although such relationship is evident, this information should be investigated more carefully, as depression can also interfere in this association [32].

Another factor associated with GAD in pregnant teenagers was the presence of a previous abortion. A meta-analysis identified that women who underwent abortion had 81% risk of mental health problems, and that nearly 10% incidence of mental health problems are directly attributed to abortion [33]. Women who have experienced an abortion in previous pregnancies can have greater fear to go through this situation again. Extreme concerns about the current pregnancy may also arise. Thus, it is necessary to have a special attention to these pregnant women. The prenatal care should integrate mental health actions to prevent or treat anxiety disorders.

As we expected, the pregnant that had familial history of psychiatric disorders had a higher chance of present GAD than those who did not had history of psychiatric disorders in family members. A review of risk factors for the onset of panic and

generalized anxiety disorders found that a parental history of GAD [34], depression [35], or other mental health problems [36] were associated with GAD in their offspring. Furthermore, studies on psychiatric disorders in family members point out this issue as a risk factor for most psychiatric disorders. Regarding GAD, one third of the risk of presenting this disorder is of genetic origin [7]. Moreover, by witnessing the anxious and worried behavior of the parents, the child learns this behavioral pattern and begins to actually practice it, resulting in increased vulnerability to develop the disorder. The case revolves around the biological and environmental influences that interfere with the normal development of the individual, making it more susceptible to develop some mental disorder. Although the magnitude of the association between GAD and psychiatric family history is greater than the association with parental bonding, the latter one cannot be excluded, since even after adjusted analysis it remained significant.

The findings of our study should be interpreted in the light of its limitations. First, as with any cross-sectional study, causality could not be assessed. As parental bonding was measured retrospectively, we point out the risk of recall bias. Similarly, the pregnant with GAD can have assessed their parental bonding as negative as a result of their disorder and not because it was really negative [7]. A longitudinal study would be necessary to evaluate such relationship. On the other hand, previous research showed that the subjects' mood did not have a significant impact on PBI, which proved stable over time [37]. Another limitation concerns the lack of a control group of non-pregnant adolescents, but the comparison was not possible due to the logistics of the study. As our sample was recruited from public health services, there is the risk of selection bias. It was also not possible to collect information about other possible confounding factors drug use and family structure.

Even with such limitations, this study has relevance, considering that in Brazil about 20% of children were born from adolescent mothers each year, which confirms an increased need to supply this population with adequate healthcare [15]. Moreover, recent data showed that GAD has received little attention compared to other anxiety disorders, which demonstrates the importance of further studies related to the subject. Some studies suggest that environmental factors are involved in the development and maintenance of GAD, however, there is very few information in the literature.

Concluding, a perceived lack of maternal care under 19 years was associated with GAD, suggesting that the adequate maternal bond is a contributor for a psychological healthy development. The lack of care, as well as the absence of an adequate family structure during childhood may lead the individual to be more susceptible to the onset of psychiatric disorders.

Anxiety disorders in pregnancy may have a harmful impact on the health of pregnant teenagers, as it can lead to postpartum depression, low birth weight and premature birth, and, additionally, it may also have a negative impact on child development. This indicates the relevant need of early detection of these conditions, aiming to implement appropriate preventive measures [16,30].

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The subjects signed a free and informed consent statement for the analysis and anonymous publication of the research findings. This project was approved by the Research Ethics Committee of the Catholic University of Pelotas, Brazil (protocol no. 2007/95).

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Declaration of interest

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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