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Sociodemographic risk factors of perinatal depression: a cohort study in the public health care system

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Abstract

Objective: To assess the sociodemographic risk factors for the prevalence and incidence of relevant postpartum depressive symptoms. *Method:* We studied a cohort of women in their perinatal period with the assistance of the public health system in the city of Pelotas-RS, Brazil. We assessed depressive symptoms with the Edinburgh Postnatal Depression Scale (EPDS) in the prenatal and postnatal periods. *Results:* We interviewed 1,109 women. The prevalence of meaningful depressive symptoms during pregnancy was 20.5% and postpartum was 16.5%. Women with prenatal depression were at higher risk for postpartum depression. *Conclusion:* The mother's poverty level, psychiatric history, partner absence and stressful life events should be considered important risk factors for relevant postpartum depressive symptoms.

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Fatores sociodemográficos de risco de depressão perinatal: um estudo populacional no sistema público de cuidados de saúde

Resumo

Objetivo: Avaliar os fatores sociodemográficos de risco quanto à prevalência e à incidência de sintomas depressivos pós-parto relevantes. *Método:* Estudou-se um grupo de mulheres em seu período perinatal sendo assistidas pelo sistema público de saúde na cidade de Pelotas, RS, Brasil. Foram avaliados os sintomas depressivos com o uso da *Edinburgh Postnatal Depression Scale* (EDPS) nos períodos pré-natal e pós-natal. *Resultados:* Foram entrevistadas 1.019 mulheres. A prevalência de sintomas depressivos significativos durante a gravidez foi de 20,5% e no período pós-parto de 16,5%. As mulheres com depressão pré-natal apresentaram um risco maior de depressão pós-parto. *Conclusão:* O nível de pobreza, a história psiquiátrica, a ausência do parceiro e eventos vitais estressantes devem ser considerados fatores de risco importantes para sintomas depressivos pós-parto relevantes.

Introduction

Pregnancy is a critical period in a woman's life, during which she experiences many mental and physical as well as hormonal and social changes.[1]

Perinatal depression occurs from the prenatal period (during the pregnancy) to the postpartum period (12 months after delivery). This depression presents the same characteristics as depression in the general population: depressed mood, loss of interest or pleasure in things, loss of concentration and feelings of low self-esteem.[2]

Both prenatal depression (20.5%)[1] and postpartum depression (PPD) (23.8%)[3] are high in prevalence. Studies have identified the risk factors and suggested methods to prevent, diagnose and treat these disorders. PPD poses serious consequences for the woman's life and may even affect the quality of child care. PPD may also lead to cognition and behavior disorders, poor social interaction and impaired physical development in the first year of life for the child.

Few studies have examined the pregnancy risk factors for postpartum depression,[2,4,5] possibly because longitudinal studies are necessary in this case.

Depression in the prenatal period is the main risk factor for PPD.[6] In addition, other factors before delivery may also predict PPD, including lower education, living without a partner, adolescence, smoking, previous depressive symptoms, low income, and unintended pregnancy.[3-8]

The objective was to evaluate the sociodemographic risk factors for the prevalence and incidence of postpartum depression. Only one cohort study has been conducted on this subject in Brazil, and sociodemographic risk factors may be influenced by the environmental and cultural differences of each country. Furthermore, we hypothesized that there are different risk factors for recurrent depression and depression with postpartum onset.

Method

Our study examined women in the perinatal period who had received prenatal care through the Brazilian National System of Public Health in the city of Pelotas in the state of Rio Grande do Sul (RS), Brazil. Women who did not live in the urban area and who were unable to understand or to complete the questionnaire were excluded. Pelotas has approximately 350,000 inhabitants, and more than 96% of them live in the urban area.

Authors contacted potential participants who were enrolled in the Brazilian National System of Public Health (SISPRENATAL) as well as those enrolled in two services that are not part of this system. These data cover the antenatal assistance in 38 Basic Health Units, which represents the public assistance in its entirety within the urban area of Pelotas and is responsible for delivering assistance to 51% of all pregnant women in the city.[9] Authors invited all pregnant women between 2006 and 2008 to participate in the study. The interviews were conducted at the women's residences. The first assessment was during the prenatal period and the second assessment within 30 to 60 days postpartum.

Meaningful depressive symptoms were assessed using the Edinburgh Postnatal Depression Scale (EPDS). The EPDS is a self-rated scale composed of 10 topics with scores ranging from 0 to 3 to describe the presence or intensity of depressive symptoms. The questions refer to depressive and dysphoric mood, sleep disorders, loss of pleasure, thoughts of death or suicide, reduction of performance, and guilt. The scale was specifically designed to screen for postpartum depression, but it may also be used as a valid measure of dysphoria through the various stages of pregnancy and during the puerperium. In the validation to assess the prevalence of meaningful depressive symptoms, we found a 60% positive predictive value for the cutoff point of 13 (59.5% sensitivity; 88.4% specificity) in the Brazilian population.[10]

In addition to the EPDS interview, the women completed a questionnaire regarding socioeconomic status, marital status, gestational period, previous pregnancies, stressful events, previous psychological and/or psychiatric disorders, previous familial psychiatric disorders and tobacco use.

The classification of the Brazilian Association of Research Companies (ABEP) was used to assess the socioeconomic status of the families. This classification was based on the accumulation of the material wealth and schooling of the head of household, classifying the subjects into five levels

(A, B, C, D and E).[11] The stressful events were assessed by six dichotomous questions about life events in last year: death in the family, illness, unemployment, change of address, marital separation and threatened abortion.

To ensure data integrity, the Epi-Info 6.04d software[12] was used to customize the input of data and to automatically validate their amplitude and consistency. Statistical analyses were conducted using the Stata 9 software.[13] Chi-square test was used in the comparison between proportions. All variables with an α of p ≤ 0.20 were included in the adjusted analyses to control for possible confounding variables among the measured associations.[14]

Poisson regression was used for the variables that were classified in two or three hierarchical levels. The first level consisted of socioeconomic status variables, and the second level consisted of previous pregnancy, stressful events during pregnancy, and psychological and/or psychiatric disorders. A third hierarchical level were included to verify that relevant pregnancy depressive symptoms were a risk factor for PPD.[15] In the adjusted analysis, the statistical significance was consistently evaluated using 0.05 (two-tailed) as indicative of statistical significance.

All subjects or their parents gave written informed consent for the analysis and anonymous publication of the research findings. The study was approved by the committee on research ethics at the Universidade Católica de Pelotas in accordance with existing regulations (CONEP-Res196/96).

Results

A total of 1,340 pregnant women were identified, but 76 (6%) refused to participate or were excluded from the study. Overall, 1,264 women were enrolled during pregnancy, although 19.4% (N = 245) were not found later or refused to participate in the study, and thus, we assessed 1019 women in the postpartum period.

The subjects were between 13 and 46 years old, with an average age of 25.2 years old (± 6.44), and the mean gestational age was 27.7 weeks (± 9.4). We found that 40.8% of them had not finished high school, 58.0% were from socioeconomic situation C, and 71.8% were married or had lived with a partner during their pregnancy. During the first assessment, 46.8% of them were in the third trimester of pregnancy, and 57.3% were in their first pregnancy. The average number of previous gestations was 2.0 (± 1.52) children; 58.7% of the subjects had not planned for their pregnancy, and 8.7% had considered abortion.

The prevalence of meaningful depressive symptoms in pregnancy was 20.5%, while at postpartum, it was 16.5%. The adjusted analysis found the risk factors for PPD to include lower socioeconomic status (p = 0.002), not living with a partner (p = 0.026), previous psychological and/or psychiatric disorders (p < 0.001), familial psychiatric disorder (p = 0.046) and tobacco use during pregnancy (p = 0.007). Furthermore, the presence of neonatal depression symptoms increased the risk for relevant postpartum depressive symptoms (p < 0.001) (Table 1).

Among the 209 women who had depression symptoms during pregnancy, 98 (46.9%) also had postpartum depression symptoms. It was found that 810 (79.5%) subjects were not diagnosed to have depression symptoms at the first evaluation, but 70 (8.6%) of these 810 subjects were diagnosed with PPD, which represented the incident depression cases in this period.

The variables that were significantly associated with PPD prevalence were analyzed as risk factors for PPD incidence, and in the adjusted analyses, these risk factors were: lower socioeconomic status (p = 0.020; RR 1.76; 95%IC 0.83-3.71), having suffered stressful events (p = 0.059; RR 1.56; 95%IC 0.97-2.50) and tobacco use during pregnancy (p = 0.016; RR 1.81; 95%IC 1.03-3.17) (Table 2).

Discussion

This cohort of pregnant women who were under the care of the Brazilian National System of Public Health had a high prevalence of antenatal depression symptoms (20.5%), and it was found that antenatal depression symptoms may be an important risk factor for postpartum depression symptoms. In this study, the prevalence of relevant neonatal depressive symptoms was similar to that published in a 2009 review; a Thai study, which used the same instrument, and found the same result: 20.5%.[1-16] This study's results suggested that neonatal depression symptoms may be the strongest risk factor for relevant postpartum depressive symptoms.[17]

Although there is extensive literature on the risk factors for PPD, there have been few cohort studies conducted in Brazil on this subject. This current study was necessary because the rates of disease may vary based on socioeconomic and cultural aspects in different locations, and the diagnostic criteria and instrument used in the evaluation may also differ by location.

In the study, depression symptoms were assessed using the EPDS, which is a screening instrument for depressive symptoms. Although this instrument was validated for this population, it had a limitation in that when the objective is to assess the prevalence of relevant depressive symptoms in pregnancy or the postpartum period, it tends to overestimate the rates of relevant depressive symptoms, and therefore, this instrument may be very sensitive but less specific. However, it is frequently used in similarly designed studies and is recommended for practice and research as it has also been used in primary care.

Another limitation of this study was the possible decrease in the prevalence of postpartum depression as a result of referral for psychological or psychiatric treatment, which was offered to all pregnant women who showed depressive symptoms in the first assessment.

In this study, the prevalence of PPD was 16.5%, which is similar to that found in a Chinese study that used the same instrument and cutoff point and presented a prevalence of 15.5%.[18] Nevertheless, the present result was lower than that found in a meta-analysis (23.8%),[4] and in a study from the same city (19.1%)[6] that used the Hamilton scale for depression for assessing postpartum depression. This difference may be because the Hamilton scale was created and validated for the general population, and it includes characteristic depressive symptoms of pregnancy and the postpartum period, such as changes in sleeping and eating. It was found that the postpartum depression incidence was 8.7%, and this result was similar to that of the first cohort study from Israel, which presented an incidence of 6.9%.[3] In another study from the US, 8% of women presented a score higher than 12 on the EPDS.[19]

Table 1 Sample distribution and factors associated with the PPD (EPDS ≥ 13)

Variable	Responses	Postpartum Depression	Gross analyses		Adjusted analyses	
First hierarchical level	N (%)	N (%)	PR (95% CIs)	p-value*	PR (95% CIs)	p-value*
Age						
From 13 to 19 years old	215 (21.1)	42 (19.5)	1.07 (0.74-1.57)	*0.549*	---	---
From 20 to 24 years old	286 (28.1)	46 (16.1)	0.88 (0.61-1.28)			
From 25 to 29 years old	265 (26.0)	34 (12.8)	0.70 (0.47-1.06)			
From 30 to 45 years old	253 (24.8)	46 (18.2)	1.00			
Socioeconomic Situation						
A + B	121 (11.9)	16 (13.2)	1.00	0.001	1.00	0.002
C	591 (58.0)	81 (13.7)	1.04 (0.63-1.71)		1.09 (0.65-1.81)	
D + E	307 (30.1)	71 (23.1)	1.75 (1.06-2.88)		1.75 (1.05-2.94)	
Having a cohabiting partner						
No	286 (28.2)	61 (21.3)	1.47 (1.10-1.95)	0.011	1.35 (1.02-1.80)	0.026
Yes	729 (71.8)	106 (14.5)	1.00		1.00	
Second hierarchical Level						
Previous pregnancy						
No	432 (42.7)	58 (13.4)	1.00	0.033	1.00	0.402
Yes	579 (57.3)	108 (18.7)	1.39 (1.03-1.86)		1.13 (0.84-1.51)	
Stressful events during pregnancy						
No	442 (43.8)	51 (11.5)	1.00	0.000	1.00	0.071
Yes	568 (56.2)	115 (20.2)	1.75 (1.29-2.38)		1.34 (0.98-1.52)	
Psychological or Psychiatric Problems**						
No	694 (68.7)	74 (10.7)	1.00	0.000	1.00	0.000
Yes	316 (31.3)	90 (28.5)	2.67 (2.02-3.52)		2.16 (1.61-2.89)	
Family psychological/ psychiatric problem history						
No	634 (63.3)	83 (13.1)	1.00	0.000	1.00	0.046
Yes	368 (36.7)	82 (22.3)	1.70 (1.29-2.24)		1.34 (1.00-1.78)	
Tobacco consumption during pregnancy						
Who did not smoke	538 (53.0)	66 (12.3)	1.00	0.000	1.00	0.007
Who had never smoked	272 (26.8)	47 (17.3)	1.41 (1.00-1.99)		1.23 (0.86-1.73)	
Yes	206 (20.3)	55 (26.7)	2.18 (1.58-3.00)		1.59 (1.14-2.23)	
Third hierarchical level						
Gestational Depression						
No	810 (79.5)	70 (8.6)	1.00	0.000	1.00	0.000
Yes	209 (20.5)	98 (46.9)	5.43 (4.16-7.08)		4.11 (2.99-5.64)	
Total	**1,019 (100)**	**168 (16.5)**	---	---	---	---

* When p-value ≥ 0,2 (italic) the variable hasn't been included at the next hierarchical level.
** Psychological and/or Psychiatric Problems before pregnancy.

The sociodemographic characteristic that was related to the incidence of PPD was lower socioeconomic status. Previous studies have suggested that the mother's socioeconomic status and previous depression symptoms placed her at higher risk for postpartum depression.[19] These risk factors were also reported in a previous study from Pelotas[6] as the social factors that are associated with PPD.

Not living with a partner was scrutinized as a risk factor in previous studies.[20] However the present study confirmed the likelihood that only the emotional and social support from the partner's presence was related to the prevalence of PPD.

Psychological and/or psychiatric disorders and familial psychiatric disorder history were associated with higher risk for postpartum depression. Studies have emphasized the importance of offering appropriate instruments to health teams to effectively evaluate the mental disorder history of pregnant women in order to then offer them special care.

This study showed an association between tobacco use during pregnancy and depression incidence and prevalence. Previous studies have presented the negative consequences of tobacco use for the fetus and for child development.[21] Many women do not quit smoking during pregnancy, and this can be due to the fact that nicotine helps psychiatric problems. Therefore, professionals should not only offer instruction about the risks of nicotine but also offer information about psychiatric disorder treatment when the pregnant women are not able to quit smoking on their own.[8]

Finally, the association between stressful events and relevant postpartum depressive symptoms was not statistically significant in this study, but there may be a possible

Table 2 Sample distribution and factors associated with the accumulative incidence of postpartum depression (EPDS ≥ 13)

Variable	Responses	Postpartum Depression	Gross analyses		Adjusted analyses	
First hierarchical level	N (%)	N (%)	RR (95% CIs)	p-value*	RR (95% CIs)	p-value*
Age						
From 13 to 19 years old	177 (21.9)	19 (10.7)	1.08 (0.60-1.96)	0.626	---	---
From 20 to 24 years old	227 (28.0)	19 (8.4)	0.84 (0.46-1.54)			
From 25 to 29 years old	204 (25.2)	12 (5.9)	0.59 (0.30-1.18)			
From 30 to 45 years old	202 (24.9)	20 (9.9)	1.00			
Socioeconomic Situation						
A + B	106 (13.1)	8 (7.5)	1.00	0.020	1.00	0.020
C	478 (59.0)	32 (6.7)	0.89 (0.42-1.87)		0.89 (0.42-1.87)	
D + E	226 (27.9)	30 (13.3)	1.76 (0.83-3.71)		1.76 (0.83-3.71)	
Having a cohabiting partner						
No	211 (26.1)	21 (10.0)	1.21 (0.75-1.98)	0.523	---	---
Yes	598 (73.9)	49 (8.2)	1.00			
Second hierarchical level						
Previous Pregnancy						
No	372 (46.3)	30 (8.1)	1.00	0.711	---	---
Yes	431 (53.7)	39 (9.0)	1.12 (0.71-1.77)			
Stressful events during pregnancy						
No	385 (47.9)	24 (6.2)	1.00	0.023	1.00	0.059
Yes	418 (52.1)	46 (11.0)	1.76 (1.10-2.83)		1.56 (0.97-2.50)	
Psychological or Psychiatric Problems[a]						
No	609 (75.7)	44 (7.2)	1.00	0.038	1.00	0.098
Yes	195 (24.3)	24 (12.3)	1.70 (1.06-2.73)		1.46 (0.92-2.31)	
Family psychological/ psychiatric problem history						
No	541 (67.5)	45 (8.3)	1.00	0.635	---	---
Yes	260 (32.5)	25 (9.6)	1.16 (0.72-1.84)			
Tobacco consumption during pregnancy						
Who didn't smoke	459 (56.8)	28 (6.1)	1.00	0.003	1.00	0.016
No, but who had smoked	222 (27.5)	25 (11.3)	1.85 (1.10-3.09)		1.70 (1.01-2.86)	
Yes	127 (15.7)	17 (13.4)	2.19 (1.24-3.88)		1.81 (1.03-3.17)	
Total	**810 (100)**	**70 (8.7)**	---	---	---	---

trend toward this association, as previously suggested.[22] The health team should be alerted for pregnant women who suffered stressful events and should define evaluation strategies and assistance. Support is recommended during the antenatal and the postpartum periods to avoid child and mother morbidity. This is a transitional period for the woman and her new family, and several adjustments occur that are not only physical but also psychological and social. Previous studies suggested the efficiency of postpartum support for improving the mother's knowledge, attitudes, abilities, mental health, quality of life and physical health.[23]

This study presented the prevalence and incidence of postpartum depression symptoms with assistance from the Brazilian public health system. We confirmed that both rates are high and that the mother's behavior can be risky for her own health. The most common risk factor in a study on the history of depression episodes[24] was early-onset depression.

The factors associated with the prevalence of PPD included living with a partner and a family history of mental disorders. The factors associated with the incidence of PPD were poverty and smoking. Social vulnerability is a consistent risk factor for depression, but the association with smoking may reflect a possible biochemical alteration associated with the hormonal changes during this period or the presence of anxiety symptoms during pregnancy.

Therefore, antenatal depression should be evaluated carefully in pregnant woman. Methods such as the EPDS are easy to apply and can be useful for preventive work in public health.[7] In conclusion, a mother's poverty, previous

psychiatric disorder, the absence of a partner and the stressful events in her life are important risk factors for relevant depressive symptoms.

Disclosures

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* Modest
** Significant
*** Significant: Amounts given to the author's institution or to a colleague for research in which the author has participation, not directly to the author.

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