Depressive Symptoms in Pregnancy: The Influence of Social, Psychological and Obstetric Aspects

Sintomas depressivos na gestação: influência dos aspectos social, comportamental, psicológico e obstétrico

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Rev Bras Ginecol Obstet 2016;38:293–300.

Abstract

Purpose To assess the prevalence of depressive symptoms and their association with social, psychological, behavioral and obstetric characteristics in pregnant women.

Methods This is a cross-sectional study. The sample consisted of 375 pregnant women who attended prenatal clinics in two public maternity hospitals located in the city of Goiania, Brazil. To testify the depressive symptoms, we used the Hospital Anxiety and Depression Scale (HADS). A descriptive statistical analysis was performed using programs such as CDC EPI-INFO™, version 7.1.5, and Statistical Package for Social Sciences (IBM SPSS), version 21.0.

Results the patients had probable depressive symptoms (15.47%) and possible depressive symptoms (25.33%). The bivariate analysis showed a significant association among "depressive symptoms" and the following variables: "single or divorced" (prevalence ratio, PR = 2.08; 95% confidence interval, CI = 1.26 to 3.44); "physical activity during pregnancy" (PR = 3.96; 95%CI = 1.28 to 12.31); exposure to "psychological/emotional" violence (PR = 4.74; 95%CI = 2.94 to 7.64); "prior mental problem" (PR = 2.66; 95%CI =1.49 to 4.73) and "obstetric complications during pregnancy" (PR = 2.53; 95%CI = 1.55 to 4.13). The multivariate analysis confirmed the association of these depressive symptoms with the variables "suffered psychological/emotional violence" (odds ratio, OR = 5.821; 95%CI = 2.939 to 11.528); "physical activity during pregnancy" (OR = 3.885; 95%CI = 1.060 to 14.231); "obstetric complications during pregnancy" (OR = 2.442; 95%CI = 1.233 to 4.834) and "single or divorced" (OR = 2.943; 95%CI = 1.326 to 6.533).

Keywords
- prenatal depression
- pregnancy
- prevalence
- cross-sectional studies
- public health

received January 17, 2016
accepted May 19, 2016

DOI http://dx.doi.org/10.1055/s-0036-1585072.
ISSN 0100-7203.

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Conclusions the prevalence of depressive symptoms among pregnant women is of 15.47%, and emotional violence is the main factor associated with gestational depression.

Resumo

Objetivo verificar a prevalência de sintomas depressivos e suas associações com características sociais, psicológicas, comportamentais e obstétricas em mulheres grávidas.

Métodos trata-se de estudo transversal. A amostra constou de 375 grávidas atendidas no ambulatório de pré-natal de duas maternidades públicas localizadas na cidade de Goiânia. Para a comprovação dos sintomas depressivos, empregou-se a Hospital Anxiety and Depression Scale (HADS). Foi realizada análise estatística descritiva com auxílio dos programas CDC EPI-INFO™, versão 7.1.5, e Statistical Package for Social Sciences (IBM SPSS), versão 21.0.

Resultados apresentaram prováveis sintomas depressivos e possíveis sintomas depressivos 15,47% e 25,33% das entrevistadas, respectivamente. A análise bivariada demonstrou associação significante entre "sintomas depressivos" e as seguintes variáveis: "solteira ou separada" (razão de prevalência, RP =2,08; intervalo de confiança, IC95% = 1,26–3,44); "atividade física na gestação" (RP = 3,96; IC95% = 1,28–12,31); submissão a "violência psicológica/emocional" (RP = 4,74; IC95% = 2,94–7,64); "problema mental prévio" (RP = 2,66; IC95% = 1,49–4,73) e "complicações obstétricas na gestação atual" (RP = 2,53; IC95% = 1,55–4,13). A análise multivariada confirmou associação desses sintomas depressivos com as variáveis "sofreu violência psicológica/emocional" (*odds ratio*, OR = 5,821; IC95% = 2,939–11,528); "atividade física na gestação" (OR = 3,885; IC95% =1,060–14,231); "complicações obstétricas na gestação atual" (OR = 2,442; IC95% = 1,233–4,834); e "solteira ou separada" (OR = 2,943; IC95% = 1,326–6,533).

Conclusões a prevalência de sintomas depressivos entre as grávidas é de 15,47%, e a violência emocional é o principal fator associado à depressão gestacional.

Palavras-chave
- depressão pré-natal
- gravidez
- prevalência
- estudos transversais
- saúde pública

Introduction

International studies have shown that the prevalence of depression in pregnancy can vary from 8.6% in the Middle East, 19.5% in Western Europe,[1] and 33% in the United States.[2] In Brazil, studies on the subject are scarce, and the prevalence can range from 15[3] to 28%.[4] Risk factors for gestational depression are mostly linked to indicators of socioeconomic deprivation, such as unemployment, financial hardship and low education. Moreover, having a history of violence, stressful episodes, psychiatric history, being single or divorced[3] and the lack of social support[5] were also associated with gestational depression.

Depression during prenatal care is a pathological episode; although not studied extensively,[6] it can be a predictor of postpartum depression and clinical implications such as depression, a high risk of premature birth, low birth weight and surgical birth.[7] In addition, a recent cohort study, which included 2,072 pregnant women, also found a relationship between depression in pregnancy and the early termination of breast-feeding.[8]

The psychological condition of the mother during pregnancy is different, a result of complex endocrine variations. It is important to mention that, in an experimental study using a prenatal stress model in female rats that developed trauma early in pregnancy, it was found that early environmental health problems, such as repeated maternal stress, could produce lasting changes in the function of neural circuits in the offspring.[9] These neurobiological changes will have implications for several psychiatric conditions, including abuse and dependence of psychoactive substances.[10] In humans, stressful events like these may have consequences for the mother in the form of depression and, at a worst assumption, they can lead to suicide.[11]

Depression is the result of a sophisticated interplay of social, psychological and biological factors. In this context, social circumstances such as economic pressures, unemployment and family dispute may increase the risk of disease. Considered difficult to treat, depression can cause psychic suffering.[12] That suffering includes the impairment of quality of life, relationships and activities due to the patient's functional disability, which leads to the emergence of disorders that are more serious, and to the increase in demand for public health services.[13]

On the other hand, social support can mitigate depressive episodes, particularly in the presence of physiological and psychosocial changes, such as in pregnancy.[5] In addition, teaching positive confrontation can minimize the manifestation of these events.[14]

As evidenced in the literature, performing physical activity during pregnancy can also reduce instances of depression, causing well-being and preventing weight gain, urinary loss and diabetes.[15] A study conducted in England to determine the effectiveness of exercise during pregnancy has detected an increase in the number of normal deliveries directly proportional to the frequency of physical activity.[16]

Despite the existence of known and effective therapies, less than half of the population affected globally receives treatment. Barriers to care include the social stigma related to mental disorders and the lack of resources and trained health care professionals.[11]

Considering the seriousness of the issue and the literature shortage, identifying the occurrence of mental disorders may contribute to an improvement in planning primary attention.[13] As the Women's Health Program adopted in Brazil direct assistance to women's health for reproductive purposes, the occasion becomes timely for interventions that empower pregnant women, their families and society.[17]

Given the facts, this study aimed to determine the prevalence of depressive symptoms and their association with social, psychological, behavioral and obstetric aspects in pregnant women admitted to two public hospitals in the city of Goiânia.

Methods

This is a descriptive cross-sectional study. The study involved pregnant women of low and high risk enrolled in prenatal clinics at two Public Maternity Hospitals of reference in the city of Goiânia, Brazil. These institutions perform care assistances, research and teaching, and serve the local community and several regions of the state. Data were collected from September 2014 to May 2015.

The sample consisted of pregnant women aged over 18 years. Half of the pregnant women present were invited to participate, representing the even numbers by scheduling order.

To calculate the size of the sample, it has been taken the total of 4,826 prenatal attendances in the two maternity hospitals during the collection period, an estimated proportion of 28.3% depression in pregnancy,[4] a type I error of 5% and 95% confidence interval. The minimum universe obtained was 292 pregnant women, but, set to final sample size of 375 pregnant women anticipating possible unanswered questions.[18]

In order to collect the data, we used a self-administered instrument, with the inclusion of additional information in the form of bold explanatory notes, to facilitate the application, the filling and the typing of said instrument.

The instrument with data on social and economic profiles presented questions containing age, education, marital status and economic situation. Low education was set as having eight years of schooling or less; average education was set as having nine to eleven years of schooling; and high education was set as having twelve years of schooling or more. Regarding the economic situation, we considered of low income those households with a monthly income of up to three minimum wages.[19]

Through suggested questions posed by the authors, we investigated several stressful events experienced by pregnant women, such as episodes of physical and emotional/psychological violence, obstetric complications in the current pregnancy, and the previous psychiatric history of the pregnant women and their families.

The pilot was previously applied to fifteen pregnant women. The aim was to: detect possible errors in the investigation; detect ambiguities in the questions made by the authors of this study; and comprehend the difficulties. After realizing the errors, the necessary corrections were performed.

To detect depressive symptoms during pregnancy, we used the Hospital Anxiety and Depression Scale (HADS) of Zigmond and Snaith,[20] validated in Brazil for outpatients.[21] This scale can be applied in multiple contexts,[22] such as in maternity and pre-natal services.[3]

This scale consists of fourteen items that mention the emotional state and do not address somatic symptoms indicating therefore greater chance of diagnose depression. Of these, seven are related to anxiety (HADS-A), and the other half, to depression (HADS-D), with cutoff points from seven to eight for anxiety and depression respectively. For Botega et al,[21] the cutoff point that provided good sensitivity and good specificity was 7⁄8 (that is, from 8 points) in the subscale of depression (85% and 72.4% respectively).

Each question has four alternatives with a score, which ranges from zero to three, and the sum of the points can vary from zero to 21 for each disorder. The higher the score, the greater the chance for minor mental disorders (MMD).

According to the results achieved in each subscale, the patient was placed on three levels: the unlikely event (zero to seven points); the possible/doubtful event (eight to ten points); and the probable case (eleven to twenty one points).[20]

To know the reliability of the instrument (the HADS), we made the calculation of Cronbach's α, considering that the higher the coefficient, the more reliable the instrument.[23] Thus, the value above 0.70 was adopted as suitable for this research.[24]

We excluded illiterate pregnant women who did not agree to complete the questionnaire, who did not answer all the questions of the HADS, who lived out of state, or who had a previous diagnosis of neurological diseases, such as multiple sclerosis and movement disorders.

We analyzed the data with the help of CDC EPI-INFO™, version 7.1.5, and the Statistical Package for Social Sciences (IBM SPSS), version 21.0. For the descriptive analysis of the quantitative variables, we used measures of central tendency (mean and median), dispersion measures (standard deviation, SD) and simple and absolute frequencies for ordinal variables. To verify the associations between variables and depressive symptoms, a bivariate analysis using the Chi-square (χ^2) test, Fisher's Exact and prevalence ratio (PR) was performed. To estimate the PR, we chose to perform a logistic regression analysis, justified by the low outcome of dependent variable.[25] The entrance was the hierarchical type, and the explanatory variables were based on the

Table 1 Socioeconomic characteristics and their association with the depressive symptoms of pregnant women assisted in two public hospitals of reference in the city of Goiânia, Brazil, 2015 ($n = 375$)

Characteristics	Depressive Symptoms**				Statistics	
	Yes		No			
	n	%	n	%	PR (95%CI)	*P*
Age Group***						
19 to 26	30/212	14.15	182/212	85.85	0.83(0.52–1.34)	0.454*
27 to 55	27/159	16.98	132/159	83.02		
Single/divorced						
Yes	16/58	27.59	42/58	72.41	2.08(1.26–3.44)	0.005*
No	42/317	13.25	275/317	86.75		
Years of education***						
≤ 8 years of education	18/85	21.18	67/85	78.82	1.55(0.93–2.58)	0.090*
> 8 years of education	38/279	13.62	241/279	86.38		
Family income***						
≤ three minimum wages****	41/272	15.07	231/272	84.93	0.70(0.33–1.51)	0.379*
> three minimum wages****	6/28	21.43	22/28	78.57		
Religious***						
No	9/48	18.75	39/48	81.25	1.23(0.65–2.34)	0.533*
Yes	48/315	15.24	267/315	84.76		

Abbreviations: CI, confidence interval; n, number; PR, prevalence ratio.
*Chi-square test; **Punctuation ≥ 12 in the subscale of depression of the Hospital Anxiety and Depression Scale (HADS); *** Some did not respond; ****Minimum wage = R$ 788.00 (roughly US$ 262.00 in 2015).

borderline *p*-value ($p \leq 0.010$) and the clinical importance.[26] For all tests, it was considered statistically significant a *p*-value less than or equal to 5% ($p \leq 0.05$) at the 95%CI. The variable "depressive symptoms" in prenatal care was defined as a dependent.

The study was approved by the Research Ethics Committee at Universidade Federal de Goiás (case No. 786.358). The provisions of Resolution No. 466/12, from the Brazilian National Council for Health, were respected.

Results

All 375 pregnant women were aged between 19 and 55 years old (27.06 ± 6.63), had average gestational age of 27 ± 10.60 weeks, and low-risk pregnancies (56.52%). Most were married or lived with a partner (84.53%), had more than eight years of schooling (76.42%), were unemployed (55.95%), but had an employed partner (91.14%). Most families had an income lower or equal to three minimum wages (90.67%). We also found that 87.00% followed a religion, and of these, 44.53% identified themselves as Evangelical.

In ►**Table 1**, the bivariate analysis showed a statistically significant association between "depressive symptoms" and being "single/separated."

One in four pregnant women was found to present "possible or doubtful" depressive symptoms. With respect to the internal consistency of the items for the subscale ADH, Cronbach's alpha of 0.73 allows reliability of the measurements (►**Table 2**).

Table 2 Description of depressive symptom prevalence detected by the Hospital Anxiety and Depression Scale applied to pregnant women admitted to two public hospitals of reference in the city of Goiânia, Brazil, 2015 ($n = 375$)

HAD-D Subscales* (7 items)	n (%)	CA	Obt int	Median	Average (SD)**
		0.73	0–18	7	6.87 (4.03)
Improbable (0–7 points)	222 (59.20)				
Possible/doubtful (8–11 points)	95 (25.33)				
Probable (12–21 points)	58 (15.47)				

Abbreviations: CA, Cronbach's Alpha; n, number; Obt int, obtained interval; SD, standard deviation.
*Punctuation ≥ 12 in the Hospital Anxiety and Depression Scale (HADS)

Table 3 Distribution of behavioral, psychological and obstetrical variables and their association with depressive symptoms in pregnant women from two public maternity hospitals of reference in the city of Goiânia, Brazil, 2015 ($n = 375$)

Characteristics	Depressive symptoms***				Statistics	
	Yes		No			
	n	%	n	%	PR (95%CI)	*p*
Behavioral variable						
Physical activity during pregnancy						
No	53/303	17.49	250/303	82.51	3.96 (1.28–12.31)	0.006*
Yes	3/68	4.41	65/68	95.59		
Psychiatric history						
Previous mental problem						
Yes	9/24	37.50	15/24	62.50	2.66 (1.49–4.73)	0.002*
No	49/347	14.12	298/347	85.88		
Previous family depression						
Yes	18/80	22.50	62/80	77.50	1.68 (1.02–2.78)	0.046*
No	38/284	13.38	246/284	86.62		
Violence variables						
Suffered physical violence						
Yes	4/11	36.36	7/11	63.64	2.43 (1.07–5.52)	0.075**
No	54/363	14.96	307/361	85.04		
Suffered psychological/emotional violence						
Yes	36/96	37.50	60/96	62.50	4.74 (2.94–7.64)	0.001*
No	22/278	7.91	256/278	92.09		
Obstetrical variables						
Obstetric complications in the current pregnancy						
Yes	35/141	24.82	106/141	75.18	2.53 (1.55–4.13)	0.001*
No	22/224	9.82	202/224	90.18		

Abbreviations: CI, confidence interval; n, number; PR, prevalence ratio.
*Chi-square test; **Fisher's Exact Test; ***Score $\geq$ 12 on the subscale of depression from the Hospital Anxiety and Depression Scale (HADS).

►**Table 3** shows that, among the pregnant women who exercised (18.33%), the majority (62.96%) performed physical activities two or three times a week. Also, 6.47% of the women reported "prior mental problems", that is, they had sought a doctor because of mental disorders.

We also observed that 25.67% of the participants had suffered psychological and emotional violence. The variables "previous mental problem", "performs physical activity", and "obstetric complications during pregnancy" showed a positive association with depressive symptoms. The main diagnoses of this last variable were: supervision of pregnancy risk (20.83%) and unspecified congenital malformations (2.47%).

Considering the logistic regression model (►**Table 4**), the variables with the most significant association were "suffered psychological or emotional violence", which increased in nearly six times the odds of developing depressive symptoms, and "physical activity during the pregnancy". Not exercising during pregnancy raised almost four times the possibilities of this symptomatology.

Discussion

The prevalence of depressive symptoms among pregnant women attending reference services was of 15.47%. Besides the physical inactivity, which was significantly detrimental to the mental health of the mother, associated to the onset of depressive symptom episodes of psychological violence, previous mental problem, partner absence and the occurrence of obstetric complications in the current pregnancy.

The only psychosocial situation related to depressive symptoms during prenatal care was the condition of being single or separated. A survey conducted in the Brazilian public health system associated gestational depression to stressful events such as the absence of a partner.[3,27] The vulnerability of women during pregnancy aggravates these factors, especially in developing countries, where there is more socioeconomic diversity and health care services are seldom function properly.

Social support has a beneficial effect on depressive pregnant women.[5] Therefore, we suggest that preventive

Table 4 Logistic regression analysis of the events associated with depressive symptoms, according to the violence, behavioral, psychological, social and obstetrical variables, 2015 ($n = 375$)

Characteristics	Statistic		
	OR	(95%CI)	*p*
Violence variables			
Suffered psychological/emotional violence	5.821	2.939–11.528	0.001
Suffered physical violence	0.997	0.244–4.084	0.997
Behavioral variable			
Physical activity during pregnancy	3.885	1.060–14.231	0.041
Psychological variables			
Previous mental problem	2.774	0.904–8.511	0.074
Previous family depression	1.055	0.473–2.350	0.897
Obstetrical variable			
Obstetric complications in the current pregnancy	2.442	1.233–4.834	0.010
Social variables			
Single/Separated	2.943	1.326–6.533	0.008
Years of education	1.483	0.707–3.114	0.297

Abbreviations: CI, Confidence Interval; n, number; OR, odds ratio.

interventions[28] should be made with these pregnant women without a partner, such as developing in them the positive capacity to face hardships.[14] However, the main option to assistance for these women, the basic health units (BHUs), has infrastructure and professional training problems, which can lead to unable calls.[29] In short, comprehensive care can help minimize, among other factors, the suffering of the mother/child and the increase in premature and surgical births.[7]

In relation to the adopted instrument, we inferred that, despite the many available tools for the quantification of depressive symptoms (scales, instruments and questionnaires), we opted for the HADS[21] because of its simplified application, but, above all, because it has been employed in a similar population.[3]

The percentage of depressive symptoms found in this study was lower than in Asia (17.5%) and Western Europe (19.5%).[7] The prevalence of these symptoms in prenatal care in developed countries was greater than in developing countries, including Brazil (ranging between 15% and 28%).[3,4] These differences may be related, among other factors, to the prevalence of cross-sectional studies[30] and the low representation of samples.[3,31] It is also worthy f mention the diversity of assessment tools used[3,31] and the sociocultural heterogeneity of nations. For example, in predominantly patriarchal societies like in Pakistan, depression can afflict more than half of pregnant women.[32]

Research indicates that prior mental problems can trigger a depressive symptomatology during pregnancy.[33] This study acknowledges, in multivariate analysis, an indicative of association between previous mental health and depressive symptoms. This finding confirms the need for the multidisciplinary team to have adequate tools to detect this symptomatology during prenatal care.

From this study it also appears that there is no association between physical activity and the emergence of depressive symptoms. This was ratified in the multivariate analysis, which marks an increase of almost four times the odds of manifestation of symptoms. It is important to remember that treating depression during pregnancy is difficult for both the patient and the healthcare team, because antidepressants bring obstetrical and fetal risks.[34] Based on this, the non-drug treatment would be an important option, in which simple measures like hiking could be taken to minimize the problem.

Several surveys conducted in different countries, such as Norway, indicate an association between physical activity during pregnancy and the lower prevalence of low back and pelvic pain and depression in late pregnancy, which is directly proportional to the amount of weeks of exercise.[35] These results validate our findings; therefore, within the population who exercised (18.33%), the majority (62.96%) was assiduous, and exercised three times a week. The high frequency in physical activities possibly contributed to the non-manifestation of depressive symptoms.

This study found a statistically significant association between psychological or emotional violence and depressive symptoms during prenatal care. Several authors have observed this connection. Psychological violence, although it does not leave visible signs like physical violence, can cause problems that are difficult to treat. It is also noted that any form of violence can harm the health of pregnant women, causing them to feel insecurity, low self-esteem and depression.[36] These episodes usually occur in contexts in which the women have low schooling and a submissive relationship

with their partners, which are the result of a historical sociocultural inequality that leads to these relationships of discrimination, subordination and abuse observed nowadays.[37]

There is a growing concern about the effects of stress and depression on the fetal environment. It is well known that the levels of sexual and other hormones, like cortisol, prolactin, thyroxine, are increased during pregnancy. In addition to this increase, complex interactions involving feedback mechanisms between the hypothalamic-pituitary-ovarian axis and the hypothalamic-pituitary-adrenal axis (HPA) have been observed. The HPA axis is especially important, because it involves cortisol, the adrenocorticotropic hormone and the corticotropin releasing hormone, which have their levels altered by both pregnancy and stress. There is the suspicion that high levels of cortisol resulting from stress or pregnancy affect the mood of pregnant women.[38] This finding corroborates with the findings of this study, in which the variables "suffered psychological/emotional violence" and "obstetric complications during pregnancy", which are considered stressful, had a relationship with the depressive symptoms in the logistic regression analysis.

The main diagnosis that generated "obstetric complications during the pregnancy" was a risk pregnancy monitoring with 20.83%. They are related to risk pregnancy, mainly obstetric and reproductive history, maternal medical condition, drug use and the financial and emotional issues.[39]

A study of gestational depression found a significant association with several pregnancy complications, such as bleeding in the prenatal and placental abruption. It is important to observe that some of these results were significantly associated with mild depression, demonstrating that any degree of depression can have significant influence in the context of obstetric complications.[40]

In the group that participated in this study, it is clear that the lack of a partner, relationship difficulties, and potentially stressful psychological violence may also explain the manifestation of problems during pregnancy, for they cause suffering and uncertainty about its outcome. Thus, the emergence of obstetric complications is multifactorial, and these factors are correlated, culminating in a difficult pregnancy. These problems during pregnancy can be viewed by the women as a punishment, and cause feelings of guilt, enhancing the depressive symptoms.

This study showed many strengths as the pilot of adoption and use of instrument internationally recognized and validated in Brazil. Finally, it is also noteworthy that was made sample calculation and the sample was representative.

On the other hand, the cross-sectional lineation limited interpretations about causality. Cause and effect were observed simultaneously, preventing an analysis of the origin of the depressive symptoms and the direction of these associations. Finally, it was not possible to generalize the findings to the private health sector, although the population studied belongs to two outpatient institutions with large areas of coverage.

Due to the prevalence of depression during pregnancy and the conflicts that can bring to the mother and child, psychological care should be an integral part of obstetrical care. We suggest the implementation of routine instruments to screen for depression during prenatal care, and the referral of severe cases to a psychiatrist.

Acknowledgments
The study was funded by Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Capes). There is no conflict of interests.

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