

## Factors associated with postpartum depression in social vulnerability women

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This study aimed to evaluate possible factors associated with postpartum depression syndrome (PDD), as the substance abuse and psychosocial support in a sample of 102 women in a social vulnerability condition. The study was conducted with mothers who were residents in specific hospital's lodging. Almost 20% of mothers showed symptoms to PDD as well as abusive alcohol and marijuana consumption compared with those who did not have PDD. Besides, it was observed an association between lack of psychological and familiar support with PDD. PDD it seems to be associated with other comorbidities so that some of these variables can be linked on the etiology and maintenance of PDD.

Descriptors: Depressive Disorder; Substance-Related Disorders; Postpartum Period; Social Vulnerability.

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## Fatores associados à Depressão Pós-Parto em mulheres em situação de vulnerabilidade social.

O presente trabalho teve por objetivo avaliar possíveis fatores associados com a depressão pós-parto (DPP), como o uso de substâncias e o suporte psicossocial em uma amostra de 102 mulheres em situação de vulnerabilidade social. O estudo foi realizado com puérperas que residiam provisoriamente no alojamento de um Hospital Maternidade público. Aproximadamente 20% das puérperas apresentaram critérios para a DPP além de um padrão de uso de álcool e maconha superior àquelas que não tinham o transtorno. Observou-se também associação entre violência, falta de suporte psicológico e apoio familiar com a DPP. Observou-se uma associação entre a DPP com outras comorbidades de modo que algumas variáveis estudadas possam estar envolvidas na etiologia e manutenção deste transtorno.

Descritores: Transtorno Depressivo; Transtornos Relacionados ao Uso de Substâncias; Período Pós-Parto; Vulnerabilidade Social.

## Factores asociados con la depresión posparto en las mujeres en situación de vulnerabilidad social.

Este estudo tuvo como objetivo evaluar posibles factores asociados con la Depresión Posparto (DPP) como el uso de sustancias y apoyo psicossocial em 102 mujeres em situación de vulnerabilidad social. El estudio se realizó con las madres residentes transitorias em la vivienda de un Hospital Maternidad. Aproximadamente 20% de las madres presentaron criterios para el DPP, así como un de consumo de alcohol y marihuana superior a aquellas que no tienen el trastorno. También fue observada una asociación entre la violencia, falta de apoyo psicológico y de la familia con el DPP. El DPP parece estar asociada con otras enfermedades concomitantes por lo que algunas variables pueden estar implicados en la etiología y el mantenimiento de este trastorno.

Descriptorios: Transtorno Depressivo; Transtornos Relacionados con Sustancias; Periodo Posparto; Vulnerabilidad Social.

### Introduction

A Postpartum Depression (PPD) is a mental disorder characterized by persistent changes in depressed mood, loss of interest and/or pleasure in daily activities, and changes in vegetative (sleep, libido, appetite, etc.) and psychological functions<sup>(1)</sup>. Currently, 350 million people worldwide are estimated to have depression. The prevalence of PPD varies depending on the country and the methodology used to estimate it. A prevalence of PPD ranging from 1.9% to 82.1% in developing

countries and from 5.2% to 74% in developed countries was identified in a systematic review by Norhayati et al.<sup>(2)</sup> based on 203 articles from 42 countries. These data were based on self-administered instruments and, according to the authors, a lower prevalence of PPD was observed to be associated with structured clinical interviews (between 0.1% and 26.3%).

In Brazil, a systematic review evaluating 14 studies, most of which used self-administered questionnaires, identified a prevalence of approximately 8 to 40%<sup>(3)</sup>. Another study evaluating the prevalence of DPP based

on a structured clinical interview of the DSM-IV found that 7% of the women in the city of Recife-PE were diagnosed with this condition<sup>(4)</sup>. More recently, Corrêa et al.<sup>(5)</sup> identified a prevalence of PPD of 19% and 20.3% in women in the Northeast and in the State of Amazonas, respectively.

DPP is a mental disorder that can lead to serious consequences for women, babies and close friends. A proportion of 17% of the children whose mothers had PPD presented psychomotor development delays and greater learning problems in a longitudinal study<sup>(6)</sup>. Women with PPD may also present greater difficulty to interact with the baby and the family dynamics, and may experience a worsening quality of life<sup>(7)</sup>.

Regarding its etiology, PPD appears to have multifactorial causes, especially from biological, psychological and socioeconomic nature. As to the former, the more robust evidence concentrates on hormonal changes, such as progesterone, estrogen gonadal and prolactin<sup>(8)</sup>. Changes in these hormones affect the modulation of neurotransmission systems, especially the serotonergic and noradrenergic systems. In the case of psychological variables, previous depressive episodes may increase the chances of a PPD episode by 25 to 50%<sup>(9)</sup>. Women who presented any sort of Anxiety Disorder also showed to have a greater chance of comorbidity with PPD<sup>(10)</sup>. Regarding socioeconomic aspects, there is a strong association between PPD and lack of family and social support<sup>(11)</sup>, in addition to low socioeconomic status<sup>(12)</sup>, frequency of fights with the partner<sup>(13)</sup> and substance abuse.

Regarding the latter, Certain et al.<sup>(14)</sup> found an almost 4-fold greater chance of PPD in women with a history of substance abuse. In another study<sup>(15)</sup>, 20% of women with PPD had had a history of substance abuse compared to those who did not have PPD. The study also found that approximately 47% of the PPD group and 17% of the control group reported having used at least one illicit substance during pregnancy.

The present study aimed to evaluate the association between PPD and substance use in women residing in a temporary housing of a Public Maternity Hospital of the City of São Paulo. In addition, it was intended to evaluate possible socioeconomic differences among women with and without PPD. The main hypothesis of this study was that women with PPD would be more likely to use substances and present a greater number of socioeconomic difficulties (family violence, lack of social support, income, etc.) than women without the disorder.

## Methods

### Sample

The sample consisted of 102 puerperal women who were provisionally housed in a teaching Maternity Hospital in the City of São Paulo during the first days after delivery. The rooming-in works as a temporary shelter for both pregnant and postpartum women who are in a situation of social vulnerability (homelessness, family problems, and other situations that threaten their physical and/or emotional integrity).

### Instruments

One of the instruments used in the study was a sociodemographic questionnaire developed by the authors composed of 13 general questions (gender, age, ethnicity, marital status, schooling, income, psychological help, family support and family violence, number of pregnancies, number of children and abortions and mode of last childbirth). In addition, two standardized instruments were used.

1. One was the Edimburg Postpartum Depression Scale (EPDS), which is a self-administered instrument composed of 10 questions related to specific symptoms of PPD (depressed or dysphoric mood, sleep disorders, altered appetite, loss of pleasure, suicidal ideation, decrease of performance and guilt feelings). The questions are scored between 0 and 3 and the instrument has a maximum score of 30 points, according to the presence and intensity of the symptoms. Although there are different classification procedures in this instrument, in this study the puerperae were classified only in two groups; No Risk Group (NRG) and Postpartum Depression Group (PPDG). The interviewees were classified into the PPDG when their score was greater than 10 points on the scale, as based on a previous work<sup>(16)</sup>. Women with scores of less than or equal to 10 points were classified as belonging to the NRG. The sample of the present study presented significant differences between the two groups ( $F_{(1,100)}=191.3$ ), and an acceptable effect size (*eta square*;  $\eta^2 = 0.66$ ).

2. The other instrument applied was the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST). This tool was developed by World Health Organization researchers and aims to assess substance use in the last three months. The instrument is composed of 8 items and must be applied and interpreted by the health professional, as it has specific scores that correlate with the consumption of the substances in question. The psychometric properties of the instrument were validated in the Brazilian population, with results considered robust.

## Procedures

After the presentation of the Approval Letter of the Research Ethics Committee of the Hospital and the authorization of the Institution, the puerperae were invited to participate in this study and those who accepted the invitation scheduled an interview with the researchers for the formal presentation of the Informed Consent Term and data collection. Both the scheduling and the collection were performed at the Umbigo Ambulatory, from a specific ward of the teaching Maternity Hospital. Each interview lasted approximately 20 to 30 minutes and was conducted by students of the Medicine course (6th year) of the Anhembi Morumbi University, who were trained to apply the instruments.

Before starting the data collection, a pilot procedure without the character of research was performed with some University students only to evaluate the clarity of the questions and the flow of application of the instruments. These data were not included in this study and the necessary adjustments were made for the subsequent collection procedure.

## Data Analysis

Continuous data were standardized into Z scores with the objective of detecting possible patterns of outliers which could impair the reliability of the analyses. Values below or above 3 standard deviations were excluded from specific analyses. Thus, among the 102 women in the total sample, 28 results that behaved as outliers were identified and excluded; 4 cases were detected in the variable «age», 3 in «income», 3 in «number of pregnancies», 9 in «number of abortions» and 9 in «number of children».

The  $\chi^2$  test was used for the analysis of categorical variables, and Analysis of Variance (ANOVA) for the continuous variables. Whenever possible, we chose not only the level of significance, but also the value of the Tests and the size of the effect of the analyses, as recommended by the American Association of Psychology<sup>(17)</sup>. When ANOVA was used, the Eta Square ( $\eta^2$ ) was used for testing the effect size. The analyses were carried out in the program Statistica 16.0 (Statsoft Inc®).

## Ethics

The study was submitted and approved by the Ethics and Research Committee of the Anhembi Morumbi University (CAAE 18748013.2.0000.5492), number 432.804.

## Results

Of the total of 102 puerperal women, 21 (20.6%) presented a score above 10 in the EPDS instrument, being classified in the PPDG, and the others (N = 81, 79.4%) were classified in the NRG. Table 1 shows the sociodemographic data of the groups (NRG and PPDG).

Table 1. Description of sociodemographic data and severity level of the Edimburg Postpartum Depression Scale (EPDS). São Paulo, SP, Brazil (2015), (N = 101).

	No risk N=81	Postpartum Depression N=21	Test	$p$	Effect size	Observed power
<b>Age</b>	26 ( $\pm 6.3$ )	25.6 ( $\pm 6.1$ )	0.07 <sup>(a)</sup>	0.78 <sup>(a)</sup>	0.00 <sup>(b)</sup>	0.05 <sup>(c)</sup>
<b>Ethnic group</b>			4.37 <sup>(d)</sup>	0.11 <sup>(b)</sup>	0.2 <sup>(e)</sup>	
White	36 (45%)	7 (33.3%)				
Brown	33 (41.7%)	7 (33.3%)				
Black	11 (13.3%)	7 (33.3%)				

(continues...)

Table 1 – continuation

	No risk N=81	Postpartum Depression N=21	Test	$p$	Effect size	Observed power
<b>Gross income(f)</b>	508.8 (±221.82)	412.96 (±223.15)	2.58 <sup>(a)</sup>	0.12 <sup>(a)</sup>	0.00 <sup>(b)</sup>	0.35 <sup>(c)</sup>
<b>Schooling (in years)</b>	9.1 (±2.95)	8,1 (±2,93)	1,98 <sup>(a)</sup>	0.16 <sup>(a)</sup>	0.02 <sup>(b)</sup>	0.28 <sup>(c)</sup>
<b>Marital status</b>			3.16 <sup>(d)</sup>	0.07 <sup>(b)</sup>	0.2 <sup>(e)</sup>	
Single	29 (35.8%)	12 (57,1%)				
Married	52 (64.2%)	9 (42.9%)				
<b>Number of children</b>	1.8 (±0.93)	2.2 (±0.93)	2.48 <sup>(a)</sup>	0.11 <sup>(a)</sup>	0.03 <sup>(b)</sup>	0.36 <sup>(c)</sup>
<b>Number of abortions</b>	0.34 (±0.6)	0.33 (±0.61)	0.00 <sup>(a)</sup>	0.96 <sup>(a)</sup>	0.00 <sup>(b)</sup>	

(a) Analysis of Variance- ANOVA (b) Eta Square test ( $\eta^2$ ) (c) In the case of ANOVA, the observed power of the analyses was inserted (d) Chi-square test (e) Cramer Test (f) Average quotation of the Real in July 2015; \$ 1dollar = R\$ 3.30 reais.

Regarding age, no differences were observed, although the NRG was slightly older than PPDG. Regarding ethnicity, approximately 45% of the NRG women were white, while this distribution was more uniform for the PPDG (33% for each group). Moreover, NRG women had a mean income approximately \$ 91 and a mean schooling one year above the PPDG, although there were no significant differences according to the ANOVA of these two variables. Approximately 65% of the NRG women reported being married or living with their partners (common law marriage) compared to the

PPDG (43%), and the number of children in the latter group was slightly higher (2.2 children) than in the NRG (1.8 children). Finally, the number of abortions reported by the women were very similar between the NRG (0.34) and the PPDG (0.33).

Table 2 indicates differences between the NRG and PPDG in the mean scores of use of the three substances detected in the sample (alcohol, tobacco and marijuana) in the last three months, besides some behavioral characteristics of the puerperae.

Table 2. Description of scores in the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) instrument and behavioral data of the respondents based on the severity level of the Edimburg Postpartum Depression Scale (EPDS). São Paulo, SP, Brazil (2015), (N = 101).

	No risk N=81	Postpartum Depression N=21	Test	$p$	Effect size	Observed power
<b>ASSIST</b>						
<b>Tobacco</b>	2,62 (±6,53)	4,55 (±6,76)	1,3 <sup>(a)</sup>	0,3 <sup>(a)</sup>	0,01 <sup>(b)</sup>	0,2 <sup>(c)</sup>
<b>Alcohol</b>	1,02 (±2,97)	2,85 (± 3)	6,3 <sup>(a)</sup>	0,01 <sup>(a)</sup>	0,06 <sup>(b)</sup>	0,7 <sup>(c)</sup>
<b>Marijuana</b>	0,07 (±0,66)	0,45 (±0,67)	5,2 <sup>(a)</sup>	0,02 <sup>(a)</sup>	0,05 <sup>(b)</sup>	0,62 <sup>(c)</sup>
<b>Planned Gestation</b>			0,1 <sup>(d)</sup>	0,74 <sup>(d)</sup>	0,1 <sup>(d)</sup>	
Yes	57 (70,4%)	14 (66,7%)				
No	24 (29,6%)	7 (33,3%)				
<b>Effective prenatal care</b>			2,2 <sup>(d)</sup>	0,13 <sup>(d)</sup>	0,14 <sup>(e)</sup>	
Yes	79 (97,5%)	19 (90,5%)				
No	2 (2,5%)	2 (9,5%)				
<b>Victim of violence?</b>			7,2 <sup>(d)</sup>	0,00 <sup>(d)</sup>	0,26 <sup>(e)</sup>	
Yes	6 (7,4%)	6 (28,5%)				
No	75 (92,6%)	15 (71,5%)				
<b>Psychological support?</b>			2,3 <sup>(d)</sup>	0,13 <sup>(d)</sup>	0,14 <sup>(e)</sup>	
Yes	9 (11,1%)	5 (23,8%)				
No	72 (88,9%)	16 (76,2%)				

(continues...)

Table 2 – continuation

	No risk N=81	Postpartum Depression N=21	Test	$p$	Effect size	Observed power
<b>Support from friends, partners, family?</b>			15,8 <sup>(d)</sup>	0,00 <sup>(d)</sup>	0,4 <sup>(e)</sup>	
Yes	66 (81,5%)	8 (38,1%)				
No	15 (18,5%)	13 (61,9%)				
<b>Birth of the baby</b>			4,54 <sup>(d)</sup>	0,1 <sup>(d)</sup>	0,21 <sup>(e)</sup>	
Term	67 (82,7%)	13 (61,9%)				
Preterm	10 (12,4%)	5 (23,8%)				
Post-term	4 (4,9%)	3 (14,3%)				
<b>Type of delivery</b>			0,99 <sup>(d)</sup>	0,6 <sup>(d)</sup>	0,01 <sup>(e)</sup>	
Normal	43 (53,1%)	12 (57,1%)				
Cesarean section	28 (34,6%)	8 (38,1%)				
Forceps	10 (12,3%)	1 (4,8%)				

(a) Analysis of Variance - ANOVA (b) Eta Square test ( $\eta^2$ ) (c) In the case of ANOVA, the observed power of the analyses was inserted (d) Chi-square test (e) Cramer test.

In general, the use of substances was higher among the PPDG women, however the Analysis of Variance detected significant differences only for alcohol and marijuana use (Sheffé's Test,  $p < 0.05$ ). In the case of alcohol, the score was approximately 2.5-fold higher in the PPDG, and 6.5-fold higher in the case of marijuana. As for planned pregnancies, approximately 70% of the women in both groups reported that they had planned the pregnancy and that they had received an effective prenatal care; there was a positive response from approximately 97% of the NRG and 90% of the PPDG. Regarding having already been victims of domestic violence by their partners, almost 30% of the women in the PPDG said yes, compared to 7.5% in the NRG.

However, only 23% of the PPDG women received some form of psychological support. Regarding the support of friends and relatives in child care, while more than 80% of the NRG women reported receiving some help, it was observed that only 38% of the women in the PPDG reported receiving some support. Regarding the type of birth, although no significant differences were detected, there was a double frequency of preterm births and triple frequency of post-term births in the PPDG.

Table 3 shows the main differences between the gross score in the EPDS, substance use and behavioral variables among puerperal women who received (YES group) and did not receive support (group NO) from relatives/friends for child care.

Table 3. Differences between puerperal women who reported receiving (YES) and not receiving (NO) support from family members and/or friends for child care in relation to the last gestation. São Paulo, SP, Brazil (2015), (N = 101).

	YES N=74	NO N=28	Test	$p$	Effect size	Observed power
<b>EPDS</b>	5,21	9,28	14,6 <sup>(a)</sup>	0,00 <sup>(a)</sup>	0,12 <sup>(b)</sup>	0,96 <sup>(c)</sup>
<b>ASSIST</b>						
<b>Tobacco</b>	2,64	4,08	0,85 <sup>(a)</sup>	0,35 <sup>(a)</sup>	0,00 <sup>(b)</sup>	0,15 <sup>(c)</sup>
<b>Alcohol</b>	0,66	3,33	18,71 <sup>(a)</sup>	0,00 <sup>(a)</sup>	0,16 <sup>(b)</sup>	0,98 <sup>(c)</sup>
<b>Marijuana</b>	0,08	0,37	3,65 <sup>(a)</sup>	0,06 <sup>(a)</sup>	0,03 <sup>(b)</sup>	0,47 <sup>(c)</sup>
<b>Planned Gestation</b>			2,86 <sup>(d)</sup>	0,09 <sup>(d)</sup>	0,16 <sup>(d)</sup>	
Yes	26 (35,1%)	23 (82,1%)				
No	48 (64,9%)	5 (17,9%)				
<b>Effective prenatal care</b>			4,72 <sup>(d)</sup>	0,02 <sup>(d)</sup>	0,21 <sup>(e)</sup>	
Yes	73 (98,7%)	25 (89,3%)				
No	1 (1,3%)	3 (10,7%)				
<b>Victim of violence?</b>			6,51 <sup>(d)</sup>	0,01 <sup>(d)</sup>	0,24 <sup>(e)</sup>	
Yes	5 (6,8%)	7 (25%)				
No	69 (93,2%)	21 (75%)				

(continues...)



Table 3 – continuation

	YES N=74	NO N=28	Test	$p$	Effect size	Observed power
<b>Psychological support?</b>			7,18 <sup>(d)</sup>	0,00 <sup>(d)</sup>	0,27 <sup>(e)</sup>	
Yes	6 (8,1%)	8 (28,6%)				
No	68 (91,9%)	20 (71,4%)				

(a) Analysis of Variance - ANOVA (b) Eta Square test ( $\eta^2$ ) (c) The observed power of the analyses was inserted in the case of ANOVA

(d) Chi-square test (e) Cramer test.

The group NO presented an average postpartum depression score 80% higher than the YES group, besides a higher consumption of tobacco and marijuana ( $p < 0.05$ ) as detected by the ASSIST. Among the women who received some type of support, only 35% had planned their gestation, while more than 80% of those of the NO group had planned the gestation. Furthermore, in the NO group, 25% of the women reported having suffered aggressions compared to the YES group (7%) and less than 30% of the women in the NO group reported having received psychological support.

## Discussion

Among the main findings of this study, approximately 20% of postpartum women met the criteria for PPD and these women had a higher frequency of substance use compared to those without the disorder. Violence, lack of psychological support and lack of family support were also observed to be associated with PPD compared with those who did not have the disorder. Puerperal women with PPD reported that they had not received family support, they presented higher scores for PPD and for alcohol use, as well as higher frequency of reports of violence and lack of psychological support.

Regarding the prevalence, the findings in this study are close to other Brazilian studies that also used the same instrument, which found prevalences of approximately 20 to 25%<sup>(3-5)</sup>. Regarding substance use, although greater consumption was detected among women with PPD, especially for alcohol and marijuana, the effect of this relationship needs to be better studied because it is not yet clear in the literature whether women with PPD increase their consumption of substances as a form of self-medication and also whether the prolonged use of substances may trigger neuroadaptive processes that alter neurotransmitter systems, especially monoamines, and whether the correlation between PPD and substance use is associated with social aspects.

Regarding the first case, insomnia is a very common symptom in PPD and alcohol and marijuana can be used as a sleep inducer (self-medication) due to their relaxing effects. With respect to the chronic use of substances, there is evidence of development of depressive disorders, especially resulting from the chronic use of stimulant drugs (amphetamines, methamphetamines, cocaine, crack etc.) due to a self-regulating effect of monoaminergic receptors and reduction in the production of monoamines. In a recent study evaluating more than 34,000 French women<sup>(18)</sup>, the researchers observed that those with a history of substance abuse had a nearly threefold chance of being diagnosed with PPD.

An association was observed between PPDG and lack of family support and the event of violence from a relative and/or the partner<sup>(19-20)</sup>. These data are in line with other findings in the literature, in which these situations experienced by puerperae may act as risk factors for the etiology of the disorder. In a study with puerperal women who had immigrated to Taiwan<sup>(11)</sup>, the researchers made a longitudinal evaluation of the effect of three social support models (emotional, instrumental, and informational) on women with PPD. Over time, although all had a weight in the regression models, the emotional and instrumental support had an inversely proportional correlation with PPD, so that the higher the support, the lower the DPP rates. In a study of 38 Chinese puerperal women<sup>(21)</sup>, lack of support and marital problems were among the major stressors that could aggravate PPD, for they may further weaken the emotional and affective links with people who could support them. Thus, family support seems to be one of the variables most strongly associated with PPD. In the case of this study, almost 60% of PPD patients did not receive family support. In the case of specialized support, approximately 24% of the PPDG women also received some support, which may increase the vulnerability of these women and consequently the severity of the disorder.

## Conclusions

In summary, this study showed a relationship between PPD and the use of marijuana and alcohol. Women who did not receive social support presented higher scores for PPD on the EPDS scale, besides higher alcohol consumption compared to those who received some type of support. These associations may assist midwifery and prenatal follow-up teams to prevent PPD or to plan support for pregnant women with the observed profile. The present study has limitations that must be taken into account, such as a relatively small sample that prevents to carry out more robust statistical analyses and the evaluation of possible associations with other variables. In addition, the ASSIST is a tool that detects substance use in the last three months, limiting the researchers' understanding of a possible association between a history of substance use and PPD. Another point to be emphasized is that although many researchers use self-administered tests such as EPDS, a more reliable diagnosis is only possible through a structured clinical interview with a specialist. Finally, in some studies, psychosocial support models are categorized in a specific way and, in the present work, the questions related to this item were inserted in an unclassified manner (emotional, instrumental and informational support).

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