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Postpartum depression among women with unintended pregnancy

Depressão pós-parto entre mulheres com gravidez não pretendida

ABSTRACT

OBJECTIVE: To analyze the association between unintended pregnancy and postpartum depression.

METHODS: This is a prospective cohort study conducted with 1,121 pregnant aged 18 to 49 years, who attended the prenatal program devised by the Brazilian Family Health Strategy, Recife, PE, Northeastern Brazil, between July 2005 and December 2006. We interviewed 1,121 women during pregnancy and 1,057 after childbirth. Unintended pregnancy was evaluated during the first interview and postpartum depression symptoms were assessed using the Edinburgh Postnatal Depression Screening Scale. The crude and adjusted odds ratios for the studied association were estimated using logistic regression analysis.

RESULTS: The frequency for unintended pregnancy was 60.2%; 25.9% presented postpartum depression symptoms. Those who had unintended pregnancies had a higher likelihood of presenting this symptoms, even after adjusting for confounding variables (OR = 1.48; 95%CI 1.09;2.01). When the Self Reporting Questionnaire (SRQ-20) variable was included, the association decreased, however, remained statistically significant (OR = 1.42; 95%CI 1.03;1.97).

CONCLUSIONS: Unintended pregnancy showed association with subsequent postpartum depressive symptoms. This suggests that high values in Edinburgh Postnatal Depression Screening Scale may result from unintended pregnancy.

DESCRIPTORS: Depression, Postpartum, epidemiology. Pregnancy, Unplanned. Pregnancy, Unwanted. Cohort Studies.

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RESUMO

OBJETIVO: Analisar a associação entre gravidez não pretendida e depressão pós-parto.

MÉTODOS: Estudo de coorte prospectivo realizado com 1.121 mulheres grávidas de 18 a 49 anos, acompanhadas no pré-natal pela Estratégia de Saúde da Família, Recife, PE, entre julho de 2005 e dezembro de 2006. Durante a gravidez e após o parto foram entrevistadas, respectivamente, 1.121 e 1.057 mulheres. A gravidez não pretendida foi avaliada durante a primeira entrevista e os sintomas depressivos após o parto foram avaliados utilizando-se a *Edinburgh Postnatal Depression Screening Scale*. Foram estimados os *odds ratios* simples e ajustados para a associação estudada, utilizando-se análise de regressão logística.

RESULTADOS: A frequência de gravidez não pretendida foi de 60,2%; 25,9% apresentaram sintomas depressivos após o parto. Aquelas com gravidez não pretendida tiveram maior chance de apresentar esse desfecho, mesmo após ajuste para variáveis de confundimento (OR = 1,48; IC95% 1,09;2,01). Ao se incluir a variável *Self Reporting Questionnaire* (SRQ-20), a associação diminuiu, mas manteve-se estatisticamente significativa (OR = 1,42; IC95% 1,03;1,97).

CONCLUSÕES: Gravidez não pretendida mostrou-se associada a sintomas depressivos após o parto. Isso sugere que valores elevados na *Edinburgh Postnatal Depression Screening Scale* podem resultar de gravidez não pretendida.

DESCRITORES: Depressão Pós-Parto, epidemiologia. Gravidez não Planejada. Gravidez não Desejada. Estudos de Coortes.

INTRODUCTION

Postpartum depression (PPD) is a global health problem. Its prevalence varies greatly between countries and is higher in those that are less developed. Based on the literature review, Halbreich & Karkun[12] (2006) found figures from 0.5% in Singapore to 60.0% in Taiwan. Studies have shown different prevalences in Brazil, with most estimates being around 20.0%.[17,21] Methodological[22] and cultural aspects can cause this variation.[12]

PPD can harm the relationship between mother and child, which in turn negatively impacts children in terms of their nutrition and care, as well as their physical and mental development.[19,23]

The literature reports many risk factors related to PPD, such as: history of depression/mental disorder, depressive episode, anxiety or emotional problems during pregnancy, marital problems or difficult relationship with the partner, unavoidable stressful obligations and absent or insufficient social and financial support.[3,20] Studies suggest an association between unintended pregnancy (UP) and PPD.[11,21]

Many unwanted pregnancies happen worldwide every year; it is estimated 86 million in 2008.[29] In 2006, the Brazilian National Survey on Demography and Health[a] reported that 46.0% of all pregnancies in Brazil over the previous five years were in fact unplanned. However, other studies performed in Southern Brazil and in Bahia state showed greater frequencies (around 65.0%).[2,6,26] Carvalho[b] (2011), while studying mothers who had just given birth in their maternity accommodation in Recife's metropolitan region, found that 68.2% of these women did not intend to become pregnant. This difference is probably due to variations in methodology, such as the term "unplanned" being used instead of "unwanted" as regards the pregnancy, and to women under the age of 18 being included in the sample.

Using the terms "unplanned" and "unwanted" with the same meaning, i.e., to evaluate non-intentional pregnancies, can interfere with their frequency because the different ways that women understand the terms "unplanned", "unintended" and "unwanted".[10,15] Studies

that are periodically performed by the National Center for Health Statistics analyzed indicators of fertility, family planning and reproductive health in American women. They proposed using the term unwanted pregnancy to refer to those pregnancies in cases where the women did not want to have more children, and mistimed pregnancy, when the mother would have liked to have them at another time, grouping both these categories within another (unintended).[4] In Brazil, the term – in Portuguese – "*gravidez não pretendida*", used in the same sense as "unintended pregnancy", had already been proposed by Azevedo et al[1] (2013).

UP can have negative impacts on the health of children and women. Starting prenatal care late or not doing it at all, using alcohol and illicit drugs in pregnancy[2,11] and increased maternal mortality, as a result of unsafe abortions, are reported.[29] Children born from unintended pregnancies may be at a disadvantage in relation to maternal care, with a higher risk of death, retarded growth and abuse/violence.[11]

The aim of this study was to analyze the association between UP and PPD.

METHODS

This prospective cohort study[17] included 1,121 pregnant women aged 18 to 49 years, who had enrolled in the Brazilian Family Health Strategy (FHS) in the Sanitary District (DS) II, Recife, PE, Northeastern Brazil, and comprehended those that were not already undertaking prenatal care in the basic health units of this district. The study took place from July 2005 to December 2006. The district's population is made up mainly by low-income families. During the data collection, the FHS covered 78.0% of the district, comprising four teams from the Program of Community Health Workers (PACS) and 38 from the FHS.[17]

Out of the 1,121 women who participated in the research, 1,056 were included in the analysis, representing the total number of women who participated in the two steps (interview during pregnancy and following childbirth). The percentage of dropouts was 5.8%, due to: changing address (37), death (3), inability to participate in the second interview (2), moving to areas under the control of drug dealers (13), becoming homeless (4) and refusing to remain part of the research (5). One woman only participated in the second interview.

The participants were identified using prenatal records from the FHS or the PACS. The interviews were conducted on a face to face basis, in a private area, by interviewers with a higher level of education and research experience in areas concerning women's health, violence and gender.

The interviews in which the questionnaires were completed took place during pregnancy (from 31 weeks onwards) and following childbirth. Contact with the women involved in the second interview had to be done based on childcare study guidelines, however, due to insufficient coverage, most were contacted and interviewed at home. On average, these interviews happened eight months after giving birth.

The EPDS (Edinburgh Postnatal Depression Scale), developed by Cox et al[8] (1987), was used to assess depressive symptoms during puerperium. The scale contains 10 items that assess symptoms related to depression in the previous seven days, with scores ranging from zero to three for each item and varying from zero to 30 for the final score. Its psychometric properties were evaluated in the United Kingdom by the authors, who obtained 86.0% sensitivity and 78.0% specificity. In Brazil, it was validated by Santos et al[27] (1999). The authors suggested a cutoff point of 11/12, the value used in this study, with 72.0% sensitivity and 88.0% specificity. Despite it being designed to be self-administered, the scale was applied by the interviewers themselves during this study.

The independent variable unintended pregnancy was built from the following multiple choice question: "Before you knew you were pregnant, which sentence best described you?: a) I was trying to get pregnant; b) I wanted to get pregnant; c) I wanted to get pregnant, but not then (untimely/mistimed); d) I did not want to get pregnant at all (unwanted); e) it made no difference either way".[1] Women who chose one of the first two alternatives ("a" or "b") were classified as having an intended pregnancy, and those who chose item "c" or "d", as an unintended pregnancy. The "made no difference" answers were reclassified into one of these two categories based on the analysis of other variables, which assessed the attitudes and feelings of the women in relation to their pregnancy, such as: reaction to discovering pregnancy, reasons for not wanting to get pregnant and using contraceptives in the period before the pregnancy. Forty-eight women chose the: "made no difference" option. From these, six were categorized as unintended pregnancy and the rest as intended pregnancy. Out of the women who reported that they were trying or wanted to get pregnant, 32 thought about or tried to get an abortion. However, these were not reclassified due to the difficulty of categorizing these pregnancies as mistimed or unwanted.

The following were selected as potentially confounding variables: age (up to 19 years; 20 years or older), race/skin color (white; non-white), education (zero to four years; five years or more), housing status (owned; not owned), working status (active; inactive), personal income (with an income; no income), marital status (with a partner; without a partner), dependents (no

children; at least one child) and personal history of self-reported mental disorder (yes; no). Variables that were also included in the evaluation were mental status during pregnancy, partner behavior and social support.

The mental status during pregnancy was evaluated using the Self Reporting Questionnaire (SRQ-20), which is a self-assessment scale containing 20 questions developed by Harding et al[13] (1980). This scale was developed to screen for common mental disorders (CMD) in primary health care, which are non-specific for evaluating depression symptoms. The cut-off point used was 7/8, which was the same used in the validation study conducted in Brazil (77.0% sensitivity and 81.0% specificity).[18] Despite this questionnaire having been designed to be self-administered, the interviewers gave the interviews themselves during this study.

The partner's controlling behavior was measured by asking questions that assessed, for example, the man's attempts to stop the woman from having contact with her relatives and friends, in particular male members.[17]

Social support was evaluated by MOS-SSS (Medical Outcomes Study Questions-Social Support Survey), which is a questionnaire that was developed by Sherbourne & Stewart[28] (1985) and validated in Brazil by Chor et al[5] (2001). The questionnaire consists of 19 questions that are made up of five functional dimensions of social support: emotional, affective and tangible support (provision of practical resources and material assistance), or support in terms of information and company or social interaction. There are five possible answers to each question: never, rarely, sometimes, often, or always. A score is assigned for each answer and individuals are divided into categories of overall social support according to the score achieved by the sum of their points. The cut-off point used was 33. The two categories used were: great support (greater than or equal to 34 points) or little/moderate support (0 to 33 points).[7]

Descriptive analyses were performed and the UP frequency and the PPD prevalence obtained. The association between UP and PPD was analyzed by way of logistic regression, estimating the crude and adjusted odds ratio (OR) and the 95% confidence intervals (95%CI). The variables that were associated with exposure and outcome in the bivariate analysis, and that had been previously selected, were included in the model for fitting. The statistical significance assessment was done considering a $p < 0.05$ and 95%CI. The software Stata, version 10.0, was used to assist in the analysis.

The research was approved by the Ethics Committee at the Universidade Federal de Pernambuco (Protocol 303/2004 – CEP/CCS). All participants signed an informed consent form.

RESULTS

Most women were less than 20 years old (86.2%), were non-white (80.1%), had a partner (86.8%), owned their house (65.8%) and had five or more years of education (77.3%). About 70.0% of the women were economically inactive, but 59.4% declared

Table 1. Socioeconomic and demographic characteristics, concerning the relationship with the partner, social support and mental health for women. Sanitary District II, Recife, PE, Northeastern Brazil, 2005 to 2006. (N = 1,056)

Variable	n	%
Age (years)		
Up to 19	146	13.8
≥ 20	910	86.2
Race/Color		
White	210	19.9
Non-white	846	80.1
Housing status		
Owned	695	65.8
Not owned	361	34.2
Education (in years)		
0 to 4	240	22.7
≥ 5	816	77.3
Working status		
Active	319	30.2
Inactive	737	69.8
Marital status		
With a partner	917	86.8
Without a partner	139	13.2
Income		
With an income	627	59.4
No income	429	40.6
Partner's controlling behavior		
Not controlling	314	29.7
Controlling	742	70.3
Social support		
Great	317	30.0
Little/Moderate	739	70.0
SRQ-20		
< 8	603	57.1
≥ 8	453	42.9
Personal history of mental disorder		
No	928	87.9
Yes	128	12.1
Dependents		
0	376	35.6
≥ 1	680	64.4

SRQ-20: Self Reporting Questionnaire – 20 question version

having some source of personal income (including governmental benefits and help from friends/relatives) (Table 1); 36.0% had no children.

About 70.0% of the participants reported having experienced some kind of control on the behalf of their partner; 70.0% had little or moderate social support; 12.1% reported at least one episode of mental disorder in their life; and 42.9% scored above eight on the SRQ-20 (Table 1).

The UP frequency was 60.2%. Of these, 22.5% were mistimed and 37.7% unwanted. The PPD prevalence was 25.9%. Among the women who reported an UP, 30.0% had symptoms of postpartum depression (EPDS ≥ 12).

The bivariate analysis carried out between PPD and the covariates in the study showed a greater odds ratio for the outcome occurring among women without their own home, with less than five years of education, economically inactive and with their own income. Those who reported that they received controlling behavior by their partner were 2.58 times more likely to present PPD symptoms. The odds ratio for the occurrence of this outcome in the group with little or moderate social support was 3.57. Women who scored ≥ 8 in the SRQ20 and had a personal history of mental disorder had the highest odds ratio for PPD. Women with at least one child were 2.36 times more likely to present PPD. The age and race/color variables did not show any association with PPD (Table 2).

Table 3 shows the bivariate analysis between the exposure variable and the other independent variables used in the study, as well as the potential confounding variables for the studied association. Women who reported their pregnancy as being unintended were 1.74 times more likely to present PPD symptoms, compared with those who wanted to get pregnant, according to logistic regression (OR = 1.74; 95%CI 1.30;2.34; p = 0.0002) (Table 3).

The variables that were associated with exposure and outcome in the literature review and bivariate analysis (potentially confounding variables) were inserted in the model. The initial fitting included the following variables: partner's controlling behavior, social support, and parity. A reduction in the odds ratio was observed for the association between UP and PPD, but it was still statistically significant (OR = 1.48; 95%CI 1.09; 2.01; p = 0.012). Following the inclusion of the SRQ-20, the odds ratio decreased a little more, but it remained statistically significant (OR = 1.42; 95%CI 1.03;1.97; p = 0.031) (Table 4).

DISCUSSION

In this study, we found a high PPD prevalence (25.9%), which is frequent in developing countries[12] and similar to other Brazilian studies.[17] O'Hara & Swain[22] (1996),

in their literature review, found higher PPD prevalences when self-assessment scales were used instead of interviews performed by psychiatrists. We used the EPDS, which may have overestimated PPD prevalence; however, the symptoms were assessed averagely eight months following childbirth, which may have underestimated the prevalence. This is because symptoms mostly disappear within the first six months of the puerperium.[16,24] Some cases of PPD might not have been detected in this study, due to the time when the interviews were conducted.

UP is a central theme in the field of reproductive health. Despite advances in the area of contraception, UP frequency is still high, especially in developing countries, where few studies are conducted with this aspect as their objective.[29] The UP frequency in this study was also high (60.2%). This is similar to the values identified by Brazilian studies who used unplanned pregnancy as their definition instead of unintended pregnancy.[2,6,26] Despite this value being high, it may be underestimated due to aborted pregnancies having been excluded from the study. In addition, the assessment that investigated the intention to become pregnant was done during the advanced stages (third quarter) and it is possible that the woman's feelings may have changed as the gestation progressed.[c] This change of mind may have been a result of economic, marital and family circumstances, perception and values regarding family and abortion.[10] In this study, 32 women who claimed to be trying or wanting to become pregnant also reported that they thought about or tried to have an abortion.

This frequency of unintended pregnancies (60.2%) was higher than that found in the National Demographic and Health Survey of Children and Women (PNDS) (46.0%) in 2006.[c] Such a difference can be explained by differences in the study population. The PNDS involved middle-class women, which is different to this study in which low-income women predominated. These women of lesser financial means depend on the Family Health Program to receive their contraceptives. In addition, the PNDS is a nationwide research project that involves women from regions that have different contraception access standards.

Women who reported UP presented a greater frequency of postpartum depressive symptoms. This association remained after adjusting for potentially confounding variables (parity, social support, partner's controlling behavior and the SRQ-20), albeit to a lesser magnitude.

We used different instruments to screen for depressive symptoms before and after childbirth since it was slightly better than the EPDS in a comparative

Table 2. Bivariate analysis between PPD and potentially confounding variables in women. Sanitary District II, Recife, PE, Northeastern Brazil, 2005 to 2006.

Variable	EPDS Score				OR	95%CI	p
	< 12		≥ 12				
	n	%	n	%			
Age (years)							
Up to 19	113	77.4	33	22.6	0.81	0.54;1.23	0.315
≥ 20	669	73.5	241	26.5	1		
Race/Color							
White	160	76.2	50	23.8	1		
Non-white	622	73.5	224	26.5	1.15	0.81; 1.64	0.430
Housing status							
Owned	528	76.0	167	24.0	1		
Not owned	254	70.4	107	29.6	1.33	1.00; 1.77	0.050
Education (in years)							
0 to 4	160	66.7	80	33.3	1.60	1.17;2.19	0.004
≥ 5	622	76.2	194	23.8	1		
Working status							
Active	257	80.6	62	19.4	1		
Inactive	525	71.2	212	28.8	1.67	1.22;2.30	0.001
Income							
With an income	449	71.6	178	28.4	1		
No income	333	77.6	96	22.4	0.73	0.55;0.97	0.028
Partner's controlling behavior							
Not controlling	268	85.4	46	14.6	1		
Controlling	514	69.3	228	30.7	2.58	1.82;3.67	0.0001
Social support							
Great	280	88.3	37	11.7	1		
Little/Moderate	502	67.9	237	32.1	3.57	2.45;5.20	0.0001
SRQ-20							
< 8	527	87.4	76	12.6	1		
≥ 8	255	56.3	198	43.7	5.38	3.97;7.30	0.0001
Personal history of mental disorder							
No	716	77.2	212	22.8	1		
Yes	66	51.6	62	48.4	3.17	2.17;4.63	0.0001
Dependents							
0	315	83.8	61	16.2	1		
≥ 1	467	68.7	213	31.3	2.36	1.71;3.24	0.0001

SRQ-20: Self Reporting Questionnaire – 20 question version; EPDS: Edinburgh Postnatal Depression Scale

study.[25] The second instrument was used during puerperium as it was specifically designed for screening for PPD. The latter instrument, has the advantage of not including somatic symptoms, which may be part of the physiological changes that occur in a woman's body during this period.[8] It is unlikely that this change had a significant impact on the results as both measures are highly correlated, and both have good specificity and sensitivity when compared with an interview performed by a psychiatrist.[25]

The EPDS was administered by interviewers in this study, despite it having been designed to be self-administered. A systematic review was carried out with Asian women residing in the United Kingdom in order investigate the relevance, validity and effectiveness of PPD assessment instruments, which included the EPDS. This review indicated that women preferred face-to-face interviews rather than self-administered questionnaires.[9] In addition, studies have used the EPDS as a questionnaire administered by interviewers.[17,23] The same happened with the

Table 3. Bivariate analysis between unintended pregnancy and potentially confounding variables in women. Sanitary District II, Recife, PE, Northeastern Brazil, 2005 to 2006.

Variable	Pregnancy planning				OR	95%CI	p
	Intended		Unintended				
	n	%	n	%			
Age (years)							
Up to 19	49	33.6	97	66.4	1.36	0.94;1.97	0.096
≥ 20	371	40.8	539	59.2	1		
Race/Color							
White	82	39.0	128	61.0	1		
Non-white	338	40.0	508	60.0	0.96	0.71;1.31	0.811
Housing status							
Owned	266	38.3	429	62.7	1		
Not owned	154	42.7	207	57.3	0.83	0.64;1.08	0.168
Education (in years)							
0 to 4	87	36.3	153	63.8	1.21	0.90;1.63	0.201
≥ 5	333	40.8	483	59.2	1		
Working status							
Active	136	42.6	183	57.4	1		
Inactive	284	38.5	453	61.5	1.18	0.91;1.55	0.212
Income							
With an income	240	38.3	387	61.7	1		
No income	180	42.0	249	58.0	0.86	0.67;1.10	0.230
Partner's controlling behavior							
Not controlling	144	45.9	170	54.1	1		
Controlling	276	37.2	466	62.8	1.43	1.09;1.87	0.009
Social support							
Great	142	44.8	175	55.2	1		
Little/Moderate	278	37.6	461	62.4	1.35	1.03;1.76	0.030
SRQ-20							
< 8	259	43.0	344	57.0	1		
≥ 8	161	35.5	292	64.5	1.37	1.06;1.76	0.015
Personal history of mental disorder							
No	370	39.9	558	60.1	1		
Yes	50	39.1	78	60.9	1.03	0.71;1.51	0.861
Dependents							
0	190	50.5	186	49.5	1		
≥ 1	230	33.8	450	66.2	2.00	1.55;2.58	0.0001

SRQ-20: Self Reporting Questionnaire – 20 question version

Table 4. Association between unintended pregnancy and postpartum depression with and without fitting for confounding variables. Sanitary District II, Recife, PE, Northeastern Brazil, 2005 to 2006.

Variable	Total number of participants	Participants with post-partum depression	OR_{crude}	95%CI	$OR_{adjusted}^{a}$	95%CI	$OR_{adjusted}^{b}$	95%CI
Intended pregnancy	420 (40.0%)	83 (20.0%)	1		1		1	
Unintended pregnancy	636 (60.0%)	191 (30.0%)	1.74	1.30;2.34	1.48	1.09;2.01	1.42	1.03;1.97
p	–	–	0.0002		0.012		0.031	

[a] Adjusted for social support, controlling behavior by the partner and parity.
[b] Adjusted for social support, controlling behavior by the partner and parity and the Self Reporting Questionnaire – 20 question version (SRQ-20).

SRQ-20 in this study. The World Health Organization recommends this form of use in countries that have low education levels, this was the reason that this recommendation was followed in this study.[d] Studies have proven the effectiveness of this form of administration.[14] We believe that there was no prejudice in the study's findings or conclusions as a result of the chosen method of administering the two instruments.

This is a population-based study, with a large sample and a small loss percentage (5.8%). We actively searched for the women who were not registered in FHS prenatal units to minimize selection bias. Using the SRQ-20 made it possible to identify women who already had depressive symptoms during pregnancy, a factor described as a strong predictor for PPD in the literature. We adjusted for this variable, which reduced the strength of the association.

The sample was mainly made up of low-income women, which means that generalizing the results for populations with other socioeconomic profiles is not possible.

Despite it having been possible for there to be information bias in the variable related to the partner (controlling behavior), as the information was collected during the first interview (before the outcome), makes this mistake, if it happened, and not relevant, thereby underestimating such an association.

Preventing unwanted or untimely pregnancy (as a result of making information available and providing contraceptive means, including male and female sterilization) is a right for both women and couples, and can reduce the likelihood of PPD, according to the results from this study, by reducing the number of unintended pregnancies. Identifying women with UP during the prenatal period can contribute to guiding care and offer support for these women during pregnancy and puerperium.

Although PPD has been well documented in literature in recent years, the sexual and physical recovery of women and available care for newborns remain as central health factors for women in puerperium. Thus, unrecognized or undervalued symptoms of mental distress can worsen matters and lead to immediate and later effects for the woman and her child. Additional investigations can widen the understanding on the theme, including, for example, women younger than 18 years, an age group that was excluded from this study.

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