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# EPIDEMIOLOGY OF PERINATAL DEPRESSION IN PORTUGAL
## Categorical and Dimensional Approach

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**SUMMARY**

The aim of the present study was to estimate depressive disorder and symptomatology prevalence and incidence in perinatal period in a population-based sample. Three-hundred and eighty six Portuguese women (mean age=30.08 years, SD=4.21) were interviewed with the Diagnostic Interview for Genetic Studies and completed Beck Depression Inventory-II/BDI-II and Postpartum Depression Screening Scale/PDSS, in pregnancy and postpartum. OPCRIT polydiagnostic system generated ICD-10 and DSM-IV diagnoses. One-month prevalence in pregnancy was of 2.3%/ICD-10 and 1.3%/DSM-IV; in postpartum it was of 16.6% and 11.7%. Pregnancy incidence was of 0%/ICD-10 and .3%/DSM-IV and in postpartum of 7.5%/ICD-10 and 4.9%/DSM-IV. Depression pregnancy point-prevalence found with BDI-II cut-offs ranged from 13.7% to 19.4% in pregnancy and from .8% to 13.0% in postpartum and with PDSS from 14.2% to 17.9% in pregnancy and from 3.9% to 12.7% in postpartum. In the same sample, different diagnostic systems generated different prevalence and incidence rates. Higher prevalence rates were found using self-reported questionnaires. ICD-10 generated higher prevalence and incidence rates than DSM-IV.

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**RESUMO**

**EPIDEMIOLOGIA DA DEPRESSÃO PERINATAL EM PORTUGAL**
**Abordagem Categorical e Dimensional**

O objectivo do presente estudo foi estimar a prevalência e incidência da perturbação depressiva e da sintomatologia depressiva no período perinatal numa amostra baseada na população. Trezentas e oitenta e seis mulheres Portuguesas (idade média=30.08 anos, DP=4.21) foram entrevistadas usando a versão portuguesa da Diagnostic Interview for Genetic Studies e completaram o Beck Depression Inventory-II/BDI-II e a Postpartum Depression Screening Scale/PDSS, na gravidez e no pós-parto. O sistema polidiagnóstico OPCRIT gerou os diagnósticos segundo a CID-10 e o DSM-IV. A prevalência de 1 mês na gravidez foi de 2.3%/CID-10 e de 1.3%/DSM-IV; no pós-parto foi de 16.6% e de 11.7%. a incidência na gravidez foi de 0%/CID-10 e de .3%/DSM-IV e no pós-parto foi de 7.5%/CID-10 e de 4.9%/DSM-IV. A prevalência de depressão pontual encontrada através dos pontos de corte para o BDI-II variaram de 13.7% a 19.4% na gravidez e de .8% a 13.0% no pós-parto e para a PDSS variaram de 14.2% a 17.9% na gravidez e de 3.9% a 12.7% no pós-parto. Na mesma amostra, diferentes sistemas de diagnóstico geraram diferentes taxas de prevalência e de incidência. Foram encontradas taxas mais elevadas usando questionários de auto-resposta. A CID-10 produziu taxas de prevalência e de incidência mais elevadas do que o DSM-IV.

## INTRODUCTION

In the last two decades there has been an increasing interest in the perinatal psychiatric disorders. Contemporary epidemiological studies reveal that more than 40% of women present depressive symptomatology both in pregnancy and postpartum, suggesting a distress continuum[1]. Moreover, studies have shown that depressive symptomatology can happen more frequently during pregnancy than in the postpartum[2]. There is some agreement about the prevalence of perinatal depression, being expected that up to 13% of all pregnant women will develop postpartum depression[3]. Although a number of epidemiologic studies have been conducted in different parts of the world, few have assessed depression during the entire perinatal period.

There are two notable meta-analyses[3,4] and one systematic review[5] of perinatal depression prevalence. Bennett et al.[5] systematic review combined estimates from 21 studies assessing depression during pregnancy with a structured clinical interview or self-reported instruments. Depression prevalence was estimated to be of 7.4% (CI 95%, 2.2-12.6%) for the first trimester, 12.8% (CI 95%, 10.7-14.8%) for the second, and 12.0% for the third trimester (CI 95%, 7.4-16.7%). In the most recent meta-analysis, Gaynes et al.[4] observed that only 30 studies provided perinatal depression prevalence estimates, with only 13 also providing incidence estimates. They found that the point-prevalence of major depression alone ranged from 3.1% to 4.9% at different times during pregnancy and from 1.0% to 5.9% at different times during the first postpartum year. Fewer estimates were available for depression incidence, suggesting that as many as 14.5% (CI 95%, 8.1-24.4%) of the pregnant women have a new episode of major/minor depression, with also 14.5% (CI 95%, 10.9-19.2%) having a new episode during the first 3-postpartum months. Considering only major depression, 7.5% (CI 95%, 3.8-14.2%) may have a new episode during pregnancy and 6.5% (CI, 95%, 4.2-9.6%) in the first 3-months postpartum. Gaynes et al.[4] suggested that as many as 18.4% of all pregnant women are depressed during pregnancy, with as many as 12.7% having a major depression episode. As many as 19.2% (CI 95%, 10.7-31.9%) of the new mothers may have a major/minor depression in the first 3-months postpartum, with as many as 7.1% (CI 95%, 4.1-11.7%) having a major depression.

In Portugal only four studies[6-9] assessed perinatal depression prevalence and/or incidence, but they have considerable methodological limitations. Only two[6,8] used a semi-structured clinical assessment (RDC and DSM-IV, respectively). The one using DSM-IV presented a small sample[8].

The aim of the present study was to determine perinatal depression prevalence and incidence in Portugal, using both a categorical (ICD-10 and DSM-IV) and a dimensional approach (Beck Depression Inventory/BDI-II[10] and Postpartum Depression Screening Scale/PDSS[11]).

## METHODS

Data from this study were drawn from a research project funded by the Portuguese Science and Technology Foundation (POCI/SAU-ESP/57068/2004) and approved by the Ethical Committee of the Faculty of Medicine, Coimbra.

The sample socio-demographic and obstetric characteristics are shown in Table I.

*Table I. Sample Socio-demographic Characteristics (N=386)*

| | n (%) |
|---|---|
| **Age** (mean=30.08; SD=4.21) | |
| 19-29 | 180 (46.6) |
| 30-39 | 196 (50.8) |
| 40-44 | 10 (2.6) |
| **Nationality** | |
| Portugal | 338 (87.6) |
| Other European countries | 22 (5.7) |
| African countries | 15 (3.9) |
| South-American countries | 11 (20.8) |
| **Marital Status** | |
| Single/Never married | 64 (16.6) |
| Married | 309 (80.1) |
| Divorced | 12 (3.1) |
| Widowed | 1 (.3) |
| **Educational level** (mean=13.83; SD=3.78; range=4-25) | |
| Primary school (1st-4th grades) | 4 (1.0) |
| Junior school (5th-6th grades) | 22 (5.7) |
| Secondary school (7th-12th grades) | 171 (44.3) |
| Degree | 144 (37.3) |
| Master | 28 (7.3) |
| Other (e.g. PhD) | 17(4.4) |
| **Work Status** | |
| Still Working | 241 (62.4) |
| Unemployed | 43 (11.1) |
| Maternity leave | 97 (25.1) |
| Unknown | 5 (1.3) |

## ASSESSMENT

Participants were asked to complete the Portuguese versions of the BDI-II[12] and of the PDSS[13]. ***BDI-II*** is a self-report instrument to evaluate the presence and severity of depressive symptoms (last 2-weeks). It was developed to accommodate the changes in DSM-IV major depression criteria. The total score is the sum of the 21 items' ratings and the maximum total possible score is 63. The Portuguese version of BDI-II possesses good psychometric characteristics[12]. ***PDSS*** was specifically designed to screen for postpartum depression. It is a self-report instrument with 35 items. For each item the woman is asked to rate the feelings that she has experienced the last 2-weeks in a *Likert* scale from 1 (strongly disagree) to 5 (strongly agree). The total possible scores range between 35-175 points. Higher scores indicate higher levels of postpartum depression symptomatology. The reliability and validity studies of the Portuguese translation were found to be very good[13]. PDSS was found, with some items slightly adapted for application in pregnancy, a valid screening instrument for antenatal depression too[14].

BDI-II and PDSS probable cases of depression were defined using the cut-offs adjusted to Portuguese prevalence of Major Depression/DSM-IV, Mild/Moderate Depression/ICD-10 and Mild/Moderate Depression with Somatic Syndrome or Severe Depression without Psychotic Symptoms/ICD-10 recently found by our group[13].

### *Diagnostic Tools*

To collect relevant information for a depressive disorder diagnosis women were interviewed face-to-face with the Portuguese version of the Diagnostic Interview for Genetic Studies/DIGS, which has shown excellent inter-rater reliability[15,16]. The DIGS was designed to assess the presence of signs and symptoms of a broad range of psychiatric disorders, including mood disorders, allowing the user to make diagnosis according to a number of different diagnostic systems (e.g. DSM-IV/ICD-10). It is composed by a list of questions and the interviewers are trained not to deviate from the printed format, so that the scope for clinical judgement is reduced to a minimum. To optimise its application in the postpartum, minor changes were introduced by the senior psychiatrist (M.H. Azevedo) who participated in the translation process and the reliability study of the Portuguese version. Only Sections on Major Depression, Suicidal Behaviour and a reduced part on Mania/Hypomania of the DIGS were administered. We also used the OPCRIT (Operational Criteria) polydiagnostic system, a 90 item checklist of signs and symptoms linked to a computer diagnostic algorithm, which generates diagnoses according to several sets of criteria[17]. The OPCRIT system afforded good reliability with raters from a variety of geographical and theoretical backgrounds, including Portugal [18,19]. The final diagnoses of depression (DIGS/OPCRIT-derived diagnosis) were obtained applying the following procedure: following the interview, the interviewers completed the OPCRIT checklist based upon the information obtained from the DIGS. The interviewers were unaware of participants BDI-II and PDSS scores. Next, the completed interviews and OPCRIT ratings of each women were reviewed, usually once a week, by one of the three authors (A. Macedo, M.J. Soares, and J. Valente) who received DIGS/OPCRIT training at the same centre. In case of disagreement all the raters reviewed the OPCRIT item by item and resolved disagreements to produce consensus OPCRIT diagnoses[20]. In this report we used both DSM-IV and ICD-10 criteria of depression.

## PROCEDURE

Healthy pregnant women (≥18 years), in their last gestation trimester, following their pregnancy at Local Health Medical Centres, while waiting for their prenatal medical appointment were invited to participate in the study. Women were again contacted by phone at 3-months postpartum to arrange another appointment. Procedures were identical as in pregnancy. Aims and procedures were explained, confidentiality guaranteed and informed consent obtained.

## STATISTICAL ANALYSES

All statistical analyses were conducted using SPSS 15.0. The frequencies of participants classified as cases/non cases of depression, based on their DIGS/OPCRIT diagnosis and on their BDI-II and PDSS cut-offs, were calculated.

## RESULTS

### DSM-IV and ICD-10: Lifetime prevalence and 1-month prevalence of pregnancy and postpartum depression

The Lifetime prevalence of Major Depression/DSM-IV was of 35.0% (n=135); of Depressive disorder/ICD-10 was of 39.6% (n=153). Considering ICD-10 criteria, 6.0% (n=23) had a diagnosis of Mild Depression, 6.7% (n=26) of Moderate Depression, 2.6% (n=10) of Mild Depression with Somatic Syndrome, 14.2% (n=55) of Moderate Depression with Somatic Syndrome, 9.8% (n=38) of Severe Depression without Psychotic Symptoms, and .3% (n=1) of Severe Depression with Somatic Symptoms. Ten women (2.6%) and 4 (1.0%) met criteria for other

psychiatric disorders (i.e. Bipolar, Bipolar-Hypomania and Other Non-Psychotic Disorder) according to DSM-IV and ICD-10, respectively.

The 1-month prevalence of depression in pregnancy (from 2nd to 3rd trimester) was of 1.3% (n=5) Major Depression/DSM-IV and of 2.3% (n=9) Depressive disorder/ICD-10. We found a postpartum period prevalence (from birth to 3rd month postpartum) of 11.7% (n=45) Major Depression/DSM-IV and of 16.6% (n=64) Depressive disorder/ICD-10. There were 1.6%/DSM-IV (n=6) and .3%/ICD-10 (n=1) with other psychiatric disorders (i.e. Bipolar, Bipolar-Hypomania and Other Non-Psychotic Disorder).

**DSM-IV and ICD-10: Pregnancy and Postpartum Incidence**

From the 386 women, only 1 (.3%) developed their first episode of depression in pregnancy/DSM-IV. Regarding ICD-10, none of the women had their first episode in pregnancy. The incidence of postpartum depression was of 4.9%/DSM-IV and 7.5%/ICD-10, with respectively 19 and 29 of the women developing their first depression episode after giving birth.

**BDI-II Caseness: pregnancy and postpartum point-prevalence**

Pregnancy point-prevalence (2-weeks) of Major Depression/DSM-IV (BDI-II≥12)**,** Mild/Moderate Depression/ICD-10 (BDI-II ≥10) and of Mild/Moderate Depression with Somatic Syndrome or Severe without Psychotic Symptoms/ICD-10 (BDI-II≥11) was of 13.7% (n=15), 19.4% (n=75) and 15% (n=58), respectively. Postpartum point-prevalence (2-weeks) of Major Depression/DSM-IV (BDI-II≥11) and Mild/Moderate Depression/ICD-10 (BDI-II≥11) was of 13.0% (n=50). For Mild/Moderate Depression with Somatic Syndrome or Severe Depression without Psychotic Symptoms/ICD-10 (BDI-II≥13) an estimate of .8% (n=3) was found.

According to BDI-II-Major Depression/DSM-IV cut-offs we verified that 284 (73.6%) of the women were non-cases at both pregnancy and postpartum. Thirty-three (8.5%) exhibited depressive symptoms only in pregnancy and 25 (6.5%) only in postpartum. From the 363 women that completed BDI-II in pregnancy and postpartum, 21 (5.4%) were 'cases' of depression at both periods. Regarding BDI-II-Mild and Moderate Depression/ICD-10 cut-offs we found that most of the women were non-cases at both periods (n=267, 69.2%). Forty-seven (12.2%) exhibited depressive symptoms only in pregnancy, and 24 (6.2%) only in postpartum. From the 362 women that completed BDI-II in pregnancy and postpartum, 24 (6.2%) were 'cases' of depression at both periods. According to BDI-II-Mild and Moderate Depression with Somatic Syndrome or Severe without Psychotic Symptoms/ICD-10 cut-offs, 288 (74.6%) were non-cases both in pregnancy and postpartum. Forty women (10.4%) showed depressive symptomatology only in pregnancy and 18 (4.7%) only in postpartum. From the 363 that completed BDI-II at both times 17 (6%) reported depression.

**PDSS Caseness: pregnancy and postpartum point-prevalence**

Pregnancy point-prevalence (2-weeks) of Major Depression/DSM-IV (PDSS≥63)**,** Depression/ICD-10 (PDSS≥62) and of Mild/Moderate Depression with Somatic Syndrome or Severe without Psychotic Symptoms/ICD-10 (PDSS≥67) was of 16.8% (n=65), 17.9% (n=69) and 14.2% (n=55), respectively. Postpartum point-prevalence (2-weeks) of Major Depression/DSM-IV (PDSS≥69)**,** Mild/Moderate Depression/ICD-10 (PDSS≥67) and of Mild/Moderate depression with Somatic Syndrome or Severe without Psychotic Symptoms/ICD-10 (PDSS≥80) was of 10.4% (n=40), 12.7% (n=49) and 3.9% (n=15), respectively.

According to PDSS-Major Depression/DSM-IV cut-offs 270 (70.7%) women were non-cases at both periods. Thirty-five (9.2%) exhibited depressive symptomatology only in pregnancy and 13 (3.4%) only in postpartum. From the 342 women that completed PDSS both in pregnancy and postpartum, 24 (6.2%) were depressed at both periods. Regarding PDSS-Mild/Moderate Depression/ICD-10 cut-offs most of the women were non-cases at both periods (n=264, 69.5%). Thirty-four (8.9%) exhibited depressive symptoms (≥cut-off) only in pregnancy, and 15 (3.9%) only in postpartum. From the 342 women that completed PDSS in pregnancy and postpartum, 29 (7.5%) were depressed at both periods. For PDSS-Mild/Moderate Depression with Somatic Syndrome or Severe without Psychotic Symptoms/ICD-10 cut-off's, 292 (75.6%) were non-cases at both periods. Thirty-six (9.3%) were depressed only in pregnancy and 2 (.5%) only in postpartum. From the 342 that completed PDSS at both periods, 12 (3.1%) were depressed both in pregnancy and postpartum.

## DISCUSSION

It is well established that perinatal depression prevalence estimates vary widely depending on the type of disorder, diagnostic criteria, sampling procedures, populations' location, assessment measures and period length being considered[3,4].

In the most recent meta-analysis, Gaynes et al.[4] reported a postpartum period prevalence of 7.1% using RDC. This estimate was based on the only two studies[21,22] documenting major depression period prevalence form birth to the 3rd month postpartum. However, period prevalence estimate for major and minor depression

according to this review was of 19.2% (IC 95% 10.7-31.9%). It was based on the only three studies reporting this kind of estimate[6,21,22]. Worth mentioning is the fact that two of these studies were conducted with Japanese women[21,22] and the higher estimates found for major depression could be due to cultural differences well known to exist between European and Asian countries. Gaynes et al.[4] presents the best incidence estimate, during the first three months after delivery of 6.5%, based on three studies. Two were conducted in Asia, Hong-Kong and Japan[21,23], respectively, and the last one, although conducted in England, studied Japanese women[21]. The postpartum incidence estimate that we found (DSM-IV: 4.9%; ICD-10: 7.5%) was quite lower than the one reported by Gaynes and colleagues[4], based in RDC[6,21-23] and DSM-III-R for major and minor depression (14.5% IC 95% 10.9-19.2%), but is in accordance with the one reported for major depression (6.5% IC 95% 4.2-9.6%). None of the studies presented in this review used ICD-10 criteria. Future studies with European samples could now compare their results with the one we found.

We found higher estimates using BDI-II cut-offs than with a structured clinical interview. We found a pregnancy period prevalence of 1.3%/DSM-IV and of 2.3%/ICD-10. When considering BDI-II the values ranged from 13% to 19.4%. A similar pattern was found with PDSS. Our study corroborates the finding that the real number of women fulfilling major depression criteria during pregnancy is much lower than the number reporting depressive symptomatology [2,5,21-23].

Some of the women considered 'cases' of depression in pregnancy were still 'cases' after birth (BDI-II/PDSS). This finding supported the distress continuity hypothesis.

Although our data was collected in the community, to reduce selection bias, the vast majority of the women had a high educational level (49%), in contrast with the Portuguese government official data (Census) from 2001 (11.5%). Our higher educational level could justify the lower pregnancy estimates found.

Our longitudinal study was conducted in a community sample of women using a soundly methodology, overcoming some methodological problems identified in most of the previous studies. To our knowledge, this was the first study determining perinatal depression prevalence and incidence according to a dimensional and a categorical approach and using a polydiagnostic system. PDSS was used to overcome some limitations of the BDI-II as it is more specific to the motherhood period. These procedures guarantee the future comparability and replicability of the results. Another major strength of our study concerns the sample size. Moreover, recruiting a sample from the general population, we avoided the selection of subgroups with high-risk pregnancies, in opposition to Areias et al.[6] and Costa et al.[9]. Contrary to other studies the full perinatal period and not only the postpartum period was considered.

It is now well established that pregnancy represents a period of a higher risk to develop psychological problems.

As it was already shown, perinatal depression involves a substantial morbidity, with valid information about its prevalence and incidence being needed around the world. In our country women are followed in general health care systems during pregnancy and postpartum, but no special attention is given to those who become mentally ill in these specific life periods. The true knowledge of depression morbidity constitutes the first step to follow some European countries, such as the United Kingdom, with the Mother and Baby Units. In Portugal is crucial to teach physicians and midwives about pregnant women emotional needs, promoting its identification and, consequently, allowing postpartum depression prevention or the mitigation of its consequences. In that sense, we truly hope that these findings will have some social and political agenda effects, promoting maternal mental illness awareness, prevention and treatment.

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Conflict of interests:
The Authors who have taken part in this study declared that they do not have anything to disclose regarding funding or conflict of interest with respect to this manuscript.

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