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Perinatal Depression – Mental Health Referral Uptake Rate

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Dissertação de candidatura ao grau de Mestre em Medicina, submetida ao Instituto de Ciências Biomédicas Abel Salazar – Universidade do Porto

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Perinatal Depression – Mental Health Uptake Referral Rate

Resumo

Introdução: A depressão perinatal é o mais relevante indicador do comprometimento da saúde mental das mães. Por conseguinte, a comunidade científica procura caracterizar e identificar precocemente mulheres em risco de desenvolver tal transtorno afetivo.

Objetivos: Avaliar a adesão das mulheres ao rastreio e acompanhamento psicossociais propostos por uma equipa multidisciplinar, envolvendo profissionais nas áreas da saúde mental e materno-fetal. Em última análise, o estudo pretende descrever um perfil de risco para a adesão a tratamento psicológico.

Metodologia: Grávidas e puérperas seguidas numa maternidade de um hospital terciário foram incluídas neste estudo (n=2163). Para a identificação de mulheres em risco de perturbação depressiva, foram utilizadas duas perguntas de rastreio e a escala EPDS. Dados demográficos e obstétricos foram obtidos através da consulta de registos médicos. O preenchimento do questionário de rastreio e a adesão ao tratamento foram analisadas de forma descritiva. Para prever um perfil de risco, foi criado um modelo através de regressão logística.

Resultados: Entre 2163 mulheres que participaram no Programa de Rastreio, 10,2% foram identificadas como estando em risco de ter uma perturbação depressiva. Destas, 51,8% aceitaram encaminhamento para o apoio dado pela Equipa de Saúde Mental. Por sua vez, destas, 74,9% compareceram à consulta de Psicologia e 74,1% à de Psiquiatria. Mulheres com história passada de depressão mostraram maior aceitação quanto à referência pela Equipa de Saúde Mental.

Conclusão: A história prévia de depressão das mulheres deve ser algo a incluir nos questionários de rastreio para a depressão perinatal.

Palavras-chave: Depressão Perinatal, Adesão Terapêutica, Rastreio, Saúde Mental

Perinatal Depression – Mental Health Uptake Referral Rate

Abstract

Purpose: Perinatal depression is an important indicator of mothers' mental health. Therefore, throughout time, studies have been carried out to characterize and early identify women at risk of such affective disorder. The aim of this study is to assess mothers' adherence to a screening and follow-up proposal by a multidisciplinary team, which includes mental health and maternal-fetal professionals. Ultimately, it describes a risk profile for the uptake rate of referral to psychological support.

Methods: Pregnant women from a maternity of a tertiary hospital with on-site assessment and treatment (n=2163) were included in this study. For the identification of women at risk for depression, this study used a two-question screen plus the EPDS scale. Demographic and obstetric data were obtained from the medical records. The completion of screening evaluations, the uptake referral rate and the compliance to treatment were analyzed. Logistic regression was used to predict a risk profile for adherence.

Results: Among 2163 enrolled in the protocol, 10.2% screened positive for depression. Of these, 51.8% accepted referral for mental health assistance. 74.9% were compliant to Psychology appointments and 74.1% to Psychiatry appointments. Women who had a previous history of depression were more likely to accept referral for mental health support.

Conclusion: Women's previous history of depression should be included in screening questionnaires for perinatal depression.

Keywords: Perinatal Depression, Compliance, Uptake Rate, Screening, Mental Health

List of abbreviations

DSM-V: Diagnostic and Statistical Manual of Mental Disorders V

ICD -10: International Classification of Diseases

EPDS: Edinburgh Postnatal Depression Scale

MHT: Mental Health Team

CMIN: Centro Materno-Infantil do Norte Albino Aroso

CHUP: Centro Hospitalar Universitário do Porto

SQ: Screening Questionnaire

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Perinatal Depression – Mental Health Uptake Referral Rate

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Introduction

Pregnancy is known to be a period of vulnerability in which emotions between astonishment and insecurity may sprout. Specially for women, it can become a difficult challenge, not only regarding their body, but also their mental health. Therefore, throughout the years, efforts have been made to bring up professionals dedicated to maternal health disorders, on behalf of identifying perinatal mood and anxiety disorders.

Perinatal depression is, by far, the most common mood disorder, affecting one in every seven women (Kendig et al., 2017). It is defined by the presence of depressive symptoms that occur during pregnancy or until one year after delivery (Norma I.Gavin et al., 2005). However, some authors categorize this disorder as perinatal depression only if it occurs within pregnancy and four months after delivery (Gorman et al., 2004). In Portugal, where this study resides, Areias et al. (1996) and Augusto et al. (1996) found that the prevalence of depression during pregnancy was 16.7% whereas in the postpartum period was 13.1%.

Evaluating perinatal depression can be challenging once it is not specifically categorized by the Diagnostic and Statistical Manual of Mental Disorders V (DSM-V)(Gorman et al., 2004) or the International Classification of Diseases (ICD-10)(WHO, 2004). On the contrary, perinatal depression is a specifier of a major depressive episode (DSM-V), and by ICD-10, it is reported as a mental disorder associated with puerperium. Also, pregnancy's physical effects may be confounding factors during evaluation of depressive symptoms (anorexia and fatigue, for instance). Therefore, expertise is required when diagnosing perinatal depression.

Evidence suggests that only 20% of depressed pregnant woman receive the adequate treatment (Vigod et al., 2016). It is known that an untreated depression can result in adverse effects such as: poor adherence to healthcare, exacerbation of previous physical conditions, substance abuse, suicide and others (Kendig et al., 2017; Vigod et al., 2016). Therefore, it becomes imperative to standardize a screening protocol for perinatal depression, as well as an appropriate follow-up for those in need (Kendig et al., 2017; O'Connor et al., 2016). Many authors recommend the Edinburgh Postpartum Depression Scale (EPDS), which was validated by Cox et al. (1987) not only for postpartum, but also for pregnancy.

This screening tool consists in ten straightforward questions, easily and quickly answered by women. Cox et al. affirms satisfactory results for a cut-off of 12/13, once sensitivity and specificity showed up to be 78% and 86%, respectfully. It identifies depression in women

during pregnancy and postpartum (Psych & John L. Cox MA, 1990). Once EPDS is a screening tool, its use in secondary prevention was explored. Nevertheless, considering depression can be recurrent, using it for screening women with previous history of mental disorders, is still of great value (O'Connor et al., 2016).

Risk factors that contribute to the development of perinatal depression have been identified: a previous psychiatric history (either personal or familial), adverse life events, obstetric complications, lack of support and others (Vigod et al., 2016). Moreover, 20% of pregnant woman in developed countries have a chronic physical condition, which may be exacerbated during pregnancy, resulting in a higher vulnerability of developing a mental disorder (Brown et al., 2019). Evidence suggests that hypertensive disorders (Roberts et al., 2019), gestational diabetes (Varela et al., 2017), pregnancy losses (Giannandrea et al., 2013) and premature births (Lassi et al., 2013) might have a positive relationship with depression.

Most of the above-mentioned complications can be closely assessed by obstetricians during appointments. Therefore, they have a unique opportunity to, not only follow-up physical illnesses, but also to identify potential changes in women's mental health. This, may result in a precocious detection and referral for mental health support (Goodman & Tyler-Viola, 2010).

Byatt et al.(2018) showed that pregnant women not only appreciate, but wish to actively discuss mental health with their obstetrician. In a study with 218 women, one third affirmed not being asked about their mental wellbeing (Ayres et al., 2019). Furthermore, only 26% of positive screened women were recognized by their physician as being symptomatic (Smith et al., 2004). In due time, if detection does not foresee treatment, its value is limited (Byatt et al., 2012).

All mental health services should evaluate the engagement level of their patients, since the rate of non-compliance to scheduled appointments is 20%, two times greater than in other clinical areas (Mitchell & Selmes, 2007). Also, there is no universal definition for treatment drop-out or withdrawal of treatment (Barrett et al., 2008), which does not facilitate analysis. Considering perinatal mental health, research suggests that approximately only half of positive screened gravidae for depression and/or anxiety attend a mental health specialist(Kim et al., 2010). Causes for this should be explored, for instance, lack of literacy, since 30% of women reported no information about depression (Ayres et al., 2019).

In conclusion, the aim of this study is to assess therapeutic adherence to a proposed protocol carried out by a local maternity considering sociodemographic and obstetric factors. Ultimately, the study will focus on describing women who uptake referral for psychological assistance.

Methods

Implementation of depression screening

The Obstetric Department, supported by the Mental Health Team (MHT), at *Centro Materno-Infantil do Norte Albino Aroso* (CMIN), a local maternity of a tertiary hospital – *Centro Hospitalar Universitário do Porto* (CHUP) –, has implemented a protocol that aims to detect depression in pregnant and postpartum women. The procedure foresees the completion of a Screening Questionnaire (SQ), in three distinct moments, which correspond to obstetrical visits; namely: the first contact with the Obstetric Department (SQ 1), the last month of pregnancy appointment (SQ 2) and the postpartum review assessment (SQ 3). The SQ is applied during the nursing assessment in each appointment. Subsequently the questionnaires are analyzed by the MHT.

The SQ is composed of two screen questions plus the 10-question EPDS. Therefore, considering them as two steps:

Step 1: two screen questions with “Yes/No” answers; *1- During the last month, did you feel frequently unmotivated, depressed or hopeless?; 2- During the last month, did you feel frequently disinterest or dissatisfaction in carrying out activities?*

If at least one answer is “Yes”, women proceed to Step 2, which is EPDS. In other words, the completion of the EPDS (Step 2) is dependent on the previous answers.

The screening evaluation is considered positive if the women completed Step 2 and the EPDS score is equal or higher than 12. A negative result corresponds to two “No” answers in Step 1 or, in Step 2, an EPDS score lower than 12.

Finally, women have to answer the following, also with “Yes/No” answers: *1-Do you already have psychological support? 2- Do you feel in need of psychological support?* If the SQ result is positive and the woman wants support, the MHT makes a referral and schedules a Psychology appointment. If the woman does not want the referral to be made, it is considered a refusal.

Sample and data collection

Women were eligible if the SQ registration was correct and enabled statistical analysis. Sociodemographic, obstetric data and past medical history were collected retrospectively through medical records, as well as the data concerning the referral to psychological assistance

and its respective uptake and compliance. Emphasize must be made to the fact that this screening program has an on-site assessment and treatment, with an established referral network to mental health professionals.

Figures 1 and 2 describe schematically the process.

Measures

After the completion of the SQ, the referral acceptance and refusal were registered. The uptake referral rate (number of women who accept referral among those to whom it was offered) was obtained through clinical records as well as the compliance to Psychology and Psychiatry appointments. Compliance designates women who attended at least one appointment, unlike non-compliance that refers to those cases that had full non-attendance.

The variables analyzed were divided into three moments considering the timeline of a pregnancy and postpartum. Within the preconception variables, "Previous Condition", assembles mental and/or physical maternal comorbidity; "Psychiatric History", contemplates proper diagnoses with prescribed medication and/or assertion of the woman as having a regular psychological or psychiatric external accompaniment; "Maternal Comorbidity" gathers those who have a physical condition. Also, data was collected for the number of pregnancies, children, poor pregnancy outcomes and the type of conception. "Pathology" during the antenatal period concerns medical circumstances that only occurred during the index pregnancy. The same applies to "Hospitalization" and presence of "Fetal Malformation". Characterization of the delivery was made by the "Type of Delivery" and the discriminated "Complications".

Statistical Analysis

A descriptive analysis was made of the whole sample using SPSS version 27. The sample was initially analyzed using chi square tests.

The positive group (n=220) was then analyzed considering either the referral uptake or its refusal. Chi square tests were performed to characterize this group.

A binary logistic regression was used to estimate the predictors that increased the probability of referral uptake among positive screened women. The dependent variable was "uptake referral for Psychology appointments". The independent variables were used in a univariate analysis, and all were included in the final model, using a binary logistic regression.

Results

Primary analysis

Among 2593 pregnant and postpartum women who were enrolled in our Perinatal Depression Screening Protocol during the study period from July to December 2019, 2163 (83.4%) women were analyzed, since 427 women were ineligible due to inconsistent data registration. Under the present conditions, the screening protocol enables data analysis in 83.4%.

Out of the 2163 women analyzed, 220 were positive (10.2%). Of these, 114 accepted the referral (51.8%) and 106 refused. Only 9.5% of the refusals were women with ongoing external accompaniment by a mental health professional. 114 women were evaluated by a psychologist and of these, 27 were evaluated by the psychologist as in the need of psychiatric clinical assessment.

Regarding women's compliance to Psychology and Psychiatry appointments, the analysis shows similarity (about 75%). Among these, the mean attendance was 71.7% and 61.1% respectively. The median attendance of compliant pregnant women for Psychology was 75% (IQR: 50-90%), which means that 25% of women were present in less than 50% of scheduled appointments. Concerning Psychiatry appointments, similar results were observed (median of 75%, IQR: 50-100%). More details can be seen in the Figure 1.

Figure 1 describes schematically the flow of participants in each step of the protocol. It briefly shows the number of SQs completed. No differences were found between the referral uptake rates concerning the three screening moments ($p=0.249$). However, among those who accepted referral, the difference showed a trend: those with a positive SQ 1 or 2 will more likely be compliant to appointments ($p=0.066$).

Figure 2 outlines the number of SQs that are performed in each moment and demonstrates possible paths women could have made, since they could have completed SQ 1 and/or SQ 2 and/or SQ 3.

Secondary analysis

Overall, 220 women (10.2%) screened positive for depression. The mean age was 32.1 years; they had a past psychiatric history (depression, anxiety and/or other psychopathology), have been pregnant more than once, already have one or more children and have had previous

pregnancy losses (either pharmacological abortion and/or had a miscarriage or an ectopic pregnancy). For the remaining variables, no significant differences were observed. (See Table 1)

This group of at-risk women for perinatal depression was analyzed under the same characteristics considering their referral uptake, enabling the comparison between those who accepted referral (n=114) and those who did not (n=106). Differences were only seen in preconception characteristics. Namely, those who accepted being referred, had a psychiatric history (depression and/or anxiety) and had a previous pregnancy loss. For the remaining variables, no differences were observed. (See Table 1)

The results of the univariate analysis show that mothers that had a previous history of depression were more likely to uptake the referral, as well as those with a previous pregnancy loss. Although the P value is not significant ($p=0.092$), having a premature child shows a trend ($OR=2.51$, $0.86-7.35$) in which there is a higher probability of referral acceptance. After the multivariate analysis, having a previous depression, turned out to be the only variable with statistical significance ($OR=6.11$, $2.08-17.93$; $p<0.001$). Having a child already, yet not significant, showed a trend ($p=0.093$). The remaining characteristics were not predictive of up taking referral, as shown in Table 2.

Discussion

This study focuses on managing women at risk for depression during the perinatal period. The prevalence of depression screened in this study (10.2%) is similar to what has been detected by other studies, suggesting that our protocol should be a recognized procedure. When detection does not foresee treatment, then its value is limited. The cornerstone in-between these two moments, is the woman's will. That is why this study compromises to gather certain characteristics that may lead women into treatment.

As studies suggest (Miller et al., 2012; Flynn et al., 2006), an on-site assessment enables a superior accompaniment of mothers, with a higher uptake rate for mental health referral and an easier access to support. It also improves engagement and decreases stigma (Albaugh et al., 2018), since their standard care occurs in the same environment. Xue's et al.(2020) findings also affirm that an on-site assessment or referral has a higher rate of treatment than a referral to a mental health service (60% vs. 32%).

Our referral uptake rate is of 51.8%, meaning that little more than half of the positive screened women showed willingness to have psychological support. Studies which we can compare our result to are those by Chen et al.(2011), Flynn et al.(2006) and Segre et al.(2012).

The first one (Chen et al., 2011), used EPDS as the screening tool and offered on-site counselling to those with a 10-12 score. If the score was 13 or more, a referral to psychiatric support was offered. Among 1367 women, 126 were offered a referral and only 33% (n=42) accepted it. Forty-one of these women followed the suggested indications, undergoing intervention, thus constituting a 98% of compliance. This result is much higher than ours. A possible explanation for this difference might be that Chen et al. (2011) had a smaller population than ours. 78% of these women, had a reduction of scores to under 12. Those who refused the referral (67%), were provided with supportive counseling by case managers whose outcomes were the same.

Flynn et al.(2006), having a similar protocol to ours, obtained a referral uptake rate of 53% (n=110/207). Although they used a cut-off score of 10 for EPDS, this result is close to ours. In Flynn's et al. study, after a positive result, women were clinically evaluated and 40% met criteria for having a current major depressive disorder (MDD), emphasizing once more the importance of screening for this disorder. Additionally, this study evaluated how common it was

for women to discuss depression with their physician and those who did discuss were more likely to have sought treatment at the 1-month prenatal follow-up period (39% vs. 15%; $p=0.05$).

Although the screening and counseling were made through home-visits, Segre et al.(2012) had a referral uptake of 65% ($n=370/573$). Out of those women who accepted referral, only 47% sought treatment (counseling and/or medication). Women were expected to fill out the EPDS in different moments throughout pregnancy and postpartum period. If the score was higher than 12, home visitors would offer a referral and encourage women to seek treatment. Concerning predictive characteristics, Segre et al. (2012) found that towards an elevated EPDS score at an early stage, women would be more likely to accept referral and seek treatment. Although we did not take this into account in our study, it could have been worthy of our attention. Furthermore, likewise Chen et al. (2011), this study enabled evaluation of changes in the depressive symptoms throughout time: 58% obtained a score lower than 12 in the latter assessment, reinforcing the importance of depression treatment subsequent to detection.

Three studies that did not take into consideration women's will will be mentioned (Kallem et al., 2019; Harvey & Pun, 2007; Venkatesh et al., 2016).

Venkatesh et al.(2016), with an on-site assessment, referred all women with a positive screen (6,5%; $n=8985$) to a mental health professional. 79% attended that evaluation, being the attendance higher during pregnancy (83% vs. 71%; $p=0.002$). Some women had an on-site evaluation whereas others didn't. Additionally, 21% of positive women were not evaluated due, mainly, to refusal (30%). During their evaluation, past psychiatric history was extracted.

Kallem et al.(2019) referred to services 74.1% of 263 positive screens, amongst 1986 women. Compliance to the appointments was 11.8%, which is a rather low result. Possibly because this study was designed with an external referral network. Findings in this study suggest that mothers who underwent a depression treatment in the year before the index pregnancy, will more likely attend psychological support. In spite of not evaluating the period in which the depressive episode occurred, through our study the same conclusion was drawn.

Harvey and Pun (2007), using a cut-off score of 12 for a positive result in EPDS screening, amongst 102 at-risk women for perinatal depression, had a compliance rate of 51%. This is a study designed with an external referral network, which may explain the lower result when compared to our study.

We believe our compliance results are satisfying which may be due to, not only, having an on-site assessment with a functional referral network, but also considering the mothers' will

of undergoing mental support. We found statistical differences between the moments the SQs were completed, demonstrating a higher compliance when the positive screen was in the postpartum (SQ 3). Such information corroborates Smith's et al.(2009) investigation, however it contradicts Venkatesh's et al.(2016) findings.

In our study, the referral refusal rate was of 48.1% which is a worrisome fact, since only 10% of these women, with a positive screening, have external accompaniment. Scholle & Kelleher (2003) found that many women do not want professional advice on depression and prefer to rely on informal sources or family/friends. This may be an explanation for our high rate of refusals since these were women who affirmed not feeling the need of psychological support.

Upon our results concerning the risk profile, it can definitely be affirmed that women with a history of depression adhere in a larger scale to psychological support. Similar results were seen in other studies (Kallem et al., 2019). Depression disorders have a high probability of recurrence. Since pregnancy is a period of susceptibility, it can be considered as a trigger. Acknowledging that, and based on our results, we suggest the addition of a new screen question in Step 1: *"Have you had a previous depression disorder?"*. If so, women should be required to complete the EPDS. This way, we would have a higher probability of detecting women at risk for perinatal depression and, possibly, a higher compliance to mental health support.

This approach has already been implemented in Southwest Michigan (Kothari et al., 2016), and it has been discovered that women who have previously had depression are more likely to experience postpartum depression. This strengthens our suggestion of including a new screen question in the Screening Questionnaire, not only in postpartum but also during pregnancy, according to our findings. Furthermore, this study's findings refer that an early onset of postpartum depression predict a longer period of depression and higher severity.

Although this study did not aim to identify barriers or reasons for refusals, some should be discussed. Previous research (Byatt et al., 2012; Mitchell & Selmes, 2007) suggests that the main reasons for non-attendance to treatment are lack of time, difficulty in finding childcare, believing to be capable of using their own resources and working through problems alone, not being informed or asked about mental health. Stigma is still poorly understood, with dichotomous opinions. Furthermore, studies (Mitchell & Selmes, 2007; Smoller et al., 1998) suggest the implementation of a protocol that pursues disengaged or non-compliant patients as well as propose a higher knowledge of providers and other staff to use a combination of screening, education and other motivational engagement that may encourage women into treatment (Byatt et al., 2012).

There are several limitations in this study. Firstly, the ineligible data that was excluded from the study, from which we could extract more information, turning our study stronger. Secondly, we did not register the motives of non-compliant patients. This would be information of great value to exponentiate the efficiency of the protocol. Thirdly, we did not consider the accurate period of mental disorder episodes (one or several years ago).

Conclusion

Our study emphasizes the importance of an on-site assessment. Having mental healthcare services integrated with obstetric and pediatric-related services increases women's engagement.

According to our results, women with a previous history of depression are more likely to accept mental health assistance. Therefore, we consider that it is of utmost importance to include in screening questionnaires women's previous psychiatric history, namely if they have had a depression disorder at some point in life. This may contribute to a precocious detection of perinatal depression, diminishing its prevalence and improving its treatment.

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Appendix

Tables

Table 1 - Description of mothers' past obstetric history, comorbidities and delivery characteristics

Characteristics	EPDS Screen Score					P value	Uptake of Referral					P value
	<12		≥12		Yes		No					
	n	%	n	%	n		%	n	%			
No. of women	1943		220			114		106				
Mean age (SD)	31.5	(5.6)	32.1	(6.0)	0.142	32.3	(6.0)	31.6	(5.7)	0.582		
Preconception												
Any Comorbidity	625	32.2	131	59.5	<0.001	77	67.5	54	50.9	0.012		
Psychiatric History ^a	54	2.8	55	25.0	<0.001	42	36.8	13	12.3	<0.001		
Depression	33	1.7	35	15.9	<0.001	30	26.3	5	4.7	<0.001		
Anxiety	17	0.9	9	4.1	<0.001	8	7.0	1	0.9	0.023		
Other psychopathology	7	0.4	6	2.7	<0.001	5	4.4	1	0.9	0.117		
Maternal Physical Comorbidity	571	29.4	76	34.5	0.113	35	30.7	41	38.7	0.214		
Multigravida	1043	53.7	149	67.7	<0.001	78	68.4	71	67.0	0.819		
Number of Children					<0.001					0.600		
No children	1146	59.0	101	45.9		56	49.1	45	42.5			
One child	566	29.1	79	35.9		38	33.3	41	38.7			
More than one child	231	11.9	40	18.2		20	17.5	20	18.9			
Previous Pregnancy Loss	489	25.2	73	33.2	0.010	45	39.5	28	26.4	0.040		
Pharmacologic Abortion	93	4.8	18	8.2	0.031	11	9.6	7	6.6	0.410		
Medical Interruption	43	2.2	8	3.6	0.189	6	5.3	2	1.9	0.181		
Miscarriage/Ectopic Pregnancy	385	19.8	56	25.5	0.050	34	29.8	22	20.8	0.123		
Assisted Procreative Technology	72	3.7	5	2.3	0.277	1	0.9	4	3.8	0.150		
During Pregnancy												
Pregnancy Pathology ^b	598	33.0	67	32.4	0.854	38	35.2	29	29.3	0.365		
Hospitalization ^c	174	9.7	23	11.2	0.502	15	13.9	8	8.2	0.193		
Geminal Pregnancy ^d	19	1.0	2	0.9	0.910	1	0.9	1	1	0.952		
Fetal Malformation ^e	64	3.6	7	3.4	0.896	5	4.6	2	2.0	0.306		
Delivery	1636		197			104		93				
Delivery Type												
Eutocic	821	50.2	95	48.2	0.598	50	48.1	45	48.4	0.965		
Dystocic	815	49.8	102	51.8		54	51.9	48	51.6			
Vacuum Delivery	332	20.3	35	17.8	0.584	16	15.4	19	20.4	0.710		
Forceps Delivery	39	2.4	6	3.0		4	3.8	2	2.2			
Cesarian Section	444	27.1	61	31.0		34	32.7	27	29.0			
Neonatal Death	14	0.9	4	2.0	0.114	3	2.9	1	1.1	0.369		
Premature	149	9.1	18	9.1	0.989	13	12.5	5	5.4	0.083		
Prolonged Hospitalization												
Mother	368	22.5	51	25.9	0.284	30	28.8	21	22.6	0.316		
Newborn	181	11.1	16	8.1	0.208	9	8.7	7	7.5	0.773		

^a Women may have simultaneous conditions; ^b 144 missing information; ^c 162 missing information; ^d 88 missing information; ^e 167 missing information

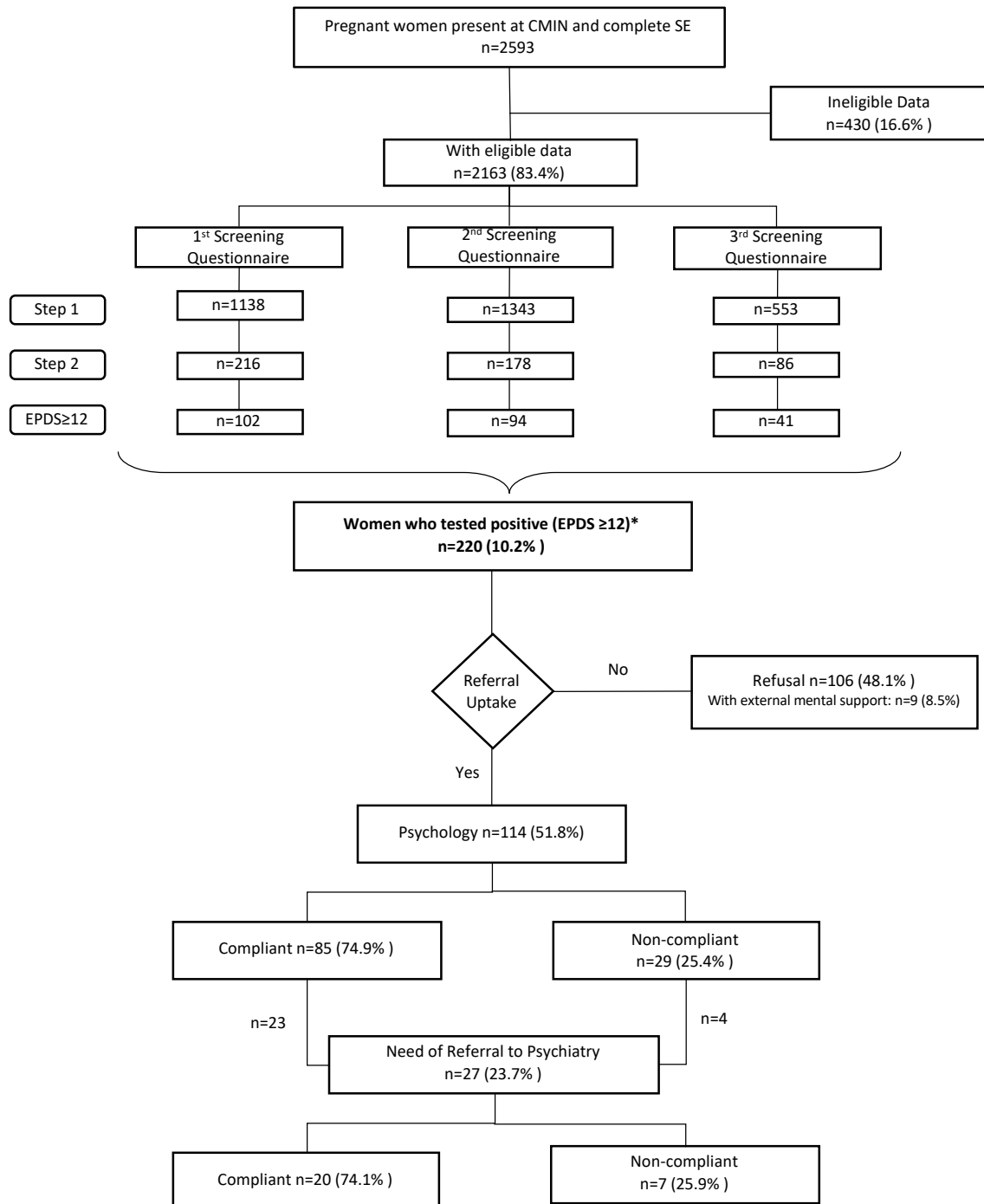
Table 2 - Univariable and multivariable models for uptake referral characterization (n=197*)

Characteristics	Univariate			Multivariate		
	OR	95% CI	P value	OR	95% CI	P value
Age	1.01	0.97-1.05	0.686	1.03	0.97-1.09	0.339
Preconception						
Depression	7.21	2.68-19.4	<0.001	6.11	2.08-17.9	<0.001
Maternal Physical Comorbidity	0.70	0.40-1.23	0.215	0.95	0.50-1.90	0.946
Multigravida	0.94	0.53-1.65	0.819	1.96	0.56-6.89	0.295
Children	0.76	0.45-1.30	0.322	0.38	0.13-1.17	0.093
Previous Pregnancy Loss	1.82	1.03-3.22	0.041	1.08	0.46-2.56	0.855
Assisted Procreative Technology	0.23	0.02-2.05	0.186	0.18	0.01-2.45	0.200
During Pregnancy						
Pregnancy Pathology	1.31	0.73-2.35	0.366	0.76	0.34-1.70	0.499
Hospitalization	1.82	0.73-4.49	0.197	1.52	0.48-4.81	0.475
Fetal Malformation	2.33	0.44-12.3	0.319	2.88	0.45-18.4	0.262
Delivery						
Eutocic	1.00		(0.788)	1.00		(0.612)
Instrument Delivery	0.86	0.41-1.78	0.680	0.66	0.29-1.53	0.334
Cesarian Section	1.13	0.59-2.16	0.704	0.98	0.45-2.17	0.968
Neonatal Death	2.73	0.28-26.7	0.388	1.28	0.08-21.1	0.861
Premature	2.51	0.86-7.35	0.092	3.00	0.75-12.1	0.122
Prolonged Hospitalization						
Mother	1.39	0.73-2.65	0.317	1.03	0.44-2.40	0.949
Newborn	1.16	0.42-3.26	0.773	0.95	0.28-3.16	0.928

*Excluded 23 cases with missing information

Figures

Figure 1: Descriptive flowchart illustrating our Perinatal Depression Screening Protocol



*Women can have more than one positive Screening Questionnaire

Figure 2 - Dendrogram with number of participants in each screening moment

