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# Depression Screening in Antepartum Females

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DEPRESSION SCREENING IN ANTEPARTUM FEMALES

Doctor of Nursing Practice Project Presented to the

Faculty of Graduate Studies

University of Missouri – St. Louis

In Partial Fulfillment of the Requirements

for the Degree of Doctor of Nursing Practice

by

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**Abstract**

*Problem:* Perinatal mood disorders, including depression, affects one in five pregnant or postpartum females. The American College of Obstetricians and Gynecologists (ACOG) and the US Preventative Task Force (USPTF) recommended screening for depression at least once during the antepartum and postpartum periods. The purpose of this quality improvement initiative was to introduce depression screening using the patient health questionnaire (PHQ) in antepartum women in a Midwestern private OB-GYN practice.

*Methods:* An observational, descriptive, cohort design utilizing a retrospective record review was used to evaluate for PHQ depression screening. A convenience sample of antepartum patients at/or around 36-weeks gestation was studied. A Plan-do-study-act (PDSA) cycle was utilized.

*Results:* There were 66 prenatal visits from January 2<sup>nd</sup> through March 20<sup>th</sup>, 2019. Of those, 54 patients ( $N=54$ ) were screened with the PHQ-2 and four were screened further with the PHQ-9 ( $n=4$ ). Most women screened negative for antepartum depression at 36-weeks gestation ( $n=50$ ), but the PHQ-2 identified four at risk and in need of further evaluation with the PHQ-9 ( $\chi^2=39.19$ ,  $df = 1$ ,  $p<0.001$ ); hence, approximately one in twenty patients screened positive for depression at/or around 36-weeks gestation. All patients who screened positive on the PHQ-9 were treated with medication and referred for counseling services.

*Implications for Practice:* Early identification of depression in pregnant females allowed for early medication management and counseling services. Further study is needed to determine if depression treatment during the antepartum period impacts the postpartum period.

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### Depression Screening in Antepartum Females

Currently in the United States, perinatal mood disorders affect approximately 15 to 21% of antepartum and postpartum females (Byrnes, 2018). There is a significant difference between “baby blues” (a less severe form of postpartum depression), clinical postpartum depression and psychosis. Baby blues immediately postpartum comprises 40-80% of depressive symptoms (Byrnes, 2018). Screening for more severe depression in obstetrics and gynecology practices (OBGYN) is recommended and may assist providers in accurately diagnosing mental health changes during the perinatal period. The American College of Obstetricians and Gynecologists (ACOG) has advocated for patients to be screened with a validated depression screening tool at least once during the perinatal period (Avalos, Raine-Bennett, Chen, Adams & Flanagan, 2016). However, the US Preventative Task Force (USPTF) recommended females to be screened for depression at least once during the antepartum period and once during the postpartum period (Brown, 2018).

In general, depression can affect females more than males. Depression in females can cause significant life-long disabilities (Fairbrother, Young, Janssen, Antony & Tucker, 2015). Fairbrother et al., (2015) reported depression may be a leading cause of disability related to the disorder. Females are also 1.6 to 1.7 times more likely than men to experience depressive symptoms overall (Fairbrother et al., 2015). Perinatal depression includes depressive episodes occurring during pregnancy and in the postpartum period. The postpartum period is defined as the first twelve months after delivery (Fairbrother et al., 2015). Hence, one in seven females may experience perinatal and postpartum depression (Silverman et al., 2017).

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The Patient Health Questionnaire (PHQ) is the most widely used depression screening tool in primary care and OB-GYN practices (Kroenke, Spitzer, & Williams, 2003). The PHQ-2 includes two questions, and if positive, a PHQ-9 containing nine questions, may provide more information. The PHQ-2 and PHQ-9 have a high sensitivity and specificity for identifying depression risk (Sit & Wisner, 2009). With any positive screen, the recommendation is to have the patient further evaluated for moderate to severe depression and to consider treatment options.

The purpose of this quality improvement initiative was to introduce depression screening using the PHQ-2 and/or PHQ-9 in antepartum women in a Midwestern private OB-GYN practice. Currently, there is not a standardized depression screening tool used during the antepartum and postpartum periods within the practice. Often the provider determined if the patient was at risk for depression by asking non-standardized questions. Implementation of the PHQ-2 and PHQ-9 may provide a standardized, validated screening process during the perinatal period for the practice. In addition, early identification of depression in antepartum females may facilitate early treatment (if needed) and decrease the risk of a more severe postpartum depression from occurring. The questions for study included:

In pregnant women aged 18-45 years at/or around 36-weeks gestation,

1. what was the rate of PHQ-2 screening?
2. when the PHQ-2 indicated increased depression risk, what was the rate of PHQ-9 screening?
3. of those identified as increased risk for depression, what was the rate of those who received treatment (medication) or referral to a mental health provider?

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### **Review of the Literature**

The search engines used were Cochrane Library, CINAHL, and PUBMED. The search included the terms: depression screening tools, pregnant females, antepartum AND postpartum females, PHQ-2 AND PHQ-9. The search included literature from the years 2008-2018. Most of the literature reviewed was from 2013-2018. There was a more advanced search that identified depression screening from 2003-2018. The inclusion criteria included only adult females equal to or above age 18-years and PHQ depression screening. The exclusion criteria were females below age 18-years and other screening tools for depression. There were 20 publications selected for this literature review.

The prevalence of postpartum depression is approximately 10% in the obstetrical patient (Viguera, Tondo, Koukopoulos, Reginaldi, Lepri & Baldessarini, 2011). In a retrospective study, Viguera et al., (2011) evaluated the prevalence of antepartum and postpartum depression. Clinical datasets of greater than 200,000 antepartum women and greater than 4,000 postpartum women were reviewed (Viguera et al., 2011). They found in at least 1,000 pregnant women with depression, the risk of perinatal depression was more than double with a prior history of depression (Viguera et al., 2011). Viguera et al. (2011) also found screening all postpartum women for depression was important in identifying those who might chronically suffer from the disorder.

There are several factors affecting perinatal depression. One reason for the higher incidence of depression during pregnancy might be a rapid fluctuation of hormones during pregnancy. With pregnancy, the estrogen and progesterone levels are significantly elevated. Schiller, Melzer-Brody and Rubinow (2014) reported the fluctuations in

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hormones during pregnancy may lead to depressive symptoms during pregnancy and postpartum in susceptible women. They emphasized every reproductive hormone can influence virtually every biological state (Schiller et al., 2014). Likewise, Viguera et al., (2011) found supporting evidence of endocrine factors being involved in the pathogenesis of depression during pregnancy. Elevated levels of corticotropin-releasing hormones at 25-weeks gestation was identified as a strong predictor of postpartum depression (Viguera et al., 2011).

The PHQ-2 and PHQ-9 are validated depression screening tools and are the most commonly used instruments for adults. Maurer (2012) reported the PHQ-2 contains two questions with a 97% sensitivity and 67% specificity for detecting depression. The PHQ-9 has nine questions with a 61% sensitivity and 94% specificity in the adult population (Maurer, 2012). When a PHQ-2 is found to be positive for depression, further screening is recommended using the PHQ-9 (Maurer, 2012). Because these screening tools take two to five minutes to administer and they have demonstrated a high sensitivity and specificity for detecting depression, they are the most commonly used instruments for adult depression screening (Maurer, 2012). Arroll et al. (2010) compared the PHQ-9 and another depression screening tool in 2,642 adult patients in primary care. The results exhibited a sensitivity of 86% and specificity of 78% for diagnosing depression of the tool when compared with the PHQ-9 (Arroll, et al., 2010). Thus, the PHQ-9 appeared to be a more sensitive and specific tool for diagnosing depression in adult patients (Arroll et al., 2010).

The use of the PHQ screening instrument is effective in identifying women at risk for depression during pregnancy and the postpartum period. Avalos et al., (2016)

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conducted a retrospective cohort study of approximately 100,000 pregnant females. In their study, the Kaiser Permanente Northern California members screened perinatal women with the PHQ-9 during three phases of the Universal Perinatal Depression Screening program from 2007-2014 (Avalos et al., 2016). Patients were screened three times during pregnancy and once during the postpartum period. Avalos et al., (2016) found depression screening to be less than 1% for pre-implementation of a developed screening program but improved to 98% when a depression screening program was fully implemented ( $p < .001$ ). In addition, providers began treatment earlier for those screening positive and was considered a benefit of the perinatal depression screening program (Avalos et al., 2016). Furthermore, Avalos et. al., (2016) suggested there was an improvement for symptom outcomes for perinatal females when identified early from a depression screening program.

A similar outcome was demonstrated by Kroenke et al., (2003). In their study, the PHQ-2 and PHQ-9 questionnaires were completed by 6,000 patients in eight primary care clinics and seven OB-GYN clinics (Kroenke et al., 2003). A self-administered PHQ questionnaire found if the scores were greater than three on the PHQ-2, further screening using the PHQ-9 was completed (Kroenke et al., 2003). Results demonstrated a PHQ-2 score greater than or equal to three had a sensitivity of 83% and a specificity of 92% for major depression (Kroenke et al., 2003). There were comparable results with the PHQ-9 between the primary care clinics and the OB-GYN clinics (Kroenke et al., 2003).

Screening for perinatal depression may reduce the symptoms and prevalence of depression. Sit and Wisner (2009) reviewed two cohorts of obstetrical patients who were screened for depression using the PHQ-9. For those who screened positive, there was a

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high overall sensitivity and specificity of 88% for obstetrical patients. (Sit & Wisner, 2009). The remission rate for perinatal depression went from 6.2% to 34.6% when depression was identified early and treatment was initiated early. This study recommended screening pregnant and postpartum women for depression with the PHQ-2 or PHQ-9 for early identification and treatment (Sit & Wisner, 2009).

Similarly, O'Connor, Rossom, Henninger, Groom, and Burda (2016) performed a systematic review of pregnant and postpartum females over the age of 18-years who were screened for depression. A total of six trials with two investigators independently reviewing the abstracts and full-text articles demonstrated a 2.1% to 9.1% reduction in reported depression with programs utilizing a standardized depression screening modality (O'Conner et al., 2016). They found screening pregnant and postpartum women for depression may help to reduce depressive symptoms and the prevalence of the disease (O'Conner et al., 2016). Early identification may provide early treatment, thus reducing symptoms and preventing the condition from worsening. O'Conner et al., (2016) demonstrated pregnant and postpartum women age 18-years or older had an 18% to 59% reduction in depressive symptoms when they were screened and treated early for depression.

Treatment for perinatal or postpartum depression with behavioral therapy and/or medication may enhance the care for depression. Silverman et al., (2017), found screening during the perinatal or postpartum period was important, and treatment with behavioral therapy and/or medication improved outcomes. Sit and Wisner (2009) found a positive benefit when cognitive behavioral therapy was implemented. The increase in the depression remission rates were 6.2 % to 34% when cognitive behavioral therapy was

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implemented (Sit & Wisner, 2009). Furthermore, there is supporting evidence for medication therapy such as sertraline, citalopram and escitalopram as being effective and safe to use in pregnancy, and they are preferred for medication therapy in pregnancy.

Grigoriadis et al., (2013) found antidepressant medication during pregnancy was actually safer than not treating a female for depression during her pregnancy. Also, Grigoriadis et al., (2013) recommended treatment should start with sertraline if the patient had not used an antidepressant previously, but citalopram and escitalopram were reasonable alternatives if they had. Finally, some providers chose to use cognitive behavioral therapy in conjunction with medication management (Grigoriadis, et al., 2013).

For improving the quality of healthcare delivered, the Plan-Do-Study-Act cycle (PDSA) is a preferred framework and scientifically valid process for testing change. The PDSA cycle can provide the method for structuring the development of change (Taylor et al., 2013). The PDSA cycle was a result of the work of Deming's process using the structure, process, outcomes method in Japan (Taylor et al., 2013). The learning and improvement in outcomes may be achieved through testing the changes made and measuring for improvement using small, incremental changes for each cycle. In the PDSA cycle, measuring outcomes aids in understanding the impact of the intervention (Taylor et al., 2013). Hence, utilizing a PDSA cycle for implementing a standardized, valid depression screening tool during the antepartum period may be useful in improving outcomes for those affected by perinatal depression.

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### Methods

#### Design

An observational, descriptive, cohort design utilizing a retrospective record review was used. This quality improvement process used a PDSA cycle to implement the PHQ-2 and PHQ-9. This was the first cycle of the quality improvement process.

#### Setting

An organizationally owned, OB-GYN practice in a Midwestern suburb contained in a metropolitan area of over three million residents. The practice employs one nurse practitioner, three physicians who are board-certified in OB-GYN, two registered nurses, and four medical assistants. Office hours are Monday through Friday, 0800-1630. Pregnant women in the practice deliver at one local hospital in an area with more than ten hospitals with obstetrical units. In the practice there are approximately 40 new pregnant patients each month. The total number of patients seen per year is approximately 9,600.

#### Sample

A convenience sample of antepartum patients at/or around 36-weeks gestation was studied. Inclusion criteria were pregnant females between the ages of 18-45 years who were at or near 36-weeks gestation. Exclusion criteria were non-pregnant females, those below age 18-years and above age 45-years.

#### Procedures

A team of key stakeholders was formed in September 2018, including the primary investigator, practice physicians, nurses, medical assistants and office staff. There were several meetings regarding depression screening, high rates of depression during pregnancy, and the PHQ-2 and PHQ-9 as a potential standardized depression screening

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tool. A decision was made to utilize and implement the PHQ depression screening tools into the practice. In October 2018, the practice physicians and staff were educated on how to access and complete the tool in the electronic health record (EHR). The process agreed upon for utilizing the tool included a physician or nurse completion when a patient presented at/or around 36-weeks gestation. PHQ-2 would be completed initially and if positive, the PHQ-9 would appear automatically. If the PHQ-9 was positive, further evaluation would be indicated by the physician or NP provider. The provider would be expected to document medication treatment prescribed or any referral to a mental health provider, if either of those treatments would be needed. The follow-up visit would also be documented.

### **Data Collection and Analysis**

Data was collected via a retrospective medical record review between January 2<sup>nd</sup>, 2019 and March 20<sup>th</sup>, 2019. Demographic data included age, race/ethnicity, parity, number of live births, and gestational age. Other data included number of PHQ-2 and PHQ-9 screenings completed, depression treatment medications prescribed (if any), and referrals for depression as documented in the medical record. The data was collected and stored on a password protected computer and jump drive by the primary investigator. All data was de-identified and coded as 1, 2, 3, 4, etc. The data was analyzed using descriptive statistics and inferential statistics with chi-square.

### **Approval Processes**

Initial approvals were obtained by the doctoral committee and the organizational practice where the study was conducted. In addition, Institutional Review Board (IRB)

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approval from the University of Missouri-St. Louis (UMSL) was obtained. Final approval from the graduate school at UMSL was also obtained.

### Results

The total number of patients who met inclusion criteria between January 2<sup>nd</sup> and March 20<sup>th</sup>, 2019 was 66; however, the number of patients who were screened for depression was 54 ( $N=54$ ). Thus, 19% ( $n=12$ ) of patients meeting the inclusion criteria were not screened. The age of the patients ranged from 19-42 years ( $m=28.6$ ;  $sd=4.8$ ). The number of pregnancies (parity) ranged from one to six ( $m=1.8$ ;  $sd=0.9$ ), and the total number of live births was zero to two ( $m=0.63$ ;  $sd=0.62$ ) for each woman. Most of the women were white ( $n=40$ , 74.1%), 20.4% were black ( $n=11$ ), 3.7% were Asian ( $n=2$ ) and 1.9% were another race/ethnicity ( $n=1$ ). The most frequently observed categories for the number of weeks gestation were 35+5 and 36+1 ( $n=7$ ; 13%) indicating about 26% of patients were screened for depression at essentially 36-weeks gestation (appendix A). The most frequently observed category of PHQ-2 was negative ( $n=50$ , 93%). Although most women tested negative on the prenatal depression screen at 36-weeks gestation, chi square test of independence indicated the PHQ-2 identified those at risk and in need of further evaluation with the PHQ-9 ( $\chi^2=39.19$ ,  $df=1$ ,  $p<0.001$ ). The most frequently observed category of PHQ-9 was positive ( $n=4$ , 7%). All women who screened positive on the PHQ-9 ( $n=4$ ) for depression were treated ( $\chi^2=29.01$ ,  $df=1$ ,  $p<0.001$ ); hence, those who screened positive for depression were treated with medication, referral, or both (appendix B). There were some patients who were already being treated for depression ( $n=3$ ) prior to screening at 36-weeks gestation; however, there were four patients identified to be at risk for moderate to severe depression. Of those four, all were treated

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either with medication prescription, referral to a mental health care provider, or both (appendix C).

### **Discussion**

There were 66 pregnant patients who met criteria for the depression screening during the January 2<sup>nd</sup> through March 20<sup>th</sup>, 2019 time frame when the PHQ-2 and PHQ-9 screening instruments were implemented in a private, organizationally-owned OB-GYN practice. About 80% of the patients meeting the inclusion criteria were screened. While most patients screened negative for being at risk for depression, all of those who screened positive on the PHQ-2 had a PHQ-9 administered as recommended. Furthermore, all patients who screened positive with the PHQ-9 were prescribed recommended medications (i.e., sertraline, citalopram or escitalopram) for treatment along with referral to a cognitive behavioral therapist.

Implementation of depression screening with a validated instrument found approximately one in twenty patients screened positive for depression at/or near 36-weeks gestation and they received treatment in the antepartum period. Overall, an 80% rate of depression screening using a validated depression screening tool for those at/or around 36-weeks gestation when compared to no previous depression screening mechanism was a clinically significant success for the practice. Moreover, the results indicated statistically significant results for the PHQ-2 and PHQ-9 ( $p < 0.001$ ) when screening for depression in antepartum females at or near 36-weeks gestation. Screening for antepartum depression with the PHQ-2 and PHQ-9 identified patients at risk for moderate to severe depression and enabled early treatment.

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Use of the PHQ-2 and PHQ-9 were helpful in identifying pregnant females who were at risk for depression and enabled medication management and referrals prior to delivery. These patients will have several weeks prior to delivery to allow their medications to achieve a therapeutic level; however, consideration may be given to screening antepartum at or near 34-weeks to improve the therapeutic effects of medication prior to the anticipated delivery date. Furthermore, screening in the postpartum period will be important. The next cycle of the PDSA framework should include PHQ screening at or near 6-weeks postpartum to align with the current recommendations to screen at least once before and after delivery. Of interest will be the comparison of depression screening rates before and after delivery, especially for those treated with medications and cognitive behavioral therapy prior to delivery.

### **Conclusion**

This quality improvement initiative found the PHQ depression screening instruments to be helpful in identifying one in every 20 pregnant females at risk for moderate to severe depression when screened at or near 36-weeks gestation. Treatment with recommended medication and referral to a cognitive behavioral therapist may allow for therapeutic effects to occur beyond delivery. However, these patients were not re-screened during the postpartum period as the ACOG and USPTF recommended. Early screening for depression and early treatment (if needed), may prevent severe postpartum depression and subsequent chronic depression beyond the postpartum period, but further study is needed to compare antepartum and postpartum depression screening.

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**Appendix A**

Table 1

*Demographics***Age, Number of Pregnancies, Live Births**

	Minimum	Maximum	Mean	Std. Deviation
Age	19	42	28.59	4.819
Pregnancies	1	6	1.80	.898
Total Live Births	0	2	.63	.623

**Race**

	Frequency	Percent	Valid Percent	Cumulative Percent
White	40	74.1	74.1	74.1
Black	11	20.4	20.4	94.4
Asian	2	3.7	3.7	98.1
Other	1	1.9	1.9	100.0
Total	54	100.0	100.0	

**Weeks Gestation**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 34+6	2	3.7	3.7	3.7
35+0	3	5.6	5.6	9.3
35+2	3	5.6	5.6	14.8
35+3	4	7.4	7.4	22.2

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35+4	5	9.3	9.3	31.5
35+5	7	13.0	13.0	44.4
35+6	4	7.4	7.4	51.9
36+0	6	11.1	11.1	63.0
36+1	7	13.0	13.0	75.9
36+2	3	5.6	5.6	81.5
36+3	4	7.4	7.4	88.9
36+4	1	1.9	1.9	90.7
36+5	1	1.9	1.9	92.6
36+6	1	1.9	1.9	94.4
37+0	1	1.9	1.9	96.3
37+2	1	1.9	1.9	98.1
37+3	1	1.9	1.9	100.0
Total	54	100.0	100.0	

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**Appendix B**

Table 2

*Depression Screening***PHQ-2**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Positive	4	7.4	7.4	7.4
Negative	50	92.6	92.6	100.0
Total	54	100.0	100.0	

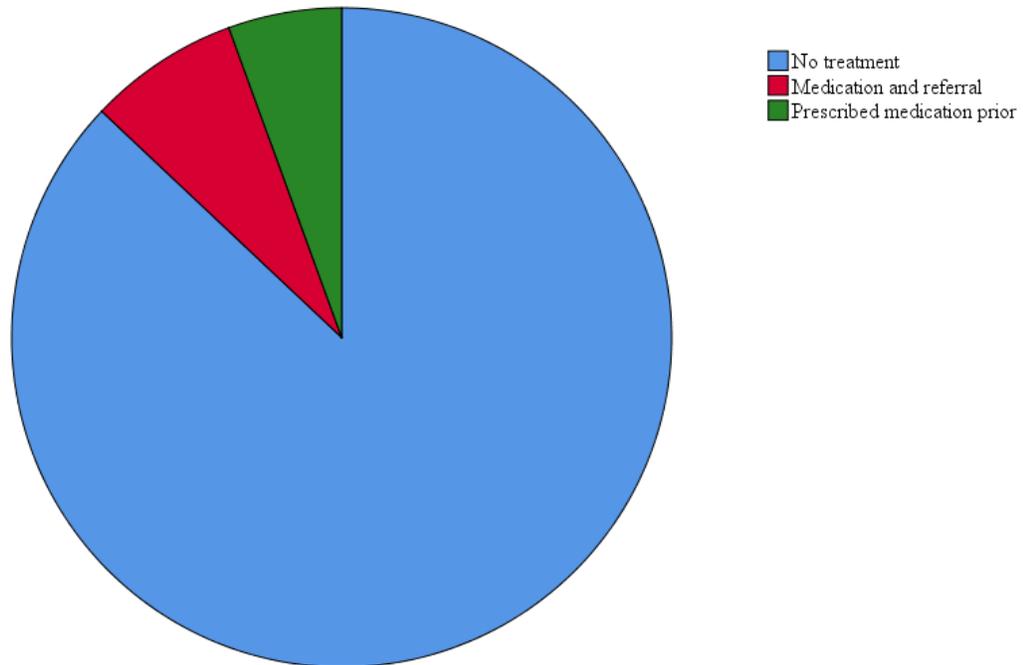
**PHQ-9**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	4	7.4	100.0	100.0
Missing	50	92.6		
	54	100.0		

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## Appendix C

Figure 1. PHQ 2 and PHQ 9 Screening and Treatment



*Figure 1.* Some patients were already being treated for depression ( $n=3$ ) and screened negative on the PHQ-2. Those who were not previously treated but tested positive ( $n=4$ ) received treatment either by medication prescription or mental health referral during their pregnancy ( $\chi^2=29.01$ ,  $df=1$ ,  $p < 0.001$ ).