PRAMSGRAM
OKLAHOMA PREGNANCY RISK ASSESSMENT MONITORING SYSTEM

Depression After Delivery Among Oklahoma Mothers

Background

Pregnancy and the postpartum period present mothers and their families with a variety of increased demands. Usually, mothers cope well with the requirements of infant care and their effects on family, economic, social, and marital responsibilities;[1] however, depression is exceedingly common in the first six months following delivery. This depression may reflect a mother's difficulty in adjusting to the new demands.[1] It may also impair her ability to make use of available resources.

Three types of depression after delivery have been described: postpartum (or baby) blues, postpartum depression, and postpartum psychosis. Postpartum blues refers to a brief depression experienced by 50%-80% of mothers in the early postpartum period.[2] It represents a variation of normal emotional changes after childbirth perhaps, in part, resulting from fluctuation in hormone levels after childbirth.[3] Postpartum depression occurs in 10% to 15% of new mothers.[3] Usually beginning within two weeks of delivery, it can last up to 14 months.[2] Postpartum psychosis is the most severe manifestation of depression after delivery. Estimates suggest that out of every 1,000 deliveries there are one to four cases of postpartum psychoses.[3] These women experience severely depressed mood, confusion, hallucinations, or delusions.[1]

Clinically significant depression after delivery is a common, potentially serious health problem among new mothers, and may result in reduced ability of the mother to attend to her infant's needs (e.g., feeding).[4] It may also pose long-term adverse consequences to the cognitive and behavioral development of the infant.[2]

To explore the patterns and prevalence of self-reported "depression" during the postpartum period among Oklahoma mothers, this report analyzed data from the Oklahoma Pregnancy Risk Assessment Monitoring System (PRAMS).

Materials and Methods

In the postpartum period, mothers were asked the following: "In the months after your delivery would you say you were 1) not depressed at all; 2) slightly depressed; 3) moderately depressed; 4) very depressed; or 5) very depressed and had to get help." All mothers who answered the question were included in the analysis except those whose babies died or were in an intensive care unit or premature nursery after delivery. The factors influencing these mothers' emotional state after delivery are different from those with a live, healthy infant.

This analysis examined factors associated with reporting *any level* of depression and those associated specifically with experiencing *severe* depression. *Any level* of depression included "slightly," "moderately," and "very" depressed as well as "very depressed and had to get help" (i.e., all mothers who reported some depression). *Severe* depression was defined as a self-report of "very depressed" or "very depressed and had to get help." Prevalence percentages and standard errors for no depression *(none), any level* of depression, and *severe* depression were calculated for a variety of characteristics including sociodemographic, behavioral, and lifestyle. Chi-square tests were performed to identify factors associated with *any level* of depression and with *severe* depression. P-values were calculated for each of the tests; a value less than 0.05 was considered statistically significant.

Counseling about postpartum depression is an important component of the assessment and intervention for depression after delivery. In order to examine this issue, mothers were asked "Did a doctor, nurse, or other health care provider discuss postpartum depression (baby blues) with you?" Answer options included: "No"; "Yes, during pregnancy"; and "Yes, after pregnancy." Counsel-

In Oklahoma:

- Two out of three mothers report some level of depression after delivery.
- Age, race, education, and marital status are not associated with a mother reporting depression after delivery.
- Depression appears to be associated *primarily* with a mother's reported source of income (a measure of socioeconomic status) and stressful life events (e.g., divorce/separation).
- Mothers with an unwanted pregnancy are three times as likely to report being severely depressed after delivery as mothers with an intended pregnancy.
- Mothers experiencing a violent event in the 12 months prior to delivery are 3.3 times as likely to report severe depression after delivery as mothers not experiencing violence.

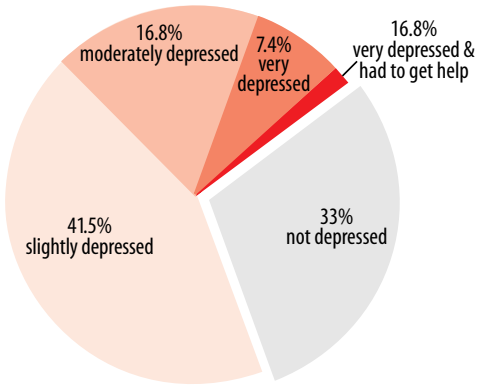
ing among women experiencing depression after delivery was examined using prevalence percentages.

Although the PRAMS data are some of the only population-based data on the prevalence of depression after delivery, they are not without limitations: 1) only self-reported experience of depression is used; there is no information on duration of depression or other symptoms of depression (e.g., crying, mood swings) which could refine the analysis; 2) the survey is sent to mothers three to six months after delivery; it may be difficult for mothers to remember how they were feeling (recall bias); 3) mothers may be reluctant to report their feelings of depression given various cultural expectations surrounding motherhood (e.g., it is expected to be a joyful time); and 4) each mother will have a different definition/experience of depression.

Mothers Reporting Any Level of Depression after Delivery

Some form *(any level)* of depression in the postpartum period was reported by the majority of mothers (67.0%). Specifically, 41.5% of mothers reported being slightly depressed, 16.8% reported being moderately depressed, 7.4% reported being very depressed, and 1.3% reported being very depressed and had to get help (Figure 1).

Figure 1. **Percent of Oklahoma Mothers Experiencing Depression Postpartum**



Age, education, race, and marital status were not significantly associated (p-value >.05) with reporting *any level* of depression after delivery (Table 1). A mother's economic status, however, *was* significantly associated (p-value <.05) with reporting *any level* of depression after delivery.

Compared to women who report income from a job or business, women receiving public assistance were more likely to report *any level* of depression (74.9% vs 64.1%). Women using Medicaid to pay for pregnancy-related services were also more likely (64.8% vs 60.7%) to report *any level* of depression postpartum than women not receiving Medicaid (Table 1).

Table 1 **Mothers Experiencing Any Level of Depression After Delivery**

Characteristic	None[1]		Any Level[2]		p[3]
	%	[se]	%	[se]	Value
Age					
<20	31.6	[2.9]	68.4	[2.9]	.29
20-24	31.0	[1.8]	69.0	[1.8]	
25-29	32.8	[1.8]	67.2	[1.8]	
30-34	37.3	[2.4]	62.7	[2.4]	
35+	34.6	[3.8]	65.4	[3.8]	
Education[4]					
<12	28.2	[3.0]	71.8	[3.0]	.09
12+	33.7	[1.1]	66.3	[1.1]	
Race					
White	32.2	[1.1]	67.8	[1.1]	.18
African American	42.0	[4.4]	58.0	[4.4]	
Native American	32.9	[3.5]	67.1	[3.5]	
Marital Status[5]					
Married	33.9	[1.2]	66.1	[1.2]	.06
Unmarried	31.0	[1.9]	69.0	[1.9]	
Income Source					
Job/Business	35.9	[1.2]	64.1	[1.2]	<.001
Welfare	25.1	[2.1]	74.9	[2.1]	
Medicaid Funding[6]					
Yes	29.3	[1.7]	70.7	[1.7]	.01
No	35.2	[1.3]	64.8	[1.3]	
Pregnancy Intention					
Intended	36.4	[1.4]	63.6	[1.4]	.01
Mistimed	30.9	[1.9]	69.1	[1.9]	
Unwanted	28.3	[3.0]	71.7	[3.0]	
Time During Pregnancy					
Happy	36.7	[1.3]	63.3	[1.3]	<.001
Moderately Difficult	25.3	[2.5]	74.7	[2.5]	
Very Difficult	21.5	[2.6]	78.5	[2.6]	
Divorce/Separation[7]					
Yes	24.9	[2.4]	75.1	[2.4]	<.001
No	35.0	[1.1]	65.0	[1.1]	

[1] Mothers reporting "not depressed at all"
[2] Mothers reporting "slightly," "moderately," or "very" depressed as well as "very depressed and had to get help"
[3] P-value from chi-square test for association between no depression (none) and any level of depression
[4] Excludes mothers < age 18
[5] At Conception
[6] For either PNC or Delivery
[7] Divorced or separated in the 12 months prior to delivery

Mothers Reporting Severe Depression after Delivery

Almost all sociodemographic variables, with exception of race, were significantly associated with *severe* depression (Table 2). Self-reported *severe* depression after delivery was higher among younger mothers, mothers with less than 12 years of education, and unmarried mothers. *Severe* depression was also associated with economic indicators. It was reported more than twice as often (14.3% vs 6.9%) among mothers receiving public assistance

PRAMS is a population-based survey of Oklahoma women with a recent delivery. Analysis weights were applied to adjust for selection probability and non-response. A stratified systematic sampling approach is used to select approximately 200 new mothers each month from the state's live birth registry. Up to three mailed questionnaires are used to solicit a response. Telephone interviews are attempted for non-respondents. Data for this report reflect live births occurring between April 1990 and March 1994. The response rate was 70%. The analysis includes information collected from 4,490 mothers who responded to the question related to depression after delivery. All data represent state estimates.

compared to mothers with income from a job or business. Similar differences occurred with respect to Medicaid status; mothers whose prenatal care or delivery was paid by Medicaid were almost twice as likely to report *severe* depression than mothers who did not receive Medicaid (11.9% vs. 6.7%).

Similar to *any level* of depression, a mother's behaviors and life experiences were also associated with her reporting *severe* depression. Mothers with an unwanted pregnancy were three times as likely to report *severe* depression as mothers whose pregnancies were intended (17.8% vs. 5.9%) (Table 2).

Divorce/separation, violence, and a mother's mood during pregnancy were all associated with reporting *severe* depression after delivery. Mothers experiencing physical violence in the 12 months prior to delivery were 3.2 times as likely to report *severe* depression as mothers who did not experience physical violence *(data not shown)*. Mothers who were divorced/separated in the 12 months prior to delivery were 2.1 times as likely to report *severe* depression as mothers not experiencing these events. The most commonly cited stress and support variables associated with depression after delivery include high levels of marital conflict/dissatisfaction and an increased number of stressful life events during pregnancy.[2] In addition, mothers who reported their pregnancy as being a "very difficult time" were six times as likely to report *severe* depression as mothers for whom pregnancy was a "happy time." A mother's mood during pregnancy has been consistently shown to predict her experience of depression after delivery.[5]

Table 2 **Mothers Experiencing Severe Depression After Delivery**

Characteristic	None[1]		Severe[2]		p[3]
	%	[se]	%	[se]	Value
Age					
<20	31.6	[2.9]	10.9	[2.0]	<.001
20-24	31.0	[1.8]	10.5	[1.3]	
25-29	32.8	[1.8]	8.9	[1.2]	
30-34	37.3	[2.4]	4.5	[1.0]	
35+	34.6	[3.8]	6.1	[1.8]	
Education[4]					
<12	28.2	[3.0]	14.2	[2.4]	.003
12+	33.7	[1.1]	7.2	[0.6]	
Race					
White	32.2	[1.1]	8.4	[0.7]	.48
African American	42.0	[4.4]	11.5	[3.0]	
Native American	32.9	[3.5]	8.3	[2.2]	
Marital Status[5]					
Married	33.9	[1.2]	7.0	[0.7]	.001
Unmarried	31.0	[1.9]	11.7	[1.3]	
Income Source					
Job/Business	35.9	[1.2]	6.9	[0.7]	<.001
Welfare	25.1	[2.1]	14.3	[1.7]	
Medicaid Funding[6]					
Yes	29.3	[1.7]	11.9	[1.2]	<.001
No	35.2	[1.3]	6.7	[0.7]	
Pregnancy Intention					
Intended	36.4	[1.4]	5.9	[0.7]	<.001
Mistimed	30.9	[1.9]	9.3	[1.2]	
Unwanted	28.3	[3.0]	17.8	[2.7]	
Time During Pregnancy					
Happy	36.7	[1.3]	4.5	[0.6]	<.001
Moderately Difficult	25.3	[2.5]	11.9	[1.9]	
Very Difficult	21.5	[2.6]	27.1	[2.9]	
Divorce/Separation[7]					
Yes	24.9	[2.4]	17.3	[2.1]	<.001
No	35.0	[1.1]	6.8	[0.6]	

[1] Mothers reporting "not depressed at all"
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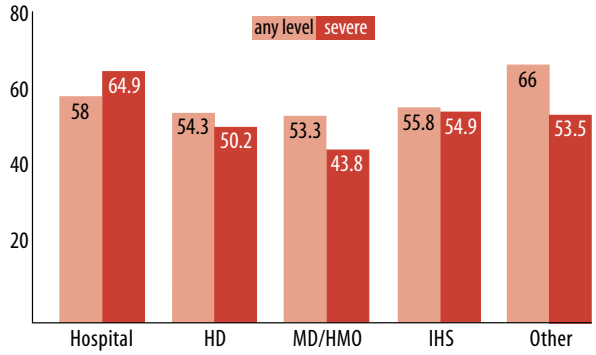
Counseling about Postpartum Depression

Given the high rate of depression after delivery, it is important to assess the prevalence of counseling by health care providers on postpartum depression. Among mothers reporting *any level* of depression after delivery, 45.1% were *not* counseled by a doctor, nurse or other health care worker about postpartum depression during or after pregnancy. Among those reporting *severe* depression, 49.9% were not counseled (*data not shown*).

Women experiencing *any level* and *severe* depression were examined by location of their prenatal care to identify differences regarding postpartum depression counseling among prenatal health care providers. Among mothers experiencing *any level* of depression, no major differences existed in percent of mothers receiving counseling among private doctors/HMOs, the health department, and the Indian Health Service (IHS). Those receiving care from an "Other" type of provider, primarily a midwife, were the most likely to get counseled on postpartum depression.

Figure 2 **Percent of Mothers Experiencing Depression Who Were Counseled about Postpartum Depression by Location of Prenatal Care**



Mothers experiencing *severe* depression were less likely than those with *any level* of depression to receive counseling in almost every prenatal care setting, with the exception of the hospital clinics (Figure 2). Overall, mothers at greatest risk, those reporting *severe* depression after

delivery, do not receive counseling as often as women reporting *any level* of depression.

Conclusions

The majority of mothers, 67%, report some level of depression after delivery. Among the various subgroups examined (e.g., race, income source), no fewer than 58% reported experiencing *any level* of depression. Reporting *any level* or *severe* depression was associated primarily with a mother's source of income and occurrence of stressful life events in the prenatal period including behaviors, events, and personal relationships. *Severe* depression was also associated with sociodemographic factors such as age, education, and marital status. These associations may indicate an increased risk for depression in the postpartum period among new mothers. As such, they may be used by health care providers to assist in assessing their clients for depression after delivery.

Although neither socioeconomic indicators nor social class have previously been found to be associated with depression after delivery,[2] there is strong evidence for an association between depression and stress, including social support and relationship/marital difficulties.[2] It is likely that the sociodemographic and income variables associated with depression after delivery in this analysis are strongly interrelated with the various stress factors (e.g., divorce/separation) that were also associated with depression. Additional analyses are needed to further explore the interrelationship among sociodemographic characteristics, economic status, stress, and depression after delivery among Oklahoma mothers.

Recommendations

Primary health care professionals providing prenatal, postpartum, and pediatric care need to be aware of the prevalence and characteristics associated with depression after delivery among mothers in Oklahoma. To date, this information has not been available as it relates specifically to Oklahoma. Familiarity with the potential symptoms of depression is also important, particularly as they may be masked by multiple physical complaints[2] or reports of anxiety[6] in both the prenatal and postpartum periods.

Symptoms of Depression

- crying
- mood swings
- recurring thoughts of death
- increase/decrease of appetite
- increase/decrease in sleep
- increase/decrease in weight
- guilt
- anxiety
- agitation
- loss of libido (sex drive)
- feeling "weighted down" or fatigue
- difficulty thinking

Currently existing screening tools such as the *Edinburgh Postnatal Depression Scale*[7] or the *Beck Depression Inventory* may assist in the identification of depression after delivery. Providers may also want to strengthen their assessment efforts during both the prenatal and postnatal follow-up periods, including pediatric visits, to assist in the identification of those mothers experiencing depression in the postpartum period.

Pregnant mothers at high risk for severe depression after delivery should, along with their families, receive additional information about the symptoms of depression. It is important to educate mothers about the symptoms of depression so they can identify it and seek assistance/support for treatment. Once depression has been identified after delivery, the mother and her support system need to receive further education about depression and the different treatment or intervention options available. Primary health care providers should be aware of the recommended treatment and intervention options for depression after delivery as well as additional referral resources (e.g., community or non-profit organizations) for those mothers who require or request it.

Changes in the health care delivery system may expand the role of the primary provider including an increased role in the identification, counseling, and possible interventions for mothers experiencing depression after delivery. Currently, some managed care organizations are identifying their populations at risk of depression after delivery and attempting to prevent it through intervention strategies during pregnancy and the early months after delivery. In addition to these efforts, it is important that the ability to make appropriate and necessary referrals to mental health professionals be ensured.

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