



Published in final edited form as:

Matern Child Health J. 2015 June ; 19(6): 1212–1219. doi:10.1007/s10995-014-1625-6.

Maternal Depressive Symptoms and Parenting Practices 3-Months Postpartum

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Abstract

Objectives—Using data from two postpartum depression randomized trials, we examined the association between postpartum depressive symptoms and parenting practices among a diverse group of mothers.

Methods—We examined the association between safety practices (back sleep position, car seat use, smoke alarm), feeding practices (breastfeeding, infant intake of cereal, juice, water), and health care practices (routine well child and Emergency Room (ER) visits) with 3-month postpartum depressive symptoms assessed using the Edinburgh Depression Scale (EPDS 10).

Results—Fifty-one percent of mothers were black or Latina, 33% had Medicaid, and 30% were foreign born. Depressed mothers were less likely to have their infant use back sleep position (60% vs. 79%, $p<.001$), always use a car seat (67% vs. 84%, $p<.001$), more likely to feed their infants water, juice, or cereal (36% vs. 25%, $p=.04$ respectively), and to bring their babies for ER visits (26% vs. 16%, $p=.03$) as compared with non-depressed mothers. In multivariable model, depressed mothers remained less likely to have their infant use the back sleep position, to use a car seat, and to have a working smoke alarm in the home.

Conclusions—Findings suggest the need to intervene early among mothers with depressive symptoms and reinforce positive parenting practices.

Keywords

depression; mothers; safety; feeding; health care

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Introduction

Postpartum depression negatively impacts infant development and has been associated with suboptimal parenting practices.¹⁻⁴ Screening positive for depression is associated with multiple negative consequences⁵ for mothers and babies including poor maternal functioning,⁶ impaired parenting practices,⁷⁻⁹ reduced breastfeeding and bonding^{1,10} and has a negative impact on infant development.^{4,11} Socioeconomic status and race/ethnicity have been found to be associated with the prevalence of postpartum depression and minority low-income mothers are at increased risk.^{6,12}

Parenting and early care giving relationships are important for early infant development.¹³ Unfortunately, maternal depression can impact parenting practices and studies suggest that mothers with symptoms of depression are less likely to follow recommended safety, feeding, and developmental practices. Mounting evidence suggests that parenting practices play a mediating role in the association between depression and children's outcomes.¹⁴ A meta-analysis of 46 observational studies, found a moderate association between maternal depressive symptoms and parenting behavior in 3 domains: negative or hostile behavior, disengaged behavior, and to a lesser extent positive behavior.¹² Maternal postpartum depression is negatively associated with the way that mothers' parent; mothers with depressive symptoms are less engaged and exhibit more withdrawn parenting skills.¹⁴ Mothers with postpartum depressive symptoms are less likely to engage in important developmental behaviors (i.e. playing, talking, showing/reading books to the baby) and less likely to practice daily routines.^{2,4} In addition, mothers with depressive symptoms may be preoccupied with fatigue, less responsive and attentive to their children's and household needs, and less able to interpret and manage symptoms in their infants.^{9,12} For example, mothers with depressive symptoms are less likely to have a working smoke alarm in the home^{1,3} and more likely to have acute infant utilization of the emergency room.⁹

The current study examines the association between maternal depressive symptoms and parenting practices among a racially/ethnically diverse sample of postpartum mothers, half of whom are Latina or black, and a third of whom were born outside of the United States. This study contributes to the literature on postpartum depression and parenting by including a diverse patient sample. In addition, this study is one of the few studies to use the Edinburgh Postnatal Depression Scale (EPDS), a validated, 10-item self-report scale¹⁵ to assess maternal depressive symptoms and its association with common parenting practices. The EPDS is widely recommended and used in obstetrical and pediatric practices.¹⁶ The EPDS has also been found to be quick and easy to administer and is well received by both clinicians and patients.¹⁷

We examined 7 parenting practices in 3 domains: safety practices, feeding practices, and health care practices. The American Academy of Pediatrics recommendations, Healthy People 2020 Goals, and maternal child health evidence support these guidelines. We hypothesized that 3-month postpartum depressive symptoms would be associated with lower use of recommended safety practices, feeding practices, and recommended health care use.

Methods

Data for this study come from the results of two randomized controlled trials that tested a behavioral educational intervention aimed at preventing postpartum depression among minority and majority women. The intervention prepared and educated mothers about the postpartum experience, bolstered social support, and enhanced self-management skills. The two trials enrolled 1,080 postpartum mothers who delivered at a large tertiary inner-city hospital located in East Harlem in New York City between April 2009 and April of 2010. The Program for the Protection of Human Subjects (Institutional Review Board) at the Icahn School of Medicine at Mount Sinai approved both of these studies and both studies were registered at Clinical Trials.gov, www.clinicaltrials.gov, NCT01312883 and NCT00951717. The study sample was identified through an electronic documentation system for the labor and delivery unit. Eligible participants were all women 18 years or older, English or Spanish speaking, delivered infants with birthweights greater than or equal to 2500 g and had 5-min Apgar scores greater than 6, and had a working telephone.

A recruitment strategy utilized patient feedback to identify and understand the recruitment barriers. Feedback on patients' reasons for trial refusal informed adaptations to the recruitment process.¹⁸ The two trials had low refusal rates, 19.2%¹⁹ and 26.4%²⁰ and sociodemographic characteristics of women who participated versus those women who refused were similar. Patients randomized to the intervention arm were given a two-step behavioral educational intervention. The in-hospital component of the intervention involved a 15-minute, in-hospital review of a patient education pamphlet and partner summary sheet by the mother with a Masters-trained bilingual social worker. The second step was a 2-week post delivery call in which the social worker assessed patients' symptoms, skills in symptom management, and other needs. Neither the intervention arm nor the usual care arm received instructions on infant safety or health care practices. Results of the two trials have been published elsewhere.¹⁸⁻²¹

Data for the current study come from the analysis of 3-month survey results of 945 mothers enrolled in these trials. Survey items included questions on socio-demographics, clinical characteristics (antepartum complications, comorbid conditions, gravity, parity), past depression history, anxiety, social support, healthcare factors, and parenting practices. The 3-month survey was conducted in English and Spanish and lasted approximately 35 minutes. A total of 945 mothers (88% of all study participants) completed both the in-hospital postpartum survey (baseline) and the 3-month survey. The mothers did not receive study instruction on healthcare and safety practices between the baseline and the 3-month survey. One hundred and thirty-five women could not be reached over the telephone during their 3-month window (75 to 104 days postpartum) and were therefore excluded from this study. If the mothers could not be reached during the day, clinical research coordinators made numerous attempts to contact them in the evening or on the weekend. No significant differences occurred in the baseline characteristics (race, birthplace, primary language, marital status, education, insurance, and delivery type) between the 945 respondents and the 135 non-respondents.

We studied 7 parenting practices which were grouped into four domains: 1) safety (infant use of the back sleep position, use of car seat, having a working smoke alarm in the home); 2) feeding (breastfeeding at three months and the early introduction of water/juice/cereal); and healthcare (number of well-child visits and if baby had been taken to the Emergency Room). These variables were selected based on literature from the American Academy of Pediatrics (AAP) ²²⁻²⁵ that has discussed the importance of these practices and is outlined by the Healthy People 2020 Maternal, Infant, and Child Health objectives. ²⁶

To ascertain safety ^{2,3,7} and feeding practices, ¹ respondents were asked a number of questions. The Centers for Disease Control and Prevention recommends back sleeping to reduce the risk of infant mortality, and determines back sleeping with the question, “How do you put your new baby down to sleep most of the time? The baby’s side, back, or stomach?” ²⁷ For sleep practices we asked, “In what position do you usually put your baby down to sleep? On his or her side, back or stomach?” Responses were dichotomized into 1 for back and 0 for other. Use of car seat and having a smoke alarm in the home were determined by the following questions: “How often do you use a car seat for your baby when driving in a car?” (1 for always and 0 for other responses). Also dichotomized were the answers to the question “Do you have a working smoke alarm in your home?”

Feeding practices were determined with the information obtained from the following questions: “Please remind me, did you decide to breastfeed your baby(s)?” Answers were coded 1 (“Yes, I am currently breastfeeding my baby”) and 0 (“Yes, I did start breastfeeding but have decided to stop” or “No, I never started breastfeeding”). Finally, mothers were asked if their baby had water, juice or cereal in the last week? Responses were coded as 1 (introduction of cereal, juice, and/or water) and 0 (breast milk and/or formula only).

We asked respondents “How many times has your baby been to a doctor or a nurse for routine well-infant care?” Based on the AAP recommendations of well child visits at the following intervals, 2-4 days postpartum, by 1 month, 2 month, and 4 month ²⁸ responses were dichotomized into “<3 visits” and “≥ 3 visits.” To further ascertain health care practices, we asked “Have you taken your baby to the emergency room in the last three months?” Responses were coded “0” and “1”.

Independent Variables

Maternal depressive symptoms were measured with the Edinburgh Postnatal Depression Scale (EPDS), a 10-item self-report scale. ^{15,29} The EPDS is a validated, widely used postpartum depression screening instrument. ^{30,31} For each scale item, women were asked to select one of four responses that most closely describe how they have felt over the past 7 days. Each response has a value between 0 and 3; scores for the 10 items are summed to give a total score between 0 and 30. We chose to regard an EPDS score ≥ 10 as indicating possible depression. Although a number of cut-off points have been used, Cox et al ¹⁵ recommended that to minimize the failed detection of depressive cases, a cut-off score of 9/10 be used. Cronbach’s alpha coefficient of the EPDS in this study was 0.820.

Control variables that were selected for inclusion in our analyses were: maternal demographic characteristics (age, race/ethnicity, nativity, language, educational attainment,

insurance coverage, marital status, income and whether or not working outside the home at three months), maternal health and clinical characteristics (parity, breastfeeding at baseline, delivery type), and intervention status (i.e. intervention arm vs. usual care arm).

Statistical Analyses

Chi-square tests for categorical variables were used to compare parenting practices among mothers with and without depressive symptoms. To estimate the risk of adverse infant safety, feeding, and healthcare practices with postpartum symptoms, odds ratios were calculated using multiple logistic regression models for each of the dependent variables. Risk factors and confounders were identified a priori on the basis of prior research and theoretical considerations.³ These models assessed whether differences by depressive symptoms were due to covariates that may potentially be associated with both depressive symptoms and parenting practices.¹ The following variables were controlled for in all logistic models: age, race, marital status, education, parity, intervention status, employment status, and language. Analyses were conducted using SAS version 9.2 (SAS Institute, Cary, NC).

Results

Descriptive and bivariate analyses

Table 1 shows the percentage of women with depressive symptoms by demographic characteristics. The mean age of the study sample was 30, the majority of whom were married or living in a marriage-like relationship. Forty-four percent of the women were White, 19 percent Black/African American, 32 percent Hispanic/Latina and 6 percent other. Thirty percent of the participants were born outside of the United States and 11 percent reported to be primarily Spanish speakers. The sample was highly educated; with 70 percent of participants having some college or more. The majority of women in the sample had private or other insurance. Thirty percent of women sampled had returned to work three months postpartum. The average maternity leave was 8.36 (± 3.48) weeks. Two-thirds of women delivered vaginally. Fifty-six percent of the women were on their second or greater baby and 85 percent of mothers reported breastfeeding at baseline. At baseline, 14 percent of mothers screened positive (EPDS ≥ 10) and at three months postpartum, 8 percent of mothers screened positive (EPDS ≥ 10) for postpartum depression using the Edinburgh Postpartum Depression Scale.

Table 2 demonstrates parenting practices among mothers with depressive symptoms and parenting practices among mothers without depressive symptoms. Seventy-seven percent of new mothers put their babies to sleep using the back sleep position, 83% always used a car seat and 95% had a working smoke alarm in the home. Sixty-three percent of mothers were breastfeeding at three months, while only 26% had introduced water, juice, and/or cereal into their baby's diets. Over two-thirds of women had taken their infants to three or more routine childcare visits and only 17% had taken their child to the ER. The bivariate analyses reveal significant differences between women with depressive symptoms and those women without depressive symptoms for safety practices. Mothers with depressive symptoms were less likely than mothers without depressive symptoms to have used the AAP recommended

back sleep position for their infant (60% vs. 79%, $p<.001$). Similarly, mothers with depressive symptoms were less likely to always use a car seat than mothers without depressive symptoms (67% vs. 84%, $p<.001$). Lastly, mothers with depressive symptoms were less likely to have a working smoke alarm in their home than mothers without depressive symptoms (86% vs. 96%, $p<.001$).

Mothers with depressive symptoms as compared with mothers without depressive symptoms were more likely to introduce water, juice, or cereal earlier than recommended to their infants (36% vs. 25%, $p=.04$). Finally, significant differences occurred between the two groups of women in terms of baby healthcare utilization. Mothers with depressive symptoms were more likely to report taking their infant to the emergency room than non-depressed mothers (26% vs. 16%, $p=.03$). However, no subgroup differences in well child visits occurred.

Multivariate Analyses

The bivariate analyses reveal sizeable differences between mothers with depressive symptoms and those women without depressive symptoms for all safety related parenting practices. We next conducted multivariable logistic regression to investigate the association between depressive symptoms and parenting practices. Table 3 displays odds ratios for the likelihood of engaging in various parenting practices, after adjusting for maternal age, race, marital status, education, parity, intervention status, employment status, and language. Mothers with depressive symptoms were significantly less likely to engage in parental safety practices. In adjusted multivariable models, women with postpartum depressive symptoms as compared with mothers without depressive symptoms were less likely to place their infant on their back when sleeping, (OR=.37, CI= [0.22-0.61], $p=.0001$), less likely to always use a car seat (OR=.44, CI= [0.25-0.79], $p=.006$), and less likely to have a working smoke alarm in the home (OR=.26, CI= [0.12-0.56], $p=.0006$). Feeding practices and healthcare utilization did not differ for mothers with depressive symptoms versus those mothers without depressive symptoms in multivariable models.

Discussion

Our findings suggest that maternal depressive symptoms are associated with non adherence to recommended safety practices. After controlling for demographic and clinical factors, mothers with depressive symptoms remained significantly less likely to have their infant use the back sleep position, to always use a car seat, and to have a working smoke alarm in the home. The reduced odds of these important safety practices are concerning as the American Academy of Pediatrics (AAP) recently expanded recommendations for a safe infant sleeping environment.²² The AAP recommends infants be placed to sleep in a supine position (wholly on the back) for every sleep until 1 year of life in order to reduce the risk of Sudden Infant Death Syndrome (SIDS). Our results highlight the need for early postpartum depression screening and parental education on safety practices.

The AAP also recommends that all infants and toddlers should ride in a rear-facing car safety seat until 2 years of age.²³ While we did not ask mothers their most frequent mode of transportation, (car, bus, taxi, subway), or whether they owned a car, New York State child

car seat law states that any child under the age of four must ride in a federally approved child safety seat that is properly secured by a safety belt or a universal restraint anchorage system,³² and mothers with depressive symptoms in our study were less likely to always use a car seat. Similarly, although 95% of women reported a working smoke alarm in the home, mothers with depressive symptoms in both bivariate and multivariable analyses were statistically significant less likely to have a working smoke alarm in the home. These findings are similar to Stone et al.³³ which found that while 98 percent of urban families enrolled in the East Baltimore Healthy Start home visiting program self-reported the presence of a smoke alarm, in actuality only 45 percent of participating families had a working smoke alarm in the home. An additional safety practice that was asked in our study, “Have you lowered the temperature (less than 120° F) of the hot water heater in your home since you had your baby?” was not analyzed since the majority of respondents (57%) answered that they did not have control over the lowering the temperature on the water heater in their home.

Unlike a few studies that found depressive symptoms are associated with all three domains, we found that after controlling for demographic and clinical factors (in particular race/ethnicity) depressive symptoms were not associated with feeding practices or healthcare practices. Our breastfeeding findings support Chung et al.³, who found in an urban setting no association between maternal depressive symptoms and breastfeeding at 1 month. Although not statistically significant, depressed mothers were less likely to be breastfeeding at 3 months than non-depressed mothers (54% vs. 64%). The AAP guidelines recommend mothers should exclusively breastfeed or feed with expressed human milk (i.e., not offer any formula or other non-human milk-based supplements for 6 months)²⁵ and the Healthy People 2020 Goals include the increasing the exclusive breastfeeding rate to 46.2% at 3 months and 25.5% at 6 months respectively.²⁶ Mothers with depressive symptoms were more likely to introduce water, juice, or cereal to their infants 3 months postpartum. However, after adjusting for covariates, our findings on the early introduction of water, juice, or cereal was similar to McLearn et al.¹, who found no difference in feeding practices. Our results suggest that social/cultural factors are closely linked with feeding practices.

The presence of depressive symptoms was not significantly associated with healthcare practices. Similar to findings by others,³ the rate of well-child care visits did not differ between mothers with depressive symptoms and those mothers without depressive symptoms. Mothers with depressive symptoms were more likely to have taken their infant to the emergency room in the last three months as compared with mothers without depressive symptoms in bivariate analyses but this association was no longer significant in multivariable analyses.

Our research has several strengths. The parenting practices were measured in a racially/ethnically diverse sample of women. In addition, approximately one-third of our sample was born outside of the United States making our results relevant to women from diverse backgrounds. This study is an important contribution to the literature, due to the fact that half of all US births are to racial/ethnic minority women.^{34,35} In addition, the present study is one of the few studies to use the EPDS to assess maternal depressive symptoms and its association with common parenting practices. The EPDS is validated in Spanish and other

languages and is a widely used screening instrument, specific to postpartum depression. Previous studies have used the CES-D, a 20-item self-report scale designed to measure depressive symptoms and association to parenting practices. The EPDS is shorter, takes less than 5 minutes to complete, and its use as a postpartum depression screening instrument is endorsed by the American College of Obstetricians and Gynecologists (ACOG).¹⁶ The potential for identifying women with depressive symptoms in the postpartum period has the potential to improve health of mothers and infants.¹⁴

This study has several limitations. The 3-month survey was conducted on mothers from one large urban hospital and therefore the results may not be generalizable to all mothers and young infants. Parenting practices were measured by self-report. In addition, the prevalence of postpartum depression at 3 months postpartum was 8%; this prevalence rate is lower than our previous studies,⁶ other research, and national estimates. Public awareness campaigns and state and federal legislative action and policy initiatives aimed at postpartum depression education during the recruitment and follow up period may have influenced the prevalence of postpartum depression rates.³⁶

Conclusion

Our findings suggest that clinicians should address safety practices carefully with mothers that screen positive for depressive symptoms. Obstetricians and pediatricians are encouraged to incorporate postpartum depression screening with either the 2-item screen, Patient Health Questionnaire-2 (PHQ-2), or the EPDS at the 6 week postpartum visit and during the early well child visits.^{37,38} Women who screen positive for depressive symptoms require follow up evaluation, appropriate referral, and treatment if deemed necessary.¹⁶ Our study highlights the need to intervene early among mothers with depressive symptoms, to provide tailored referrals, and to reinforce parenting practices, especially safety practices.

Acknowledgments

This study was supported by the National Institute for Minority Health and Health Disparities grant 5P60MD000270 (Trial Registry Number ID: NCT01312883) and the National Institute of Mental Health grant 5R01MH77683. (Trial Registry Number ID: NCT00951717).

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Table 1

Demographic and Clinical Characteristics of MADE IT Study Population by Depressive Status.

	Total N=945 N (%)	Depressed EPDS 10 N=78 N (%)	Non-Depressed EPDS < 10 N=867 N (%)	P-Value
<i>Maternal Demographic Characteristics</i>				
Mean Age (yrs) std dev.	30.25 (±6.1)	30.36 (±6.2)	30.24 (±6.1)	.88
Race*				.02
White	414 (44)	21 (27)	393 (45)	
Black or African American	177 (19)	18 (23)	159 (18)	
Hispanic or Latina	301 (32)	33 (42)	268 (31)	
Other	53 (6)	6 (8)	47 (5)	
Primary Language				.04
English	840 (89)	64 (82)	776 (90)	
Spanish	105 (11)	14 (18)	91 (10)	
Marital Status				.20
Single, Separated, Divorced, Widowed	190 (20)	20 (26)	170 (20)	
Married or Living as if Married	755 (80)	58 (74)	697 (80)	
Education				.04
High School or less	288 (30)	32 (41)	256 (30)	
Some college or more	657 (70)	46 (59)	611 (70)	
Income*				.06
< \$30,000	318 (34)	35 (45)	283 (33)	
\$30,000	563 (60)	37 (47)	526 (61)	
Missing/not answered	64 (7)	6 (8)	58 (7)	
Insurance				.04
Medicaid or Medicaid Managed Care	315 (33)	34 (44)	281 (32)	
Private or Other	630 (67)	44 (56)	586 (68)	
Returned to work 3 mos. postpartum (1=yes)	288 (30)	17 (22)	271 (31)	.08
<i>Maternal Clinical Characteristics</i>				
Parity				.38
Primiparous	406 (43)	29 (37)	377 (43)	
Multiparous	532 (56)	49 (63)	483 (56)	
Parity data missing or not answered	7 (1)	-	7 (1)	
Breastfeeding				.59
Breastfeeding at baseline	804 (85)	736 (92)	68 (8)	
Not breastfeeding at baseline	141 (15)	131 (93)	10 (7)	
<i>Intervention Status</i>				
Intervention	472 (50)	32 (41)	440 (51)	.10
Usual Care	473 (50)	46 (59)	427 (49)	

Notes: Source: MADE IT (2009-2010) N=945.

* Totals do not add up to 100, due to rounding.

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Table 2

Parenting Practices by Depressive Status at 3 Months Postpartum.

Parenting Practices	Total Sample N =945 N (%)	With Depressive Symptoms N= 78 N (%)	Without Depressive Symptoms N= 867 N (%)	P value
<i>Safety</i>				
Infant use back sleep position	728 (77)	47 (60)	681 (79)	<.001
Always uses car seat	781 (83)	52 (67)	729 (84)	<.001
Working Smoke Alarm	902 (95)	67 (86)	835 (96)	<.001
<i>Feeding</i>				
Currently Breastfeeding at 3 months	594 (63)	42 (54)	552 (64)	.09
Early introduction of water/juice/cereal	248 (26)	28 (36)	220 (25)	.04
<i>Healthcare</i>				
Routine Childcare visits 3 visits	638 (68)	47 (61)	591 (68)	.25
Baby ER Visits 1 visit	157 (17)	20 (26)	137 (16)	.03

Notes: Source: MADE IT (2009-2010) N=945.

Table 3

Adjusted Odds Ratios for Parenting Practices for Depressed vs. non-Depressed Mothers

Parenting Practices	Adjusted Odds Ratio (95% CI) Depressed vs. non-Depressed Mothers	P Value
<i>Safety</i>		
Infant use back sleep position	0.37 (0.22-0.61)	.0001
Always uses car seat	0.44 (0.25-0.79)	.006
Working Smoke alarm	0.26 (0.12-0.56)	.0006
<i>Feeding</i>		
Exclusive Breastfeeding at 3 months	0.71 (0.42-1.19)	.20
Early introduction of water/juice/cereal	1.40 (0.82-2.39)	.22
<i>Health care</i>		
Routine Childcare Visits	0.81 (0.48-1.37)	.43
Baby ER Visits	1.49 (0.84-2.63)	.17

Source: MADE IT (2009-2010) N=945. Multivariable models controlled for age, race, marital status, education, parity, intervention status, employment status, and language.