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SCREENING FOR SYMPTOMS OF POSTPARTUM TRAUMATIC STRESS IN A SAMPLE OF MOTHERS WITH PRETERM INFANTS

Richard J. Shaw¹, Emily Lilo², William Benitz³, Amy Storfer-Isser⁴, M. Bethany Ball³, Melinda Proud³, Nancy S. Vierhaus³, Audrey Huntsberry³, Kelley Mitchell³, Marian M. Adams³, and Sarah M. Horwitz⁵

¹Department of Psychiatry and Behavioral Sciences, Stanford University School of Medicine, Palo Alto, CA 94305

²Department of Pediatrics and Stanford Health Policy, Stanford University School of Medicine, Palo Alto, CA 94305

³Division of Neonatology, Lucile Packard Children's Hospital, Stanford University School of Medicine, Palo Alto, CA 94305

⁴Statistical Research Consultants, L.L.C. Perrysburg, OH

⁵Department of Child and Adolescent Psychiatry, New York University Medical School, New York, New York 10016

Abstract

Objective—There are no established screening criteria to help identify mothers of premature infants who at risk for symptoms of emotional distress. The current study, using data obtained from recruitment and screening in preparation for a randomized controlled trial, aimed to identify potential risk factors associated with symptoms of depression, anxiety and posttraumatic stress in a sample of mothers with premature infants hospitalized in a neonatal intensive care unit.

Method—135 mothers of preterm infants born at 26–34 weeks of gestation completed three self-report measures, the Stanford Acute Stress Reaction Questionnaire, the Beck Depression Inventory, Second Edition and the Beck Anxiety Inventory to determine their eligibility for inclusion in a treatment intervention study based on clinical cut-off scores for each measure.

Results—Maternal sociodemographic measures, including race, ethnicity and age, maternal pregnancy history and measures of infant medical severity were not helpful in differentiating mothers who screened positive on one or more of the measures from those who screened negative.

Conclusions—Programs to screen parents of premature infants for the presence of symptoms of posttraumatic stress, anxiety and depression will need to adopt universal screening rather than profiling of potential high risk parents based on their sociodemographic characteristics or measures of their infant's medical severity.

Keywords

neonatal intensive care; premature infants; posttraumatic stress disorder; screening

It is now well established that mothers of premature infants are at increased risk of symptoms of psychological distress including posttraumatic stress disorder (PTSD),

postpartum anxiety and postpartum depression (Bener et al., 2012; Kersting et al., 2004; Ross & McLean, 2006; Miles, 1989; Peebles-Kleiger, 2000). Data from community samples, for example, suggest that prevalence rates of women who screen positive for meeting diagnostic criteria for PTSD after childbirth range from 1.7- 9% (Beck et al., 2011) while mothers of premature infants hospitalized in the neonatal intensive care unit (NICU) are at even higher risk with prevalence rates as high as 23-35% in the immediate postpartum period (Lefkowitz et al., 1989; Feeley et al., 2011; Vanderbilt et al., 2009). However, despite the existence of several well validated measures useful for screening for both PTSD (Brewin, 2005) as well as other common postpartum disorders (Cox et al., 1987), guidelines for screening in this high risk population of NICU parents are absent.

To date, interest in screening parents of physically ill and hospitalized children has been focused primarily in the area of pediatric oncology. Kazak et al. (2011), for example, have developed the Psychiatric Assessment Tool, a screening measure that assesses family psychosocial risk for clinically significant distress during treatment in 18 separate domains which include parent and family functioning, psychosocial resources, social support and illness factors. The instrument is based on the premise that the majority of families dealing with the diagnosis of a pediatric cancer are competent and adaptively organized while a smaller proportion of families have risk factors that place them at greater risk for poor outcomes. Scores on this measure are also postulated to help in decisions about the allocation of psychosocial treatment interventions. Other instruments, also from the pediatric oncology literature and recently reviewed by Kazak et al. (2012), include the Distress Thermometer (CAU National Comprehensive Cancer Network, 2003), a brief unidimensional rating of distress which has been used to screen parents to determine eligibility for a behavioral intervention during child cancer treatment (Warner et al., 2011). In addition, the SCREEM Family Resources Questionnaire (Panganiban-Corales et al., 2003) has been used to help assess psychosocial needs in families of children with cancer.

Although there is agreement on the importance of recognizing parental distress and trauma in the NICU, and a small number of interventions have been developed to target and prevent trauma symptoms, what is missing from the literature is a rigorous, systematic effort to compare mothers who screen positive for symptoms of depression, anxiety and traumatic stress with those who do not. While research on posttraumatic stress symptoms after childbirth has established specific risk factors which include prior history of psychological problems (specifically of anxiety), prior trauma exposure, obstetrical difficulties and lack of social support (Olde et al., 2006), it is not known whether factors related to the infant's medical history including their gestational age or pregnancy-related complications place mothers at higher risk of psychological distress. In this brief report, we describe a sample of mothers of premature infants who were screened for possible inclusion in a randomized controlled trial designed to reduce symptoms of depression, anxiety and posttraumatic stress (Shaw et al., 2013a, 2013b). Based on prior work that has not shown a strong relationship between maternal psychological distress and their infants' medical history, we hypothesized that maternal rather than infant variables would be associated with maternal symptoms. Our specific aims were to determine whether there are easily identifiable maternal sociodemographic characteristics, aspects of their pregnancy history or factors related to their infant's medical history in postpartum mothers who screen positive for symptoms of psychological distress so that guidelines for appropriate screening procedures in the NICU parent population might be developed. Secondary aims were to examine sociodemographic and medical characteristics that differentiate mothers with multiple categories of psychological distress (i.e. depression, anxiety and posttraumatic stress), and finally, given the high prevalence of posttraumatic symptoms in NICU parents (Shaw et al., 2006), whether it is possible to differentiate mothers specifically based on these symptoms.

METHODS

Subjects

135 English- and Spanish-speaking mothers of infants born between 26 and 34 weeks old, weighing over 1000 grams, born at the Lucile Packard Children's and El Camino Hospitals in northern California or transferred within 72 hours, without major health complications such as congenital abnormalities, and judged by physicians as likely to survive, were eligible for participation in a treatment intervention study which has been previously described (Shaw et al., 2013a, 2013b). During the recruitment process, 187 mothers were approached, 30 of whom declined to meet to discuss the study. Of the 157 mothers who were assessed for eligibility, an additional 14 declined to participate and 8 were considered ineligible (2 spoke neither English nor Spanish, 2 had infants who were transferred to other hospitals, and 4 lived > 1 hour from the hospital). Although psychiatric risk factors including suicidal or homicidal ideation or the presence of psychotic symptoms were exclusion factors for the study, no mothers endorsed any of these symptoms.

Study Design

The study was approved by the Stanford University Institutional Review Board. Recruitment and delivery of the intervention took place between July, 2011 and December, 2012. After obtaining informed consent, mothers completed three screening measures within one week of the birth of their infants. Mothers who screened positive on one of the three measures were invited to participate in a separate treatment intervention study (Shaw et al., 2013a, 2013b). These well validated self-report measures included the Beck Depression Inventory, Second Edition [BDI-II: Beck et al., 1996] the Beck Anxiety Inventory [BAI: Beck et al., 1988], and the Stanford Acute Stress Reaction Questionnaire [SASRQ: Cardeña et al., 2000; Koopman et al., 1994].

Measures

Sociodemographic/self-reported health variables—Mothers' date of birth, years of education, race/ethnicity, family composition, family income and employment were gathered using questions employed in the NIMH-funded Connecticut Early Development Project (Horwitz et al., 1997). Women were asked to rate their overall physical health on a 5-point Likert scale from 'poor' to 'excellent.' In addition, history of the mother's pregnancy and obstetrical complications were collected from the medical record along with data on their infant's birth and medical history. These data were used to compute the Illness Health Severity Index.

Illness Health Severity Index (IHSI)—A probability of death index (range 0-1) was calculated using a multivariable risk adjustment model, designed to capture important factors related to patient risk based upon Vermont Oxford Network (VON) model (Horbar, 1999; Zupancic et al., 2007) using modifications tailored to the California Perinatal Quality Care Collaborative (CPQCC) data. The model includes terms for gestational age, gestational age squared, race, sex, location of birth, multiple birth, prenatal care, 5-minute Apgar score, small size for gestational age (lowest 10th percentile), major birth defect, and California Children's Services (CCS) NICU level. The CCS NICU level is determined in the CPQCC database using a Regional NICU comparison chart.

Stanford Acute Stress Reactions Questionnaire (SASRQ)—This 30-item self-report questionnaire was used to assess the DSM-IV TR symptoms of acute stress disorder (ASD) related to the traumatic experience of the mother's premature birth and her infant's NICU hospitalization. The SASRQ was chosen since screening occurred within the first week of the infant's birth and ASD is a more appropriate diagnostic category given that

symptoms need to be present for a longer period to meet criteria for PTSD. Each item is rated on an ordinal scale of 1 to 5 to indicate the frequency of experiencing each symptom. The SASRQ has been shown to have a high internal consistency for ASD in a range of survivor samples ($\alpha = 0.80-0.95$), good test-retest reliability as assessed during a 3 to 4-week retest period ($\alpha = 0.69$) and sound convergent and discriminant validity (Cardeña et al., 2000). In addition, symptoms measured using the SASRQ are strongly related to later PTSD symptomatology (Cardeña et al., 2000). In the current study, individuals who reported a score of 3 (“sometimes experienced”) on at least 2 of the 4 ASD symptom categories were considered to have screened positive for ASD based on a scoring algorithm developed for the SASRQ (Koopman et al., 2001).

Beck Depression Inventory-Second Edition (BDI-II)—This 21-item self-report questionnaire was used to assess maternal symptoms of depression in the two week period prior to enrolment in the study. The reliability of the BDI-II is excellent (Coefficient Alpha = .92; Beck et al., 1996) and it both correlates well with other screening measures and is highly sensitive when compared with a diagnostic assessment particularly in the late postpartum period. Because women in this study were to be followed past the postpartum period, the BDI-II was selected to screen for depressive symptoms (Ji et al., 2011). A BDI-II score of 20 (indicating at least moderate depression based on criteria in the scoring manual) was used as the cut-off value to assign mothers who screened positive (Beck et al., 1996).

The Beck Anxiety Inventory (BAI)—This 21-item self-report measure was used to assess maternal symptoms of anxiety. The scale has good internal consistency and one week test retest reliability of .75 (Beck, 1988). A BAI score of 16 (indicating at least moderate anxiety based on criteria in the scoring manual) was used as the cut-off value to assign mothers who screened positive (Beck & Steer, 1993).

Statistical Analysis

Study data were collected and managed using REDCap (hosted at the Stanford Center for Clinical Informatics). REDCap (Research Electronic Data Capture: Harris et al, 2009) is a secure, web-based application designed to support data capture for research studies. Categorical responses were summarized using counts and frequencies, normally distributed variables were described using means and standard deviations, and the median and interquartile range were reported for non-normally distributed measures. Mothers who screened positive for depression, anxiety, or ASD were coded as having a positive screening and were eligible for inclusion in the treatment intervention study. Bivariate statistics including the two-sample t-test, Wilcoxon rank-sum test, the Chi-square test, and Fisher’s exact test were used to compare maternal sociodemographic and medical characteristics for mothers who screened positive to those who screened negative (primary analyses). Effect sizes were calculated to facilitate the interpretation of the results; Cohen’s D , ρ , and Cramer’s V are reported for normally distributed, non-normally distributed, and categorical measures, respectively. To further understand variations in maternal characteristics by the number of posttraumatic stress symptoms, a three-level variable was created to indicate whether mothers screened positive on 0, 1, or 2-3 instruments. ANOVA, the Kruskal-Wallis test, and the Mantel-Haenszel Chi-Square test were used to compare these three groups. Secondary analyses also included comparing mothers who screened positive on the SASRQ versus those who did not among the subset of mothers who screened positive on at least one instrument. SAS version 9.2 (SAS Institute Inc., Cary, NC) was used for data analysis.

RESULTS

One hundred and five (77.8%) mothers out of the total sample of 135 mothers screened positive on at least one of the three measures (SASRQ, BDI-II or BAI). Nearly three-fourths (96/135; 71.1%) of the sample met screening criteria for ASD. Almost half (64/135; 47.4%) of mothers screened positive for anxiety symptoms while over one-third (48/135; 35.6%) screened positive for depressive symptoms.

Baseline demographic characteristics of the mothers in the two groups are shown in Table 1. With the exception of one single variable (Born in the U.S.), no maternal sociodemographic variable was useful in differentiating mothers who screened positive from those who screened negative. While U.S.-born mothers were significantly more likely to screen positive ($p=.05$), race, ethnicity, native language and years of maternal education showed no significant differences between the two groups. Furthermore, the two groups did not significantly differ with respect to pregnancy history and the Infant Health Severity Index (including birth weight, gestational age and probability of death).

Table 2 illustrates the profile of mothers based on whether they screened positive on 0, 1 or 2-3 of the three screening instruments. Importantly, over half (69/135; 51.1%) of the sample endorsed symptoms on two or three of the screening instruments; among mothers who screened positive, almost two-thirds (69/105; 65.7%) had elevated symptoms two or three of the screening instruments. As with previous findings, only maternal birthplace (U.S. vs. non-U.S.) was associated with the number of positive screenings on the three instruments. Maternal sociodemographic measures, pregnancy history and Infant Health Severity Index did not differentiate the groups, although there was a trend for mothers with lower self-rated physical health to screen positive ($p=.07$). Looking specifically at the subset of mothers who screened positive on at least one instrument, comparisons of those who did (96/105; 91.4%) and did not (9/105; 8.6%) screen positive for ASD showed no maternal or infant health variables related to a positive screen with the exception of increased symptoms of maternal depression among mothers who screened positive for ASD (Table 3).

DISCUSSION

Data from our study confirm findings from prior work suggesting that mothers of premature infants are at greatly elevated risk of symptoms of psychological distress (Bener et al., 2012; Holditch-Davis et al., 2003; Kersting et al., 2004). 77.8% of our sample screened positive for symptoms of depression, anxiety or trauma while 51.1% of the sample endorsed symptoms on two or three of the screening instruments. These data suggest that this group of women experience considerable psychological distress related to their birth and NICU experience. In addition, the data highlight the issue of comorbidity. While the occurrence of postpartum depression is a well-recognized phenomenon, there is less awareness of the issue of postpartum traumatic stress which has the potential for its own separate longer term sequelae including an association with adverse infant outcomes (Pierrehumbert et al., 2003; Singer et al., 1999). Our finding that higher scores on the BDI were associated with increased ratings of symptoms of ASD on the SASRQ highlights the importance of screening for postpartum traumatic stress in mothers identified with postpartum depression.

The second major finding from these data relates to the issue of mental health screening in parents of premature infants. Our data suggest that maternal sociodemographic characteristics, pregnancy history, and severity of their infant's medical history cannot be used to differentiate those mothers who screen positive for anxiety, depression, and symptoms of posttraumatic stress from those who screen negative. This suggests that it is not possible to profile mothers based on any sociodemographic variables or aspects of their

infants' medical history including gestational age. The trend towards higher rates of psychological distress in mothers with low self-ratings of physical health, a finding well documented in other populations (Zbozinek et al., 2012), is of interest although also did not reach statistical significance. One clear implication of these findings is that if effective screening practices are to be implemented to help identify at-risk mothers of preterm infants, screening will either have to be universal and target all mothers, or else rely upon some of the more established correlates of trauma, such as age and educational level (Olde et al., 2006), anxiety (Bener et al., 2012) and depression (Vigod et al., 2010) in this population. Other psychological variables, including parental coping style, family environment, social support, prior trauma exposure and the presence of pre-existing psychopathology are all potential risk factors but these require separate measures to accurately quantify their potential contribution (Olde et al., 2006; Verreale et al., 2012). The single finding that U.S. born mothers were more likely to endorse symptoms is also at odds with findings of high rates of psychiatric morbidity in immigrants and refugees who may be more likely to have prior trauma histories (Fazel et al., 2005).

This brief report has several limitations. The small sample size and the demographic distribution (e.g., African American, n=6) limited the statistical power to detect group differences. There may also have been effects for race, non-Hispanic ethnicity, and higher probability of death of baby that the study was underpowered to detect. There were very few single mothers in the sample with the result that differences by marital/partnership status could not be assessed. Finally, the screening instruments were administered in the first week after the hospitalization of the infant in the NICU and it is not known whether symptoms of distress would have either increased or decreased over time and which mothers were in fact at risk of developing clinically significant psychiatric symptoms. Nonetheless, the results may provide some guidance to inform clinicians who work with this high risk population about the issue of mental health screening in the parent NICU population. It is clear from these data that the vast majority of women who deliver preterm infants have considerable psychological stress across multiple types of symptom categories and that as a result interventions to alleviate their stress should be universally available and part of routine NICU care.

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Table 1Sociodemographic and Medical Characteristics by Screening Status ($N=135$)[†]

Maternal Characteristics	Screen Negative ($n=30$)	Screen Positive ($n=105$)	Effect Size	p -value
Sociodemographic Characteristics				
Age (years)	31.4 $\pm$ 5.5	32.5 $\pm$ 6.1	.19	.37
Race				
White	19 (63.3%)	64 (61.0%)	.16	.48
Black	0 (0%)	6 (5.7%)		
Asian	10 (33.3%)	26 (24.7%)		
Other	1 (3.3%)	9 (8.6%)		
Hispanic ethnicity	13 (43.3%)	30 (28.6%)	.13	.13
Born in U.S.	11 (36.7%)	60 (57.1%)	.17	.05
Language				
English	11 (36.7%)	57 (54.3%)	.16	.18
Spanish	10 (33.3%)	21 (20.0%)		
Other	9 (30.0%)	27 (25.7%)		
Married/Partner	29 (96.7%)	101 (96.2%)	.01	.99
Education				
< College	12 (40.0%)	38 (36.2%)	.05	.84
College degree	7 (23.3%)	30 (28.6%)		
Post-graduate degree	11 (36.7%)	37 (35.2%)		
Employment				
Not employed	12 (40.0%)	36 (34.3%)	.11	.44
Part-time	4 (13.3%)	8 (7.6%)		
Full-time	14 (46.7%)	61 (58.1%)		
Household income				
< \$50k	9 (30.0%)	24 (22.9%)	.17	.25
\$50k - \$99k	4 (13.3%)	15 (14.3%)		
\$100k	11 (36.7%)	56 (53.3%)		
Unknown	6 (20.0%)	10 (9.5%)		
First child	16 (53.3%)	64 (61.0%)	.06	.45
Number of other children				
None	16 (53.3%)	64 (61.0%)	.11	.43
One	10 (33.3%)	23 (21.9%)		
Two, Three or Four	23 (13.3%)	18 (17.1%)		
Other children born preterm	5 (16.7%)	12 (11.4%)	.07	.53
Age of oldest child (years)	6.1 $\pm$ 4.6	7.3 $\pm$ 5.1	.24	.52
Pregnancy Characteristics				
Bed rest 1 week before delivery				
No	22 (73.3%)	72 (68.6%)	.10	.48
Yes	7 (23.3%)	22 (21.0%)		
Unknown	1 (3.3%)	11 (10.5%)		

Maternal Characteristics	Screen Negative (n=30)	Screen Positive (n=105)	Effect Size	p-value
Gestational age (weeks)	32.2 ± 2.7	31.6 ± 2.9	.21	.32
Singleton	24 (80.0%)	84 (80.0%)	.00	.99
Illness Health Severity Index Baby 1 *	0.018 (0.013, 0.030)	0.024 (0.016, 0.047)	.01	.12
Illness Health Severity Index Baby 2 **	0.015 (0.008, 0.017)	0.019 (0.011, 0.039)	.04	.20
Health				
Physical health excellent/very good	21 (70.0%)	60 (57.1%)	.11	.20
BAI	4.6 ± 3.3	21.3 ± 12.1	1.55	<.001
BDI-II	7.0 ± 5.6	19.3 ± 10.1	1.33	<.001
SASRQ				
Total	0.53 ± 0.51	3.04 ± 0.96	2.87	<.001
2 positive symptom classes	0 (0%)	96 (91.4%)	.84	<.001

† Mean ± SD and Cohen's D shown for normally distributed measures; median (25th percentile, 75th percentile) and ρ shown for non-normally distributed measures; n(%) and Cramer's V shown for categorical measures.

* Median (25th percentile, 75th percentile) shown

** Median (25th percentile, 75th percentile) shown; N=25 twins; n=6 twins among mothers who screened negative; n=19 twins among mothers who screened positive

Table 2Sociodemographic and Medical Characteristics by Number of Positive Screening Criteria Met ($N=135$)[†]

Maternal Characteristics	None ($n=30$)	One ($n=36$)	Two or Three ($n=69$)	<i>p</i> -value
Sociodemographic Characteristics				
Age (years)	31.4 ± 5.5	32.4 ± 5.3	32.5 ± 6.5	.67
Race				
White	19 (63.3%)	20 (55.6%)	44 (63.8%)	.19
Black	0 (0%)	0 (0%)	6 (8.7%)	
Asian	10 (33.3%)	12 (33.3%)	14 (20.3%)	
Other	1 (3.3%)	4 (11.1%)	5 (7.2%)	
Hispanic ethnicity	13 (43.3%)	6 (16.7%)	24 (34.8%)	.75
Born in U.S.	11 (36.7%)	19 (52.8%)	41 (59.4%)	.04
Language				
English	11 (36.7%)	18 (50.0%)	39 (56.5%)	.22
Spanish	10 (33.3%)	6 (16.7%)	15 (21.7%)	
Other	9 (30.0%)	12 (33.3%)	15 (21.7%)	
Married/Partner	29 (96.7%)	36 (100%)	65 (94.2%)	.42
Education				
< College	12 (40.0%)	7 (19.4%)	31 (44.9%)	.24
College degree	7 (23.3%)	12 (33.3%)	18 (26.1%)	
Post-graduate degree	11 (36.7%)	17 (47.2%)	20 (29.0%)	
Employment				
Not employed	12 (40.0%)	11 (30.6%)	25 (36.2%)	.66
Part-time	4 (13.3%)	2 (5.6%)	6 (8.7%)	
Full-time	14 (46.7%)	23 (63.9%)	38 (55.1%)	
Household income				
< \$50k	9 (30.0%)	7 (19.4%)	17 (24.6%)	.18
\$50k - \$99k	4 (13.3%)	4 (11.1%)	11 (15.9%)	
\$100k	11 (36.7%)	24 (66.7%)	32 (46.4%)	
Unknown	6 (20.0%)	1 (2.8%)	9 (13.0%)	
First child	16 (53.3%)	23 (63.9%)	41 (59.4%)	.69
Number of other children				
None	16 (53.3%)	23 (63.9%)	41 (59.4%)	
One	10 (33.3%)	8 (22.2%)	15 (21.8%)	.92
Two, Three or Four	4 (13.3%)	5 (13.9%)	13 (18.8%)	
Other children born preterm	5 (16.7%)	4 (11.1%)	8 (11.6%)	.79
Age of oldest child (years)	6.1 ± 4.6	8.2 ± 6.4	6.9 ± 4.5	.56
Pregnancy Characteristics				
Bed rest 1 week before delivery				
No	22 (73.3%)	25 (69.4%)	47 (68.1%)	.33
Yes	7 (23.3%)	5 (13.9%)	17 (24.6%)	
Unknown	1 (3.3%)	6 (16.7%)	5 (7.3%)	

Maternal Characteristics	None (n=30)	One (n=36)	Two or Three (n=69)	p-value
Gestational age (weeks)	32.2 ± 2.7	32.1 ± 2.5	31.2 ± 3.1	.19
Singleton	24 (80.0%)	31 (86.1%)	53 (76.8%)	.56
Illness Health Severity Index Baby 1 *	0.018 (0.013, 0.030)	0.020 (0.015, 0.039)	0.025 (0.016, 0.055)	.22
Illness Health Severity Index Baby 2 **	0.015 (0.008, 0.017)	0.018 (0.013, 0.032)	0.019 (0.011, 0.039)	.41
Health				
Physical health excellent/very good	21 (70.0%)	24 (66.7%)	36 (52.2%)	.07

[†] Mean ± SD shown for normally distributed measures; median (25th percentile, 75th percentile) shown for non-normally distributed measures; n(%) shown for categorical measures.

* Median (25th percentile, 75th percentile) shown

** Median (25th percentile, 75th percentile) shown; N=25 twins; n=6 twins among mothers who screened negative; n=4 twins among mothers who screened positive on 1 instrument; n=14 twins among mothers who screened positive on 2-3 instruments

Table 3

Subset Analysis of Mothers who Screened Positive: Sociodemographic and Medical Characteristics by SASRQ Status ($N=105$)[†]

Maternal Characteristics	SASRQ negative ($n=9$)	SASRQ positive ($n=96$)	p -value
Sociodemographic Characteristics			
Age (years)	33.6 $\pm$ 4.2	32.4 $\pm$ 6.3	.58
Race			
White	5 (55.6%)	59 (61.5%)	.59
Black	1 (11.1%)	5 (5.2%)	
Asian	3 (33.3%)	23 (24.0%)	
Other	0 (0%)	9 (9.4%)	
Hispanic Ethnicity			
Born in U.S.	5 (55.6%)	55 (57.3%)	.99
Language			
English	5 (55.6%)	52 (54.2%)	.81
Spanish	1 (11.1%)	20 (20.8%)	
Other	3 (33.3%)	24 (25.0%)	
Married/Partner	8 (88.9%)	93 (96.9%)	.31
Education			
< College	1 (11.1%)	37 (38.6%)	.23
College degree	3 (33.3%)	27 (28.1%)	
Post-graduate degree	5 (55.6%)	32 (33.3%)	
Employment			
Not employed	3 (33.3%)	33 (34.4%)	.99
Part-time	0 (0%)	8 (8.3%)	
Full-time	6 (66.7%)	55 (57.3%)	
Household income			
< \$50k	2 (22.2%)	22 (22.9%)	.79
\$50k - \$99k	2 (22.2%)	13 (13.5%)	
\$100k	5 (55.6%)	51 (53.1%)	
Unknown	0 (0%)	10 (10.4%)	
First child	6 (66.7%)	58 (60.4%)	.99
Number of other children			
None	6 (66.7%)	58 (60.4%)	.99
One	2 (22.2%)	21 (21.9%)	.99
Two, Three or Four	1 (11.1%)	17 (17.7%)	.99
Other children born preterm	2 (22.2%)	10 (10.4%)	.27
Age of oldest child (years)	5.0 $\pm$ 2.0	7.5 $\pm$ 5.3	.57
Pregnancy Characteristics			
Bed rest 1 week before delivery			
No	6 (66.7%)	66 (68.7%)	.39
Yes	1 (11.1%)	21 (21.9%)	

Maternal Characteristics	SASRQ negative (n=9)	SASRQ positive (n=96)	p-value
Unknown	2 (22.2%)	9 (9.4%)	
Gestational age (weeks)	31.4 ± 2.7	31.6 ± 3.0	.78
Singleton	8 (88.9%)	76 (79.2%)	.68
Illness Health Severity Index Baby 1 *	0.018 (0.016, 0.040)	0.024 (0.015, 0.050)	.64
Illness Health Severity Index Baby 2 **	0.023	0.019 (0.011, 0.039)	.65
Health			
Physical health excellent/very good	5 (55.6%)	55 (57.3%)	.99
BAI	20.6 ± 8.6	21.4 ± 12.4	.62
BDI-II	12.9 ± 6.1	19.9 ± 10.2	.04

[†] SASRQ negative: 0-1 positive SASRQ symptom class; SASRQ positive: 2-4 positive SASRQ symptom classes. Mean ± SD shown for normally distributed measures; median (25th percentile, 75th percentile) shown for non-normally distributed measures; n(%) shown for categorical measures.

* Median (25th percentile, 75th percentile) shown

** n=1 twin among mothers who screened negative on the SASRQ negative; n=18 twins for mothers who screened positive on the SASRQ; median (25th percentile, 75th percentile) shown