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Longitudinal Suicidal Ideation across 18-Months Postpartum in Mothers with Childhood Maltreatment Histories

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Abstract

Objective—The current study extends our understanding of postpartum suicidal ideation (SI) in the context of childhood maltreatment (CM). The study longitudinally examines the prevalence and severity of maternal SI. We further examined risk and protective factors' associations with postpartum SI.

Methods—SI was assessed at 4, 6, 12, 15, and 18-months postpartum in a non-clinical sample of mothers with CM histories (N = 116). For the first aim, frequency, longitudinal percentage counts, and ANOVAs were conducted. For the second aim, logistic and linear regressions were completed to examine associations between risk and protective factors and the presence and severity of SI, respectively.

Results—Endorsement of SI was highest at 4-months (37%) and remained at approximately 25% for the duration of the study. While the severity of CM was not significant, our sample of women with CM histories evidenced markedly higher rates of SI than other postpartum investigations. Resilience, marital status, maltreatment-related shame, and family support were associated with suicidal ideation or severity at some assessments; however, these relationships were highly variable over time.

Limitations—Limitations of this study include the use of self-report measures and generalizability to mothers without CM histories.

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Conclusion—Mothers with histories of CM are at risk for postpartum SI. Our findings elucidate the importance of understanding the interplay and variability of risk and protective factors during postpartum. These results aid clinicians in identifying women at risk for suicidal ideation during postpartum.

Keywords

Postpartum; suicidality; maltreatment; risk factors; protective factors

1. Introduction

While overall suicidal ideation (SI), attempts and deaths are less frequent among peripartum women compared to non-peripartum populations, if suicide attempts occur, they are more violent and show high intent (Lindahl et al., 2005). In fact, suicides account for 20% of maternal postpartum deaths (Fauveau and Blanchet, 1989; Lindahl et al., 2005). The sequelae of completed suicide among new mothers are life altering and often debilitating for children and families. However, emerging evidence suggests that even postpartum suicidal ideation (SI), which occurs between 4%–8% in non-clinical (Mauri et al., 2012), 19%–30% in depressed clinical samples (Mauri et al., 2012; Wisner et al., 2013), and 9% in a primary care setting (Howard et al., 2011) is correlated with objectively-assessed disturbances across a variety of domains, including amplified parenting stress (Mauri et al., 2012).

The observed variability in rates of maternal SI postpartum is related to both psychiatric and contextual factors (see review Lindahl et al., 2005). For example, peripartum depressive symptoms and disorders, and a lifetime history of suicidal behavior were identified as strong psychiatric factors associated with postpartum SI (Mauri et al., 2012; Pope et al., 2013). In regards to contextual factors, SI shows great variability across postpartum. Most studies investigated the links in the first few weeks postpartum (approximately 3–6 weeks; Yonkers et al., 2001; Wisner et al., 2013), whereas a few research groups have taken a longitudinal perspective across the first year after childbirth (Mauri et al., 2012; Pope et al., 2013). Data on socioeconomic adversity as a contextual factor to heightened risk for postpartum SI is most likely dependent on the demographic make-up of the sample studied. For example, Mauri and colleagues studied a demographically low risk non-clinical sample and did not report a link between demographics and postpartum SI, whereas Yonkers et al., (2001) studied demographically at-risk, inner-city Latina and African-American postpartum mothers presenting to maternity care and found elevated rates of postpartum SI suggesting a positive association between demographic and SI risk. Pinheiro et al., (2008) found similar results with lower income women being at higher risk for suicidality (i.e., suicidal ideation and suicide attempts). However, these two studies differ on timing of assessments during postpartum, and the differential results may be due to temporal changes of these associations. Theoretically, demographic risk contributes to self-perceptions of burdensomeness (Joiner, 2005), which correlates with increased suicide risk (McMillen, 2010), and complicates postpartum functioning (Dearing et al., 2004; Gjerdingen et al., 2014). Thus, further research on demographic risk factors, including income, using a demographically heterogeneous sample and longitudinal repeated assessment design beyond the first year postpartum, is warranted and one aim of our current study.

Another demonstrated risk factor for SI during postpartum is a history of childhood maltreatment (CM; Krysinaka & Lester, 2010). During the postpartum period, women reflect on their own childhoods, thus triggering prior memories and experiences that result in emotional (psychopathology) as well as behavioral (parenting) disruptions (Lyons-Ruth & Block, 1996; Wright, Fopma-Loy, & Oberle, 2012). The frequency and severity of CM are known to predict increased psychopathology in adult postpartum populations (Choi and Sikkema, 2015; Grekin and O'Hara, 2014; Leigh and Milgrom, 2008; Muzik et al., 2013; Sexton et al., 2015). Sit et al.'s (2015) investigation established a relationship between CM and SI in mothers with postpartum depressive disorder (PPD). They found 21% of women with PPD 4–6 weeks postpartum described some thoughts of suicide on the Edinburgh Postnatal Depression Scale (EPDS). Dichotomous queries evaluated the presence of CM in childhood or adolescence with a question specific to physical (17% endorsed) and sexual abuse (21% endorsed). Mothers with histories of childhood physical abuse, but not sexual abuse, had increased risk for postpartum SI. In terms of behavioral disruptions, women with CM histories have greater difficulties when interacting with their infants (Levendosky and Graham-Bermann, 2001) which impacts child development (Martinez-Torteya, et al., 2014). Investigations incorporating more comprehensive assessment of CM including multiple types of abuse and neglect, and the severity of maltreatment with validated measures may further elucidate relationships between distal trauma exposure (e.g., abuse and neglect), postpartum functioning, and SI, and is a principle aim of the present study.

CM exposure is, in many instances, associated with the development and maintenance of shame that can persist long after the abuse ends (Feiring & Taska, 2005; Stipek et al., 1992). Shame is a painful, self-conscious emotion involving self-condemnation and a desire to hide the damaged self from others (Tangney & Fischer, 1995; Feiring et al., 2002). The persistence of shame links CM to subsequent psychopathology. For example, Wright et al. (2009) found among adults with a history of emotional abuse and neglect that shame mediated the relationship between maltreatment exposure and subsequent onset of anxiety and depression. Further, when posttraumatic shame is present in the context of interpersonal trauma histories, the risks for suicide ideation and attempts are amplified (Dutra et al., 2008; Wilson et al., 2006). Less is known about the role of shame as a risk factor for postpartum SI among mothers with CM histories which is a focus of this study.

Fortunately, most individuals with histories of CM do not evidence pathology in adulthood. Resilience, or the capability to be “tested ... and continue to demonstrate adaptive...stress responses”, (Feder et al., 2009, p. 446) has preliminary support in the context of suicidal behaviors. Specifically, a study examining two populations found lower resilience, as assessed by the Connor-Davidson Resilience Scale (CD-RISC; Connor and Davidson, 2003), predicting suicide attempts in those with CM histories (Roy et al., 2011). A recent investigation by Sexton et al. (2015) in postpartum women showed that resilience, CM severity, and their interaction were associated with PTSD and MDD postpartum. Given the associations between CM, shame, resilience and psychiatric functioning, continued efforts to understand relationships between these factors and postpartum SI are warranted.

Finally, theory ties interpersonal and social support as protective factor against suicidality. One of the best-validated theories concerning suicidal behavior is Joiner's Interpersonal

Theory of Suicide (IPTS; Joiner, 2005; Van Orden et al., 2010), which posits that social connectedness and support can buffer susceptibility to SI and depression (Esposito & Clum, 2002; Kleiman & Liu, 2013; Xie et al., 2009). Specific to postpartum women, family and peer support are associated with reduced risk for mood and anxiety disorders as well as SI after childbirth (Leahy-Warren et al., 2012; Killian, 2013; Norhayati et al., 2015; Robertson et al., 2004; Sexton et al., 2015). Some literature has shown that individuals who are married also demonstrate reduced risk for suicidal behavior (Kposowa, 2000; Smith et al., 1988).

The current study aims to extend our understanding of postpartum SI in the context of CM. Our objectives were twofold. First, we aimed to describe the point and period prevalence and severity of maternal SI longitudinally from 4–18-months postpartum. For our second aim, we sought to examine risk and protective factors associated with endorsement and severity of postpartum SI among postpartum women with CM histories. We sought to identify whether these risk/protective factors had differential relationships to maternal SI at specific time points postpartum. We hypothesized CM severity and shame would be associated with presence and severity of SI, whereas family social support, resilience and low demographic risk (i.e., married/partnered and/or higher income) and would confer buffering effects.

2. Methods

2.1. Procedures

The current study investigated postpartum women with CM histories ($n=116$) and is derived from the Maternal Anxiety during the Childbearing Years (MACY-PI; Muzik) study. MACY participants were recruited either as a follow-up to another study (STACY; Seng et al., 2009) or through the community.

Participants were non-psychiatrically referred, English speaking, and aged 18 or older. Exclusion criteria included the use of illegal or nonprescription drugs during pregnancy, maternal history of bipolar and psychotic illness, child prematurity (<36 weeks term), or child developmental disability or severe illness (e.g., epilepsy).

Eligible women completed assent procedures and a phone-based assessment at 4-months postpartum. Following the baseline assessment, mothers completed informed consent during a home visit at 6-months postpartum with subsequent assessments at 12-, 15- and 18-months postpartum. Women were compensated \$10 to \$130 for participation in the longitudinal study. The study was IRB approved. Current study analyses include data collected from a subset of 116 women that completed a home visit and shame measures at 6-months. Descriptive statistics and child maltreatment characteristics are noted in the results (See Table 4).

2.2 Measures

2.2.1 Suicidal ideation—Suicidal thoughts were assessed via the Suicidal Ideation Subscale of the Postpartum Depression Screening Scale (PDSS; Beck and Gable, 2001) at 4, 6, 12, 15, and 18-months postpartum. Suicidal thoughts were rated on a 5-item self-report subscale, with each item rated from 1 (strongly disagree) to 5 (strongly agree), with higher

total scores indicating higher severity. Total scores greater than or equal to 6 were considered “SI present”.

2.2.2. Risk factors

2.2.2.1. CM severity: CM was assessed via 28 items on the Childhood Trauma Questionnaire (CTQ; Bernstein and Fink, 1998) at 4-months. Childhood experiences were maternal rated on a 5-point Likert Scale (1 (never true) to 5 (very often true)) with higher scores indicating higher severity.

2.2.2.2. Shame: Maltreatment-related shame was assessed via the Shame Attributions Questionnaire (SAQ; Feiring and Taska, 2005) completed at 6-months postpartum. The SAQ is an 8-item self-report questionnaire of maltreatment-related shame. In consultation with the creator, the original SAQ was adapted to a 5-point scale ranging from 1 (not true at all) to 5 (very true). Higher total scores indicated more maltreatment-related shame.

2.2.3. Protective factors

2.2.3.1. Demographics: Mothers reported demographic data at 4-months postpartum including income and marital status.

2.2.3.2. Family Social Support: Perceived social support was assessed via the Family Adaptation, Partnership, Growth, Affection, and Resolve Scale (FAPGAR; Smilkstein et al., 1982) at 4-months postpartum. Mothers rated perceived social support on this 5-item Likert Scale, items ranging from 0 (Never) to 4 (Always) with higher scores indicating higher social support satisfaction.

2.2.3.3. Resilience: Resilience was assessed via the 25-item Connor-Davidson Resiliency Scale (CD-RISC; Connor and Davidson, 2003), completed at 4-months postpartum. The CD-RISC is rated on a 5-point Likert Scale ranging from 0 (not true at all) to 5 (true nearly all of the time). Scores ranged from 0–100 with higher scores indicating higher resilience.

2.3. Data analyses

Data analyses were performed using SPSS version 22. Two variables of interest (e.g., SI severity, social support) were found to be skewed (as defined by z-scores of 2.57 or more: Tabachnick & Fidell, 2006). However, given these variables have low base-rates with skewed theoretical distributions, no transformations were performed. See Table 1 for variable descriptive information. Chi-square and t-tests were conducted to assess for randomness of attrition between individuals longitudinally missing versus not missing.

The first aim assessed the presence and severity of SI with frequency statistics. Longitudinal percentage counts regarding new and repeated SI presence were conducted. A repeated measure (RM) ANOVA evaluated changes in SI severity across the postpartum assessments.

The second aim investigated associations between potential risk and resilience factors and the presence or severity of postpartum SI, in a two-step process. First, bivariate relationships between outcome (presence and severity of SI at each time-point), and risk and resilience

factors (FAPGAR score, resilience, marital/partnered status, income, shame, and maltreatment history) were examined (see Table 2). More specifically, Pearson correlations were used to examine the relationships between pairs on continuous variables (i.e. SI severity, shame, resilience, CM severity), and point-biserial correlations were used to examine the relationships between continuous and categorical (i.e. income, FAPGAR score) or binary (i.e. marital status and SI presence) variables. Finally, phi coefficients were used to examine the relationship between the two binary variables, marital status and SI presence. Second, logistic and linear regressions were performed at each of the five time-points for SI presence and severity, respectively. The bivariate correlations informed decisions concerning which of the six hypothesized risk/resilience factors would be entered into each regression equation. Only statistically correlated variables were included in each equation for outcomes.

3. Results

3.1. Participant characteristics

Mother's age ranged from 19 to 45 years ($M = 29.49$, $SD = 5.93$) with the majority being Caucasian (65.3%, $n = 64$), married (66.1%, $n = 72$), having a college education (30.2%, $n = 35$), and a household income greater than \$50,000 per year (42.1%, $n = 45$). 25.9% ($n = 29$) of participants met criteria for MDD and 23.2% ($n = 26$) of participants met criteria for PTSD at 4-months postpartum. To determine if attrition was random, chi-square, and independent sample t-tests were completed comparing individuals missing versus not missing at 6-, 12-, 15-, and 18-months on 4-month demographic characteristics (e.g., income, marital status, education, age, and race). Attrition appears to be random because missing versus not missing participants were not significantly different based on demographic characteristics (results available upon request).

3.2. Trauma characteristics

Of the 116 women, all had histories of CM with emotional abuse (77.2%; see Table 3) as the most prevalent. Most participants experienced multiple types of abuse: 13.7% ($n = 13$) experienced only one type of maltreatment, and 86.3% ($n = 82$) experienced multiple types of maltreatment. CM severity was moderate ($m = 50.75$, $sd = 17.84$) with 35.1% ($n = 33$) participants experiencing the maltreatment during one developmental period (e.g., before or after puberty), and 65.9% ($n = 61$) experiencing maltreatment across more than one developmental period. Most participants experienced maltreatment many times (77.7%, $n = 73$), and the primary perpetrators were parents (70.1%, $n = 68$; see Table 3).

3.3. Postpartum SI

3.3.1. Aim 1: Longitudinal presence and severity of SI—Endorsement of SI was highest (37%) at 4-months and remained at ~25% for the remainder of the study (range 24–28%). During the study, 34% never endorsed SI, 28% acknowledged SI at only one timepoint, 37% experienced SI at multiple assessments, and 11% described SI at every assessment. See Table 4 for the percentages of new, resolving, and returning SI during the 18-month study window. Specific to SI severity, the SI scores ranged from a mean of 6.1 ($SD = 2$) at 6-months to 6.7 ($SD = 3$) at 4-months. RM ANOVA indicated, SI severity did

not differ significantly between time-points ($F(1,72) = 1.72, p = .16$), suggesting that SI severity is consistent across postpartum.

3.3.2. Aim 2: Associations between risk and protective factors and postpartum SI

3.3.2.1. Four months postpartum: Correlations indicated the association between SI presence and hypothesized risk and protective factors (resilience, household income, marital/partnered status, shame, FAPGAR scores, and severity of CM). Resilience, income, marital/partnered status, and shame were significantly associated with presence and severity of SI, and were included as independent variables in the regression analyses.

A logistic regression established whether any of the four noted variables were associated with SI presence at 4-months postpartum. Test of the full logistic regression model was statistically significant, indicating that the independent variables as a set reliably distinguished between individuals with and without SI at 4-months postpartum ($\chi^2(4) = 20.85, p < .001$) and Nagelkerke's R^2 (.34) indicated a moderate relationship between association and grouping. The Wald criterion demonstrated that only resilience ($OR = -0.07, p = .004$) was significantly associated with 4-month SI.

In correlations of independent variables with SI severity, only resilience, income, marital status, and shame, were significantly associated. Linear regression examining associations with SI severity and the four noted variables was significant ($F[4, 67] = 5.05, p < .001, R^2 = .23$). Resilience ($\beta = -0.34, p = .003$) and marital status ($\beta = 0.37, p = .006$) were significantly associated with SI severity (see Table 5).

3.3.2.2. Six months postpartum: Correlations between SI presence and hypothesized risk and protective factors revealed resilience, income, and shame were significantly correlated. Logistic regression was performed with the three noted variables included as independent variables in the model, and again the test of the full logistic regression model was statistically significant ($\chi^2(4) = 8.42, p = .036$), and Nagelkerke's R^2 (.18) indicated a low relationship between association and grouping. However, the Wald criterion demonstrated that none of the individual independent variables added to the model were significantly associated with SI presence.

Specific to SI severity, correlations indicated that only six month FAPGAR score was significantly associated with SI severity. The corresponding linear regression analysis was significant ($F[1, 80] = 6.055, p = .016, R^2 = .07$) suggesting that six month FAPGAR score significantly associated with SI severity ($\beta = -.26, p = .016$; see Table 5).

3.3.2.3. Twelve months postpartum: Correlations revealed that at 12-months postpartum, endorsement of SI was significantly associated with income, and shame. The subsequent logistic regression was statistically significant ($\chi^2(2) = 9.01, p = .011$), although Nagelkerke's R^2 (.17) indicated a weak relationship between associations and grouping. The Wald criterion demonstrated that only shame ($OR = 0.08, p = .036$) was associated with SI presence.

Results from initial correlations with SI severity at 12-months postpartum were mostly consistent; income, shame, and marital/partnered status were significantly associated with SI severity. The linear regression including these three variables in the model was significant ($F[3, 53] = 4.32, p = .008, R^2 = .20$). However, examination of standardized beta values revealed that only marital status independently contributed to the relationship with SI severity at this time-point ($\beta = .32, p = .030$; see Table 5).

3.3.2.4. Fifteen months postpartum: At 15-months postpartum only resilience was significantly associated with SI presence, and as such it was the only independent variable in the logistic regression. A test of the full logistic regression model was statistically significant ($\chi^2(1) = 5.75, p = .016$), and Nagelkerke's $R^2 (.10)$ indicated a low relationship between association and grouping. The Wald criterion confirmed that resilience ($OR = -0.04, p = .021$) facilitated distinction between individuals with and without SI at 15-months postpartum.

Correlations also indicated that only one variable of interest, being married or partnered was significantly associated with SI severity at 15-months postpartum. Linear regression was significant ($F[1, 73] = 5.89, p = .018$), however, confirming marital status at this time-point is associated with SI severity ($\beta = .27, p = .018$; see Table 5).

3.3.2.5. Eighteen months postpartum: Finally, correlations at 18-months indicated that shame, and 18-month FAPGAR score were significantly associated with 18-month SI presence. Testing showed that the full logistic regression model with shame and FAPGAR entered as independent variable was statistically significant ($\chi^2(2) = 8.38, p = .015$); Nagelkerke's $R^2 (.15)$ indicated a weak relationship between predictor variables and grouping. The Wald criterion indicated that only shame ($OR = 0.17, p = .031$) was significantly associated with 18-month SI.

The findings for SI severity at 18-months indicated that only shame, and 18-month FAPGAR score were significantly associated with SI severity at 18-months postpartum. Further, linear regression predicting SI severity was significant ($F[2, 69] = 5.54, p = .006, R^2 = .14$), but only shame was significantly associated with 18-month SI ($\beta = .32, p = .006$; see Table 5). 4.

Discussion

The current study examined the risk and protective factors related to SI during postpartum. The first aim of the study was to describe the point and period prevalence and severity of maternal SI longitudinally through 18-months postpartum. Analyses suggest 24–37% of women experience postpartum SI, with the highest rate occurring at 4-months postpartum and approximately 25% of mothers endorsing SI during the study. These frequencies are higher than Lindahl et al.'s (2005) reporting 15% postpartum SI and Howard et al., (2011) 9%; however, both of these authors reported on cross-sectional data. Lack of longitudinal data spanning an extended period is problematic in the context of postpartum research as postpartum is characterized by a series of changes requiring adjustment to accommodate both infants' rapid changing needs and external demands on new mothers' time, all of which may alter SI risk.

While we anticipated that mothers with histories of CM would demonstrate elevated SI during the postpartum, the endorsement rates throughout postpartum are alarming and, to our knowledge, the highest reported to-date. This is concerning, given our study is not limited to mothers experiencing postpartum depression or other psychiatric morbidities. Our study supports the findings of Sit et al. (2015) that postpartum endorsement of SI is amplified in the context of CM history and extends this research to include longitudinal observation, and validated assessments of trauma history. Additionally, the high rates of SI throughout later postpartum (i.e., 12-, 15-, and 18-months postpartum), suggest that parenting a toddler may confer continued stressors for mothers beyond the early infancy period. For example, early postpartum brings maternal stress related to fluctuations in infants' sleep patterns, hormonal changes, developing lactation skills, and financial strain obtaining items for newborn care (i.e., cribs, bottles, etc.). Later in postpartum, mothers who return to work may be challenged by competing demands of employment and family. However, many of these stressors are likely to be transient (e.g., infant sleep pattern stabilizes, etc.), and family support can buffer some of the risks. Women who receive significant extended family and peer support in the initial weeks and months following delivery may experience less distress and thus present with lower rates of psychopathology and postpartum SI. Interestingly, our data confirm this pattern.

The longitudinal assessment suggests that only a third of postpartum women with histories of CM did not endorse SI at any point and a small minority (11%) endorsed thoughts at each assessment period. This suggests, rather than identifying those who are persistently experiencing SI or free of SI, that SI may emerge or subside at any point during the first 18-months postpartum. In fact, 21% of new endorsements of SI in our study did not report this symptom until 12-months postpartum or later. Clinically, this suggests that health providers should regularly assess for thoughts of suicide. Further, in cases in which SI has emerged and resolved, the return of these thoughts is not atypical. Future analyses examining the relationships between prenatal and postpartum SI will further elucidate the longitudinal patterns of SI.

Our study also highlights stability of postpartum SI over time in this sample. Pope et al. (2013) conducted a yearlong assessment of Canadian mothers with postpartum major depressive or bipolar disorders at obstetric visits. Among women who endorsed SI, they found 73–89 % reported thoughts of suicide at only one of the postpartum evaluation points, depending on the assessment measure used. In contrast, only 28% demonstrated a similar pattern in our study. It is possible that maltreatment-related factors may enhance the stability of SI.

Secondly, we aimed to examine risk and protective factors associated with endorsement and severity of SI among women with CM. We hypothesized that CM severity and shame would confer risk, whereas being married or partnered, family social support, higher income, and resilience would confer buffering towards postpartum SI. Our results showed partial support for our hypotheses, demonstrating most of these factors are salient, but that they vary in relative import at different time-points postpartum.

Unanticipated, we did not see a direct link between CM severity and the presence or severity of postpartum SI, although as noted, the endorsement rate of SI was elevated for our sample. Further, we found strong support for maltreatment-related shame on postpartum endorsement of SI at 12- and 18-months and the severity of SI symptoms at 18-months postpartum. Together, these findings suggest that the presence of CM and how this is emotionally experienced in adulthood, rather than trauma severity, may be effective at identifying those at risk for postpartum SI.

Suicidal behaviors, shame, and low and unstable sense of self are reciprocally associated, (Wilson et al., 2006). Consistent with Joiner's Interpersonal Theory of Suicide (IPTS; Joiner, 2005; Van Orden et al., 2010), low self-esteem and self-perception of being a burden (Joiner, 2005), both of which go along with feeling shame, are correlated with increased suicide risk (McMillen, 2010) and postpartum difficulties (Dearing et al., 2004; Gjerdingen et al., 2014). According to the IPTS, movement from suicidal thoughts to behaviors requires the presence of an additional construct: "acquired capability" or a high pain tolerance and a learned ability to override the innate fear of death. From a theoretical perspective, exposure to pain and life stressors (e.g., CM) are posited to increase risk for suicide due to habituation to fearful or painful stimuli which may dampen death-related apprehension. As such, CM may be an antecedent in developing "acquired capability" (Joiner, 2005), and maltreatment-related shame may be the pathway to low self-esteem and despair enhancing SI prevalence. Future research with larger samples examining the interplay between shame and SI may provide data to test mediational models and aid clinicians in further understanding how maltreatment-related shame may impact postpartum adaptation and aid treatment development. It may also be that particular types of CM confer particular longitudinal risk. For example, Sit et al., (2015) observed that childhood physical abuse but not childhood sexual abuse was associated with SI at 6-weeks postpartum. Future research needs to examine if different types of maltreatment are associated with SI among postpartum women with maltreatment histories.

Aspects of social support were more frequently related to postpartum SI, though differential relationships with the presence and severity of SI. Perceived family support was only related to SI severity at 4-months postpartum. Marital/partnership status was associated with the severity, though not presence of, SI at 12- and 15-months. This is in partial contrast to Mauri et al. (2012) 12-month longitudinal study that did not identify relationships between marital status and SI. It may be the case that partnership status is particularly salient in the context of mothers with histories of CM. Alternatively, it could be that the importance of spouses or partners is especially relevant to the developmental contexts evidenced within families when children are between 12- and 18-months of age. Further research is warranted to better elucidate the waxing and waning importance of family relationships.

Finally, we investigated income and resilience as protective factors. In contrast to our hypothesis and consistent with the findings of Mauri et al. (2012), income was not associated with presence or severity of SI. By contrast, resilience was significantly associated with 4-months and 15-months SI. These findings are consistent with non-postpartum research demonstrating negative associations between resilience and contemplation of suicide (Izadinia et al., 2010; Mansfield et al., 2011; Pietrzak et al., 2010;

Pietrzak et al., 2011; Yousef et al. 2013). Women with higher resilience likely have more adaptive strategies that allow them to cope with past experiences of maltreatment and parenting demands.

The current study has important implications for clinical practice and for understanding which individuals are vulnerable to suicidal thoughts across postpartum. When examining multiple risk and protective factors, several modifiable factors emerge. Resilience, social support, and shame can be tackled with targeted interventions including Interpersonal Therapy to address social support, and venlafaxine to increase resilience (Bruce et al., 2004; Davidson et al., 2008). Continued assessment of the differential utility of interventions in the context of postpartum SI is warranted and certain interventions may be more effective at various time points postpartum.

The following limitations are worth noting. The aggregation of childhood abuse and neglect exposure does not permit an investigation into whether particular types of CM are most salient in the context of postpartum SI. Methodologically, cross sectional regression analyses were conducted to identify variables associated with particular postpartum time periods. However, it should be noted this approach does not permit an identification of factors associated with trajectories of SI risk (i.e. resolving, worsening). Future research using mixed modeling or other approaches is recommended to ascertain if risk and resilience factors can be used to identify various SI-related courses postpartum. Additionally, our risk and resilience variables were only evaluated at the 4-month postpartum assessment point. While this approach permits an early identification of factors longitudinally associated with SI through 18-months postpartum, it cannot be confirmed that these appraisals (i.e., social support, resilience) remained static throughout the study period. Moreover, although our participants are at increased risk for previous histories of suicide attempts and postpartum disorders (e.g., PTSD and MDD) secondary to CM, these were not among the variables investigated. Thus, it is impossible to disentangle whether investigated constructs led to SI or if they carry a shared vulnerability with postpartum pathology. Similarly, mothers with some psychiatric morbidities (i.e., bipolar disorder) were excluded from participation. Thus, results may not generalize to these mothers. Finally, we did not account for perinatal depression, and SI allowing us to control for the potential effects of SI during pregnancy; therefore, future analyses need to explore the associations between perinatal and postpartum depression and SI.

Despite these weaknesses, several unique strengths are evident. The current study is the first to investigate the interplay of postpartum SI with risk and protective factors in a sample of CM survivor mothers from 4- to 18-months postpartum. Our findings of high prevalence rates of postpartum SI, and the associations with unique modifiable factors such as resilience, family support, and shame, support that this is an important public health concern. Identified risk and resilience factors of SI presence and severity may assist with treatment planning with the selection of interventions that reduce shame, and enhance resilience and family/social support.

Future research should examine other protective factors that were not analyzed in the current study that may be related to SI during postpartum. Some risk factors, including adult

temperament, prior suicide attempts, and proximal traumas or stressors, were not investigated in this study, but should be for future studies. Girardi et al., (2011) suggest a dysphoric-dysregulated temperament is associated with higher suicidal ideation and behaviors and Pinheiro et al., (2008) note higher rates of suicidality (as defined by suicidal thoughts and attempts). Prior research has examined associations with SI and behaviors and variables such as family connectedness (Eisenberg et al., 2007) and emotional intelligence (Cha and Nock, 2009). Additionally, the idea of fostering resilience in women who have histories of CM may be critical for decreasing the suicidal thoughts of postpartum women. Our study identified high rates of SI endorsement in mothers with histories of CM. More research is needed with postpartum populations to understand associations between CM exposure and SI and personality disorders, depression, PTSD, and non-suicidal self-injury. Furthermore, additional research examining associations between SI and the degree of change between risk and resilience factors, SI during pregnancy and postpartum, and SI among women with and without maltreatment histories will increase our understanding of SI among these women. Finally, future analyses examining the risk and protective factors and associations with SI and parenting among women with CM histories will provide insight to potential intergenerational patterns of SI. The current study provides important information about the role of protective and risk factors for SI in postpartum, specifically that of resilience, economic resources, family support, marital status, and maltreatment-related shame.

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Highlights

- Suicidal ideation (SI) during postpartum depression is consistent across time.
- Risk and protective factors are associated with SI during postpartum.
- Some factors identified as associated with SI are possibly modifiable.

Table 1

Descriptive Statistics for Items Used in Analyses.

Variable	n	Minimum	Maximum	Mean	SD	Skewness	Kurtosis
Suicidal Ideation (presence)							
4 months PP	109	0.00	1.00	0.37	0.49	.44	-1.84
6 months PP	96	0.00	1.00	0.24	0.46	.93	-1.16
12 months PP	83	0.00	1.00	0.28	0.49	.48	-1.65
15 months PP	85	0.00	1.00	0.26	0.46	.63	-1.82
18 months PP	111	0.00	1.00	0.28	0.49	.47	-1.83
Suicidal Ideation (severity)							
4 months PP	109	5.00	18.00	6.70	2.60	1.63	2.88
6 months PP	96	5.00	20.00	6.11	2.44	3.05	1.54
12 months PP	83	5.00	16.00	6.27	2.14	2.01	4.47
15 months PP	85	5.00	18.00	6.64	2.72	1.18	3.56
18 months PP	111	5.00	17.00	6.47	2.51	2.01	4.00
Family Support: 4 months PP	111	3.00	20.00	15.41	3.64	-.90	.46
Household income: 4 months PP	107	1.00	21.00	11.35	7.10	.13	-1.50
Shame: 6 months PP	90	13.00	64.00	31.57	12.34	.61	-.25
CM experience	114	27.00	121.00	50.75	17.84	1.15	1.50
Resilience: 6 months PP	107	40.00	99.00	74.24	13.56	-.14	-.80

Note. PP=Postpartum.

Table 2

Bivariate Correlations

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. 4mo. SI (p)	1.00																		
2. 6mo. SI (p)	.31*	1.00																	
3. 12mo. SI (p)	.25†	.53*	1.00																
4. 15mo. SI (p)	.23†	.33*	.42*	1.00															
5. 18mo. SI (p)	.15*	.38*	.61*	.51*	1.00														
6. 4mo. SI (s)	.81*	.36*	.30*	.41*	.29*	1.00													
7. 6mo. SI (s)	.40*	.72*	.45*	.41*	.37*	.59*	1.00												
8. 12mo. SI (s)	.38*	.52*	.75*	.57*	.57*	.63*	.58*	1.00											
9. 15mo. SI (s)	.24†	.35*	.34*	.82*	.42*	.45*	.53*	.50*	1.00										
10. 18mo. SI (s)	.24†	.38*	.52*	.50*	.74*	.44*	.51*	.64*	.50*	1.00									
11. 4m. FS	.02	-.11	-.06	-.17	-.12	.03	-.03	-.02	-.14	-.22	1.00								
12. 6m. FS	-.21	-.21	-.05	-.20	-.01	-.27†	-.27*	-.20	-.19	-.11	.54†	1.00							
13. 12m. FS	.07	-.02	-.17	-.06	-.08	-.05	.01	-.16	.04	-.11	.53†	.72†	1.00						
14. 15m. FS	.09	-.05	-.07	-.09	-.09	.02	-.05	-.03	-.10	-.09	.66†	.71†	.65†	1.00					
15. 18m. FS	.12	-.12	-.11	-.08	-.23†	.04	-.08	-.12	-.05	-.23*	.43†	.50†	.66†	.62*	1.00				
16. Income	-.30*	-.26†	.24†	-.17	-.16	-.21†	-.10	.06	.20	.13	.19	.27*	.06	.20	.13	1.00			
17. CM	.13	.05	.04	.11	.06	.18	.12	.19	.08	.10	-.38†	-.41†	-.45†	-.46†	-.32†	-.20	1.00		
18. Shame	.25†	.32†	.29*	.18*	.29*	-.12	-.21	-.19	.26*	-.18	-.12	-.21	-.19	-.26*	-.18	-.07	.25*	1.00	
19. Resilience	-.30*	-.23†	.15	-.26†	-.91	-.23†	-.12	-.12	-.11	-.18	.32*	.40*	.45*	.30†	.30*	.23*	-.25*	-.14	1.00
20. Marital Status	.30*	.25†	.19	.19	.20	.30*	.20	.27†*	.29†	.11	-.14	-.05	.22	-.02	.05	-.47*	.51*	.11	.06

Table 3

Descriptive Statistics for Demographics and Maltreatment Characteristics

	n	Percent
Marital Status		
Married	72	66.10%
Not Married	37	33.90%
Racial Category		
Caucasian	64	65.30%
African American	21	21.40%
Other Minority	13	13.30%
Income		
Less than \$15,000	26	24.30%
\$15,000–\$25,000	13	12.10%
\$25,000–\$50,000	23	21.50%
\$50,000 +	45	42.10%
Education		
High School or Less	11	9.50%
Some College	35	30.20%
Bachelor's Degree	29	25%
Graduate Degree	23	19.80%
Frequency of Maltreatment		
One Time	8	8.50%
A Few Times	13	13.80%
Many Times	73	77.70%
Perpetrator		
Parent	68	70.10%
Not parent	29	29.90%
Maltreatment Type		
Sexual Abuse	68	60.2%
Physical Abuse	52	45.6%
Emotional Abuse	88	77.2%
Physical Neglect	47	41.2%
Emotional Neglect	73	64%

Note: n's may not total 116 due to missing information.

Table 4

Percentage of new, resolving and returning SI during the 18-month study window.

Months postpartum	# with SI	# with SI for the 1 st time at this time point	# with SI previously, resolved at this time point	# with SI previously which returned at this time point-
4	43 (/109); 37.1%			
6	28(/96); 24.1%	10	17	
12	32(/83);27.6%	7	4	3
15	30(/85); 25.9%	4	12	4
18	33(/85); 28.4%	3	7	7

Table 5

Regression Results Across Time-Points

Predictor Variable	Logistic Regression Results (Predicting Presence/Absence of SI)					Linear Regression Results (Predicting SI Severity)				
	4 m. postpartum	6 m. postpartum	12 m. postpartum	15m. postpartum	18 m. postpartum	4 m. postpartum	6 m. postpartum	12 m. postpartum	15m. postpartum	18 m. postpartum
Marital Status	p = .216					p = .006		p = .030	p = .018	
Income	p = .202		p = .127			p = .468		p = .645		
Shame	p = .004		p = .036			p = .031		p = .155		p = .006
CM										
FAPGAR						p = .157				
Resilience	p = .215			p = .021		p = .003	p = .016			p = .242