

## RESEARCH ARTICLE

# The impact of military sexual trauma on parent-infant bonding in a sample of perinatal women veterans

Suzannah K. Creech<sup>1,2</sup>  | Aimee Kroll-Desrosiers<sup>3,4</sup>  | Justin K. Benzer<sup>1,2</sup>  |  
Carey S. Pulverman<sup>1,2</sup>  | Kristin Mattocks<sup>3,4</sup> 

<sup>1</sup>VHA VISN 17 Center of Excellence for Research on Returning War Veterans and the Central Texas Veterans Health Care System, Waco, Texas, USA

<sup>2</sup>Department of Psychiatry and Behavioral Sciences, Dell Medical School of the University of Texas at Austin, Austin, Texas, USA

<sup>3</sup>VA Central Western Massachusetts Healthcare System, Leeds, Massachusetts, USA

<sup>4</sup>Departments of Population and Quantitative Health Sciences and Psychiatry, University of Massachusetts Medical School, Worcester, Massachusetts, USA

## Correspondence

Suzannah K. Creech, Department of Psychiatry and Behavioral Sciences, Dell Medical School of the University of Texas at Austin, Health Discovery Building, 1601 Trinity Street, Building B, Austin, TX 78701, USA.  
Email: [Suzannah.creech@va.gov](mailto:Suzannah.creech@va.gov) and [suzannah.creech@austin.utexas.edu](mailto:suzannah.creech@austin.utexas.edu)

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## Abstract

**Background:** The experience of sexual assault and harassment during military service (military sexual trauma [MST]) is associated with increased risk for perinatal and reproductive health problems among women veterans. The objective of this study was to examine the associations between mothers' MST exposure and mother-infant bonding, as well as to examine whether there are any salient sociodemographic or military service characteristics among women veterans with greater impairment to mother-infant bonding, including stress during pregnancy and posttraumatic stress disorder (PTSD) diagnosis.

**Methods:** This study was a secondary analysis of data collected from prospective, longitudinal study of women veterans using VHA maternity care benefits at 15 VHA medical centers across the US between January 2016 and February 2020. Participants were 697 pregnant veterans using VHA maternity care benefits.

**Results:** MST was associated with higher maternal depression, and higher maternal depression was associated with poorer mother-infant bonding. The effect of MST on bonding was indirect through depression. PTSD diagnosis and life stressors during pregnancy also had significant indirect pathways with bonding through maternal depression.

**Conclusions:** Results underscore the need for access to high quality and trauma-informed perinatal mental health treatment for women veterans, for education on the unique risks conveyed by MST provided to civilian providers treating this population outside VA, and for further research to understand how to ameliorate the harmful effects of MST on perinatal women veterans and their children.

## KEYWORDS

maternal infant bonding, perinatal depression, pregnancy, trauma, veterans, women

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## 1 | INTRODUCTION

Early parent-child bonding or attachment is critical for healthy child development and predicts child psychosocial wellbeing over time. Unfortunately, maternal exposure to trauma and resulting psychopathology appear to disrupt early mother-infant bonding (Murray et al., 2020; Muzik et al., 2013). To date, most research in this area has focused on understanding the links between maternal childhood adversity and maternal depression, with impaired bonding (Erickson et al., 2019). Less research has examined the psychosocial well-being and mother-infant bonding of women who have experienced trauma in adulthood. No research has focused on the well-being and postpartum bonding of women veterans, a rapidly growing population who are disproportionately exposed to both childhood and adulthood trauma (Street et al., 2009; Zinzow et al., 2007). The lack of research on post-partum outcomes in women veterans and their children is a serious concern considering the growing literature documenting associations between experience of military sexual trauma (MST; Department of Veterans Affairs, 2018) with myriad reproductive health and mental health problems (Katon et al., 2018).

MST refers to experiences of sexual harassment and assault during military service. A recent meta-analysis of 69 studies indicated MST prevalence rates of 23.6% for sexual assault, 52.5% for sexual harassment and 38.4% for both sexual harassment and assault (Wilson, 2018). In addition to MST, women in the military are exposed to military medical trauma (exposure to combat injuries as a healthcare provider), and combat trauma (Mattocks et al., 2012), all of which are associated with increased rates of psychopathology (Bean-Mayberry et al., 2011). There is growing concern about the experience of MST as being particularly deleterious to the reproductive and perinatal health of women veterans (Katon et al., 2018; Pulverman & Creech, 2019). For example, recent studies show that those who have experienced MST are more likely have a sexual dysfunction disorder (Turchik et al., 2012) including lower sexual function and satisfaction (Blais et al., 2018). Another study showed that sexual assault in the military alone appears to be more detrimental to women's sexual function than child sexual abuse alone (Pulverman et al., 2019). Two prior studies using the present dataset indicated that women veterans with MST history are more likely to experience intimate partner violence during pregnancy (Creech et al., 2021), and may be at higher risk for perinatal depression (Gross et al., 2020). Notably, pregnant women veterans are twice as likely as their nonpregnant peers to be diagnosed with depression, anxiety, and/or posttraumatic stress disorder (Mattocks et al., 2010). Given these characteristics, women veterans are a population with several risk factors for impaired mother-infant bonding.

More women veterans than ever before have received VHA health care during the perinatal period (Frayne et al., 2018; Mattocks et al., 2014), and VHA has several programs to serve the mental health needs of women who have experienced MST (Foyne et al., 2018). Therefore, understanding the impact of maternal trauma exposure on mother-infant bonding and child outcomes is well poised to improve services and offer support for women at-risk. The goal of this project was to examine the associations between mothers' MST exposure and mother-infant bonding, as well as to examine whether there are any

salient sociodemographic or military service characteristics among women veterans with greater impairment to mother-infant bonding. We examined self-reported maternal depression symptoms as a possible mediator of the association between MST exposure and mother-infant bonding because prior work has shown there is an association between maternal depression with bonding impairment (e.g., (Moehler et al., 2006). We included stressors during pregnancy and PTSD diagnosis from the medical record as potential confounds based on prior research (Erickson et al., 2019; Liu & Tronick, 2013). Based on prior research we hypothesized that perinatal women veterans with MST would report more impaired mother-infant bonding than their peers without MST, and PTSD and stress would explain additional variance in bonding after accounting for the influence of depression.

## 2 | METHODS

### 2.1 | Study population

Participants were sampled from the Center for Maternal & Infant Outcomes & Research in Translation (COMFORT) cohort study and included 697 women veterans utilizing VHA maternity care benefits at 15 VHA medical centers across the United States between January 2016 and February 2020. Women from the COMFORT sample were eligible for this analysis if they had a complete Postpartum Bonding Questionnaire (PBQ). Enrolled veterans participated in prenatal (~12 weeks pregnancy) and postpartum (~12 weeks postpartum) telephone surveys. For this analysis, we used data collected at the prenatal time point to examine PBQ scores collected at the postpartum time point. Study methods have been described in greater detail elsewhere (Gross et al., 2020; Kroll-Desrosiers et al., 2019; Kroll-Desrosiers et al., 2020; Mattocks et al., 2019; 2019). The VHA Central Institutional Review Board approved this study and granted a waiver of written informed consent; however, verbal informed consent from all participants was obtained.

### 2.2 | Participant characteristics—prenatal survey

#### 2.2.1 | Demographics

Demographic data from the prenatal interviews included age, marital status, race, and ethnicity. Military-related characteristics included service in Operations Enduring Freedom, Iraqi Freedom, and/or New Dawn (OEF/OIF/OND) and military branch.

#### 2.2.2 | Military sexual trauma

We included a 2-item screener on MST, adapted from the VHA's universal MST screening questions (Kimerling et al., 2007), which we defined as a dichotomous variable to indicate any history of MST (harassment and/or rape) versus no history of MST. MST history was assessed during the prenatal interview.

## 2.2.3 | PTSD history

History of PTSD was based on VHA electronic health records. A diagnosis of PTSD by any VHA provider at any time while in VHA care was counted as presence of PTSD. For this analysis, we included ICD-9 and ICD-10 codes 309.81 and F43.1x.

## 2.2.4 | Perinatal depression

The Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987) is a self-report measure of depressive symptoms during the perinatal period. The EPDS includes 10 items inquiring about symptoms of depression in the past 7 days, e.g., “Have you felt sad or miserable.” Items are scored on a 4-point scale ranging from 0 = *not at all* to 3 = *most of the time*. Responses are summed and scores  $\geq 10$  are indicative of depression symptoms during pregnancy (Bergink et al., 2011). For this analysis, we utilized EPDS scores assessed during the prenatal interview.

## 2.3 | Participant characteristics—postpartum survey

### 2.3.1 | Postpartum bonding

The PBQ is a 25-item self-report measure of mother-infant bonding disturbances during the early postpartum period (Brockington et al., 2006; van Bussel et al., 2010). The scale was revised after a principal components analysis revealed a 16 item version performed better with a single factor of “impaired bonding” and the revised version was used in this study (Reck et al., 2006). Scores on the measure range from 0 to 80, and higher scores indicate greater impairment in mother-infant bonding. Items (e.g. “I feel close to my baby” or “I wish the old days when I had no baby would come back”) are scored based on “how often they are true for your recent experience” on a 0–5 point Likert-type scale where 0 = “always” and 5 = “never” with negative items reverse scored.

## 2.3.2 | Pregnancy stressors

Stress during pregnancy was assessed with a question during the postpartum interview on typical daily stress during pregnancy: “Thinking about the amount of stress in your life in the 12 months before your baby was born, would you say that most days were: not stressful, somewhat stressful, or very stressful.”

## 2.4 | Data analysis

We began by examining overall descriptive statistics of our sample, using frequencies and percentages for categorical data and means and standard deviations for continuous data. We then conducted analysis of variance models to examine the differences in PBQ score between different groups of demographic, mental health, and military experience characteristics.

To test our hypothesis that MST would result in greater impaired mother-infant bonding among perinatal women veterans compared to their peers without MST, we used structural equation modeling (using PROC CALIS in SAS) with maximum likelihood estimation to test whether maternal bonding is associated with depression and stress during pregnancy. Furthermore, to examine if PTSD explains additional variance in mother-infant bonding after accounting for the influence of depression, we tested whether MST or PTSD diagnoses have a direct association with maternal bonding or an indirect association through the mediation of depression and stress during pregnancy (Figure 1). We used any experience of MST versus no MST in the SEM models. To assess model fit, we used the overall model chi-square and the AIC/BIC to compare between models. To evaluate models with a significant chi-square value, we examined alternative fit indices (comparative fit index) to determine the degree of misfit. Further details on our methods are included in Appendix I.

All analyses were conducted in SAS v.9.2 (SAS Institute, Inc.). For all analyses we report  $\beta$  (unstandardized path coefficient), standard

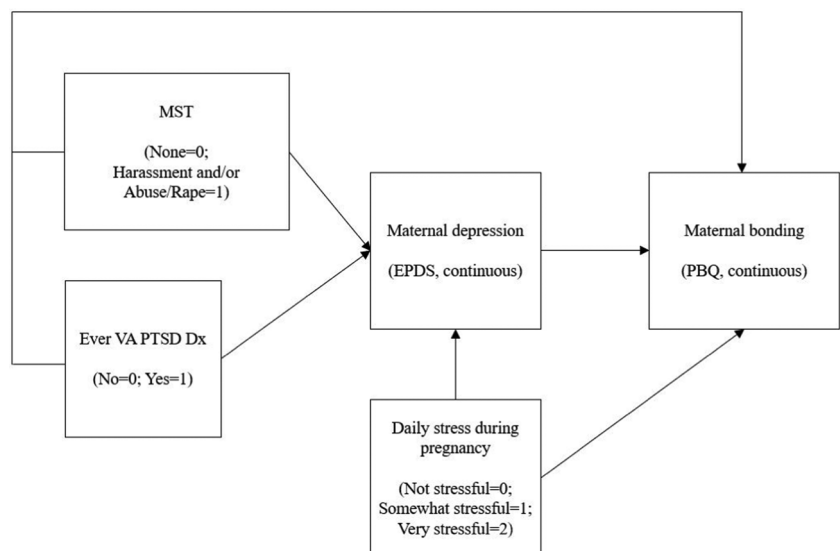


FIGURE 1 SEM model

error, and  $p$  values. Effect sizes are reported using  $R^2$  as calculated by SAS PROC CALIS.

### 3 | RESULTS

The average PBQ score in our sample of 697 women veterans was 5.6 ( $\pm 5.4$ , range: 0–34) with a median score of 4. On average, women were 32 years old (range: 20–48) at the time of their COMFORT prenatal interview. The majority of our sample were white (59%), non-Hispanic (80%), and married (67%). Most veterans had served in the Army (48%) and in OEF/OIF/OND (81%). Over half of our sample were previously deployed (62%). A substantial number of the women in our sample reported MST experiences, with 52% reporting harassment and 30% reporting abuse or rape. Nearly 1/3 of our sample had been diagnosed with PTSD by a VA provider. When asked about the levels of stress experienced on a typical day during pregnancy, 65% of our sample reported that most days were “very” or “somewhat” stressful. Prenatal EPDS scores averaged 5.9 ( $\pm 5.8$ ) (Table 1).

Table 2 shows PBQ score comparisons between groups of participants. We found significantly higher PBQ scores indicating greater mother-infant bonding impairment in older women ( $\beta = 0.12$ ,  $SE = 0.05$ ,  $p = 0.02$ ) and in non-White (including Black, African American, Asian, Native Hawaiian or other Pacific Islander, American Indian or Alaska Native, and Other) versus White women ( $\beta = 1.16$ ,  $SE = 0.42$ ,  $p = 0.006$ ), women who experienced MST ( $\beta = 1.06$ ,  $SE = 0.41$ ,  $p = 0.01$  for any MST vs. no MST); women who reported a greater amount of daily stress in the 12 months before their infant being born ( $\beta = 1.88$ ,  $SE = 0.59$ ,  $p = 0.002$  for “very stressful” vs. “not stressful”); women with a medical record history of diagnosis of PTSD ( $\beta = 0.91$ ,  $SE = 0.45$ ,  $p = 0.05$ ); and women scoring higher on the prenatal EPDS ( $\beta = 0.19$ ,  $SE = 0.03$ ,  $p < 0.0001$ ).

SEM model results are presented in Table 3. The model presented demonstrated good fit to the data, with a nonsignificant chi-square  $\chi^2(1) = 4.71$ . Overall, the model accounted for 20% of the variance in maternal bonding and 5% of the variance in maternal depression. Maternal depression was positively associated with maternal bonding ( $\beta = 0.21$ ,  $SE = 0.04$ ,  $p < 0.01$ ). Neither MST nor PTSD had direct associations with maternal bonding. However, a significant indirect association was observed for MST ( $\beta = 0.34$ ,  $SE = 0.11$ ,  $p < 0.01$ ), through the mediation of maternal depression. Significant indirect associations were also observed for PTSD ( $\beta = 0.68$ ,  $SE = 0.16$ ,  $p < 0.01$ ) and pregnancy stressors ( $\beta = 0.33$ ,  $SE = 0.09$ ,  $p < 0.01$ ).

### 4 | DISCUSSION

This study utilized a national sample of women veterans using VHA maternity care benefits to examine the associations between MST, mental health and postpartum mother-infant bonding in women veterans, accounting for the effects of life stressors during pregnancy. Results indicated that higher levels of maternal depression were strongly associated with poorer mother-infant bonding. In addition, the experience of MST had a modest association with poorer bonding

**TABLE 1** Sample characteristics ( $n = 697$ )

	<i>n</i>	Mean $\pm$ SD	Range
PBQ total	697	5.6 $\pm$ 5.4	0–34
Age at Prenatal Interview, years	560	32.3 $\pm$ 4.4	20.1–48.7
Prenatal EPDS <sup>a</sup>	697	5.9 $\pm$ 5.8	0–26
	<i>n</i>	%	
Race			
Non-white <sup>b</sup>	274	39.3%	
White	413	59.3%	
Hispanic or Latino/Latina	139	19.9%	
Marital status			
Not married	200	28.7%	
Married	468	67.1%	
Military branch			
Air force	124	17.8%	
Army	337	48.4%	
Marine corps	78	11.2%	
Navy	147	21.1%	
Coast guard	7	1.0%	
OEF/OIF/OND	567	81.3%	
Ever deployed	435	62.4%	
MST experiences			
Harassment	362	51.9%	
Abuse/Rape	208	29.8%	
Harassment AND abuse/rape	198	28.4%	
Harassment OR abuse/rape	372	53.4%	
Typical daily stress during pregnancy			
Very stressful	122	17.5%	
Somewhat stressful	333	47.8%	
Not stressful	232	33.3%	
VA Diagnosis of PTSD	223	32.0%	

Abbreviation: PBQ, Postpartum Bonding Questionnaire; PTSD, posttraumatic stress disorder.

<sup>a</sup>A total of 163 (23.4%) participants had an EPDS score  $\geq 10$ , indicating the presence of depression symptoms.

<sup>b</sup>The non-White category included women identifying as Black, African American, Asian, Native Hawaiian or other Pacific Islander, American Indian or Alaska Native, and other.

indirectly through higher maternal depression. Presence of PTSD diagnosis in the medical record and life stressors during pregnancy also had significant indirect pathways with bonding through maternal depression. These results are consistent with prior literature in nonveteran samples showing links between maternal psychopathology, and maternal depression in particular, during the perinatal period with poorer early mother-infant bonding (Alhusen, 2008; Moehler et al., 2006).

**TABLE 2** PBQ scores<sup>a</sup> by participant characteristics (*n* = 697)

	PBQ total		PBQ total—GLM model			
	Mean (intercept)	SD	$\beta$	SE	t value	p value
<b>MST experiences</b>						
Harassment (vs. no harassment)	6.20	5.72	1.40	0.40	3.50	<b>0.001</b>
Abuse/Rape (vs. no abuse/rape)	5.93	5.97	0.56	0.44	1.26	0.21
Harassment or abuse/rape (vs. no MST)	6.11	5.67	1.06	0.41	2.62	<b>0.01</b>
No MST	5.05	4.94	REF			
<b>Typical daily stress during pregnancy</b>						
Very stressful	6.64	6.83	1.88	0.59	3.16	<b>0.002</b>
Somewhat stressful	5.82	5.03	1.05	0.46	2.31	<b>0.02</b>
Not stressful	4.77	4.80	REF			
VA diagnosis of PTSD (yes vs. no)	6.07	6.09	0.91	0.45	2.01	0.05
Prenatal EPDS	4.53	0.28	0.19	0.03	5.37	<b>&lt;0.0001</b>

Note: Bold values are statistically significant at  $p < .05$ .

Abbreviation: PBQ, Postpartum Bonding Questionnaire; PTSD, posttraumatic stress disorder.

<sup>a</sup>Higher PBQ scores indicate greater impairment in mother-infant bonding.

**TABLE 3** SEM results

Dependent variable	Independent variable	Estimate	SE	p value
PBQ score	Any MST	0.54	0.45	0.24
	PTSD Ever	-0.59	0.47	0.21
	Prenatal EPDS	0.21	0.04	<0.01
Prenatal EPDS	Any MST	1.63	0.44	<0.01
	PTSD Ever	3.25	0.44	<0.01
	Maternal Stress	1.54	0.29	<0.01

Abbreviations: MST, military sexual trauma; PBQ, Postpartum Bonding Questionnaire; PTSD, posttraumatic stress disorder

Previous work has pointed toward the experience of MST as being particularly deleterious to the reproductive and perinatal health of women veterans in terms of sexual function, IPV during pregnancy, perinatal depression, and other mental health disorders during pregnancy (Blais et al., 2018; Creech et al., 2021; Gross et al., 2020; Katon et al., 2018; Mattocks et al., 2010; Pulverman & Creech, 2019; Pulverman et al., 2019; Turchik et al., 2012). Findings from this study point toward yet another negative consequence of military sexual assault and harassment with a unique impact on women during reproductive years, and underscore the need for further study of parent-child outcomes in veteran samples to understand the intergenerational consequences of sexual trauma in military service. Importantly, prior work in civilian samples has shown that the association between post-partum mental health and mother-infant bonding impairment is predictive of a transition to impaired parenting behaviors later (Muzik et al., 2013). Early intervention is, therefore, critical

considering that impairments to parenting are one of the most modifiable influences on psychosocial outcomes for children in families in which there are parental mental health disorders (Ary et al., 1999; Berg-Nielsen et al., 2003; Smith, 2004; Vostanis et al., 2006).

We hypothesized that perinatal women veterans with MST would report more impaired mother-infant bonding than their peers without MST, and PTSD would explain additional significant variance in bonding after accounting for the influence of depression. The hypothesis was partly supported in that results indicated these effects on bonding were each indirect through maternal depression. Considering prior research showing that women veterans who experienced MST appear to be at higher risk for depression and PTSD during the perinatal period (Gross et al., 2020; Mattocks et al., 2010), this suggests that mother-infant bonding should be routinely assessed in the presence of postpartum depression and PTSD. Results also pointed toward older women veterans, those identifying as non-White, and those with higher levels of reported stressors during pregnancy as groups with greater impairment to mother-infant bonding who may be in need of support for bonding.

Although women veterans receive prenatal and obstetric care outside of VA, these findings and the body of literature in this area highlight an opportunity for increasing access to evidence-based treatment for perinatal mental health among women veterans (Katon et al., 2017). Myriad barriers exist to accessing evidence-based treatment for perinatal mental health disorders in the community (Byatt et al., 2012; Cox et al., 2016). In contrast, VA is a national leader in offering evidence-based mental health care, and with training, many providers could likely be well equipped to offer evidence-based treatment for depression and PTSD in perinatal women veterans. Measurement and treatment of mother-infant

bonding should also be part of expanded access to post-partum mental health treatment. Findings also speak to the need to educate civilian providers to pregnant veterans about this emerging constellation of risk factors associated with MST.

In samples of nonmilitary women (civilians), studies have indicated associations between maternal childhood trauma and poor bonding (Muzik et al., 2013), worse infant socioemotional symptoms (McDonnell & Valentino, 2016), and insecure attachment (Berthelot et al., 2015). These disruptions to early bonding are thought to be one mechanism through which maternal psychopathology conveys risk for poorer child psychosocial outcomes (Groh et al., 2017). Less research has focused on the relationship between maternal adulthood trauma and mother-infant bonding, despite research indicating that childhood trauma is a risk factor for adulthood trauma (Benjet et al., 2016). The majority of research on adulthood trauma and bonding has focused on intimate partner violence, with studies showing that exposure to intimate partner violence is associated with deficits in mother-infant bonding (Kita et al., 2016; Murray et al., 2020). The present study adds to this limited body of work on trauma in adulthood and mother-infant bonding, implicating sexual harassment and assault during military service as important correlates of bonding through an impact on maternal depression.

Research in at risk civilian samples indicates women with prior trauma and PTSD appear to be at risk for increased bonding difficulties during the postnatal time period (Erickson et al., 2019), and they also are at increased risk for depression (Loveland Cook et al., 2004). An estimated 20% of women develop depression during the perinatal period (O'Hara & Wisner, 2014). Symptoms of maternal depression, including even mild depression, in the postpartum period predict mother-infant bonding through and beyond the first year of life (Moehler et al., 2006). Several mechanisms have been implicated in the association between depression and bonding impairment in samples who have experienced trauma including avoidance of fearful stimuli (Choi et al., 2017), and less sensitive or responsive parenting overall (Erickson et al., 2019). Although the body of research on perinatal depression in women veterans is small, prior work conducted in a sample of women veterans using VA maternity benefits has suggested rates of perinatal depression were 16.7% among those with no prepregnancy mental health diagnosis and 46.1% among those with a preexisting mental health diagnosis, with higher rates of MST in the group with pre-existing diagnoses (Katon et al., 2017). Prior work in the present data set indicates rates of perinatal depression were 28%, which is higher than in the general population (Kroll-Desrosiers et al., 2019). In addition, the association between MST experiences with perinatal depression echoes findings from at risk civilian samples implicating prior trauma as a vulnerability for perinatal depression (Muzik et al., 2016; Oh et al., 2016).

Strengths of this study include its use of a large, well-characterized sample of women veterans who completed measures during pregnancy and again after delivery of their infants. Important limitations to consider include that this was not a representative sample and these results may not apply to all women veterans experiencing a pregnancy, nor women veterans of all racial identities. The lack of racial diversity in our sample is especially problematic

given prior research indicating that certain racial groups are already at an increased risk of perinatal issues (Brown et al., 2021). Findings may also be limited by our reliance on a two-item screener for MST, a medical record diagnosis for PTSD rather than a self-report measure, as well as by the short form of the PBQ rather than the long form of this measure. Although we did not have a measure of maternal trauma in childhood, future studies should examine the impact of trauma throughout the lifespan.

Limitations notwithstanding, we are aware of no other prior studies examining postpartum bonding among women who served in the military. Consistent with prior work in civilians linking maternal depression to poorer mother-infant bonding and with the growing body of work linking MST to reproductive and perinatal health concerns for women veterans, results indicated that MST was associated with maternal depression, and maternal depression was associated with poorer mother-infant bonding. As expected, presence of PTSD diagnosis in the medical record and life stressors during pregnancy also had significant indirect pathways with bonding through maternal depression.

In light of MST prevalence rates among women of 23.6% for sexual assault, 52.5% for sexual harassment and 38.4% for both sexual harassment and assault (Wilson, 2018), the U.S. Military as a whole continues to grapple with an epidemic of sexual assault (Chappell, 2021). Results from this study suggest the impact of this sexual assault is intergenerational and infants and children of MST survivors are an additional group with risks for negative health and mental health outcomes through their lifetimes, although further research to understand the harmful effects of parental MST on children is needed. As VHA continues to be charged with providing care to assault survivors, results underscore the need for increased access to perinatal mental health treatment for women veterans and for education of civilian providers treating this population. While maternal mental health difficulties convey risk for poorer child outcomes, the presence of positive parent-child bonding is protective (Erickson et al., 2019). Expansion of perinatal and MST specific services to address mother-infant bonding and parenting difficulties appears to be warranted, particularly in the presence of depression. This could include partnering with community agencies to ensure women veterans have adequate access to resources for new mothers, including support for maternal/infant bonding, as well as food, housing, and employment assistance. Currently available support for parenting at VHA is not widespread except for a general parenting course available free at <https://www.veterantraining.va.gov/parenting/index.asp>. Prior studies indicate interest in parenting support interventions at VHA is increasing among providers and veterans (see Creech et al., 2019 for a review), and parenting support for veterans with PTSD is currently being researched (Creech, 2018; Creech et al., 2019); however, we are unaware of any efforts to address parent-infant bonding.

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## DATA AVAILABILITY STATEMENT

A copy of the de-identified summary level data that support the findings of this study may be made available on request from the last author and pending appropriate institutional approvals.

## ORCID

Suzannah K. Crech  <http://orcid.org/0000-0002-6582-1673>

Aimee Kroll-Desrosiers  <http://orcid.org/0000-0002-0026-7499>

Justin K. Benzer  <http://orcid.org/0000-0001-5151-2127>

Carey S. Pulverman  <http://orcid.org/0000-0001-6619-0503>

Kristin Mattocks  <http://orcid.org/0000-0002-6012-3008>

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## APPENDIX I: DETAILED SEM METHODS

Due to the skewed distribution of PBQ scores, we ran models with PBQ as scored as well as with a Box-Cox transformation (Box & Cox, 1964). However, because the data had a large number of participants ( $n = 89$ , 13%) who scored a 0 on the PBQ, a legitimate score for the questionnaire, we added 1 to each score when transforming our data. In total, we ran two different structural equation models: (1) untransformed PBQ; and (2) Box-Cox transformed PBQ. Comparing across our structural equation models, there were no cases where an effect was significant in one model but not significant in the other. Therefore, we report the unstandardized results in our main analysis and differentiate between direct and indirect effects for the two models below.

TABLE A1: SEM RESULTS FROM TRANSFORMED PBQ AND NOT TRANSFORMED MODELS

		No transformation to PBQ	Box-Cox PBQ + 1 Transformation
Absolute index	Chi-square	4.71	5.11
	Chi-square DF	1	1
	Pr > Chi-Square	0.03	0.02
	Standardized RMSR (SRMSR)	0.02	0.02
Parsimony index	RMSEA estimate	0.08	0.08
	Probability of close fit	0.18	0.16
	Bozdogan CAIC (AIC)	109.24	109.64
	Schwarz Bayesian Criterion (BIC)	95.24	95.64
Incremental index	Bentler-Bonett Non-normed Index	0.99	0.99
	Bentler Comparative Fit Index	0.87	0.85
		Standardized total effect/SE/t value/p value	
		No transformation to PBQ	Box-Cox PBQ + 1 transformation
PBQ score	Prenatal EPDS	0.22	0.14
		0.04	0.04
		5.42	3.77
		<0.0001	0.0002
PBQ score	Any MST	0.08	0.28
		0.04	0.04
		1.93	7.55
		0.05	<0.0001
PBQ score	PTSD ever	0.01	0.19
		0.04	0.04
		0.20	5.42
		0.84	<0.0001
PBQ score	Maternal stress	0.04	0.20
		0.01	0.04
		3.80	4.80
		0.0001	<0.0001
Prenatal EPDS	Any MST	0.14	0.09
		0.04	0.04
		3.77	2.21
		0.0002	0.03
Prenatal EPDS	PTSD ever	0.28	-0.01
		0.04	0.04
		7.55	-0.27
		<0.0001	0.79
Prenatal EPDS	Maternal stress	0.19	0.04
		0.04	0.01
		5.42	3.57
		<0.0001	0.0004