

# Associations Between Child Maltreatment Types and Pre- and Post-Partum Posttraumatic Stress Disorder Symptoms: A Brief Report

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## Abstract

**Objective:** To foster resilience through reducing posttraumatic stress disorder (PTSD) symptoms in pregnant mothers with child maltreatment (CM) histories, it is important to understand factors impacting their well-being. This study explored whether CM predicted the severity of PTSD symptoms and symptom clusters during pregnancy and change in symptoms from pregnancy (Time 1; T1) to 3 months postpartum (Time 2; T2).

**Methods:** 88 pregnant women (aged 18 to 29) completed surveys on CM exposure, adult interpersonal trauma experiences, and PTSD symptoms at T1; 58 participated at T2.

**Results:** Stepwise regressions were conducted with the covariates age, family status, and adult interpersonal traumas. When accounting for all CM types, only neglect remained associated with overall PTSD symptoms ( $F_{7,4}(4, 71) = 19.08, p < .001$ ) and for each of the PTSD symptom clusters ( $p < .01$ ). Physical abuse remained associated with the alterations in cognition and mood cluster. No CM types were associated with changes in PTSD symptoms from T1 to T2.

**Implications:** In future research, the implications of neglect for pregnant mothers should be explored in depth. Perinatal care should be trauma-informed, including assessing for CM histories, to foster greater resilience by reducing perinatal PTSD symptoms.

**Keywords:** Child abuse and neglect; child maltreatment; perinatal PTSD.

## Introduction

Child maltreatment (CM; child physical, sexual, and emotional maltreatment, neglect and exposure to domestic violence) is a pervasive issue worldwide that can have immediate and long-lasting detrimental effects on mental and physical health (Afifi et al., 2014; Herrenkohl et al., 2013), including posttraumatic stress disorder (PTSD) symptoms that can persist into adulthood (Kisely et al., 2020). Major life transitions, such as pregnancy and childbirth, while naturally challenging, can be particularly difficult for CM survivors. The perinatal period involves extensive medical care that can cross physical boundaries and cause major changes to one's body and personal identity, potentially causing or increasing PTSD symptoms for CM survivors (Frederickson et al., 2023). This period may also evoke memories of being maltreated for those who have survived CM, increasing their susceptibility to psychopathological issues (Atzl et al., 2019; Montgomery et al., 2015). To foster greater resilience through reducing perinatal PTSD symptoms in pregnant mothers with CM histories, it is necessary to better understand the factors impacting their well-being. Our study will contribute to this endeavor by exploring whether CM types predicted PTSD symptoms during pregnancy and changes in PTSD symptoms from pregnancy to 3 months postpartum in emerging adult women.

Past research indicates that CM survivors have worse outcomes during and following the perinatal period (i.e., up to one-year postpartum; Lev-Wiesel & Daphna-Tekoa, 2007). For instance, in a systematic review on CM and perinatal mood and anxiety disorders ( $N = 35$  studies), six studies showed that CM was associated with greater PTSD symptoms during the antenatal period and postpartum (Choi & Sikkema, 2016). Findings were mixed regarding which types of CM were associated with PTSD during and after pregnancy, with studies showing that child sexual abuse (CSA) predicted perinatal PTSD and others showing that emotional maltreatment and neglect were predictors (e.g., Huth-Bocks et al., 2013; Lev-Wiesel & Daphna-Tekoah, 2007; 2010). Similarly, Sanchez et al. (2017) found that compared to no CM history, physical or sexual abuse was associated with PTSD symptoms in mothers, and a history of both led to a greater risk. However, no studies have explored associations between CM types and PTSD symptom clusters, which may explain the mixed findings. Studies on this topic could provide insight into the specific needs of this population for perinatal care.

The literature demonstrates that CSA can lead to increased sensitivity to the development of psychiatric disorders and transdiagnostic difficulties such as emotion dysregulation, insecure attachment, and the biological embedding of stress, which can impact their future outcomes (e.g., Brunton & Dryer, 2021; Noll, 2021). However, while the perinatal period may be particularly distressing for CSA survivors, other CM types may have unique consequences that also leave survivors vulnerable to PTSD. For instance, physical abuse, neglect, and emotional maltreatment have also been found to elevate hypothalamic-pituitary-adrenal (HPA) axis dysregulation and PTSD severity later in life (Gama et al., 2021; Juruena et al., 2020). Therefore, accounting for other CM types is important as to not overlook their differential impact.

Pregnancy during late adolescence and early adulthood, although not uncommon, occurs during tumultuous life stages marked by important decision-making, evolving social roles, and potential financial and career instabilities and occurs while the HPA axis is still developing, therefore showing increased cortisol reactivity (Adam et al., 2023). Emerging adults may therefore be particularly vulnerable to stress, which can be exacerbated by a history of CM. This study focuses on PTSD symptoms in pregnant mothers aged 18 to 29 to better understand perinatal stress during emerging adulthood.

This study aims to extend findings on the associations between CM types and perinatal PTSD symptoms. Specifically, it will examine which CM types are associated with overall PTSD symptoms, PTSD symptom clusters (i.e., intrusions, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity; American Psychiatric Association, 2013), and changes in PTSD symptoms from pregnancy to postpartum. Based on past literature, it is expected that CSA will exhibit the strongest association with overall, symptom clusters, and changes in PTSD symptoms compared to the other CM types. This study will account for adult interpersonal trauma, as maltreated individuals are prone to revictimization in adulthood, which is linked to higher PTSD risk (Walker et al., 2019; Widom et al., 2008).

## Method

### Participants

From January 2020 to 2021, ads were placed on social media and in urban areas of Quebec, Ontario, and Manitoba to target individuals aged 18 to 29, who were at least 16 weeks pregnant, with the goal of recruiting a diverse sample likely to use perinatal community/health services. Participants were excluded if they: (1) did not reside in recruitment target areas ( $n = 2$ ); (2) did not meet the inclusion criteria ( $n = 3$ ; 18-29 years old and at least 16 weeks pregnant); or (3) exhibited careless responding ( $n = 5$ ; e.g., incorrectly answered two of three attention-check questions). The final sample at Time 1 (T1) included 88 mothers (of 98 initially recruited). At Time 2 (T2), 58 mothers completed the survey (66% retention rate), with an average time gap of 6 months between T1 and T2 questionnaires.

### Procedure

Upon consent, participants completed the T1 questionnaires on Qualtrics. Three months after their due date, participants received emails with a unique identification number inviting them to complete T2 measures and received a \$30 e-gift card. The study obtained ethical approval from the McGill University Research Ethics Board (REB File #1080719).

### Measures

#### Sociodemographic Characteristics

Participants' sociodemographic characteristics (e.g., age, weeks pregnant, family status, ethnicity) were measured at both time points (Table 1).

**Table 1.** Sociodemographic and CM Characteristics of Participants

Characteristic	N	M (SD)	n (%)
T1 Age	88	25.38 (2.53)	
T1 Weeks pregnant	87	26.05 (6.66)	
First pregnancy (yes)	88		49 (55.7)
T2 Infant age in months	58	3.00 (.32)	
T1 Ethnicity	88		
White			68 (78.2)
Indigenous			8 (9.2)
Black			3 (3.4)
Asian			3 (3.4)
Hispanic			1 (1.1)
Mixed			3 (3.4)
Other			1 (1.1)
T1 Education	88		
Pre-university or more			63 (71.6)
High school or less			25 (28.4)
T1 Annual family income	85		
≤ \$19 999			9 (10.6)
\$20 000 - \$59 999			29 (34.1)
≥ \$60 000			47 (55.2)
T1 Family status	87		
With parent of children			69 (79.3)
With parent of one of their children or separated or divorced			18 (20.7)

Note. T1=Time 1

**Table 2.** Bivariate Correlations between Predictors and Covariates on Overall PTSD Symptoms and Each PTSD Symptom Cluster

Variable	M (SD)	1	2	3	4	5	6	7	8	9	10	11
1. Overall PTSD symptoms (T1)	20.70 (17.56)	--										
2. Re-experiencing	4.49 (4.48)	.906***	--									
3. Avoidance	2.21 (2.14)	.797***	.710***	--								
4. Negative alterations	7.79 (6.79)	.961***	.816***	.708***	--							
5. Hyperarousal	6.21 (5.60)	.941***	.779***	.689***	.879***	--						
6. Adult interpersonal traumas	1.06 (1.26)	.455***	.383***	.369***	.483***	.409***	--					
7. Maternal age	25.39 (2.53)	-.319**	-.263*	-.243*	-.291**	-.343***	.014	--				
8. Physical abuse	1.41 (1.52)	.390***	.374***	.327**	.349***	.376***	.419***	-.248*	--			
9. Sexual abuse	1.46 (1.87)	.368***	.327**	.404***	.330**	.339***	.258*	-.049	.518***	--		
10. Emotional maltreatment	2.02 (1.92)	.444***	.356***	.343***	.471***	.407***	.401***	-.275**	.712***	.321**	--	
11. Neglect	1.11 (1.30)	.570***	.528**	.435***	.536***	.549***	.340**	-.232*	.594***	.453***	.535***	--

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . T1=Time.

### Child Maltreatment

At T1, CM was assessed (Table 2). The 5-item neglect subscale of the *International Society for the Prevention of Child Abuse and Neglect (ISPCAN) Child Abuse Screening Tool Retrospective Version* (Dunne et al., 2009) evaluated experiences of physical neglect (e.g., "Have you ever not been given food to eat and/or drink even though your parent(s) or caretaker(s) could afford it?";  $\alpha = .55$ ), requiring a 'yes' (coded as 1) or 'no' (coded as 0) response. The *Early Trauma Inventory Self Report – Short Form* (ETISR-SF; Bremner et al., 2007) assessed histories of childhood physical (5 items), sexual (6 items), and emotional (5 items) abuse ( $\alpha = .73$  to  $.84$ ), with the same dichotomous response scale. An example item is "before the age of 18, were you ever punched or kicked by a parent or caregiver?". A total score, ranging from 0-5 or 0-6, was calculated to reflect the number of items positively endorsed for each CM type (Bremner et al., 2007).

### PTSD Symptoms

At T1 and T2, the *PTSD Checklist for DSM-5* (PCL-5; Weathers et al., 2013b) assessed PTSD symptoms in the past month (re-experiencing, avoidance, negative alterations in cognitions and mood, and hyperarousal) using 20 items rated on a 5-point Likert scale (0 = not at all to 4 = extremely). Participants were asked to keep their most difficult experience in mind during completion. An example item is "repeated, disturbing, and unwanted memories of the stressful experience". Total scores range from 0 to 80 (T1  $\alpha = .96$ ; T2  $\alpha = .93$ ). Changes in overall PTSD symptoms and symptom clusters scores were created by subtracting scores at T1 from T2.

### Adult Interpersonal Trauma

At T1, the *Life Events Checklist for DSM-5* (LEC-5; Weathers et al., 2013a) assessed adulthood exposure to traumatic events. This study only used interpersonal trauma items experienced after age 18 (5 items;  $\alpha = .72$ ), including physical assault, assault with a weapon, sexual assault, other unwanted or uncomfortable sexual experiences, or captivity after the age of 18. Total scores range from 0 to 5.

### Data Analysis

Analyses were performed using SPSS v.28. Normality checks were performed using a histogram and P-P plots of residuals. Residuals appeared to be normally distributed except for the change scores in re-experiencing and avoidance. No outliers were identified for CM or PTSD symptoms. With an anticipated effect size of .30, an alpha of .05, and the inclusion of 4 CM predictors and 3 covariates, a power of .81 was reached with a sample of 46 participants.

Preliminary analyses compared sociodemographic, CM, and PTSD measures for those who completed both timepoints and drop-outs after T1. Bivariate correlations and group differences were calculated to identify potential covariates. Out of the total sample of 88 (T1) and 58 participants (T2), listwise deletion was used to exclude individuals with incomplete data on measures used in the regression analysis ( $n = 12$  for T1 and  $n = 7$  for T2). For the main analyses, stepwise regressions were performed. All regressions controlled for adult interpersonal traumas, age, and family status, and the models exploring change in PTSD symptoms controlled for corresponding T1 PTSD symptom scores. A stepwise procedure was deemed appropriate given our exploratory research question (Henderson & Denison, 1989), and limited and non-normally distributed sample.

## Results

### Preliminary Analyses

Participants that dropped out did not differ from those who remained on sociodemographic variables or on scores of PTSD symptoms at T1. Bivariate correlations between adult interpersonal traumas and PTSD symptoms at T1 ( $r = .46, p < .001$ ) and T2 ( $r = .55, p < .001$ ) revealed moderate to large positive associations; interpersonal trauma was thus retained as a covariate. Age and family status also emerged as significant covariates. Younger participants had higher scores of neglect, emotional, and physical abuse ( $r = -.23$  to  $-.28, p = .010$  to  $.030$ ). After dichotomizing our participants' family status (0 = with the child's parent, and 1 = separated, divorced, or with the parent of other children), we observed significant group differences in CM types. Specifically, individuals who were separated from or not currently with the parent of their child had higher scores on all CM measures (neglect:  $t(84) = -3.22, p = .002$ ; physical abuse:  $t(84) = -3.54, p < .001$ ; emotional maltreatment:  $t(84) = -3.83, p < .001$ ; and sexual abuse:  $t(84) = 2.68, p = .009$ ). Bivariate correlations were calculated between variables used in the regression models (Tables 2 and 3).

Multicollinearity was not problematic as all tolerance levels were greater than .10 (.485 to .965) and all variance inflation factors were less than 4 (1.04 to 2.06).

## Main Analyses

### Overall PTSD Symptoms and PTSD Symptoms Clusters at T1

Stepwise regressions (Tables 4 and 5) determined whether CM types were associated with overall PTSD symptoms and symptom clusters at T1, beyond what was accounted for by covariates. Results indicated that at T1, the covariates were associated with overall PTSD symptoms ( $F_{T1}(3, 72) = 13.24, p < .001$ ) and explained 36% of the variance. Emotional, sexual, and physical abuse did not remain in the equation, leaving neglect as the only CM type significantly associated with overall PTSD symptoms ( $F_{T1}(4, 71) = 19.08, p < .001$ ). Neglect explained an additional 16%, with the final model explaining 52% of the variance of overall PTSD symptoms.

**Table 3.** Bivariate Correlations between Predictors and Covariates on Changes in Overall PTSD Symptoms and Changes in Each PTSD Symptom Cluster

Variable	M (SD)	1	2	3	4	5
1. Changes in overall PTSD symptoms (T2-T1)	2.09 (12.89)	--				
2. Changes in re-experiencing	.68 (3.95)	.766***	--			
3. Changes in avoidance	-.09 (1.85)	.665***	.455***	--		
4. Changes in negative alterations	.77 (5.05)	.925***	.608***	.579***	--	
5. Changes in hyperarousal	.72 (4.72)	.840***	.427***	.424***	.722***	--
6. Adult interpersonal traumas	<sup>a</sup>	-.123	-.108	-.048	-.195	-.020
7. Maternal age	<sup>a</sup>	.294*	-.006	.138	.417***	.309*
8. Physical abuse	<sup>a</sup>	-.050	-.033	.044	-.141	.024
9. Sexual abuse	<sup>a</sup>	-.020	-.007	.091	-.085	.008
10. Emotional maltreatment	<sup>a</sup>	.010	.163	-.023	-.092	-.001
11. Neglect	<sup>a</sup>	-.071	-.056	.005	-.166	.029

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . T1=Time 1, T2=Time 2.

<sup>a</sup> Correlation is provided in Table 2.

**Table 4.** Stepwise Regression Analysis for Variables Predicting Overall T1 PTSD Symptom Scores (N = 76)

Variable	Model 2			
	B	$\beta$	SE	t
Constant	49.69		17.65	2.82**
Adult interpersonal traumas	4.14	.29	1.41	2.94**
Family status	.30	.01	4.53	.07
Maternal age	-1.62	-.23	.64	-2.56*
Neglect	6.89	.47	1.41	4.81***
R <sup>2</sup>		.52***		
$\Delta R^2$		.16***		

Note.\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

The covariates were associated with each of the PTSD symptom clusters at T1 ( $F_{re-exp}(3, 72) = 8.12, p < .001$ ;  $F_{avoid}(3, 72) = 8.37, p < .001$ ;  $F_{alter}(3, 72) = 13.07, p < .001$ ;  $F_{hyper}(3, 72) = 12.10, p < .001$ ) and explained 25%, 26%, 35% and 34% of their variances respectively. Results indicated that for PTSD symptom clusters of re-experiencing, avoidance, and hyperarousal, the only CM type that remained in the equation was neglect ( $F_{re-exp}(4, 71) = 12.39, p < .001$ ;  $F_{avoid}(4, 71) = 8.96, p < .001$ ;  $F_{hyper}(4, 71) = 16.44, p < .001$ ). The inclusion of neglect yielded a 16% increase for re-experiencing (total explained variance was 41%), an 8% increase for avoidance (total explained variance was 34%), a 15% increase for hyperarousal (total explained variance was 48%). For alterations in cognition and mood, three models were identified. In the second model, neglect remained in the equation ( $F_{alter}(4, 71) = 17.98, p < .001$ ), and increased the variance by 15%. In model 3, physical abuse was included in the model,  $F_{alter}(5, 70) = 16.71, p < .001$ , and increased the variance by 4%, for a final explained variance of 54% for alterations in cognition and mood. It is important to note that this result indicated that higher scores of physical abuse were linked to reduced alterations in cognition and mood.

**Table 5.** Stepwise Regression Analysis for Variables Predicting PTSD Symptom Cluster Scores at T1 (N = 76)

PTSD sub-symptom Final Model	Re-experiencing Model 2			Avoidance Model 2			Negative Alterations Model 3			Hyperarousal Model 2		
	B	SE	t	B	SE	t	B	SE	t	B	SE	t
	Constant	9.27	4.89	1.90	6.64	2.41	2.75**	18.83	6.76	2.78**	17.88	5.83
Adult interpersonal traumas	.79	.39	2.03*	.44	.19	2.28*	2.13	.55	3.85***	1.16	.46	2.51**
Family status	.08	1.26	.07	-.11	.62	-.18	.24	1.71	.14	-.03	-.002	1.50
Maternal age	-.30	.18	-1.68	-.21	.09	-2.45*	-.61	.24	-2.50*	-.60	-.26	-.21
Neglect	1.07	.39	4.37***	.55	.19	2.87**	3.42	.63	5.40***	2.08	.44	4.46***
Physical abuse							-.126	.50	-2.50*			
R <sup>2</sup>												
ΔR <sup>2</sup>												

Note: \*p < .05, \*\*p < .01, \*\*\*p < .001

### Changes in Overall PTSD Symptoms and Changes in PTSD Symptom Clusters from T1 to T2

Stepwise regressions determined whether CM types were associated with changes in overall PTSD symptoms and in each PTSD symptom cluster separately, beyond what was accounted for by adult interpersonal traumas, age, family status, and the corresponding T1 PTSD overall or symptom cluster scores. For changes in overall PTSD symptoms, the covariates explained 30% of the variance and were significant ( $F_{change\_PTSD}(4, 47) = 5.15, p = .002$ ) but no CM type remained in the model. Therefore, there were no associations between any CM type and overall PTSD symptoms change. For changes in symptom clusters, the covariates were not significant for re-experiencing ( $F_{change\_re-exp}(4, 47) = 1.67, p = .171$ ) and for avoidance ( $F_{change\_avoid}(4, 47) = 1.31, p = -.280$ ). The covariates were significant for alterations to cognition and mood, explaining 31% of the variance ( $F_{change\_alter}(4, 47) = 5.33, p < .001$ ), and were significant for hyperarousal, explaining 34% of the variance ( $F_{change\_hyper}(4, 47) = 6.15, p < .001$ ). For each symptom cluster, no CM type remained in the models.

### Discussion and Implications

This study explored which CM types were associated with overall PTSD symptoms and symptom clusters during pregnancy and from pregnancy to 3 months postpartum. Results showed that, contrary to research stating that CSA was associated with perinatal PTSD (e.g., Lev-Wiesel & Daphna-Tekoah, 2007; 2010), neglect was the only CM type that was associated with both overall and all symptom clusters of PTSD, when controlling for other CM types, adult interpersonal traumas, family status, and age. This finding was unexpected as past research found that CSA was associated with perinatal PTSD (e.g., Lev-Wiesel & Daphna-Tekoah, 2007; 2010). Neglect, compared to other CM types which involve commission of physical, sexual, or psychological violence, involves the omission of necessary care and protection (Chauhan et al., 2021). While neglect does not involve the same immediate threat as other CM types, the deprivation of necessary resources and protection in early development can impair learning in several domains (sensory, cognitive, affective, linguistic, and social) and may also lead to deficits in functioning, emotion regulation, and poor adjustment (McLaughlin et al., 2017). These implications, especially when chronic and severe, may lead to increased vulnerability to developing psychopathology, such as PTSD, during the perinatal period; a period that requires a greater capacity to cope (McLaughlin et al., 2017). The perinatal period may also bring up memories of parents' neglect, and generate feelings of insecurity, inadequacy, and anxiety about one's ability to care for an infant (Slade et al., 2009). The current findings therefore point to the importance of revisiting neglect as a CM form with severe implications for perinatal mental health.

Results showed that while neglect was associated with greater PTSD symptoms during pregnancy, physical abuse was associated with fewer negative alterations in cognitions and mood. This finding was unexpected, however might be explained by the fact that physical abuse is thought to be the CM type that children can most easily understand is wrong, given that acts of physical violence are more obvious to children than emotional or sexual abuse or neglectful experiences (Ney et al., 1986).

When experiencing physical violence from an adult, a child is more likely to feel the need to protect themselves from the threat and to internalize the blame less as compared to other CM types (Ney et al., 1986). Taken

together, child physical abuse may not have the same implications for children's belief systems as other CM types and may lead to externalizing rather than internalizing difficulties (Dye, 2018).

Contrary to what was expected, scores of CM were not associated with changes in PTSD symptoms over time. Coupled with change scores close to 0 for total PTSD symptoms and symptom clusters, this suggests a relatively consistent trajectory of PTSD symptoms from pregnancy to the postpartum period, regardless of the CM status. Our research extends the findings of Choi and Sikkema (2016) which identified the presence of PTSD both during pregnancy and in the postnatal period for individuals with CM histories. Our findings suggest that the trajectory of change in PTSD symptoms from the prenatal to postnatal periods is not different as a function of CM experiences. PTSD trajectories for pregnant mothers may therefore unfold in similar ways for individuals with differing CM profiles.

A strength of this study is our younger sample, which may have reduced the bias introduced by other traumatic experiences across the lifespan. Our covariate, adult interpersonal traumas, is noteworthy, as such traumas have been associated with perinatal PTSD in previous research (Guyon-Harris et al., 2017). The study's limitations include its small, non-diverse sample with high levels of PTSD symptoms and CM experiences, limiting its generalizability.

A further limitation of our study sample involves the potential impact of attrition between T1 and T2. The participants who dropped out may have exhibited higher levels of postnatal PTSD, and the inclusion of these participants in the postnatal phase may have altered the change in PTSD symptoms results. Moreover, the LEC-5 was not utilized at T2 and participants may have experienced unmeasured interpersonal traumas after T1. Also, our CM measure did not capture the onset, frequency, and severity of the CM experiences; factors that may relate to PTSD development. Furthermore, as participants answered the PCL-5 based on their "most difficult experience", it is unclear which experience they were recollecting. While several forms of CM were measured, exposure to domestic violence was not accounted for in this study. Finally, given the non-normality in changes for re-experiencing and avoidance and the suboptimal internal consistency of the neglect measure, it is essential to approach the findings with caution. However, it is worth noting that Cronbach's alpha often underestimates internal consistency for scales with fewer than 10 items.

Future research should replicate these findings in larger, more diverse samples, including those meeting clinical PTSD criteria, given the lack of clear associations between CM types and PTSD symptoms for pregnant and postnatal women. Exploring PTSD symptom trajectories in those with and without CM to uncover how symptoms unfold over the perinatal period is also needed. Furthermore, a multi-method assessment of CM would increase validity (e.g., self-report, child protection records). Implications of the findings for the assessment, prevention, and intervention of trauma include routinely assessing all CM types in perinatal care. Additionally, specialized care for CM survivors, such as trauma-informed primary care (TIPC), should be offered in both the prenatal and postnatal periods to decrease the risk of retraumatization. Tailored interventions addressing maltreated individuals' unique experiences, including neglect, should be readily accessible and offered in both the prenatal and postnatal periods alongside TIPC to promote resilience, and reduce pregnancy and postnatal PTSD symptoms. To make TIPC available to this population, policies enabling and enforcing access to this approach is necessary.

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## Conflict of interest

The authors have no conflict of interest to disclose.

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Associations Between Child Maltreatment Types and Pre- and Post-Partum Posttraumatic Stress Disorder Symptoms:  
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