

## Original Investigation

# Maternal Posttraumatic Stress Disorder and Depression in Pediatric Primary Care

## Association With Child Maltreatment and Frequency of Child Exposure to Traumatic Events

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**IMPORTANCE** Maternal posttraumatic stress disorder (PTSD) may be associated with increased risk for child maltreatment and child exposure to traumatic events. Exposure to multiple traumatic events is associated with a wide range of adverse health and social outcomes in children.

**OBJECTIVE** To examine the association of probable maternal depression, PTSD, and comorbid PTSD and depression with the risk for child maltreatment and parenting stress and with the number of traumatic events to which preschool children are exposed.

**DESIGN** Cross-sectional observational design. We used analysis of variance to determine whether probable maternal psychopathology groups differed on child maltreatment, parenting stress, and children's exposure to traumatic events. Hierarchical regression analyses were used to examine the unique and interactive effects of depression and PTSD severity scores on these outcomes.

**SETTING** Urban pediatric primary care outpatient clinic.

**PARTICIPANTS** Ninety-seven mothers of children aged 3 to 5 years.

**EXPOSURE** Pediatric primary care visit.

**MAIN OUTCOMES AND MEASURES** Probable maternal depression and/or PTSD, parenting stress, child exposure to traumatic events, and child maltreatment.

**RESULTS** Mothers with probable comorbid PTSD and depression reported greater child-directed psychological aggression and physical assault and greater parenting stress. The children of mothers with PTSD (mean number of events the child was exposed to, 5.0) or with comorbid PTSD and depression (3.5 events) experienced more traumatic events than those of mothers with depression (1.2 events) or neither disorder (1.4 events). Severity of depressive symptoms uniquely predicted physical assault and neglect. Symptom scores for PTSD and depression interacted to predict psychological aggression and child exposure to traumatic events. When PTSD symptom severity scores were high, psychological aggression and the number of traumatic events children experienced rose. Depressive symptom severity scores predicted the risk for psychological aggression and exposure to traumatic events only when PTSD symptom severity scores were low.

**CONCLUSIONS AND RELEVANCE** Children of mothers with PTSD are exposed to more traumatic events. Posttraumatic stress disorder is associated with an increased risk for child maltreatment beyond that associated with depression. Screening and intervention for maternal PTSD, in addition to maternal depression, may increase our ability to reduce children's exposure to traumatic stress and maltreatment.

*JAMA Pediatr.* doi:10.1001/jamapediatrics.2013.2218  
Published online September 2, 2013.

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Child maltreatment has long been recognized as an important form of childhood adversity that has toxic consequences for child development. Maltreated children have greater risks for suicide, cardiovascular illness, obesity, diabetes mellitus, mental health problems, self-injurious behaviors, and violence and have increased alcohol and other drug problems.<sup>1,2</sup> Increasingly, approaches to preventing maltreatment take advantage of the special importance of pediatric primary care as a nexus for promoting the health and well-being of children.<sup>3,4</sup> The American Academy of Pediatrics recently called for pediatricians to take a leading role in reducing child exposure to toxic stress, which it defined as exposure to adverse childhood events in the absence of the buffering effects of “stable, responsive relationships that help children develop a sense of safety.”<sup>5</sup>(pe225) This call broadened the focus on child safety beyond child maltreatment, citing increasingly compelling evidence that adverse early childhood events become toxic when caregivers are not able to buffer the child from their effects. Toxic stress can impair the normal development of “brain circuitry and other important regulatory systems in ways that continue to influence physiology, behavior, and health decades later.”<sup>5</sup>(pe225),6,7

Caregiver psychopathology has long been understood as an important risk factor for child maltreatment. Specifically, maternal depression is associated with increased use of corporal punishment<sup>8</sup> and physical abuse of children.<sup>9-11</sup> National representative longitudinal data on children in contact with child protective services suggest that 46% of the mothers of maltreated preschool children experienced a major depressive episode.<sup>12</sup> Increased recognition of the negative effect of depression on mothers and their children has resulted in emphasis that pediatricians can play an important role by screening for maternal depression as a means of keeping children safe.<sup>13-16</sup> Screening for maternal depression in pediatric primary care settings is feasible and facilitates referrals for further evaluation.<sup>17,18</sup> Treating maternal depression results in improved child mental health.<sup>19</sup> Previous research supports the use of “routine, brief, maternal depression screening conducted during well-child visits.”<sup>17</sup>(p207)

Until recently, research on maternal depression and maltreatment risk has largely ignored the high rate of comorbidity between depression and posttraumatic stress disorder (PTSD).<sup>20</sup> Data from the National Comorbidity Survey<sup>21</sup> reveal that 24.7% of depressed women have PTSD. Conversely, 48.4% of women with PTSD have depression. Relative to women with depression alone, those with comorbid PTSD have more exposure to traumatic events and greater severity of anxiety and depression and are more impaired.<sup>22,23</sup> De Bellis et al<sup>24</sup> found a greater lifetime incidence of PTSD and comorbid psychiatric disorders among maltreating mothers than among comparison mothers, suggesting that maternal PTSD is associated with an increased likelihood of child maltreatment. Kaplan and colleagues<sup>25</sup> found that 42.4% of abusive mothers had comorbid psychiatric diagnoses. More generally, PTSD is associated with deterioration and conflict in relationships and with parents' ability to help young children recover from exposure to traumatic stress.<sup>26,27</sup> Cumulative maternal exposure to traumatic events is associated with less parenting sat-

isfaction and with greater levels of neglect, child welfare system involvement, and use of punishment.<sup>28</sup> Maternal exposure to traumatic events is also predictive of child abuse potential, more punitive behavior, and psychological aggression.<sup>29</sup> The mother-child relationship is adversely affected by the poor parental emotion regulation that is associated with PTSD.<sup>30,31</sup> Parenting stress mediates the association between maternal psychopathology and parenting behavior.<sup>32,33</sup> Finally, recent epidemiological data indicate that the children of mothers with PTSD are more likely to experience traumatic events than are the children of comparison mothers.<sup>34</sup> In brief, maternal PTSD increases the risk of child exposure to traumatic events, is associated with an increase in the risk of maltreating one's offspring, and may interfere with a mother's ability to serve as a buffer of the child's response to toxic stress. Thus, identifying maternal PTSD is likely to yield information that may be useful as part of a broader effort to reduce child exposure to toxic stress and may serve to increase child safety.

This study sought to examine the association of maternal PTSD and depression with child maltreatment and child exposure to traumatic events, in the context of a pediatric primary care setting. We reasoned that if PTSD or comorbid PTSD and depression are associated with the distinct outcomes of child maltreatment and exposure to traumatic events, pediatricians should screen for maternal PTSD as well as maternal depression. Because greater severity of illness and greater impairment are associated with comorbid PTSD and depression, we hypothesized that mothers with probable comorbid PTSD and depression would have an increased risk of maltreating their children compared with mothers with depression or PTSD only or with neither diagnosis. Second, we hypothesized that mothers with probable comorbid PTSD and depression would endorse greater levels of parenting stress than those with one disorder or neither disorder. Third, we hypothesized that the children of mothers with PTSD (alone or comorbid with depression) would be exposed to more traumatic events than the children of mothers with depression only or with neither disorder. Finally, to evaluate the unique effects of depression and PTSD, we conducted analyses using depressive and PTSD symptom severity scores to assess their distinct association with parenting stress, child maltreatment, and child exposure to traumatic events.

## Methods

### Participants

Participants included 97 biological mothers of children aged 3 to 5 (mean [SD], 4.4 [0.6]) years presenting for a pediatric primary care appointment. Approximately half the children (50.5%) were boys. The mothers had a mean (SD) of 2.63 (1.33) children. The median maternal age was between 22 and 30 years. Mothers identified themselves as African American (52 mothers [54%]), Hispanic (38 [39%]), biracial (5 [5%]), non-Hispanic white (1 [1%]), and Asian (1 [1%]). Most were single (59 mothers [61%]); 33 (34%) were married, and 5 (5%) were divorced or separated. High school was the median maternal educational level attained.

## Measures

Mothers' exposure to traumatic events, PTSD symptoms, and impairment were assessed using the 49-item Posttraumatic Stress Diagnostic Scale (PDS).<sup>35</sup> The PDS assesses exposure to traumatic events, including serious accidents, natural disasters, nonsexual or sexual assault by a stranger or family member, military combat or exposure to war, imprisonment, torture, life-threatening events, and a category of "other." The PDS parallels the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition,<sup>36</sup> diagnostic criteria for PTSD. The internal consistency reliability ( $\alpha = 0.92$ ) and test-retest reliability (intraclass correlation coefficient [ICC] = 0.83) of the PDS is very good. Relative to the Structured Clinical Interview for the *Diagnostic and Statistical Manual of Mental Disorders*, Third Edition Revised, the sensitivity (0.89) and specificity (0.75) of the PDS are also very good.<sup>37</sup> The recommended cutoff score of 15 or more was used to determine probable PTSD. Internal consistency of the PTSD severity score in this sample was very good ( $\alpha = 0.96$ ). The PDS includes a 9-item measure of functional impairment. Each item reflects a different domain for functioning (such as work, family, and friendships). Impairment is scored by summing the items.

Maternal depressive symptoms were assessed using the Edinburgh Postnatal Depression Scale.<sup>38</sup> The Edinburgh Postnatal Depression Scale is a 10-item scale assessing depressive symptoms in the past week. Items are rated on a scale from 0 to 3. A total score is computed by summing items. Using a cutoff score of 13 or more, the Edinburgh Postnatal Depression Scale has demonstrated good psychometric properties among nonpostnatal women relative to clinical diagnosis. The Edinburgh Postnatal Depression Scale demonstrated good internal consistency reliability ( $\alpha = 0.86$ ) in this study.

Parenting stress was assessed with the Parenting Stress Index-Short Form,<sup>39</sup> a 36-item self-report measure rated on a 5-point Likert scale. The total stress score was used to measure parenting stress. Normative values for the Parenting Stress Index-Short Form were developed using a sample of 800 parents, thus allowing raw scores to be converted to *t* scores. The Parenting Stress Index-Short Form has good psychometric properties. The test-retest reliability for the total stress score is 0.84, with an internal consistency of 0.91. The Cronbach  $\alpha$  was 0.94 in this study.

The parent-to-child version of the Conflict Tactics Scale (CTS-PC), a widely used 22-item parent-reported measure, was used to assess psychological and physical maltreatment and neglect of children by parents. The psychometric characteristics of the instrument, including its reliability, discriminant validity, and construct validity, have been well documented.<sup>40</sup> We assessed maltreatment and neglect with the following 3 subscales of the CTS-PC: Psychological Aggression, Physical Assault, and Neglect. We used these subscales to assess whether PTSD and depression were differentially associated with different aspects of maltreatment. Evidence of construct and discriminant validity for the subscales is good. The CTS-PC subscales have been reported to have low to moderate reliability (Physical Assault, 0.55; Psychological Aggression, 0.60; and Neglect, 0.22). However, internal consistency reliability in the present study for the Physical Assault

( $\alpha = 0.92$ ), Psychological Aggression ( $\alpha = 0.78$ ), and Neglect ( $\alpha = 0.94$ ) subscales was good to very good. We used standard instructions and scoring rules.

Children's exposure to traumatic events was assessed using the Traumatic Events Screening Inventory-Parent Report Revised (TESI-PRR).<sup>41</sup> The TESI-PRR is a 24-item parent-reported measure that assesses children's exposure to a wide variety of traumatic events, such as natural disasters, accidents, injuries, hospitalizations, domestic violence, community violence, physical abuse, and sexual abuse. The TESI-PRR provides a count of the total number of types of traumatic events experienced by a child. In the present sample, the TESI-PRR demonstrated good internal consistency reliability ( $\alpha = 0.82$ ).

## Procedure

Study procedures were approved by the institutional review board of the Mount Sinai School of Medicine, where the study was conducted. Clinic staff identified children aged 3 to 5 years who were scheduled for a primary care appointment on that day and provided the mothers with a flyer describing the study. Children who were not 3 to 5 years of age, children with a developmental delay, and mothers who could not complete measures in English were excluded. If mothers expressed an interest, a trained research staff member conducted informed consent procedures. Of families meeting inclusion criteria, 90.1% agreed to participate. Children of mothers who refused participation (9.9%) did not differ from those who participated in the study in terms of age or sex. After providing consent, mothers completed the questionnaires before leaving the office. A procedure was established to flag endorsing items of the CTS-PC that would trigger the primary care staff to determine whether a threshold for reasonable cause to suspect abuse or neglect had been met. Parents were informed that the investigators were mandated to report suspected abuse and/or neglect. Although mothers completed the measures independently, a research assistant was available to provide child care and to answer any questions about the measures. Mothers received \$50 as compensation for completing the assessment battery.

## Statistical Analysis

Based on clinical cutoff severity scores for maternal depression ( $\geq 13$ ) and posttraumatic stress disorder ( $\geq 15$ ), mothers were classified as having probable depression (depression-only group), PTSD (PTSD-only group), comorbid depression and PTSD (comorbid group), or no diagnosis (no-diagnosis group). We then conducted 1-way analyses of variance (ANOVAs) to examine differences in child maltreatment and maternal psychopathology type. Dependent variables included maternal exposure to traumatic events, severity of depression and PTSD symptoms, functional impairment, child maltreatment (assessed by the CTS-PC Physical Assault, Psychological Aggression, and Neglect subscales), parenting stress, and child exposure to traumatic events. When significant differences were found by ANOVA, we used Tukey honestly significant difference post hoc tests to examine specific contrasts among the 4 maternal psychopathology groups. Data were analyzed using

Table 1. Mean Differences in Parent and Child Variables as a Function of Parent Psychopathology Group

	Parent Psychopathology Group <sup>a</sup>				Analysis, $F_{3,96}$ Value	$\eta^2$ Value	Specific Contrasts ( $P < .05$ ) <sup>b</sup>
	No-Diagnosis (A)	Depression-Only (B)	PTSD-Only (C)	Comorbid (D)			
Diagnostic category, No. (%)	70 (72)	11 (11)	6 (6)	10 (10)	...	...	...
Maternal exposure to traumatic events	0.60 (1.32)	0.55 (1.04)	3.00 (2.19)	3.70 (3.50)	12.83 <sup>c</sup>	0.29	D > A and B; C > A and B
Maternal PTSD severity	0.80 (1.92)	1.55 (3.50)	17.33 (5.39)	27.90 (15.04)	91.06 <sup>c</sup>	0.75	D > A, B, and C; C > A and B
Maternal depression severity	5.29 (3.33)	15.91 (3.27)	7.83 (3.06)	16.90 (3.51)	59.95 <sup>c</sup>	0.66	D > A and C; B > A and C
Maternal impairment	0.27 (1.05)	0.36 (0.92)	2.83 (2.31)	4.11 (3.02)	24.17 <sup>c</sup>	0.44	D > A and B; C > A and B
CTS-PC subscale							
Psychological Aggression	2.88 (3.13)	3.80 (4.44)	8.33 (4.18)	6.67 (4.72)	6.78 <sup>c</sup>	0.19	D > A; C > A
Physical Assault	2.53 (4.14)	5.10 (6.54)	3.50 (3.73)	10.11 (10.22)	5.79 <sup>c</sup>	0.17	D > A
Neglect	0.26 (1.53)	1.40 (4.43)	0.17 (0.41)	0.33 (0.71)	1.02	0.03	...
Child exposure to traumatic events	1.43 (1.80)	1.18 (1.17)	5.00 (1.90)	3.50 (3.66)	8.60 <sup>c</sup>	0.22	C > A and B; D > A and B
Total stress score, maternal PSI	59.89 (19.25)	74.82 (16.92)	80.50 (32.21)	102.20 (22.98)	14.30 <sup>b</sup>	0.32	D > A and B

Abbreviations: CTS-PC, parent-to-child version of the Conflicts Tactics Scale; ellipses, not applicable; PSI, Parenting Stress Index; PTSD, posttraumatic stress disorder.

<sup>a</sup> Unless otherwise indicated, data are expressed as mean (SD) scores. Measures for maternal psychopathology, psychological and physical maltreatment and

neglect of children, and child exposure to traumatic events are described in the Measures subsection of the Methods section.

<sup>b</sup> Compared using the Tukey honestly significant difference post hoc test.

<sup>c</sup>  $P < .001$ .

SPSS, version 17.0, statistical software.<sup>42</sup> All tests were 2-tailed, with a significance level of  $\alpha = .05$ .

Subsequently, we conducted hierarchical multiple regression analyses to examine the relationship of continuous scores reflecting the severity of PTSD and depressive symptoms and their potential interaction with child maltreatment, child exposure to traumatic events, and parental stress. In the first step of each model (model 1), we entered PTSD and depression severity as predictors. In the second step (model 2), we added the interaction between PTSD and depression severity as a predictor. Interaction terms were created by multiplying centered predictors to address potential problems with multicollinearity.<sup>43</sup> Tolerance and variance inflation factor values for each predictor were acceptable, indicating that multicollinearity was not a concern for these analyses. Below, we summarize the results of model 1 when the interaction was not significant and focus on interpreting model 2 when the interaction was significant. Post hoc probing of significant moderation effects was conducted following procedures outlined by Holmbeck.<sup>44</sup>

## Results

Although most mothers did not have clinical levels of probable PTSD or depression (72%), 11% had clinical levels of depression, 6% had clinical levels of PTSD, and 10% had clinical levels of both disorders. Table 1 presents means (SDs) by maternal psychopathology groups and results of ANOVA and post hoc contrasts. As might be expected, mothers in the PTSD-only and comorbid groups reported being exposed to more traumatic events than did mothers in the no-diagnosis or depression-only groups. As expected, mothers in the PTSD-only

group reported significantly higher severity of PTSD symptoms relative to mothers in the depression-only and no-diagnosis groups. However, mothers in the comorbid group reported significantly higher severity of PTSD symptoms ( $P < .01$ ) than all other diagnostic groups. Mothers in the PTSD-only and comorbid groups also endorsed significantly higher levels of impairment relative to the other groups. Last, mothers in the depression-only and comorbid groups reported greater severity of depression symptoms than the other groups.

### Maternal Probable Diagnosis Groups and Child Maltreatment

As seen in Table 1, ANOVA revealed a significant effect of maternal psychopathology type on child maltreatment, specifically on the Physical Assault ( $F_{3,96} = 5.79$ ;  $P < .001$ ;  $\eta^2 = 0.17$ ) and the Psychological Aggression CTS-PC ( $F_{3,96} = 6.78$ ;  $P < .001$ ;  $\eta^2 = 0.19$ ) subscales. Tukey post hoc comparisons of the 4 groups indicated that mothers in the comorbid group reported significantly higher levels of physically aggressive behavior toward their children than did mothers in the no-diagnosis group ( $P = .03$ ). Mothers in the comorbid ( $P = .04$ ) and PTSD-only ( $P = .001$ ) groups reported significantly higher levels of psychological aggression toward their children relative to mothers in the no-diagnosis group. We found no differences in child neglect based on maternal psychopathology.

Maternal psychopathology type was associated with child exposure to traumatic events ( $F_{3,96} = 8.60$ ;  $P < .001$ ;  $\eta^2 = 0.22$ ). Children of mothers in the PTSD-only group were exposed to significantly more traumatic events than were children of mothers in the no-diagnosis ( $P < .001$ ) or probable depression-only ( $P < .01$ ) groups. Children of mothers in the comorbid group were exposed to significantly greater numbers of trau-

**Table 2. Hierarchical Regression Analyses Predicting Child Maltreatment, Exposure to Traumatic Events, and Parental Stress**

Variable	Model 1, B (SE)	$\beta$ Coefficient	Model 2, B (SE)	$\beta$ Coefficient
<b>Psychological Abuse</b>				
Depression	0.18 (0.077)	0.26 <sup>a</sup>	0.15 (0.074)	0.22 <sup>a</sup>
PTSD	0.09 (0.042)	0.25 <sup>a</sup>	0.26 (0.065)	0.71 <sup>b</sup>
PTSD $\times$ depression	...	...	-0.02 (0.006)	-0.52 <sup>c</sup>
R <sup>2</sup> value	0.20	...	0.28	...
$\Delta R^2$	...	...	0.08 <sup>c</sup>	...
F value	10.92 <sup>b</sup>	...	11.45 <sup>b</sup>	...
<b>Physical Abuse</b>				
Depression	0.33 (.114)	0.33 <sup>c</sup>	0.31 (0.114)	0.31 <sup>c</sup>
PTSD	0.09 (0.061)	0.17	0.21 (0.101)	0.39 <sup>a</sup>
PTSD $\times$ depression	...	...	-0.01 (0.009)	-0.26
R <sup>2</sup> value	0.19	...	0.21	...
$\Delta R^2$	...	...	0.02	...
F value	10.39 <sup>b</sup>	...	7.76 <sup>b</sup>	...
<b>Neglect</b>				
Depression	0.10 (0.042)	0.29 <sup>a</sup>	0.10 (0.043)	0.29 <sup>a</sup>
PTSD	-0.04 (0.023)	-0.20	-0.04 (0.038)	-0.19
PTSD $\times$ depression	...	...	0.00 (0.003)	-0.01
R <sup>2</sup> value	0.06	...	0.06	...
$\Delta R^2$	...	...	0.00	...
F value	2.93 <sup>d</sup>	...	1.93	...
<b>Child Exposure to Traumatic Events</b>				
Depression	-0.04 (0.044)	-0.10	-0.06 (0.039)	-0.16
PTSD	0.11 (0.024)	0.48 <sup>b</sup>	0.25 (0.035)	1.13 <sup>b</sup>
PTSD $\times$ depression	...	...	-0.02 (0.003)	-0.74 <sup>b</sup>
R <sup>2</sup> value	0.19	...	0.36	...
$\Delta R^2$	...	...	0.17 <sup>b</sup>	...
F value	11.10 <sup>b</sup>	...	17.66 <sup>b</sup>	...
<b>Parental Stress</b>				
Depression	2.07 (0.395)	0.48 <sup>b</sup>	2.00 (0.396)	0.46 <sup>b</sup>
PTSD	0.62 (0.216)	0.22 <sup>c</sup>	1.02 (0.356)	0.43 <sup>c</sup>
PTSD $\times$ depression	...	...	-0.05 (0.032)	-0.20
R <sup>2</sup> value	0.43	...	0.44	...
$\Delta R^2$	...	...	0.01	...
F value	35.55 <sup>b</sup>	...	24.61 <sup>c</sup>	...

Abbreviations: B, unstandardized  $\beta$  coefficient; ellipses, not applicable; PTSD, posttraumatic stress disorder.

<sup>a</sup>  $P < .05$ .

<sup>b</sup>  $P < .001$ .

<sup>c</sup>  $P < .01$ .

<sup>d</sup>  $P < .10$ .

matic events relative to children of mothers in the no-diagnosis ( $P = .02$ ) and depression-only ( $P = .047$ ) groups. Finally, parenting stress differed significantly by maternal psychopathology type ( $F_{3,96} = 14.30; P < .001; \eta^2 = 0.32$ ). Relative to mothers in the no-diagnosis ( $P < .001$ ) and depression-only ( $P = .01$ ) groups, mothers in the comorbid group endorsed significantly higher levels of parenting stress.

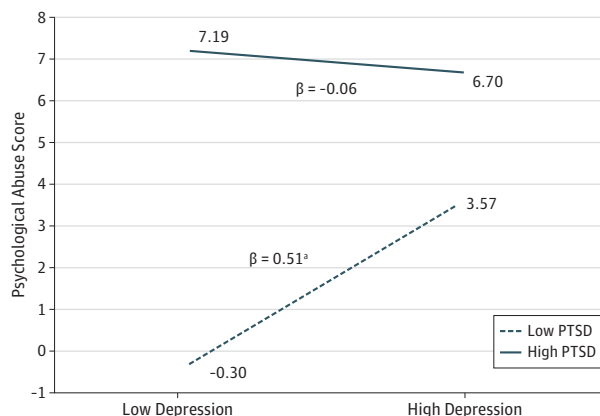
### Hierarchical Linear Regression Analyses of Severity of PTSD and Depressive Symptoms

We conducted hierarchical linear regression analyses to examine direct and interactive effects of PTSD and depressive symptom severity (using continuous symptom severity scores) on child maltreatment risk and trauma exposure. When predicting child physical abuse ( $\beta = 0.33; P = .01$ ) and neglect ( $\beta = 0.29; P = .02$ ), severity of maternal depression emerged as a unique positive predictor of risk. Severity of PTSD was not

independently related to child physical abuse and neglect, and PTSD and depression severity did not interact to predict these forms of child maltreatment (Table 2). The model predicting parental stress revealed that severity of PTSD ( $\beta = 0.22; P = .01$ ) and depression ( $\beta = 0.48; P < .001$ ) were uniquely associated with increased parenting stress. Depression and PTSD did not interact to predict parenting stress.

The hierarchical model (model 1) predicting psychological aggression indicated that severity of PTSD ( $\beta = 0.25; P = .03$ ) and depression ( $\beta = 0.26; P = .03$ ) were independently and positively related to risk for psychological aggression. In the second step of the model (model 2), the interaction between PTSD and depression ( $\beta = -0.52; P = .002$ ) was statistically significant (Table 2). Following procedures outlined by Holmbeck,<sup>44</sup> we plotted significant interactions to aid in interpretation. Figure 1 shows that when severity of maternal PTSD symptoms was high, the risk for child psychological abuse was con-

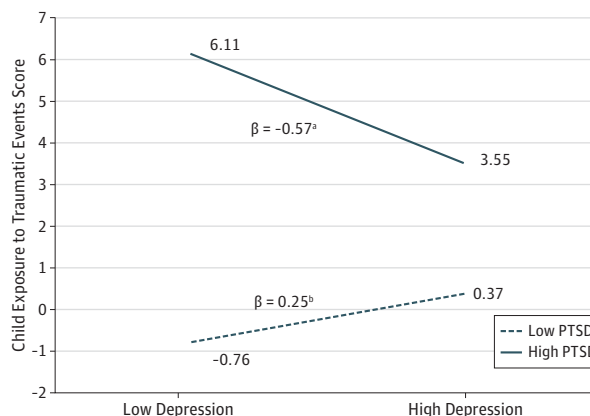
**Figure 1. Interactive Effects of Posttraumatic Stress Disorder (PTSD) and Depression on Psychological Abuse**



Severity of PTSD symptoms (high [+1 SD] vs low [-1 SD]) was assessed using the 49-item Posttraumatic Stress Diagnostic Scale; severity of depressive symptoms (high [+1 SD] vs low [-1 SD]), the Edinburgh Postnatal Depression Scale; and psychological abuse, the Psychological Aggression subscale of the parent-to-child version of the Conflicts Tactics Scale.

<sup>a</sup> $P < .001$ .

**Figure 2. Interactive Effects of Posttraumatic Stress Disorder (PTSD) and Depression on Child Trauma Exposure**



Severity of PTSD symptoms (high [+1 SD] vs low [-1 SD]) was assessed using the 49-item Posttraumatic Stress Diagnostic Scale; severity of depressive symptoms (high [+1 SD] vs low [-1 SD]), the Edinburgh Postnatal Depression Scale; and child exposure to traumatic events, the Traumatic Events Screening Inventory-Parent Report Revised.

<sup>a</sup> $P < .001$ .

<sup>b</sup> $P = .04$ .

sistently high regardless of depression severity. However, when severity of maternal PTSD symptoms was low, greater depression severity was associated with an increased risk for child psychological abuse.

Maternal PTSD severity emerged as a strong independent predictor ( $\beta = 0.48$ ;  $P < .001$ ) of child exposure to traumatic events (model 1). However, model 2 results suggested that PTSD and depression interacted to predict risk of child trauma exposure ( $\beta = -0.74$ ;  $P < .001$ ) (Table 2). For mothers with high severity of PTSD symptoms, the risk for child exposure to traumatic events decreased as depression severity increased (Figure 2). Although the relationship was weaker when the severity of maternal PTSD symptoms was low, the severity of depressive symptoms predicted an increased risk for exposure to trauma.

## Discussion

We examined the association of maternal PTSD and depression with child maltreatment and the frequency of child exposure to traumatic events in a sample of mothers of preschool children presenting for pediatric primary care visits. Mothers in the comorbid group reported the highest levels of physically and psychologically abusive behaviors and overall parenting stress. Although not statistically significant, mothers with depression alone showed a trend toward endorsing more physically abusive and neglectful parenting behaviors. Given the high comorbidity between PTSD and depression, these findings suggest the importance of measuring PTSD symptoms when considering the relationship between depression and increased risk for child maltreatment.

Children whose mothers had probable PTSD (mean number of events the child was exposed to, 5.0) or probable co-

morbid PTSD and depression (3.5 events) were exposed to a much larger number of traumatic events compared with children whose mothers had probable depression (1.2 events) or neither disorder (1.4 events). This finding is important because exposure to multiple traumatic events is associated with a substantially increased risk for psychological maladjustment, physical disease, and poorer life outcomes.<sup>45</sup> These findings support giving greater emphasis to increased recognition and identification of maternal PTSD and comorbid PTSD as potential risk factors for child exposure to traumatic events. This study's findings are consistent with those recently reported in an epidemiological study by Roberts and colleagues.<sup>34</sup> Their study compared mothers with probable PTSD with all mothers. We extend those findings by comparing mothers with probable PTSD with mothers who have probable comorbid PTSD and depression, probable depression alone, and neither disorder.

The analyses using symptom severity scores to examine the association between the severity of PTSD and depressive symptoms and the risk for maltreatment revealed unique patterns of association. Severity of depressive symptoms was independently associated with child physical assault and neglect. The severity of PTSD symptoms and the severity of depressive symptoms emerged as independent predictors of parenting stress. Notably, the association between depression severity and child-directed psychological aggression was moderated by maternal PTSD severity. At high levels of PTSD severity, the risk for psychological aggression was uniformly high. In the absence of PTSD, however, depressive symptom severity also predicted increased risk for psychological aggression. Maternal PTSD moderated the association between depression severity and child exposure to traumatic events such that, at high levels of maternal PTSD, depression severity was

negatively associated with child trauma exposure. At low levels of PTSD, however, severity of depressive symptoms was positively associated with child exposure to traumatic events. Taken together, these findings suggest that knowledge of PTSD severity is especially important in predicting risk for psychological aggression and child exposure to traumatic events. In fact, at high levels of maternal PTSD, knowledge of the severity of depressive symptoms is a less powerful predictor of risk. The prediction of child maltreatment appears to improve when both maternal PTSD and depression are included.

Because pediatric primary care is accessed by a very large proportion of families of young children, screening for maternal PTSD and depression in this setting may improve the identification and prevention of child maltreatment.

This study also has limitations. We relied on maternal self-report of clinical symptoms, parenting behaviors, and child exposure to traumatic events. Because the sample was drawn from an urban primary care clinic, the results may not generalize to children in other settings. Self-report is subject to social desirability biases, and psychopathology may bias reporting of child exposure to traumatic events. Research with larger samples using multiple assessment methods is needed. Future research should establish maternal diagnoses by using structured clinical diagnostic interviews. Similarly, the effects of maternal depression and PTSD on parenting should be evaluated by direct observation of behavior. Examination of the association of depression and PTSD with child maltreatment by using child welfare reports of confirmed investiga-

tions of maltreatment would also be useful. Although we had a relatively large sample, the diagnostic subgroups were relatively small, and these findings (although consistent with an epidemiological study<sup>34</sup>) should be confirmed. The design did not fully isolate the effects of PTSD and depression. To address this limitation, we conducted exploratory analyses using continuous severity scores for depression and PTSD. These analyses indicated that PTSD and depression severity scores were uniquely associated with different types of maltreatment risk. We also found interactions that suggested that depression had differential effects in the presence vs absence of high severity of PTSD symptoms for psychological abuse and for child exposure to traumatic events. Finally, the finding of greater exposure to traumatic events should be investigated further to determine the reasons for this difference.

We recommend that greater attention be devoted to screening for maternal PTSD alongside depression in pediatric primary care settings. Several brief measures of PTSD developed for the primary care setting could easily be used in pediatric primary care settings to identify maternal PTSD.<sup>46-48</sup> These measures are very brief and easy to score and can provide pediatricians with an opportunity to engage parents in guidance regarding the effect of traumatic events on child development and discuss ways to buffer the toxic effects of adverse events. Such screening and parental guidance would be consistent with the recent recommendations<sup>5</sup> that pediatricians become more involved in helping recognize and reduce the effects of toxic stress on young children's development.

#### ARTICLE INFORMATION

**Accepted for Publication:** February 19, 2013.

**Published Online:** September 2, 2013.  
doi:10.1001/jamapediatrics.2013.2218.

**Author Contributions:** Dr Chemtob had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

**Study concept and design:** Chemtob, Laraque.

**Acquisition of data:** Chemtob, Laraque.

**Analysis and interpretation of data:** All authors.

**Drafting of the manuscript:** All authors.

**Critical revision of the manuscript for important intellectual content:** Chemtob, Laraque.

**Statistical analysis:** All authors.

**Obtained funding:** Chemtob.

**Administrative, technical, and material support:** Laraque.

**Study supervision:** Chemtob, Laraque.

**Conflict of Interest Disclosures:** None reported.

**Funding/Support:** This study was supported by the United Jewish Appeal Federation of New York (principal investigator, Dr Chemtob).

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