

Posttraumatic Stress Reactions in New York City Children After the September 11, 2001, Terrorist Attacks

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Objective.—To assess the prevalence of posttraumatic stress reactions (PTSR) in New York City (NYC) children following the September 11, 2001, attacks and determine the key predictors of PTSR.

Methods.—Cross-sectional random digit-dial survey in NYC of parents of children 4–17 years old 4 months after the attacks. PTSR in children was measured using the 20-item Posttraumatic Stress Disorder Reaction Index—Child Revision, with parents as respondents.

Results.—Overall, 18% of NYC children had “severe” or “very severe” PTSR, and 66% had “moderate” PTSR. In a multivariate model, parental posttraumatic stress disorder (PTSD; odds ratio [OR] = 4.50; $P < .01$), the parent crying in front of the child (OR = 3.19; $P < .001$), seeing 3 or more graphic images of the disaster on television (OR = 3.18; $P < .01$), and living in Manhattan were associated with severe or very severe PTSR in children.

Conclusions.—A substantial proportion of NYC children had severe or very severe PTSR after September 11, and most children exhibited at least moderate PTSR. These findings suggest an enhanced role for primary care physicians, particularly pediatricians, for screening, treatment, and referral (coupled with appropriate training and reimbursement), especially in light of continued terrorist threats. These findings also have implications for advice that pediatricians can give to parents about limiting disaster-related television exposure and children’s need for emotional support.

KEY WORDS: children; disaster; posttraumatic stress reactions; trauma

Ambulatory Pediatrics 2003;3:304–311

The September 11, 2001, attacks on the World Trade Center were unprecedented in size and scale of man-made disaster. There were large numbers of direct victims, including those killed and injured and those who witnessed the attacks in person. However, psychological sequelae of the attacks were experienced broadly and involved the population at large, as well as direct victims. Approximately 20% of adults living in the close vicinity of the World Trade Center reported symptoms consistent with a diagnosis of posttraumatic stress disorder (PTSD) 5–8 weeks after the attacks.¹ Overall, 7.5% of adults in a larger area of Manhattan reported symptoms consistent with a diagnosis of PTSD, and 57.8% reported at least one PTSD symptom related to the events of September 11.² Moreover, the effects extended beyond New York City (NYC) to the nation as a whole, with adults reporting symptoms of psychological stress for themselves and their children after the attacks.^{3,4}

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Received for publication May 19, 2003; accepted July 12, 2003.

Effects of the disaster were felt broadly by children as well. A substantial proportion of NYC public schoolchildren grades 4–12 experienced symptoms consistent with mental health disorders, including PTSD (11%), major depression (8%), generalized anxiety disorder (10%), separation anxiety (12%), agoraphobia (15%), conduct disorder (11%) and panic (9%). Furthermore, a full 26.5% of the schoolchildren met criteria for at least one disorder and also reported problems in day-to-day functioning.⁵ Risk factors for PTSD in these children included personal physical exposure to the attack, family exposure and loss, previous exposure to a potentially traumatic situation, and amount of television viewing. In addition, being younger, female, and Hispanic were associated with increased risk of PTSD for these children.^{5,6}

The assessment of NYC schoolchildren shed light on the widespread effects of the September 11 attacks on children—the mental health impact was felt citywide, not just at Ground Zero^{5,6}—as well as on the major risk factors for PTSD in children. In this study, however, there was no opportunity to speak with parents to learn about their own mental health and its possible effects on their children. Prior research has revealed an association between child and parent reactions after a traumatic event^{7–10}; hence, it would be important to explore these relationships.

In this study, we investigated the prevalence of posttraumatic stress reactions (PTSR) to the September 11 attacks for NYC children in relationship to family characteristics, seeing disaster images on television, and parental coping reactions. We relied on the reports of parents who participated in a large population-based survey of the im-

pact of the September 11 attacks on New Yorkers¹¹ to assess PTSR in their children.

METHODS

Sample

Data are based on a random digit-dial telephone survey with 2001 adults (18 years of age or older) carried out between January 15, 2002, and February 21, 2002, 4–5 months after the September 11 attacks. The sampling frame included all adults in NYC, with an oversampling of residents living south of 110th Street. A random adult in the household was selected to be interviewed using the last birthday procedure. Those adults who were the parent or primary caretaker of a child between the ages of 4 and 17 ($n = 434$) living in the household were asked to respond to an additional set of questions about a child in the household. Parents with more than one child in that age range were asked to respond to questions about the child who had most recently celebrated a birthday. Interviews were conducted in English and Spanish using computer-assisted telephone interviewing. The overall cooperation rate for the survey was 60%. This level of cooperation is comparable to that in other large random digit-dial surveys, including the Behavioral Risk Factor Surveillance System; recent data suggest that the nonresponse bias inherent in this survey is small.¹² Comparisons between our study sample and the 2000 United States Census showed that our sample was comparable to the NYC population, and that the borough samples were comparable to borough populations in terms of age, sex, and race.¹³ The study was approved by the Institutional Review Board at The New York Academy of Medicine, and procedures were in place to provide study participants with assistance in obtaining counseling if needed.

Instrument

Respondents were interviewed using a structured questionnaire that took approximately 35 minutes to administer. Parents were asked about demographic/biographic characteristics, including their child's sex, age, and race/ethnicity; whether the child had siblings; the annual household income; the borough of residence on September 11; and the number of parents in the household.

Parents were also asked about their own reaction to the disaster and mental health status using a measure of PTSD temporally linked to the September 11 attacks and major depression since the attacks. The PTSD measure for parents was a modified version of the Diagnostic Interview Schedule (DIS) based on the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)*.^{1,14,15} It has a coefficient of agreement with clinician-administered structured clinical interviews of .71 for current PTSD. A modified version of the Structured Clinical Interview for *DSM-IV* for a major depressive episode was used to determine the presence of depression in parents.^{1,16,17} Parents were also asked whether the child had seen them crying.

Parents were asked whether children saw particular images on television in the week following the disaster, in-

cluding an airplane hitting the buildings, buildings collapsing, people running from a cloud of smoke or debris, and people falling or jumping from the towers. We created a composite indicator of exposure to disaster images on television in the week following the disaster that consisted of having seen 3 of the 4 images on television. We also explored using number of images in the regression equation and found that the effects of television were stronger when we dichotomized the results into having seen 3 or more images or not. Hence, we used the dichotomized variable.

Severity of PTSR in children was ascertained using the UCLA Posttraumatic Stress Disorder Reaction Index—Child Revision, a 20-item index measuring children's degree of reaction to trauma.¹⁸ Items in this index cluster on 3 factors—re-experiencing/numbing, fear/anxiety, and concentration/sleep—which partially overlap with the 3 *DSM-IV* factors of re-experiencing, arousal, and avoidance. Internal consistency ranges from .69 to .80 for the 3 scales.^{18,19} Responders indicate for each of the 20 items whether the experience (eg, “dreams about the September 11 disaster or has had bad dreams since then”) happens “none,” “little,” “some,” “much,” or “most” of the time. Total scores on the 20 items indicate degree of disorder in 5 categories: very severe (score greater than 60), severe (score between 40 and 59), moderate (score between 25 and 39), mild (score between 12 and 24), and doubtful (score less than 12).

The instrument is not intended to establish a diagnosis, but rather to indicate reaction severity. In a clinical sense, children with severe or very severe scores are likely to be PTSD cases or to have PTSD symptoms. This instrument has been widely used both nationally—in California after a fatal sniper attack in a school yard,²⁰ and after Hurricanes Hugo²¹ and Andrew²²—as well as internationally—in Nicaragua,²³ Armenia,²⁴ and Azerbaijan²⁵—and has been translated into Armenian, Turkish, and Spanish. There are specific versions for children and adolescents; there is also a parent version that modifies the format for asking questions so as to be appropriate for parents.²⁶ Notwithstanding the existence of a parent version, the instrument is most commonly administered face-to-face with children. However, in order to secure a population-wide estimate of PTSR in a timely fashion, we asked parents to respond for their children. The 20 items include 10 items asking about behavior, which is likely to be observable, and 10 items asking about feelings and emotions, which are typically more difficult for a parent to observe. We calculated the score for each child for all 20 items and separately calculated the score for each child for the 10 items that were likely to be observable. In addition to the questions on the PTSR scale, we also asked parents whether the child felt that his or her future would be significantly altered or shortened by the events of September 11.

Statistical Analyses

We reported the prevalence of PTSR in children. Two-tailed chi-square tests and unadjusted odds ratios were

Table 1. Sample Characteristics for All Children*

	All Focal Children (%) n = 434
Child and family demographic characteristics	
Sex	
Male	237 (55)
Female	197 (45)
Age of child	
4–11 years old	248 (58)
12–17 years old	178 (42)
Race of child	
Non-Hispanic White	141 (30)
Non-Hispanic Black	146 (37)
Hispanic	115 (27)
Other	27 (6)
Child has siblings	
Yes	227 (73)
No	207 (27)
Household income	
<\$20 000	64 (17)
\$20 001–\$40 000	185 (45)
\$40 001–\$75 000	101 (21)
\$75 001+	84 (16)
Borough where child lived on September 11	
Bronx	69 (16)
Brooklyn	146 (38)
Queens	115 (27)
Manhattan	71 (11)
Staten Island	33 (8)
Single-parent household	
Yes	160 (35)
No	272 (65)
Parent's reaction to the disaster	
Parental PTSD since September 11	
Yes	37 (9)
No	397 (91)
Parental depression since September 11	
Yes	44 (11)
No	388 (89)
Crying in front of child	
Yes	139 (33)
No	278 (67)
Child's exposure to media coverage	
Child saw the following images on TV in the week following the disaster	
An airplane hitting the buildings	
Yes	353 (86)
No	50 (14)
Buildings collapsing	
Yes	359 (87)
No	46 (13)
People running from a cloud of smoke or debris	
Yes	356 (87)
No	51 (13)
People falling or jumping from the towers	
Yes	173 (48)
No	198 (52)
Saw at least 3 of the 4 television images	
Yes	298 (77)
No	136 (30)

Table 1. Continued

	All Focal Children (%) n = 434
Children's posttraumatic stress reaction	
Doubtful or mild	75 (16)
Moderate	277 (66)
Severe	62 (15)
Very severe	13 (3)
Child feels future will be significantly altered or shortened by September 11	
Yes	89 (22)
No	300 (78)

*All results are weighted using sample weights to adjust for the number of telephone lines and children in the household and for the Manhattan oversample. Source: January 2002 population survey of New York City residents to assess the effects of the September 11 attacks.

used to determine associations between the covariates of interest and severe/very severe PTSD. Multiple logistic regression was used to determine covariates that were associated with severe/very severe PTSD in adjusted models. Variables related to parental reactions and the child's exposure were entered into the final multivariate model, controlling for the child's age and race, family income, borough of residence, and single/two-parent family. Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) were calculated for all variables included in the final model. Sampling weights were developed and applied to the data to adjust for sampling fraction and to correct potential selection bias related to the number of telephones and children in the household. Standard errors were estimated using Taylor series linearization in SUDAAN software to account for the complex sampling design.²⁷ The strength of association was estimated by adjusted ORs, with 95% CIs and *P* values used to infer prediction for all variables included in the final model.

RESULTS

Child and Family Demographic Characteristics

As shown in Table 1, among the 434 children in the sample, 55% were male, 58% were 4–11 years old, and 42% were 12–17 years old. Most of the children were non-Hispanic Black (37%), with approximately equal proportions of Hispanic (27%) and non-Hispanic White (30%) children. Most children (73%) had siblings, and most (45%) were in families with incomes between \$20,000 and \$40,000 annually, although a substantial number (17%) were in families earning less than \$20,000 annually, an income just above the federal poverty line for a family of four.²⁸ Children lived in the 5 boroughs: Brooklyn (38%), Queens (27%), the Bronx (16%), Manhattan (11%), and Staten Island (8%). Most children (65%) lived in two-parent households.

Parent's Reaction to the Disaster

Approximately 9% of the children's parents had symptoms consistent with PTSD related to the September 11

attacks, whereas 11% had been depressed since that time. About one third (33%) reported that their children had seen them cry.

Child's Exposure to Media Coverage

Most children saw images of the disaster on television, including seeing an airplane hitting the buildings (86%), buildings collapsing (87%), people running from a cloud of smoke or debris (87%), and people falling or jumping from the towers (48%). More than three fourths of the children (77%) saw at least 3 of these 4 images.

Prevalence of Posttraumatic Stress Reactions in Children in NYC

The prevalence of PTSR was high for children in NYC: 84% experienced at least a moderate reaction whereas only 16% had doubtful or mild reactions. The 84% consisted of 3% with a very severe PTSR, 15% with severe PTSR, and 66% with moderate PTSR (Table 1). When scores were calculated for the subset of the instrument (10 items) that asks about the child's behavior (which a parent can observe), the number of children with severe/very severe symptoms on these 10 items only increased from 18% to 26% (data not shown).

In addition to these specific stress reactions, the September 11 attacks resulted in an altered view of the future for many NYC children. Almost one fourth of the parents (22%) reported that their children felt that their future would be significantly altered or shortened by the disaster.

Bivariate Relationships Between Covariates and Severe/Very Severe Posttraumatic Stress Reactions in Children

Table 2 shows bivariate relationships. Only one of the demographic variables—being in a single-parent family—was significantly associated with severe or very severe PTSR, with 48% of the children reporting severe/very severe PTSR in single-parent households, in contrast to 32% of the children with doubtful, mild, or moderate PTSR. There was a trend toward a relationship for income and borough, with higher percentages of children in poorer families and children in Manhattan having severe/very severe PTSR, but the associations did not reach conventional levels of statistical significance.

Variables indicating parent's reaction to the disaster were strongly associated with children having severe/very severe PTSR. Children with severe/very severe PTSR were more likely than children with doubtful, mild, or moderate PTSR to have parents with PTSD related to September 11 (29% vs 5%), to have parents with depression since September 11 (18% vs 9%) and to have seen their parents cry (58% vs 27%).

Furthermore, seeing images of the disaster on television was associated with PTSR. Although most children saw these images on television, children with severe/very severe PTSR were more likely than children with doubtful, mild, or moderate PTSR to have seen buildings collapsing (95% vs 86%) and people falling or jumping from the towers (68% vs 44%). Children with severe/very severe

PTSR were also significantly more likely to have seen 3 or all 4 of the images than children with doubtful, mild, or moderate PTSR (87% vs 68%).

Multivariate Model Predicting Severe/Very Severe Posttraumatic Stress Reactions in Children

Table 3 presents results of the multivariate analysis. Parental reactions, seeing images on television, and borough of residence were significant in the multivariate analysis. Children whose parents had symptoms consistent with PTSD had over 4 times greater odds of having severe/very severe PTSR themselves compared with children whose parents did not have these symptoms (OR = 4.50; $P < .01$). Furthermore, children who saw parents crying had over 3 times greater odds of having PTSR than those who did not see parents crying (OR = 3.19; $P < .001$). With respect to television images, children who saw at least 3 of the 4 named images had 3 times the odds of having PTSR compared with children who saw fewer than 3 of the images (OR = 3.18; $P < .01$). Finally, there was a trend toward lower odds of severe/very severe PTSR in other boroughs compared with Manhattan, with the differences in Brooklyn and Queens achieving statistical significance.

DISCUSSION

This study showed that, according to parents' assessment of their children's symptoms, a substantial proportion of NYC children (18%) had severe or very severe PTSR 4 months after the September 11 attacks. This prevalence rate suggests that as many as 260,000 children²⁹ city-wide, ages 4–17, may have experienced severe or very severe PTSR. Our study also found that indications of stress in parents seeing disturbing images of the disaster on television and living in Manhattan (compared with Brooklyn and Queens) were associated with severe or very severe PTSR in children.

Our prevalence rate for severe/very severe PTSR was higher than the level of PTSD reported from the assessment of NYC schoolchildren grades 4–12 conducted in NYC 6 months after the attack, which found that 10.5% of the schoolchildren met criteria for PTSD. Our rate may be higher because it includes children who have many of the symptoms of PTSD but may not meet *DSM-IV* definition of a case.

Our finding that parental reactions were related to children's reactions was consistent with a large body of prior research.^{7–10} There are several possible explanations for this association. First, parents and children may experience similar exposure to an incident, and both develop symptoms of stress as a consequence. Second, parents' stress may induce stress in their children. Children may use their parents' reactions as a gauge of the seriousness of a situation, with distress in parents signaling threat and fearfulness of the situation. This could account for the strong relationship between seeing parents cry and PTSR in children in this study. Third, stress in children could actually cause or increase parental stress. Finally, because in this study, in contrast to those cited earlier, parents re-

Table 2. Bivariate Relationships Between Severe/Very Severe Posttraumatic Stress Reaction and Covariates*

	Children with Moderate, Doubtful, or Mild Posttraumatic Stress Reactions n = 352	Children with Severe or Very Severe Posttraumatic Stress Reactions n = 75	Significant <i>P</i>
Child and family demographic characteristics			
Sex			NS
Male	195 (56)	38 (50)	
Female	157 (44)	37 (50)	
Age of child			NS
4–11 years old	206 (58)	42 (59)	
12–17 years old	145 (42)	33 (41)	
Race of child			NS
Non-Hispanic White	122 (32)	18 (20)	
Non-Hispanic Black	111 (36)	32 (41)	
Hispanic	97 (27)	18 (28)	
Other	19 (5)	7 (10)	
Child has siblings			NS
Yes	181 (72)	43 (75)	
No	171 (28)	32 (25)	
Household income			NS
<\$20 000	42 (15)	19 (25)	
\$20 001–\$40 000	151 (45)	30 (47)	
\$40 001–\$75 000	86 (23)	15 (16)	
\$75 001+	73 (18)	11 (12)	
Borough where child lived on September 11			NS
Bronx	56 (16)	12 (14)	
Brooklyn	121 (39)	24 (36)	
Queens	95 (28)	17 (21)	
Manhattan	53 (9)	17 (22)	
Staten Island	27 (8)	5 (8)	
Single-parent household			.03
Yes	120 (32)	37 (48)	
No	230 (68)	38 (52)	
Parent's reaction to the disaster			
Parental PTSD since September 11			.001
Yes	17 (5)	20 (29)	
No	335 (95)	55 (71)	
Parental depression since September 11			(.07)
Yes	29 (9)	13 (18)	
No	321 (91)	62 (82)	
Crying in front of child			.001
Yes	100 (27)	39 (58)	
No	244 (73)	34 (42)	
Child's exposure to media coverage			
Child saw the following images on TV in the week following the disaster			
An airplane hitting the buildings			(.07)
Yes	286 (84)	67 (93)	
No	44 (16)	6 (7)	
Buildings collapsing			.05
Yes	291 (86)	68 (95)	
No	41 (14)	5 (5)	
People running from a cloud of smoke or debris			(.07)
Yes	288 (86)	68 (94)	
No	45 (14)	6 (6)	
People falling or jumping from the towers			.002
Yes	126 (44)	47 (68)	
No	175 (56)	23 (32)	
Saw at least 3 of the 4 television images			.002
Yes	235 (68)	63 (87)	
No	117 (32)	12 (13)	

*All results are weighted using sample weights to adjust for the number of telephone lines and children in the household and for the Manhattan oversample. Source: January 2002 population survey of New York City residents to assess the effects of the September 11 attacks.

Table 3. Multivariate Model Showing Relationships Between Covariates and Predictors of Severe/Very Severe Posttraumatic Stress in Children.*

	Odds Ratio (Adjusted)	Confidence Intervals	Significant <i>P</i>
Age of child			
4–11 years old	...	...	...
11–17 years old	0.76	(0.40–1.46)	NS
Race of child			
Non-Hispanic White	...	...	...
Non-Hispanic Black	1.53	(0.64–3.67)	NS
Hispanic	0.76	(0.28–2.07)	NS
Other	2.55	(0.78–8.34)	NS
Household income			
<\$20 000	...	...	...
\$20 001–\$40 000	0.57	(0.64–3.67)	NS
\$40 001–\$75 000	0.42	(0.28–2.07)	NS
\$75 001+	0.41	(0.78–8.34)	NS
Borough where child lived on September 11			
Bronx	0.41	(0.13–1.24)	NS
Brooklyn	0.38	(0.15–0.97)	.04
Queens	0.30	(0.10–0.87)	.03
Manhattan	...	...	...
Staten Island	0.55	(0.11–2.65)	NS
Single-parent household			
Yes	1.08	(0.54–2.17)	NS
No	...	...	...
Parental PTSD since September 11			
Yes	4.50	(1.56–13.03)	.01
No	...	...	...
Parental depression since September 11			
Yes	1.30	(0.39–4.36)	NS
No	...	...	...
Crying in front of child			
Yes	3.19	(1.66–6.14)	.001
No	...	...	...
Saw at least 3 of the 4 television images			
Yes	3.18	(1.28–7.87)	.01
No	...	...	...

*Adjusted odds ratios and 95% confidence intervals (n = 427). Source: January 2002 population survey of New York City residents to assess the effects of the September 11 attacks.

ported on their children’s symptoms, the relationship between parental and child symptoms could derive, in part, from reporting bias. Reporting bias has been documented in studies, most of which have shown that parents who themselves are depressed or have symptoms overreport problems in their children,^{30–34} but some studies have found the opposite: that distressed parents may be less likely to perceive or acknowledge signs of distress in their children.^{9,35,36} Whatever the reason for the relationship between parental PTSD and child PTSR, children may have an increased need for emotional support following a trauma; if parents are not able to provide this, and if parental reaction increases the stress in the family, then their children may have a more difficult time recovering from the trauma.

In our study, seeing disturbing images on television was associated with severe/very severe PTSR. The bivariate

analysis showed that particular images—seeing people falling or jumping from the towers, for example—had an especially strong association with PTSR. However, seeing any 3 of 4 specified images of the disaster (airplane hitting the building, buildings collapsing, people running from a cloud of smoke or debris, people falling or jumping from towers) was strongly associated with PTSR in the bivariate analysis, and the relationship remained strong in the multivariate model. These findings are consistent with studies following the Oklahoma City bombing in which there was a significant relationship between posttraumatic stress in children and television exposure.³⁷ For adults in NYC, media exposure was most strongly associated with PTSD for those respondents who were directly affected by the attacks, in contrast to those not directly affected.³⁸

The finding that children in Manhattan have higher levels of symptoms than children in other boroughs was not surprising, given that the disaster occurred in Manhattan and that children in Manhattan schools were more likely to see the disaster firsthand and to be in schools that were evacuated.³⁹

The findings have several practical and policy implications. The finding that there was a substantial prevalence of PTSR in the general population suggests a need for more population-wide mental health support services. The finding that parents’ mental health was associated with PTSR in their children suggests the need to focus mental health services on families. Our findings also indicate the importance of screening for and identifying children in need of services and for referral to services. The identification could be made in any of the service sectors that see children, including schools, child welfare, juvenile justice, foster care, and faith-based systems. Primary care settings could also be important for both identification and treatment. Because between 60% (adolescents) and 80% (preschool-aged) of all children have at least one physician visit in a year,⁴⁰ primary care physicians are likely to see these stressed children. The need for enhanced training for pediatricians and appropriate reimbursement for these services has been discussed elsewhere,⁴¹ and pediatricians have begun to advocate for this in at least one state.⁴²

The findings have implications for advice that pediatricians can give after a disaster. The strong association between severe/very severe PTSR and seeing disturbing images on television suggests the need to inform parents of this association and the importance of limiting their children’s disaster-related television viewing. Pfefferbaum and colleagues⁴³ recommend taking a media history, which would include ascertaining the amount and type of exposure to media coverage, the content of the coverage, and the child’s reaction to it. Parents should be encouraged to discuss the event and the child’s reactions to it; correct distortions, misappraisals, and misperceptions; and assist the child in processing emotions related to the event.

Furthermore, the strong and consistent relationship between parents’ stress reactions and those of their children (no matter what the reason) suggests the need for assistance to the parents as part of the effort to help their chil-

dren. For pediatricians, this will require familiarity with a referral network to serve the mental health needs of children and families. For the mental health community, this suggests the need for family-oriented services. It would be important for pediatricians to inform parents that children use parents' reactions to judge the level of threat, and reactions that indicate that parents are in distress, such as crying, may frighten children.

This study had several limitations, one of which was that we cannot determine the direction of the causality for the association between parental PTSD and child PTSR. Several interpretations are possible, as noted earlier. A second limitation was that we used parental report of children's symptoms to assess PTSR in children. The literature shows that parents can report more accurately on symptoms they can observe (such as behavior problems) than on symptoms they cannot observe (such as feelings), and that they underreport the latter.⁴⁴⁻⁴⁷ Underreporting these internal symptoms would lead to an underestimate of true prevalence of PTSR symptoms in children and would mean that our prevalence estimates are conservative. When we scored only the 10 items asking about behaviors that parents would be likely to observe, the prevalence of severe or very severe PTSR rose from 18% to 26%. A third limitation was that parental reporting bias could contribute to the relationships. As indicated previously, studies have generally found that parents who are depressed or have symptoms of distress overreport problems in their children,³¹⁻³⁴ particularly boys,³¹ but some studies have found that stressed parents are less likely to perceive signs of distress in their children.^{9,35,36}

Although reporting biases exist, it is important to be clear that studies that determine parental and child symptoms separately, and that do not rely on parental report, still find a strong association between parental symptoms and child symptoms.^{30,48} Hence, acknowledging this relationship, as well as the reporting bias, in discussing results of this study seems appropriate. Furthermore, many of the recommendations for dealing with families would be the same, no matter what the interpretation of the cause of the relationship.

Despite these limitations, this study has shown that severe or very severe PTSR in children was widespread in the general population of NYC's children 4 months after September 11 and that seeing disturbing images on television along with parental symptoms were the major variables associated with children's reactions. These findings suggest an enhanced role for primary care physicians, particularly pediatricians, for screening, treatment, and referral (coupled with appropriate training and reimbursement), especially in light of the continued terrorist threats. They also speak to the need for family-oriented counseling services and for pediatricians to know where to refer parents as well as children.

ACKNOWLEDGMENTS

This research was supported by grants MH66385 and MH66081 from the National Institute of Mental Health and the William T. Grant Foundation. The authors thank Alan M. Steinberg, PhD, Robert

S. Pynoos, MD, and Melissa Brymer, PsyD (UCLA/Duke University National Center for Child Traumatic Stress) for their assistance in the use of their Child Post-Traumatic Stress Reaction Index. We thank these and two anonymous reviewers for their thoughtful comments on the manuscript.

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