Brief Report

Trauma Exposure in Primary School Children: Who Is at Risk?

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In order to direct efforts to prevent children from being exposed to trauma and its psychosocial consequences, more knowledge is needed about which children are at risk. Therefore, we examined demographic risk factors for trauma exposure in a sample of Dutch primary school children in the general population (N = 1,770, mean age 10.24 years). Fourteen percent of the children reported exposure. Age was positively associated with exposure while sex, ethnicity, and region of residence did not emerge as significant risk factors. These results imply that prevention measures should be provided not only to groups of children who are traditionally considered vulnerable but broadly.

Keywords predictors, traumatic experience, epidemiology, prevention

Exposure to traumatic events such as community violence, sexual abuse, serious accidents, and natural disasters can lead to anxiety and depressive symptomatology in children, including posttraumatic stress disorder (PTSD; see, e.g., Bolton, O’Ryan, Udwin, Boyle, & Yule, 2000). The most efficient way to prevent children from developing these symptoms and disturbances is to prevent them from being exposed. In order to direct prevention efforts efficiently and effectively, it is necessary to know which children are most at risk for exposure to trauma. Demographic risk factors, such as sex, age, ethnicity, and region of residence, would be cost-effective discriminating means with this regard if found to be of influence.

Only a few studies have been conducted in order to examine the relationship between demographic factors and exposure to trauma in children, with inconsistent results. With regard to sex, results were highly contradictory. Giaconia et al. (1995) did not find a difference in general trauma exposure between adolescent boys and girls, while Cuffe et al. (1998) found girls to report more exposure than boys, and Vrana and Lauterbach...
(1994) concluded the opposite in their study of undergraduate students. Regarding specific types of events, there is more consistency. Most studies confirm that girls are more often exposed to sexual assault (e.g., Bernat, Ronfeldt, Calhoun, & Arias, 1998; Costello, Erkanli, Fairbank, & Angold, 2002; Perkonigg, Kessler, Storz, & Wittchen, 2000) and boys more often to community violence (Bernat et al., 1998; Elklit, 2002; Stein, Jaycox, Kataoka, Rhodes, & Vestal, 2003). Boys also appear to be exposed more often to accidents than girls (Bernat et al. 1998; Elklit, 2002; Perkonigg et al., 2000), but this could not be confirmed in all studies (e.g., Costello et al. 2002; Giacalone et al., 1995).

Concerning age, there appears to be a positive relationship with exposure to trauma (e.g., Copeland, Keeler, Angold, & Costello, 2007; Perkonigg et al., 2000), but these findings are not always consistent in violence studies (Stein et al., 2003). Bernat et al. (1998) described that trauma exposure in their sample usually began in adolescence, with a mean age of initial onset of 14 years. Most of the studies included adolescents and even young adults, but few studies involved younger children. Therefore, we have little information on age (and other) effects on trauma exposure in preadolescents.

Similar to age, ethnicity and region of residence appear to be associated with exposure to traumatic events. However, there are few studies in children with this respect. Concerning ethnicity, Breslau et al. (1998) observed in their Detroit Area Survey that lifetime prevalence of assaultive violence was higher in non-White than in White adults. Frans, Rimmö, Åberg, and Fredrikson (2005) reported increased prevalence of trauma exposure associated with being born abroad in Swedish adults. Cuffe et al. (1998) and Finkelhor and Dziuba-Leatherman (1994) found similar results in children, with children in minority groups being exposed to violence more often than children in majority groups. However, Costello et al. (2002) did not find a significant difference in risk of experiencing a traumatic event due to ethnicity. With regard to region of residence, almost no study in children included urban as well as rural areas. When included, higher rates of exposure were associated with living in urban areas compared to rural areas (Finkelhor & Dziuba-Leatherman, 1994; Perkonigg et al., 2000; Stein et al., 2003). However, these studies concerned mainly exposure to violence. The differences between urban and rural areas in risk for exposure to other types of traumatic events have not yet been examined in children.

To shed more light on the relationship between demographic characteristics and trauma exposure in young children, we studied the associations between sex, age, ethnicity, and region of residence on the one hand, and trauma exposure on the other hand, in a large sample of primary school children in the general population.

**Methods**

The data were collected in the context of an epidemiological study on trauma and its psychosocial consequences in children in Utrecht, a province in the middle of the Netherlands with urban as well as rural regions. The study protocol was approved by the Medical Ethics Committee of the University Medical Center Utrecht.

Thirty-six randomly selected schools participated in the study, with 1,770 children completing a questionnaire (age range 7 to 13 years, mean age 10.24 years, SD = 1.21, further coded as younger than 10 years old versus 10 years or older). Ethnicity and region of residence were defined as having autochthonous parents versus having one or both parents born abroad, and living in a rural versus an urban area, respectively (in line with Statistics Netherlands, 2007). Compared to national data (Statistics Netherlands), the amount of boys was representative (50% compared to 51%; $\chi^2[1, N = 1,770] = .97; p = .33$), but
children with parents born in a foreign country were somewhat underrepresented (13% compared to 23%; \( \chi^2[1, N = 1,727] = 95.84, p < .01 \)) as were children in urban areas (23% compared to 42%; \( \chi^2[1, N = 1,770] = 276.70, p < .01 \)).

The children were asked to indicate whether they had or had not experienced the events listed in the exposure section of the UCLA PTSD Reaction Index for DSM-IV (UCLA PTSD RI; Pynoos, Rodriguez, Steinberg, Stuber, & Frederick, 1998) and to describe their worst experience ever. Trauma exposure was considered present when the described event fulfilled the A1 criterion for PTSD of the DSM-IV (American Psychiatric Association, 2000). Two trained graduate students in clinical psychology independently decided whether or not the event fulfilled the criterion and what type of event it concerned, according to the categorization of the UCLA PTSD RI. In case of disagreement (Cohen’s kappa was .58 for the traumatizing character and .86 for the type of the event), a third rater (EA)’s judgment was employed to decide by majority.

Missing data were rare (2%) and were multiply imputed (m = 5) using latent class modeling (Van Ginkel, 2007; BIC [Bayesian Information Criterion] = 95111.93). Odds ratios for each variable were computed for exposure regardless of type of event and for exposure to specific types of events, and were combined according to Rubin’s (1987) rules for multiple imputation.

**Results**

Fourteen percent of the children described a traumatic event as defined by the A1 criterion for PTSD (see Table 1). The sudden death or serious injury of a loved one was the most frequent (in 5% of the children), such as a best friend who died suddenly or a sibling who had committed suicide. The next most frequent were disaster experiences (in 2% of the children), such as a flood disaster due to the collapse of a dike. Several forms of violence accounted for 4% of the described events. An example of exposure to violence was a child who saw a boy being beaten badly by police when he was on holiday. In general (regardless of the type of event), younger children were less likely to be exposed to trauma than older children (OR = 0.7, \( p = .01 \), 95% CI = 0.5–0.9). With regard to the specific types of events, younger children were less likely to report the sudden death or serious injury of a loved one than older children (OR = 0.6, \( p = .02 \), 95% CI = 0.4–0.9), but no age differences were found for the other types of events. No significant sex, ethnicity, or region of residence differences were found. (Because of their small frequencies, no analyses were carried out on war experiences and sexual assault.)

**Discussion**

This study explored demographic risk factors for trauma exposure in a large sample of primary school children in the normal population. Fourteen percent of the children reported exposure to a traumatic event. Age appeared to be positively associated with trauma exposure in general and with the experience of the sudden death or serious injury of a loved one specifically. Sex, ethnicity, or region of residence differences were not found. (Because of their small frequencies, no analyses were carried out on war experiences and sexual assault.)

In considering these results, the limitations of the study should be kept in mind. Firstly, its cross-sectional design does not allow for causal inferences. Although one could argue that sex and age are naturally prior to exposure, this cannot be said of being autochthonous or of residence area. Secondly, although the children were primed with yes or no
### Table 1
Relationship Between Demographic Variables and Exposure to Traumatic Events in Primary School Children

<table>
<thead>
<tr>
<th>Event</th>
<th>All</th>
<th>Boys</th>
<th>Girls</th>
<th>&lt; 10 years</th>
<th>≥ 10 years</th>
<th>Dutch</th>
<th>Foreign</th>
<th>Rural</th>
<th>Urban</th>
<th>OR</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disaster</td>
<td>2.2</td>
<td>2.7</td>
<td>1.7</td>
<td>1.6</td>
<td>.17</td>
<td>2.1</td>
<td>2.6</td>
<td>0.7</td>
<td>.49</td>
<td>2.6</td>
<td>.06</td>
</tr>
<tr>
<td>Accident</td>
<td>1.9</td>
<td>1.9</td>
<td>1.9</td>
<td>1.0</td>
<td>.99</td>
<td>1.2</td>
<td>2.3</td>
<td>0.5</td>
<td>.10</td>
<td>1.8</td>
<td>.21</td>
</tr>
<tr>
<td>War</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>—</td>
<td>—</td>
<td>0.0</td>
<td>0.0</td>
<td>—</td>
<td>—</td>
<td>0.0</td>
<td>—</td>
</tr>
<tr>
<td>Victim of domestic violence</td>
<td>0.8</td>
<td>1.1</td>
<td>0.5</td>
<td>2.5</td>
<td>.30</td>
<td>0.8</td>
<td>1.2</td>
<td>0.9</td>
<td>.99</td>
<td>0.8</td>
<td>.92</td>
</tr>
<tr>
<td>Witness of domestic violence</td>
<td>0.5</td>
<td>0.6</td>
<td>0.5</td>
<td>1.3</td>
<td>.72</td>
<td>0.5</td>
<td>0.5</td>
<td>1.0</td>
<td>.95</td>
<td>0.5</td>
<td>.95</td>
</tr>
<tr>
<td>Victim of community violence</td>
<td>1.8</td>
<td>2.4</td>
<td>1.1</td>
<td>2.1</td>
<td>.11</td>
<td>1.4</td>
<td>2.0</td>
<td>0.7</td>
<td>.41</td>
<td>1.9</td>
<td>.28</td>
</tr>
<tr>
<td>Witness of community violence</td>
<td>0.8</td>
<td>0.9</td>
<td>0.8</td>
<td>1.2</td>
<td>.77</td>
<td>0.9</td>
<td>0.8</td>
<td>1.2</td>
<td>.78</td>
<td>0.6</td>
<td>.39</td>
</tr>
<tr>
<td>Sexual assault</td>
<td>0.3</td>
<td>0.1</td>
<td>0.6</td>
<td>—</td>
<td>—</td>
<td>0.1</td>
<td>0.5</td>
<td>—</td>
<td>—</td>
<td>0.4</td>
<td>.88</td>
</tr>
<tr>
<td>Death or injury of loved one</td>
<td>4.9</td>
<td>4.2</td>
<td>5.5</td>
<td>0.8</td>
<td>.24</td>
<td>3.5</td>
<td>5.9</td>
<td>0.6</td>
<td>.02</td>
<td>4.8</td>
<td>.89</td>
</tr>
<tr>
<td>Serious medical condition</td>
<td>0.5</td>
<td>0.7</td>
<td>0.2</td>
<td>3.0</td>
<td>.79</td>
<td>0.4</td>
<td>0.5</td>
<td>0.8</td>
<td>.99</td>
<td>0.5</td>
<td>.86</td>
</tr>
<tr>
<td>Other stressful event</td>
<td>0.6</td>
<td>0.4</td>
<td>0.7</td>
<td>0.5</td>
<td>.35</td>
<td>0.5</td>
<td>0.6</td>
<td>0.9</td>
<td>.88</td>
<td>0.6</td>
<td>.70</td>
</tr>
<tr>
<td>Any traumatic event</td>
<td>14.1</td>
<td>14.9</td>
<td>13.4</td>
<td>1.1</td>
<td>.35</td>
<td>11.5</td>
<td>16.1</td>
<td>0.7</td>
<td>.007**</td>
<td>13.9</td>
<td>.80</td>
</tr>
</tbody>
</table>

Note: N = 1, 770.

* *p < .05.

** *p < .01.
questions about exposure to different types of events, exposure to trauma was finally estimated from the described worst experiences only. A third limitation concerns indications of smaller participation rates in relatively poor neighborhoods. We noticed that parents in these areas were somewhat more reluctant to “opt in” for the study than parents in other neighborhoods. We still had a large and varied sample, but generalizations should be made with care (a limitation that also applies to other trauma studies where active parent approval is required). Finally, while this study has focused on easy-to-determine risk factors because of their cost-effectiveness in prevention efforts, it is possible that less accessible characteristics have more predictive power. For example, prior victimization appears to be a risk factor for future violence exposure (e.g., Finkelhor & Dziuba-Leatherman, 1994). Despite these limitations, in our view the strengths of this study lie in including a sample of young children in the normal population and in measuring the complete range of types of traumatic events.

Surprisingly, the prevalence of trauma exposure of 14% was considerably lower than prevalence rates found in other studies where percentages well above 40% were common (see, e.g., Copeland et al., 2007; Giaconia et al., 1995; Vrana & Lauterbach, 1994). While methodological differences are probably of influence, it is unlikely that they provide a full explanation. In general, the studies finding high exposure rates included adolescents or even young adults. It would be natural for a study in younger children to arrive at lower estimates, especially when taking into account the observation of Bernat et al. (1998) that most exposure to traumatic events occurs in adolescence. Our relatively low prevalence rate could also be seen as a confirmation of the existence of a cross-Atlantic difference (Frans et al., 2005), with American youth victimized more often than European youth. For example, witnessing physical community violence is reported commonly in American children, with rates ranging approximately from 40% to 80% in different studies (Stein et al., 2003), as opposed to the low rates in our sample.

With regard to risk factors for exposure, the positive relationship between age and exposure has already been confirmed in samples with a larger age range (Copeland et al., 2007), but apparently, even within a sample of young children, age plays a role. On the one hand, older children simply have had more time to be exposed than younger children. On the other hand, developmental changes toward a greater autonomy in traveling and social interactions may put children more at risk. For example, the transition from being brought to school to traveling autonomously is generally made during the first years of primary school.

In contrast to age, we did not find significant variation in traumatic exposure due to sex, ethnicity, or region of residence. As mentioned in the introduction, earlier studies reported contradictory results, varying from zero to negative as well as positive effects. Our study confirms the zero effect indications (e.g., Costello et al., 2002; Giaconia et al., 1995) in young children. The dissimilarity in findings might be explained by methodological issues. For example, several studies were based on convenience samples, such as undergraduate psychology students (e.g., Vrana & Lauterbach, 1994), which might be biased (see, e.g., sex differences in trauma exposure in Tolin & Foa, 2006). In addition, the instruments used to measure trauma exposure varied from self-report questionnaires (e.g., Bernat et al., 1998; the present study) to telephone interviews (e.g., Finkelhor & Dziuba-Leatherman, 1994) to structured face-to-face interviews (e.g., Copeland et al., 2007), differently affecting respondents’ feelings of confidentiality and subsequent answering behavior. In order to reach robust conclusions, especially with regard to young children, replication in large epidemiological samples will be needed.
Until we have acquired a broader base of evidence, our conclusion is that we should take a broad-spectrum approach with regard to prevention efforts, with some extra attention for older children. It appears important not to stick to prevention programs only for groups of children who are traditionally viewed as vulnerable (e.g., inner-city children). In order to reach large groups of children, teachers at primary schools would be appropriate providers of information on safety in, for example, traveling from home to school and interacting with others. Although we can attempt to make children aware of some safety risks, we cannot protect them from all types of exposure. Therefore, secondary prevention (i.e., prevention of the development of psychopathology) is of high importance. While the sudden loss or injury of a loved one was reported frequently in our sample, health care providers have an important role to play. For example, while most of the time their attention goes out to severely ill or dying patients, hospital staff should be aware of possible psychological effects in the children who are attached to these persons, and refer them to mental health professionals when necessary.

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References


