

# Teacher-Delivered Resilience-Focused Intervention in Schools With Traumatized Children Following the Second Lebanon War

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*The 2006 Lebanon War exposed children in the north of Israel to daily rocket attacks. To cope with the massive psychological needs, a teacher-delivered protocol focusing on enhancing personal resilience was implemented. Children were assessed for risk factors, symptoms, and adaptation before the 16-week program (Time 1; n = 983) and after its completion (Time 2; n = 563). At a 3-month follow-up (Time 3; n = 754) children were assessed together with a waiting-list comparison group (n = 1,152). Participating children showed a significant symptom decrease at Time 2 and significantly fewer symptoms than the control group at Time 3. Six or more risk factors were associated with greater symptoms and parental concern about the child's adaptive functioning. Teachers are valuable cost-effective providers for clinically informed interventions after mass trauma and disaster.*

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During the Second Lebanon war (July 2006), Hezbollah delivered about 4,000 rockets to the populated areas in the north of Israel, killing 44 civilians and wounding hundreds, causing fires and severe damage to civilian property. During the war, which occurred during the summer vacation, entire families spent a great part of their days in bomb shelters.

Experiencing traumatic events associated with war and its aftermath affects the mental health of individuals and communities. Psychiatric problems such as posttraumatic stress disorder (PTSD), anxiety, and depression have been identified among youth exposed to war and terrorism worldwide (Laor et al., 1997; Laor, Wolmer, Spirman, & Wiener, 2003; Lonigan, Phillips, & Richey, 2003).

Examining 80 disaster events, Norris, Byrne, Diaz, and Kaniasty (2001) found that school-age children showed more severe impairment than adults. Following disaster exposure, many

children also display negative effects in the area of cognition including deficits in memory and learning ability, deterioration in school performance (Pynoos & Nader, 1988), and their risk for subsequent development of psychopathology is higher (Schwartz & Perry, 1994; Van der Kolk, 1989).

In the case of a mass disaster, the high prevalence of post-disaster psychopathology among children becomes a critical public health problem requiring the implementation of cost-effective innovative approaches to mitigate suffering and to swiftly rehabilitate functioning. Schools have several advantages as sites for implementation of postdisaster interventions. First, school-based programs cope with disaster survivors' reluctance to seek help. Children's routine attendance at school produces higher compliance rates (Lindy, Grace, & Green, 1981; Schwartz & Kowalski, 1992). In addition, symptoms such as attention difficulties and behavioral problems, tend to appear specifically in the school setting (Pfefferbaum, 1997; Wolmer, Laor, Dedeoglu, Siev, & Yazgan, 2005; Wolmer, Laor, & Yazgan, 2003; Yule & Williams, 1990). The familiar and intensive teacher-student relationship allows for immediate feedback and follow-up, avoiding undesirable stigma of being singled out for special treatment (Klingman, 1993; Wolmer et al., 2003).

School-based interventions mobilize various aspects of a child's natural environment, a critical postdisaster coping tool (Vernberg, La Greca, Silverman, & Prinstein, 1996). Traumatized children appreciate talking to others with similar experiences and discovering that they respond appropriately to the event (Vernberg & Vogel, 1993; Yule & Williams, 1990). In addition, engaging the children within the classroom environment with a well-known set of rules and routines, in a normative context, and at a developmentally appropriate level, conveys a message of normalcy (Klingman, 1993; Wolmer et al., 2003).

School-based interventions with different methodologies can be effective following mass trauma. In a pioneer report of postdisaster school-based psychotherapy interventions, Galante and Foa (1986) found that seven monthly sessions were effective in reducing post-traumatic symptoms of children exposed to an earthquake. A similar approach following a major earthquake in Armenia resulted in a significant decrease in PTSD symptoms (Goenjian, 1993) that prevented deterioration in depressive symptoms (Goenjian et al., 1997). Layne et al.'s (2008) integrative program in post-war Bosnia consisted of schoolwide dissemination of psychoeducation and coping skills, specialized intervention for traumatized adolescents, and referral for community-based mental health services.

Chemtob and colleagues implemented a two-phase intervention (Chemtob, Nakashima, & Hamada, 2002). Phase I randomized children to either group or individual intervention and was delivered by trained school counselors and a social worker. Phase II was individual intervention provided by mental health professionals (Chemtob, Nakashima, & Carlson, 2002). Saltzman, Layne, Sternberg, Arslanagic, and Pynoos (2003) implemented a nonrandomized school-based trauma/grief group intervention conducted

postwar by mental health professionals. These approaches are cost-ineffective and inappropriate for reaching masses of children. A study following the 1999 earthquake in Turkey showed that disaster calls for whole-school revitalization including training of teachers by mental health professionals to provide efficient clinical intervention (Wolmer et al., 2003). Although teachers and children may be traumatized by the same disaster, most teachers are willing to enroll in the training process and accept a leadership position once they understand their role as educators and are assured that they will be properly supported. Teachers are trusted figures in the child's life, who provide a sense of physical security and offer factual information about disasters and their consequences (Vernberg et al., 1996).

In this systemic-ecological approach (Laor et al., 2003) applied in Turkey with children aged 6–13 severely exposed to the 1999 earthquake, teachers were trained to employ a supervised structured protocol of eight 2-hour classroom sessions, reaching the whole school population within one month (Wolmer et al., 2003). Through the vehicle of an imaginary character who writes letters to the children and invites them to share, discuss, and process their experiences, the original intervention provided psychoeducation (e.g., explanation of symptoms and their course, coping strategies), narrative techniques, play activities, and ongoing documentation in personal diaries for reprocessing traumatic experiences in eight school sessions delivered by homeroom teachers. Contents included restructuring traumatic experiences, dealing with intrusive thoughts, establishing a safe place, learning about the earthquake, mourning the ruined city, controlling body sensations, confronting posttraumatic dreams, understanding reactions in the family, coping with loss, anger, guilt, and death, extracting life lessons, and planning for the future.

In a follow-up study of this intervention, we found a significant immediate symptomatic decrease in children exposed to the disaster. This improvement continued over the course of 3 years in the assessed domains: posttrauma, grief, and dissociation (Wolmer et al., 2005). Most importantly, compared to a matched control group, the participants displayed better academic, social, and behavioral adaptation 3 years after the disaster.

Following continuous terrorist attacks in Israel since September 2000, we modified the contents of the intervention and implemented it to focus on resilience enhancement in addition to trauma alleviation. Several intervention programs have been developed in Israel but very few have been subjected to empirical evaluation. Berger, Pat-Horenczyk, and Gelkopf (2007) documented a significant symptomatic reduction in a controlled study of a different model of teacher-delivered intervention. Their intervention provided psychoeducational material, cognitive-behavioral skills, meditative practices, bioenergy exercises, and reprocessing traumatic experiences by using art therapy and narrative techniques.

For the present study, due to the school system's demands that our protocol refer only to adaptive routine, without reference to what they viewed as potentially regressive, we further adapted

the protocol to strengthen adaptive coping and socioemotional competence.

We hypothesized that following the intervention, participating children would display fewer symptoms at Time 2 compared to the baseline (pre- and post-) and at Time 3 compared to a waiting-list comparison group (cross-sectional control).

## METHOD

### Participants

Participants were 983 Israeli children (51.4% boys) between the ages 8 and 12 (Grades 3–6) studying in 19 schools located in two cities in northern Israel. Schools elected to participate were those with the closest exposure to rocket attacks during the second Lebanon War. Although all children were exposed to life-threatening experiences, less than 1% had been exposed to injured or dead people or reported injuries in their close circle.

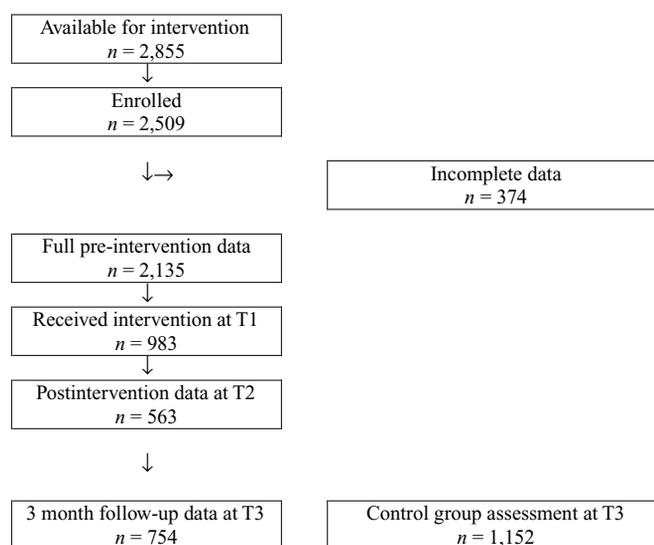
All children in the classroom participated in the intervention, but only those whose parents signed an informed consent form were assessed. The baseline measurement (Time 1: 5 months after the war) was completed by 983 students, 563 (57%) completed the postintervention measurement (Time 2: 9 months after exposure) and 754 (77%) the follow-up measurement (Time 3: 12 months after exposure). The differences in sample size are due to administrative difficulties that prevented entire classes from participating at Time 2 or Time 3. Without these classes, attrition was 10% and 5% in Time 2 and Time 3, respectively. No significant differences appeared between participants completing measures at Time 1, Time 2, and Time 3 (all  $p$ s > .05). In addition, a control group consisting of 1,152 students with similar exposure and age completed their baseline assessment at Time 3, before initiating the intervention (Figure 1).

### Measures

We constructed three brief questionnaires to collect data at Time 1 and Time 2 from multiple sources relating to the children's adaptation and responses to the war.

The children's questionnaire (see Table 1) contained eight items concerning fears, stress, and mood and five items derived from the Child PTSD Reaction Index (Pynoos et al., 1987) that in a pilot study (Laor & Wolmer, 2011) were highly associated with the total scale ( $r = .90$ ,  $p < .001$ ,  $n = 253$ ). Scores on all items ranged from 1 (*very little*) to 5 (*very much*) and the internal consistency of both scales was satisfactory (Cronbach's  $\alpha$  at Time 1 = .72).

The parents' questionnaire included 14 stressful life events that the child or the family might have experienced in the 2-year period prior to the war (e.g., severe illness in the family, hospitalization, car accident, divorce/separation, exposure to terrorist attacks, witnessing injured or dead people, and physical injuries). Previous studies demonstrated the additive effect of stressful life events in explaining children's response to traumatic exposure (Wolmer et al., 2003).



**Figure 1.** Subject flow and sample sizes available for analysis.

Therefore, we defined a risk index as the sum of the life events reported. The parents' questionnaire also included parental concern with children's functioning in six areas: school performance, social functioning, family relations, stress/anxiety, health, and personal mood. The answers ranged from 1 (*not concerned at all*) to 4 (*very concerned*).

The teachers' questionnaire evaluated satisfaction with the classroom atmosphere. The scale comprised eight questions (e.g., "To what extent do you find it pleasant to teach the class?") rated on a 4-point Likert scale ranging from 0 (*not at all*) to 4 (*a lot*). The internal consistency for this scale was satisfactory (Cronbach's  $\alpha$  at Time 2 = .79,  $n = 20$ ).

In addition, at Time 3 children from both the intervention and control groups were administered the UCLA PTSD Reaction Index (Steinberg, Brymer, Decker, & Pynoos, 2004). This self-report scale consists of 21 items derived from the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV*; American Psychiatric Association, 2000) PTSD criteria of symptoms (intrusive recollection, avoidance/numbing, and hyperarousal) and associated features (e.g., new fears, guilt). Respondents indicated the frequency with which they experienced each symptom during the last month on a 5-point Likert scale ranging from 0 (*not at all*) to 4 (*a lot*). The internal consistency for this scale was highly satisfactory (Cronbach's  $\alpha$  at Time 3 = .90,  $n = 754$ ). The authors reported the scale's high reliability and validity, with a cutoff of 38 having a sensitivity of .93 and specificity of .87 in detecting PTSD (Steinberg et al., 2004). In addition, items coded 3 and 4 were counted as symptoms to classify the children according to *DSM-IV* criteria as possible (clusters B, C, and D) or partial (only two clusters) PTSD.

**Table 1.** Factor Loadings for the Children's Questionnaire.

Variables	Factor	
	1	2
Stress and mood		
Friends include you in games.	.50	.07
Usual mood.	.70	.12
Have scary thoughts.	.56	-.39
Scared that something will happen to you or family.	.30	-.44
Usually tense or scared.	.57	-.47
Sleep at night.	.57	-.17
How often have pains.	.60	-.21
Cry sometimes.	.59	-.30
PTSD symptoms		
Become worried or scared when think about events.	-.12	.75
Have thoughts about events even when not want too.	-.22	.69
During events felt worried, scared, frightened; couldn't speak or cry.	-.08	.75
Want to get away from reminders of what happened.	-.08	.67
Since event, start doing things used to do when were little.	-.12	.47

Note. PTSD = Posttraumatic stress disorder.

## Procedure

The program was approved by the institutional review board of the Ministry of Education. Parents signed a consent form allowing their children to participate in the program and complete questionnaires.

The children completed the questionnaires with the assistance of the teacher and the school counselor. Parents received the questionnaires in their homes and returned them to the school counselor who assigned a code for each child to ensure anonymity.

The protocol consisted of fifteen 45-minute manualized didactic modules delivered weekly, and rather than focusing on clinical interventions aiming at the elimination of pathology, it espoused a coping-enhancement framework. It tackled topics such as working through positive and negative experiences, stress management and control of bodily tension, affective regulation and processing (i.e., dealing with sadness and anger), attention control, identification and correction of negative thoughts, using humor as well as other coping and social-emotional competencies.

The protocol's structure is based on a similar one focused on trauma (Wolmer et al., 2003). Contents are presented through letters sent by Adam, an imaginary character, in which he shares with the students his experiences, verbalizes complex feelings, guides the children through the process of elaboration, and proposes activities to learn and internalize the skills learned. To ensure protocol fidelity, teachers participate in weekly preparatory and supervisory meetings. Although the program aims to alleviate children's traumatic experiences, its contents are drawn also from stressful daily

life events such as examinations or interpersonal conflicts. As such, skills developed during the program continue to be assimilated under the teacher's guidance throughout the school year (information concerning manual availability can be obtained from the authors).

## Data Analysis

The internal consistency of the scales was computed with the Cronbach's  $\alpha$  procedure at the first possible assessment. Principal components factor analysis with varimax rotation explored the factorial design of the children's scale. Regression analyses studied how stressful life events explained children's symptoms. One-way analysis of variance (ANOVA) followed by Duncan post-hoc tests explored how risk factors (independent variable) affected child's and parents' reports (dependent variables). Multivariate analysis of variance with repeated measures assessed the symptomatic changes following the program according to gender and life events as well as the teachers' reports. One-way multivariate analysis of covariance (MANCOVA) compared the PTSD domains of participating and control children while controlling for three demographic variables. Significance level was set at  $p < .05$  for all tests. For repeated measures analyses, only participants present at both assessments were included.

## RESULTS

Factor analysis of the children's questionnaire distinguished between the stress/mood and the trauma factors. The two unweighted

**Table 2.** Children's Symptoms and Parent's Concern by Time and Stressful Life Event

Number of stressful life events	<i>n</i>	Preintervention						Postintervention					
		Stress/Mood		PTSD Symptoms		Parent's concern		Stress/Mood		PTSD Symptoms		Parent's concern	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
None	205	3.85	0.73	1.19	0.98	1.40	0.60	3.91	0.74	0.76	0.79	1.41	0.69
1	130	3.86	0.69	1.42	0.96	1.51	0.65	4.03	0.68	0.70	0.73	1.43	0.58
2	102	3.66	0.70	1.54	1.04	1.63	0.63	3.79	0.74	0.88	0.80	1.53	0.61
3	47	3.59	0.88	1.83	1.02	1.63	0.66	3.64	0.87	1.03	0.88	1.33	0.32
4	14	3.50	1.20	1.60	1.12	1.89	0.61	3.79	0.91	0.66	0.70	1.54	0.31
5	10	3.01	0.90	1.56	0.91	2.31	0.89	3.60	0.87	1.00	1.25	1.67	0.36
6+	5	2.53	0.92	2.40	1.03	2.04	0.64	3.66	0.97	0.96	0.79	1.33	1.67
Total	513	3.76	0.77	1.41	1.01	1.48	0.61	3.66	0.97	0.80	0.80	1.44	0.60

Note. PTSD = Posttraumatic stress disorder.

scales derived explained 23.1% and 19.9% of the variance (eigenvalues = 4.01 and 1.57), respectively (Table 1).

Simple linear regression analyses performed at Time 1 found that stressful life events explained a small proportion of the variance of children's stress/mood,  $R^2 = .019$ ,  $F(1, 790) = 15.58$ ,  $p < .001$ , PTSD symptoms,  $R^2 = .024$ ,  $F(1, 783) = 19.26$ ,  $p < .001$ ; and parental concern,  $R^2 = .038$ ,  $F(1, 844) = 33.45$ ,  $p < .001$ . Children with five or more events reported more stress/mood problems compared to children with four or fewer events,  $F(6, 965) = 4.50$ ,  $p < .001$ ,  $\eta^2 = .03$ . Children with six or more events reported more PTSD symptoms than those with 0–2 and 4–5 events,  $F(6, 950) = 2.99$ ,  $p < .001$ ,  $\eta^2 = .02$ . Parents of children with six or more events reported greater concern about the child's adaptation compared to those with one or no events,  $F(6, 868) = 8.78$ ,  $p < .001$ ,  $\eta^2 = .06$  (Table 2).

At baseline, the symptom level of boys was lower than that of girls for the Stress/Mood,  $M = 3.92$ ,  $SD = 0.70$  and  $M = 3.62$ ,  $SD = 0.81$ , respectively;  $F(1, 973) = 37.9$ ,  $p < .001$ ,  $\eta^2 = .04$ ; and the PTSD scales,  $M = 1.18$ ,  $SD = 0.93$  and  $M = 1.73$ ,  $SD = 1.03$ , respectively;  $F(1, 973) = 75.2$ ,  $p < .001$ ,  $\eta^2 = .07$ . No significant difference appeared in regard to parental concern,  $F(1, 973) = 1.75$ ,  $ns$ .

The MANOVA with Repeated Measures yielded a significant decrease (Time 1–Time 2) in both symptom domains: stress/mood,<sup>1</sup>  $M = 3.76$ ,  $SD = 0.77$  and  $M = 3.88$ ,  $SD = 0.75$ ;  $F(1, 510) = 16.63$ ,  $p < .001$ ,  $\eta^2 = .03$ ; and PTSD,  $M = 1.41$ ,  $SD = 1.01$  and  $M = 0.80$ ,  $SD = 0.80$ ;  $F(1, 512) = 223.23$ ,  $p < .001$ ,  $\eta^2 = .44$ . No significant differences appeared in regard to the parental concern,  $M = 1.48$ ,  $SD = 0.61$  and

$M = 1.44$ ,  $SD = 0.60$ ;  $F(1, 319) = 2.29$ ,  $ns$ . The decrease in PTSD symptoms was more pronounced for fourth- and fifth-grade children (than third grade), at Time 1:  $M = 1.46$ ,  $SD = 1.02$ ;  $M = 1.37$ ,  $SD = 0.95$  and  $M = 1.46$ ,  $SD = 1.05$ , respectively; at Time 2:  $M = 0.71$ ,  $SD = 0.76$ ;  $M = 0.76$ ,  $SD = 0.74$ , and  $M = 1.06$ ,  $SD = 0.91$ , respectively;  $F(2, 510) = 14.51$ ,  $p < .001$ ,  $\eta^2 = .05$ ; and for girls (reaching similar levels as for boys at Time 2), at Time 1:  $M = 1.69$ ,  $SD = 1.03$  and  $M = 1.15$ ,  $SD = 0.92$ , respectively; at Time 2:  $M = 0.67$ ,  $SD = 0.83$  and  $M = 0.93$ ,  $SD = 0.75$ , respectively;  $F(1, 510) = 11.16$ ,  $p < .001$ ,  $\eta^2 = .02$ . No significant difference appeared between the sites.

A significant interaction appeared between the child's events and the changes in Stress/Mood,  $F(6, 504) = 2.74$ ,  $p = .01$ ,  $\eta^2 = .03$ , and PTSD symptoms,  $F(6, 506) = 2.97$ ,  $p = .01$ ,  $\eta^2 = .04$  (Table 2). One-way ANOVA revealed that the reported differences at Time 1 disappeared at Time 2 ( $p > .05$ ). One-way ANOVA with repeated measures also showed a significant improvement in teachers' satisfaction with the classroom atmosphere after the intervention, Time 1:  $M = 2.94$ ,  $SD = 0.32$  and Time 2:  $M = 3.04$ ,  $SD = 3.90$ ;  $F(1, 19) = 6.44$ ,  $p = .01$ ,  $\eta^2 = .33$ .

The intervention and control groups did not differ in demographic variables such as gender distribution, car accidents, sickness in the family, or death of someone close,  $\chi^2(1, N = 2,788) = 3.30$ ;  $\chi^2(1, N = 2,127) = 0.15$ ;  $\chi^2(1, N = 2,129) = 0.05$ ; and  $\chi^2(1, N = 2,132) = 4.82$ , respectively, all  $ns$ . However, they differed in age and parental divorce,  $\chi^2(1, N = 3,186) = 270.1$ ,  $p < .001$ ; and  $\chi^2(1, N = 2,128) = 9.79$ ,  $p < .001$ , respectively. Children in the intervention group were slightly older and had more divorced parents (12% vs. 8%, respectively). The intervention group also reported experiencing slightly more terrorist attacks,  $M = 0.82$ ,  $SD = 1.18$  and  $M = 0.72$ ,  $SD = 1.11$ ;  $t(1852) = 1.98$ ,  $p = .04$ ,  $d = .09$ .

<sup>1</sup> Due to direction of the items in the Stress/Mood scale, a decrease in symptoms is marked by a higher mean score in the second measurement.

**Table 3.** Posttraumatic Stress Disorder Cluster Means at Follow-Up by Group

Symptoms	Group				Statistics	
	Intervention <i>n</i> = 754		Control <i>n</i> = 1,152			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>F</i>	$\eta^2$
Reexperiencing	0.80	0.82	1.18	0.91	84.14	.04
Avoidance/numbing	0.67	0.70	0.98	0.75	81.70	.04
Hyperarousal	0.94	0.74	1.25	0.84	65.49	.03
Associated features	0.84	0.88	1.15	1.02	44.29	.02
Total score	13.90	11.80	19.86	12.91	101.03	.05

Note. All *F* tests have *df* of 1 and 1,858 and statistically significant at  $p < .001$ .

At Time 3, a one-way MANCOVA assessed the four domains of PTSD symptoms (intrusive recollection, avoidance/numbing, hyperarousal, and associated features) of the intervention and the comparison groups. The intervention group reported significantly lower symptoms in the four domains and in the total score, even when controlling for age, parental divorce, and terrorist attacks (Table 3).

At Time 3, fewer children in the study than the comparison group met criteria for (a) cutoff PTSD: 5% ( $n = 38$ ) and 10% ( $n = 111$ ),  $\chi^2(1, N = 1,906) = 13.36, p = .01$ ; (b) possible PTSD 6% ( $n = 48$ ) and 9% ( $n = 106$ ),  $\chi^2(1, N = 1,906) = 4.93, p = .01$ ; and (c) partial PTSD: 18% ( $n = 135$ ) and 31% ( $n = 361$ ),  $\chi^2(1, N = 1,906) = 42.71, p = .01$ .

## DISCUSSION

This pre- and poststudy with a cross-sectional waiting-list comparison group illustrates the effect of a unique kind of teacher-delivered intervention focusing on resilience enhancement, designed to relieve trauma symptoms in children living in northern Israel after the 2006 war. The study was based on a multi-informant repeated measures design in which children reported on symptoms, parents reported on children's adaptation, and teachers reported on classroom atmosphere both preceding and subsequent to intervention.

Congruent with expectation, significant improvements occurred in children's stress/mood and posttrauma 3 months after termination of the intervention. More importantly, participants reported significantly lower PTSD symptoms and fewer children met criteria for possible and partial PTSD compared to a matched waiting-list comparison group one year postwar. Although the between-group effect sizes at Time 3 were generally small (2–5%), they are relevant and clinically meaningful. Therefore, although it is known that time passage has an effect on the decrease of PTSD symptoms (Wolmer et al., 2005), the use of a delayed posttest comparison control group helps bolster the view that the

intervention impacted outcomes and that the effect of time cannot be the sole explanation. Regression to the mean could also confound the results of the study.

In contrast to our hypothesis, children's adaptation as reported by parents did not improve significantly. Perhaps a longer passage of time is required for the effects of the intervention to become noticeable within the family context. Our study showing improved adaptation following an earthquake was performed 3 years after the intervention (Wolmer et al., 2005). Alternatively, it may also be that parents had low levels of concern at Time 1 (floor effect). A mean score of 1.4 on a scale ranging from 1 to 4 might point in that direction. Children's resumption of school activities immediately after the war and the structure thereby assumed may have facilitated their overall adaptation, even if it did not necessarily affect symptom levels. In addition, the return to routine activities could have given parents the impression of preserved adaptation and masked children's symptom levels for parents. These results are in line with Laor et al. (1997) who found normal adaptation despite significant symptoms in young children 30 months after exposure to missile attacks. Studies have demonstrated that different informants may have different perspectives on the child's symptomatology (Lanktree et al., 2008) leading to the underreport of parents in regard to children's symptoms after traumatic exposure (Ladakakos, 2000). This phenomenon makes paramount the information obtained directly from children.

In line with previous studies, evaluation of the impact of exposure to numerous stressful life events at Time 1 revealed the cumulative effect of risk to children's well being (Williams et al., 2007; Wolmer et al., 2003). In this study, five or more stressful life events were associated with aggravated anxiety and general negative mood, children with six or more events showed more severe PTSD symptoms, and parents of children with six or more events reported greater concern about the child's functioning. This suggests that experiencing numerous stressful life events may increase the vulnerability to develop posttraumatic symptoms following traumatic exposure. Previously we reported that children with four or more traumatic episodes in the past displayed no significant symptomatic changes after a teacher-delivered intervention (Wolmer et al., 2003). This finding could not be replicated in the current study because of the small number of children with more than three past traumatic events (0.4%). However, we recommend the early referral of these children to more specialized clinical interventions in parallel to the teacher-delivered program.

In addition, the number of events affected children's improvement after the intervention. PTSD symptoms improved most prominently in children with six or more events, and stress/mood symptoms improved most prominently in children with five or more events. Therefore, the teacher-delivered program appeared to effectively meet the needs of the most vulnerable children. However, the small sample size of children with five or more events may produce unstable parameter estimates, requiring caution when interpreting these findings.

Teacher-delivered intervention following large-scale traumatic events is a relatively new approach to deal with massive psychological casualties. The method evaluated here is based on rehabilitation of the roles of both educators and students, empowerment of teachers as agents of change and multipliers of professional resources, and development of detailed didactic protocols. This allows for the bio-psycho-social containment of traumatic experience and the screening for pathology and adaptive functioning in the school setting that becomes a community revitalization center (Wolmer et al., 2003). From a public health systemic-ecological perspective, teacher-delivered interventions allow flexible access that replaces referral with outreach, suitable setting that replaces office with school, proper format that replaces individual with group, efficient process that replaces direct care with clinical mediation, adapted technology that replaces pathology-based with a coping enhancement approach, and a platform to integrate the family.

Following traumatic events, various models of school-based interventions may be implemented based on parameters such as scope and severity of the event, resilience of the population, available resources, and system preparedness. Options include group psychotherapy for the most affected children (Chemtob et al., 2002; Goenjian et al., 1997; Saltzman et al., 2003), classroom teacher-delivered activation (Berger et al., 2007; Wolmer et al., 2003), and/or school revitalization engaging the whole community (Laor et al., 2003).

In countries with high risk and perhaps in others as well, the resilience-building protocol could be integrated as part of the regular educational curriculum. We employed such a preventive approach in southern Israel before massive rocket attacks during Operation Cast Lead and the results support the program's effectiveness (Wolmer, Hamiel, & Laor, 2011).

Both trauma- and resilience-focused interventions generate a similar decrease in posttraumatic symptoms, although our trauma-focused intervention was applied after a more severe disaster (earthquake vs. rocket attacks), a longer time after the event (6 months vs. 2 months), and during a shorter period (4 weeks vs. 16 weeks). Apparently, the normalization of psychological responses within a containing safe environment created by the educators, coupled with the enhancement of adaptive coping skills that were generalized to facilitate the mitigation of reexperiencing (attention, image control), avoidance (active coping), and hyperarousal (stress management), allowed the children to process dreadful experiences and move forward with their development. Further research is required to elucidate the specific short- and long-term contributions of these two models.

## Limitations

The first limitation of the study concerns the lack of a randomized control group. Working under disaster conditions requires the swift implementation of interventions within operating and living

systems. Unfortunately, despite our request, no permission was granted to include a randomized control group in the initial phases of the study or to use trauma-focused protocols. At a later stage, authorization was granted to include a waiting-list control group matched by age, location, and exposure. Of note, children in the intervention group were slightly older, had parents who were more likely to be divorced and experienced slightly more terrorist attacks.

Second, we lacked prewar information concerning the children. This is an almost inherent condition of postdisaster empirical studies.

Third, it would have been preferable to employ more common instruments to assess children's symptoms. The Stress/Mood scale and the five items of the Child PTSD Reaction Index were the result of a compromise to assess a large group of young children with easily answerable questions under the supervision of school counselors. For the follow-up assessment, we were granted permission to use the full version of the UCLA PTSD scale. Unfortunately, we could not add clinical evaluations to further validate our findings.

Fourth, the sample of teachers reporting on the changes in classroom atmosphere was small and somewhat biased due to their participation in the program. Nevertheless, the statistical analysis rendered significant results and corroborated qualitative data gathered from many teachers.

Future studies may strengthen our findings and advance knowledge by identifying validated specific components of the intervention, disaggregating and assessing the various resilience functions, recording the children's short-term or medium-range academic performance, and studying the cultural specificity of the protocol.

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