Preventing Children's Posttraumatic Stress After Disaster With Teacher-Based Intervention: A Controlled Study

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Objective: The psychological outcomes that the exposure to mass trauma has on children have been amply documented in the past decades. The objective of this study is to describe the effects of a universal, teacher-based preventive intervention implemented with Israeli students before the rocket attacks that occurred during Operation Cast Lead, compared with a nonintervention but exposed control group. **Method:** The study sample consisted of 1,488 students studying in fourth and fifth grades in a city in southern Israel who were exposed to continuous rocket attacks during Operation Cast Lead. The intervention group included about half (53.5%) of the children who studied in six schools where the teacher-led intervention was implemented 3 months before the traumatic exposure. The control group (46.5% of the sample) included six schools matched by exposure in which the preventive intervention was not implemented. Children filled out the UCLA-PTSD Reaction Index and the Stress/Mood Scale 3 months after the end of the rocket attacks. **Results:** The intervention group displayed significantly lower symptoms of posttrauma and stress/mood than the control group ($p <$ .001). Control children had 57% more detected cases of posttraumatic stress disorder (PTSD) than participant children. This difference was significantly more pronounced among boys (10.2% versus 4.4%) and less among girls (12.5% versus10.1%). **Conclusions:** The teacher-based, resilience-focused intervention is a universal, cost-effective approach to enhance the preparedness of communities of children to mass trauma and to prevent the development of PTSD after exposure. J. Am. Acad. Child Adolesc. Psychiatry, 2011;50(4):340–348. **Key words:** teacher-based intervention, school, disaster, PTSD

Duve uring the winter of 2008–2009, a three-week armed conflict in the south of Israel and the Gaza Strip took place—Operation Cast Lead. Hundreds of rocket and mortar attacks were launched at Israeli civilian populations. Whole families spent hours and days in shelters, experiencing a continuous existential threat.

The psychological effects that exposure to mass trauma has on children have been amply documented in the past decades. Natural and human-made traumatic events display a great impact on the well-being of children in the areas of health, cognition, and mental health.[1-4]

The growth in professional and social awareness in regard to these effects has been accompanied by efforts to alleviate the pathological responses, which, in some children may last for years.[4-9] The larger the population affected by the traumatic event, the greater the need to implement evidence-based group interventions that are cost effective and reach masses of affected individuals, with similar professional resources.

Postdisaster group interventions are generally implemented by trauma expert clinicians. However, when massive disasters result in thousands of affected individuals, any society will face limited clinical resources, overwhelming the mental health system. Therefore, endorsing a public health approach based on ecological and systemic principles is in order, one based on professional mediators available for training and responsible for the implementation of clinically informed programs.[10] For children, teachers are

undoubtedly the main natural mediator, operating within the community (see Jaycox et al. for a recent teacher-delivered pilot program for children exposed to trauma).[11]

Such an approach was tested for the first time in Turkey after a major earthquake that resulted in more than 30,000 deaths.[12] Results of this twice-a-week, eight-session, trauma-focused intervention showed an immediate significant decrease of approximately 50% in the prevalence of severe posttraumatic symptoms and long-term (3 years) better adaptive functioning compared with a nontreated control group.[13]

The same clinically informed and ecological principles were used to develop a universal teacher-based intervention for thousands of Israeli children affected by the Second Lebanon War.[14] The protocol used in this model focused on resilience building rather than directly addressing trauma symptoms (see Method). Results of this intervention revealed a significant symptom decrease. Moreover, compared with a waiting list control group, the percentage of children with moderate and severe symptoms of posttrauma was 50% lower in participating children.

Clinical research under conditions of trauma and disaster is a complex endeavor. It requires assessment efforts in parallel to the implementation of clinical relief, overcoming the resistance of individuals and institutions. Difficulties intensify when clinical researchers wish to endorse a prospective approach with communities at risk to be traumatically exposed. Such approach invites an "inoculation" perspective, one that prepares the individual to face the traumatic exposure, process it effectively, shorten the period of rehabilitation, and minimize the damage while emphasizing growth and development.

Stress Inoculation

In addition to its known negative consequences, stress may potentially enhance future competence, provided that the type and degree of stress are not excessive. Parker et al. stated that moderate stress, when overcome, provides a challenge that produces competence in the management of, and increased resistance to, future stressful circumstances.[15]

By providing training in effective coping skills before exposure, interventions within a stress inoculation training (SIT) approach aim at preparing individuals to cope more favorably with stressful events while enhancing performance.[16]

Usually, the process starts with an educational phase that helps individuals to better understand the nature of stress and its effects, and increases a sense of predictability and control by providing accurate expectations regarding the stress environment and the stress reactions. This is followed by a skill acquisition and rehearsal phase to develop and practice a repertoire of coping skills to reduce anxiety and enhance the capacity to respond effectively in the stressful situation. Finally, the coping skills are applied in conditions that approximate the criterion environment across increasing levels of stressors (e.g., imagery, behavioral rehearsal, modeling, role playing, and graded in vivo exposure).[17]

Developmental studies with primates suggest that the hypothalamic–pituitary–adrenal (HPA) axis may provide a neural basis for programming stress resistance in the developing child through manageable exposure to moderately stressful events.[15] This exposure seems to temporarily activate the HPA axis but permanently alter neuroendocrine sensitivity to subsequent stressors by fostering the acquisition of coping strategies that safeguard against the development of stress-related disorders.

Research with stress inoculated monkeys shows that they more readily self-regulate arousal and engage in more exploration than noninoculated monkeys, apparently stimulating the development of larger prefrontal cortical volumes affecting cognitive control of behavior, emotional regulation and curiosity in humans and monkeys.[18]

Adults have been found to cope better with stressful events such as spousal loss, illness, and major accidents if they have previously coped with stressors in childhood.[19] Therefore, in humans, too, stressful events that are not overwhelming, but challenging enough to elicit emotional activation and cognitive processing, may make subsequent coping efforts more efficient. A meta-analysis of 37 studies showed SIT to be effective to reduce performance and state anxiety, and enhance performance under stress.[16]

SIT in Schools

When considering the essential elements of immediate and mid-term mass trauma interventions, Hobfoll et al. regarded techniques based on SIT as a public health tool.[20] The school setting is a critical factor within such a public health approach. For example, school counselors could emphasize proactive interventions that promote

TABLE 1 Description of Schools in the Intervention and Control Groups

School	Group	N	% Girls	SES	Religiosity
I1	Intervention	155	49.7%	High	Secular
I2	Intervention	68	36.8%	Heterogeneous	Religious
I3	Intervention	170	56.5%	Heterogeneous	Religious
I4	Intervention	89	53.4%	Low	Secular
I5	Intervention	80	46.3%	High	Secular
I6	Intervention	186	47.3%	Heterogeneous	Secular
C1	Control	140	44.3%	High	Secular
C2	Control	140	56.1%	Heterogeneous	Secular
C3	Control	89	51.7%	Low	Religious
C4	Control	128	52.8%	Heterogeneous	Secular
C5	Control	49	44.9%	Heterogeneous	Religious
C6	Control	186	48.9%	High	Secular

Note: SES = socioeconomic status.

children's preparedness for coping with daily stress and major life events, expecting that inoculation training for a specific stress may be transferred unto others.[21] In this study, we view SIT in its narrow scope, implemented before rather than after traumatic exposure.

We have witnessed several times the experience reported by Chemtob et al. that the dominant attitude following a disaster is to "get the disaster behind us," an attitude that may leave the needs of children whose recovery has not proceeded apace unrecognized and unaddressed.[22]

The objective of this study is to describe the effects of a universal, teacher-based, preventive intervention implemented with Israeli students before the rocket attacks that occurred during Operation Cast Lead, compared with a nonintervention but exposed control group. The sporadic experience of mortars and the stress of an imminent military operation that might result in massive bombardment represent a moderate stressor process through the intervention within a SIT approach. To the best of our knowledge, this is the first report of such a preventive approach with children exposed to severe trauma. Our hypothesis was that, 3 months after the rocket attacks, children in the intervention group would report lower levels of symptoms and fewer cases of possible posttraumatic stress disorder (PTSD).

METHOD

Participants

The study sample consisted of 1,488 Jewish students studying in fourth and fifth grades (55 classrooms) in a city in southern Israel exposed to continuous rocket attacks during Operation Cast Lead. The intervention group included half (50.3%) of the children (n = 748, 50.5% boys, 43.7% in fourth grade) who studied in six schools where the teacher-led intervention was implemented before the traumatic exposure. These schools were selected by the local authorities according to location (those closer to the Gaza Strip) and potential collaboration (Table 1).

The control group included 740 children (49.7% of the sample; 49.8% boys, 56.2% in fourth grade) studying in six schools matched by location (to ensure similar exposure and socio-economic background) in which the preventive intervention was not implemented. The distribution of boys and girls was similar, but there were more children in fourth grade in the control group ($\chi^2 = 21.8$, df = 1, $p < .001$). One school in each group belongs to a neighborhood of low socio-economic status (SES), three are of heterogeneous SES, and two are of high SES. Two schools in the intervention group (n = 145, 20.5% of the subsample) and two schools in the control group (n = 126, 20.3% of the subsample) are religious. All children had been exposed to repeated daily sirens starting about 1 minute before the missiles hit, in which they had to find shelter and remain covered until the emergency ended. In both intervention and control schools, counselors provided support, but large-scale mental health interventions were not provided.

Measures

Children filled out two scales. The first was the UCLA-PTSD Reaction Index, a self-report scale with 21 items derived from the *DSM-IV* PTSD criteria of symptoms (Intrusive Recollection, Avoidance/Numbing and Hyperarousal) and Associated Features (e.g., new fears, guilt).[23] Children indicated how frequently they experienced each symptom during the last month on a

five-point Likert scale ranging from 0 (not at all) to 4 (a lot). The internal consistency for the Hebrew version of this scale was highly satisfactory (Cronbach's $\alpha = 0.90$, n = 754).[14] The recommended score of 38 was used as a cut-off for possible PTSD.[23]

The second scale, the Stress/Mood Scale, includes eight items concerning fears, stress and mood (e.g., "Different children are afraid of different things, do you have frightening thoughts?" "How stressed or afraid are you in general?") who showed satisfactory internal consistency in a previous study (Cronbach's $\alpha = 0.68$).[14] Also, information was gathered concerning children's school, grade, gender and religiosity (religious versus nonreligious school).

Procedure

Parents were asked by the city's Education Department to sign an informed consent form agreeing that their children will fill-out a self-report questionnaire to assess their needs after the rocket attacks. Parents in the control group were informed that their children will participate in the intervention at a later stage. All children in the study group participated in the intervention that started 9 months before the rocket attacks. However, only students whose parents signed the agreement form were assessed 3 months after the intervention. A Masters Degree–level mental health professional supervised the assessment in the classroom and clarified questions to the children. No difficulty appeared during the assessment. The study was approved by the Ministry of Education's institutional review board.

Intervention

Within a SIT framework, the type of skills training used varies according to the specific training requirements. However, it often includes modules focusing on cognitive control or cognitive restructuring techniques that train the individual to regulate negative emotions and distracting thoughts, and on relaxation training aimed at enhancing physiological control (awareness, muscle tension, breathing), rehearsed through the use of mental imagery.[16] These are in accordance with Zohar et al., who marked that the essence of acute distress management should be to help traumatized individuals contain and attenuate emotional reaction, regain emotional control, and restore interpersonal communications, and to encourage the return to full function and activity.[24]

Our manualized protocol consists of fourteen 45-minute didactic modules delivered weekly (Supplement 1, available online). It espouses a salutogenic framework rather than aiming at the elimination of pathology. School counselors received a 20-hour training and bi-weekly supervision. All teachers in the selected schools and grades received a 4-hour basic training and weekly meetings with these counselors

dedicated to preparation, supervision, and qualitative check of protocol fidelity. Supervisors monitored weekly protocol adherence and reported it as high. The classroom meetings were held during the weekly spot dedicated to the Life Skills Program that deals with structured lessons involving discussions with the students about their experience with developmental tasks, identity, sexuality, risk taking, and various life situations. Control schools continued with the regular curriculum. The process of program implementation starts with meetings with the school principal and the school staff to build working alliance and ensure necessary resources. Children are encouraged to share and exercise the coping skills learned with their families.

Session 1 provides psychoeducation and proposes a contract of respect and confidentiality. Sessions 2 to 5 deal with identifying emotions and working through positive and negative experiences, and identifying and balancing bodily tension (slow breathing and muscle relaxation). Sessions 6 and 7 focus on when and how to act inside (internal balancing, managing fears) or outside (actual coping, dealing with actual risks and challenges). Session 8 centers on identifying and balancing negative thoughts. Session 9 highlights the power of positive experiences and session 10 the effect of humor as coping and ways to control attention. Session 11 works with imagery to enhance the ability to make decisions, the feeling of internal balance and integrative rehearsal of coping skills. Session 12 deals with coping through empathic and assertive interpersonal communication. Session 13 concentrates on emotional processing and regulation of strong emotions (fear, anger and sadness). Session 14 emphasizes the power of the group and creating a vision for the future.

The contents of the intervention are introduced through letters sent by an imaginary character named Adam, who had gone through similar events. Through his letters, Adam shares with the students his experiences and skills learned, legitimizing and verbalizing complex feelings. Adam also guides the children and proposes activities to practice and internalize newly acquired skills.

Our approach supplements the traditional SIT, among others, with a view of teachers as "educators" (role transformation), an emphasis on processing basic emotions and on executive skills and attention regulation. More importantly, the intervention is led within frameworks that constitute a gradational mix of reality (teacher's instructions) and imagination (Adam's letters), on which children are invited to reflect critically. The contents of the program are drawn also from classroom stressful daily life events such as examinations or interpersonal conflicts. This way, skills acquired during the program continue to be assimilated and practiced throughout the school year under the teacher's guidance according to specific guidelines. These stressful situations (fights, examinations, inter-

personal conflicts, anger bursts, and events such as road accidents, death of a parent, or news about possible rocket attacks) are the stressors that serve to apply during the assimilation stage the coping skills learned and practiced in the former stages, including dealing with failure/feeling of being overwhelmed by intense emotions (information concerning manual availability can be obtained from the authors).

Statistical Analyses

Group differences (treatment–control) in symptom expression and their interaction with gender, age, and religiosity were computed with multivariate analysis of variance (MANOVA, two-tailed). Differences in the distribution of children meeting or exceeding the UCLA PTSD-RI cut-off score by group were calculated with 2×2 χ^2 tests.

RESULTS

Psychological Responses by Group, Gender, and Religiosity

According to MANOVA with the two symptom measures as dependent variables, we found significant group ($F_{2, 1389} = 11.62$, $p < .02$), gender ($F_{2, 1389} = 14.12$, $p < .001$), and SES differences ($F_{4, 2780} = 3.00$, $p < .02$). Univariate tests revealed significantly lower symptoms of posttrauma and stress/mood among the intervention group ($p < .008$), boys ($p < .001$) and children with low SES ($p < .02$). The multivariate group × gender ($p < .05$) and group × SES ($p < .008$) interactions were significant. Boys in the intervention group reported fewer symptoms than girls but similar to girls within the control group (Table 2). Also, high SES children in the intervention group reported fewer symptoms of stress/mood compared with the other subgroups (means = 2.08, 2.28, and 2.34 for low, heterogeneous, and high SES, respectively). We found no group × gender × SES interactions.

When we analyzed the four domains of the PTSD-RI, a similar pattern of group and gender main effects emerged (multivariate $F_{4, 1313} = 7.12$ and 21.57, respectively, both $p < .001$), with significantly fewer symptoms for the intervention group and for boys within the four clusters. In addition, marginal group × gender univariate interactions ($p < .067$) for Avoidance/Numbing and Hyperarousal and the associated features indicated that the group differences were more pronounced among boys (Table 2).

According to the recommended PTSD-RI cut-off score of 38, 7.2% of the children in the

**TABLE 2** Means (SD) of Symptom Scales According to Group and Gender

| | Intervention Group | | | Control Group | | | Univariate Effects $F_{1, 1319}$ | | |
	Boys (n = 355)	Girls (n = 345)	Entire Group (n = 700)	Boys (n = 348)	Girls (n = 354)	Entire Group (N = 702)	Group	Gender	Group × Gender
Stress/mood[a]	2.10 (0.71)	2.34 (0.70)	2.22 (0.71)	2.29 (0.71)	2.43 (0.73)	2.36 (0.72)	12.70***	23.43***	3.41
PTSD-Reaction Index[b]	15.3 (11.4)	20.6 (12.6)	17.9 (12.3)	19.8 (12.6)	22.5 (12.5)	21.1 (12.6)	22.56***	34.87***	1.41
Intrusion	0.81 (0.78)	1.27 (0.93)	1.03 (0.89)	1.07 (0.87)	1.34 (0.91)	1.20 (0.90)	11.75***	57.20***	3.53
Avoidance/numbing	0.77 (0.71)	0.90 (0.69)	0.83 (0.70)	1.03 (0.74)	1.02 (0.72)	1.02 (0.73)	23.52***	3.02	3.37
Hyperarousal	1.07 (0.79)	1.27 (0.80)	1.17 (0.80)	1.31 (0.87)	1.40 (0.83)	1.35 (0.85)	15.90***	9.60§	1.65
Associated features	0.72 (0.83)	1.11 (0.83)	0.91 (0.85)	1.01 (0.89)	1.22 (0.92)	1.12 (0.91)	18.04***	38.17***	3.41

Note: [a]Range 1 to 5; a score of 3 represents moderate symptoms.
[b]Range 0 to 84; a score of 38 was used as a cut-off for possible posttraumatic stress disorder (PTSD).
§$p < .005$; ***$p < .001$.

FIGURE 1 Percentage of children with probable posttraumatic stress disorder (PTSD), by group and gender.
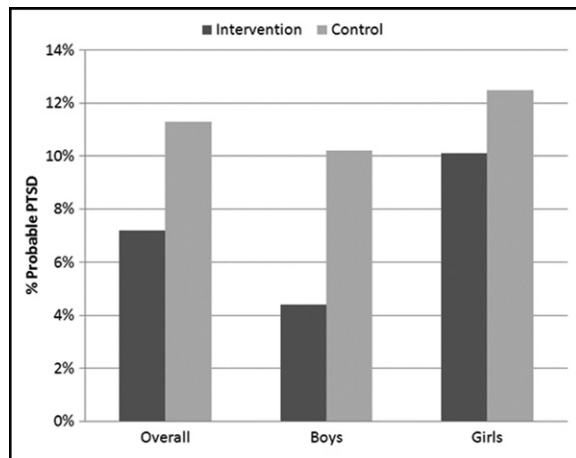
intervention group met criteria for likely PTSD, compared with 11.3% of the children in the control group ($\chi^2 = 6.66$, df $= 1$, $p < .008$). When boys and girls were analyzed separately, we found no significant difference in the percentage of girls from the intervention and the control groups meeting or exceeding the cut-off score (10.1% and 12.5%, respectively; $\chi^2 = 0.97$, df $= 1$, $p > .05$). However, significantly more boys from the control group met criteria for likely PTSD compared with boys from the intervention group (10.2% and 4.4%, respectively, $\chi^2 = 8.31$, df $= 1$, $p < .004$) (Figure 1). The numbers needed to treat to prevent one additional adverse outcome were 24, 17, and 42 for the whole sample, for boys, and for girls, respectively.

Younger children (fourth grade) reported higher symptoms of posttrauma and stress/mood (multivariate $F_{2, 1400} = 13.12$, $p < .02$). Within the RI clusters, fourth graders reported significantly more symptoms of Avoidance/Numbing and Hyperarousal compared with fifth graders. The group $\times$ grade interaction was not statistically significant ($F_{4, 1315} = 0.33$, $p > .05$). One-way ANOVA followed by Duncan tests revealed significant school differences among six (four experiment) schools with lower PTSD symptoms and three (two control) schools with higher symptoms ($F_{11, 1408} = 4.35$, $p < .001$).

We found no multivariate or univariate main effects for religious affiliation, no group $\times$ religiosity interaction and no group $\times$ religiosity $\times$ gender interaction ($F_{2, 1310} = 0.66$, 1.13, and 0.64, respectively, all $p > .05$) for symptoms of post-

trauma and stress/mood. Also, the percentage of children meeting the cut-off criteria for PTSD was similar in religious and nonreligious schools in the intervention (7.1% and 7.6%, respectively) and the control groups (11.1% and 11.9%, respectively) (both $\chi^2 < 0.07$, $p > .05$).

DISCUSSION

In recent years, there have been increasing efforts to develop effective mental health interventions that can be delivered within community settings where children and adolescents are active. For many children, schools have been the de facto provider of mental health services.[25] The case of mass trauma, requiring the use of clinical mediators to cope with large needs, emphasizes the central role that schools can play. The present study focuses on one of such possible psycho-educational missions: to provide children effective preparedness to cope with traumatic events and with continuous stress.

This study demonstrated that a teacher-mediated, protocol-based intervention focused on resilience enhancement is an effective method to grant students coping skills to help them face daily stressors and transfer the knowledge to cope with severe life events, process them, and recover swiftly to regain normal routine. The current results add to former studies demonstrating the effect of teacher-based interventions after traumatic exposure.[12,13,26,27] However, to the best of our knowledge, this is the first study to investigate the implementation of the teacher-based intervention as preventive strategy before actual exposure. Other strengths of this study include the use of a large sample, a matched control group, and validated measures.

The main result of our study is the significant difference in symptoms of posttrauma and stress/mood among participant and control children. The mean scores of both scales were lower among participants (although a 3.2-point average difference in the Reaction Index might be considered of low clinical significance) and the percentage of children meeting or exceeding the accepted cut-off score for PTSD was significantly lower, although mostly among boys. Children with low SES reported more symptoms of both scales than those with moderate and high SES. Also, it seems that the program had a somewhat better effect on children in the intervention group with high SES, who reported fewer symptoms of

stress/mood. As a group, control children had 57% more detected cases than participants. However, this difference was significantly more pronounced among boys (4.4% versus 10.2%) and less among girls (10.1% versus 12.5%). Although the rate of PTSD may seem low given the traumatic exposure, similar rates of severe PTSD (~10%) had been documented in Israeli youth after continuous terrorist attacks during the Intifada, suggesting a high level of resilience among the Israeli population.[28]

A question that arises out of these findings is the difference in response rates across genders. It may be that boys usually report fewer symptoms of posttrauma than girls.[3] However, if that explanation was correct, we would have expected to find a similar gender difference also in the control group. A second explanation might be related to the gender of the protocol's "main hero," Adam. Perhaps boys could identify more easily than girls with the character of Adam, a boy, and could incorporate more effectively the contents of the intervention. Yet, other important characters in the protocol are female (Adam's teacher, friends).

A third explanation concerns the coping mechanisms provided by the intervention. It is well known that boys use more externally oriented strategies, whereas girls use more internally oriented ones.[29,30] It might be that the skills incorporated during the intervention to process traumatic exposure, emphasizing an internal orientation (e.g., stress management, emotional processing, image control, thought correction), benefitted more boys by enriching their repertoire of coping skills with those used more "naturally" by girls. To note, when this intervention was implemented after traumatic exposure, boys reported lower preintervention PTSD symptoms, and the symptom decrease was more pronounced for girls, reaching postintervention levels similar to those for boys.[14] Also, qualitative information gathered throughout the process did not support any gender difference in regard to motivation, participation, or identification with Adam.

Recently, Farchi and Gidron found that psychological inoculation was more beneficial for men, and ventilation for women in reducing helplessness in citizens exposed to continuous war threats.[31] The authors suggest that these gender differences in response to a stressor might be explained through enhanced limbic activation in women (calmed by the ventilation) and increased right and reduced left frontal activity in men (whose left prefrontal activity is reduced by the logic and verbal processing of psychological inoculation). Future empirical research comparing the approach described with others facilitating more expression ought to elucidate whether, in the absence of actual traumatic exposure, boys assimilate skills better than girls or they are able to implement them more effectively during and after exposure.

It has been stated that the majority of children are resilient and able to cope with psychological distress after a disaster and, therefore, that only a small proportion of children exhibiting pre-existing vulnerability require structured, intensive intervention.[32] Our results and those of others clearly demonstrate that many children might require some kind of structured intervention, and that stress inoculation as a way of primary prevention might be a cost-effective strategy.[33,34] One needs to consider that the effects of the teacher-delivered intervention go beyond reduction in trauma symptoms and include the enhancement of coping and adaptation in general. For example, 3 years after such an intervention after a major earthquake, children were assessed by raters blinded to the intervention as displaying significantly better academic, social, and behavioral adaptation compared with control children.[13]

Hobfoll et al. emphasized the restoration of the school community as an essential step in re-establishing a sense of self-efficacy through renewed learning opportunities, engagement in age-appropriate, adult-guided memorial rituals, and school-initiated, pro-social activity.[20] They also summarized five intervention principles that have empirical support to guide evolving intervention practices and programs following disaster and mass violence: to promote a sense of safety, calm, self- and collective efficacy, connectedness, and hope.

In accordance with these principles, our teacher-based intervention aimed at enhancing children's resilience by the following: (1) providing psychoeducation to understand and normalize stress reactions; (2) addressing (identifying and replacing) dysfunctional thoughts and beliefs that mediate development of psychological symptoms, for example that the world is completely dangerous; (3) learning to manage anxiety and regulate emotions, and understanding and

better controlling the interrelationship between thoughts, feelings and behavior; (4) teaching problem-focused coping and imaginal exposure (to develop perspective taking, self-talk, and positive imagery); (5) encouraging students to increase activities that foster positive emotions; (6) facilitating social support and sustained attachments (to build on and enhance existing support and lasting relationships, e.g., effective listening); and (7) instilling hope to counteract the shattered worldview and the vision of a shortened future characteristic of mass trauma (see also Skills Training in Affect and Interpersonal Regulation).[35]

By focusing on building resiliency and strengthening resources, rather than on the direct processing of traumatic experiences, our approach avoids the difficulties in program adherence and need for individual attention that can be encountered when classroom-based interventions are applied in regions where exposure to terror and war is direct, intense, and wide ranging.[26]

Southwick et al. asserted that it may be possible to enhance stress resilience in at-risk or already symptomatic individuals by providing nurturing caregiving environments.[36] These psychosocial resilience factors include the following: positive emotions, which tend to decrease autonomic arousal and to broaden one's focus of attention with reliance on creativity, exploration, and flexibility in thinking; cognitive flexibility; spirituality; social support; and active coping style. The authors agree that children are likely to benefit from moderate stressors that they can master successfully, resulting in stress inoculation and stress resilience to subsequent stressors.

Encounters with stress and adversity are unavoidable and stress resistance cannot reasonably reside in the avoidance of risk experiences but, rather, in successful engagement with and mastery of them. However, even mild stressful events may increase vulnerability to the effects of subsequent stressors if they supersede the developing organism's ability to cope with them.[15] Therefore, the type, timing, duration, and severity of a given stressor within a given species are likely to be important factors in determining whether early experiences ultimately produce a protective or deleterious outcome.

Social-ecological resilience, particularly the ability of communities to mobilize assets, networks and social capital both to prepare for and respond to disasters is an important determinant in recovery.[37] The accumulated clinical and research experience with the teacher-based resilience-focused intervention, a universal approach to enhance the preparedness of communities of children, seems to represent an important asset in such an effort.

The study's main limitation is the lack of baseline information concerning children's psychological functioning. Such information would have allowed the comparison of symptoms in regard to both pre–post intervention and to intervention–control baseline differences. Although assessing symptom levels of children before traumatic exposure may provide valuable information, its implementation seems complex and requires awareness and flexibility within the education system. Using a large sample in which the intervention and the control group were composed of schools matched by location (SES and exposure), religiosity, age, and gender, we tried to overcome the lack of baseline data, assuming that pre-exposure and preintervention symptom levels were comparable.

A second limitation is the lack of information from additional sources such as parents or teachers, whose report on children's adaptation may add an important aspect regarding children's functioning besides pathological responses. Parent report or the addition of clinical evaluation in a sample of children would add to the validity of the assessment. Unfortunately, the conditions under which this study was implemented (imminent rocket attacks) required us to emphasize swift program implementation at the expense of more rigorous methodology.

Also, control schools received less attention and no training or supervision of teachers that would have helped them cope better with their own stress and perhaps generate a systemic inoculation. Although the control group implemented an alternative program (Life Skills), the use of a waiting-list paradigm or a control that includes similar time for training and supervision would strengthen the validity of the results.

Finally, the present study did not assess previous cumulative traumatic experiences and type of exposure. Studies showed that teacher-based interventions performed after a disaster are less effective in children with previous multiple traumas, who might require a combined universal-specific approach.[12] Future studies may need to

elucidate whether such vulnerability is also relevant to a preventive approach. &

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SUPPLEMENT 1

The Meetings' Protocol: Building a Coping Puzzle

Session 1: Introduction and processing positive experiences
Adam's letter: Introduction, verbalization, legitimization
Processing a positive experience: Demonstration by teacher
Processing a positive experience in pairs
Sharing the examples in the classroom
A worksheet for personal positive processing
Writing in personal diary

Session 2: Slow breathing using soap bubbles
Adam's letter: Psychoeducation
Breathing exercise to manage stress and regain control
Puzzle 1—**Slow breathing**
Writing in personal diary

Session 3: Breathing and processing unpleasant experiences
Rehearsing slow breathing
Processing an unpleasant experience
Adam's letter: Unpleasant experiences
Assessing one's stress with emotions balloons
Puzzle 2—**Emotions balloons**
A worksheet for personal unpleasant processing
Writing in personal diary

Session 4: Adaptive and maladaptive tension
Breathing exercise
Adam's letter: Adaptive and maladaptive tension
The arm test: Demonstrating maladaptive tension
The "fight or flight" reaction: Experiencing and processing
Writing in personal diary

Session 5: Correcting negative thoughts
Breathing exercise
Adam's letter: Identifying negative thoughts
The Three Steps Model: A technique to identify and correct negative thoughts
Puzzle 3—**Correcting thoughts**
Writing in personal diary

Session 6: A safe place: Enlisting the "dwarf-friend"
Short breathing exercise and rehearsing thought correcting technique
Adam's letter: The dwarf-friend
Guided imagery: Creating our "dwarf-friend"
Puzzle 3—**Dwarf-friend**
Writing in personal diary

Session 7: Progressive muscle relaxation
Measuring stress with thermometer and balloon "stressometer"
Adam's letter: Integration, introduction of "Simon says"
Puzzle 5—**Thermometer and balloon "stressometer"**
Slow breathing exercise and reassessment using both methods
Progressive muscle relaxation exercise and "Simon says" game
Reassessment using both methods
Puzzle 6—**Progressive muscle relaxation**
Puzzle 7—**"Simon says"**
Writing in personal diary

Session 8: "Uncle Harry's positive experience bag"
Rehearsing the game "Simon says"
Adam's letter: The "positive experience bag"
Collecting positive thoughts to the bag
A guided imagery exercise using the "positive experience bag"
Puzzle 8—**The positive experience bag**
Writing in personal diary

Session 9: The power of communication: Active listening and cooperation
Breathing exercise and imagery
Adam's letter: Listening
Group puzzle
Discussion about the power of cooperation
Puzzle 9—**Listening and communication**

Session 10: Perspective taking, distancing, and humor
Breathing exercise and imagery
The "Zoom" exercise: Taking perspective and distancing
Puzzle 10—**Zoom: Perspective taking and Distancing**
Adam's letter: Humor
Creating humor: Cartoons on the wall and children's humoristic reactions
Laugh meditation/yoga
Puzzle 11—**Humor**
Writing in personal diary

Session 11: Rehearsing and integrating coping techniques

Slow breathing, correcting negative thoughts, positive thoughts bag, progressive muscle relaxation, active listening, zoom and humor

Measuring with thermometers and "stressometers" before and after a distraction exercise

Writing in personal diary

Session 12: Violence: Connecting between stress, tension, and aggression

Adam's letter: Stress, anger, and aggression

Visual signs indicating ineffective reactions to anger situations

Identifying the sign that best describes our reaction in a state of anger

Suggesting alternative ways to deal with anger situations

Discussion: The connection between stress, tension, and aggression

Puzzle 12—**The new anger images**

Writing in personal diary

Session 13: An integrated balance exercise and SMBIA

An integrated balance exercise

Adam's letter: The five-step method to effective reaction

SMBIA: Stop–muscle–breath–image–action

Puzzle 13—**SMBIA**

Writing in personal diary

Session 14: Conclusion: The power of the group

Adam's letter: Summary, goodbye

Positive changes that derive from a crisis

Puzzle 14—**"Finding good in evil?"**

Summary exercise: Measuring temperature biofeedback with the whole class

Festive releasing of balloons