

# Post-traumatic Reaction of Israeli Jewish and Arab Children Exposed to Rocket Attacks Before and After Teacher-Delivered Intervention

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## ABSTRACT

**Background:** Belonging to ethnic minorities is a risk factor for traumatized children. This study investigated the influence of exposure to rocket attacks during the 2006 Lebanon War on Jewish and two groups of Arab Israeli students and the effect of implementing a teacher-delivered intervention focusing on resilience enhancement.

**Method:** Children from both ethnic groups (N = 1,372) were assessed for stressful life events, symptoms and parental concern regarding adaptation before the 16-week program (T1) and after its completion (T2).

**Results:** Arab children reported more severe symptoms at T1. The three groups showed a significant decrease to the same level at T2. Both ethnic groups differed in the level of parental concern and in the way stressful life events affected children's symptoms.

**Conclusions:** The results suggest that school-based programs with teachers as clinical mediators could be a valuable, cost-effective cross-cultural model of intervention after mass trauma, moderating vulnerabilities of ethnic minorities.

## INTRODUCTION

During the Second Lebanon War (2006) Hezbollah fired around 4,000 missiles into Northern Israel, causing 44 Jewish and Arab civilian mortalities, over 1,400 wounded, significant property damage, and thousands displaced or required to live in shelters. According to Hobfoll, psychological distress occurs when one's goals, resources or basic expectations are threatened (1). These goals include tangible objects, physical safety, a positive image of one's self-worth, control and belonging to a social network. A stronger resource base diminishes the adverse psychological impact. The war disrupted children's lives on multiple levels, including exposure to destruction, injury and terror and the effects to their surroundings. This disruption of the children's ecology can threaten their basic expectations of safety and normalcy, leading to a clinical picture of grief, guilt, depression and post-traumatic stress disorder (PTSD) symptoms, as well as changes in behavior and personality (2).

Children and adolescents often exhibit higher levels of psychological distress to disasters than adults despite seeming to perform normally on a superficial level (3, 4). While rates vary greatly depending on the type of trauma and the population exposed, levels of PTSD often reach or exceed 50% (5, 6). Certain factors protect children after traumatic exposure. Personal characteristics include optimism, high self-esteem, good temperament, strong self-efficacy and positive coping (7-10). A supportive family (11, 12) and strong social networks are key predictors of resilience (13, 14).

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In contrast, risk factors that intensify the perceived threat include intensity and duration of exposure, physical injury, death of a loved one, degree of terror experienced, younger age, female gender, prior disorders, poor social support, poor parental response, inadequate family cohesion, lower socioeconomic class, and stressful life events (2, 14-16).

### **MINORITY AS A RISK FACTOR FOR TRAUMATIZED STUDENTS**

Minority ethnic groups share a common heritage and cultural values which differ from the mainstream population. Identification as a member of an ethnic minority affects the individual's interaction with the social network in multiple ways. This leads to low actual and perceived social support which can lead to different traumatic exposure rates and differential degrees of vulnerability (17). The increased vulnerability of minorities to develop PTSD may function by altering the level of risk and protective factors (18). Discriminated minority groups often have disparities in access to economic and social resources (e.g., healthcare, education, income), leading to increased risk of psychological distress when further resources are threatened. The perceptions of discrimination may prevent the individual from seeking support and using available social resources. Furthermore, discrimination can lead to feelings of decreased self-worth (19).

Moreover, degree of integration and acculturation affects PTSD development. In a study of the Taiwanese aboriginal population it was found that those with a lower degree of acculturation were twice as likely to develop PTSD as their higher acculturated counterparts (20). Individuals with low acculturation tend to be less integrated and have less support from social networks.

Ethnicity also directly impacts the individual and the proximal ecology through culturally specific attitudes and beliefs that mediate coping with trauma. For example, a close family network can act as an invaluable resource when dealing with stress; however, it can increase the pressure and limit the individual's willingness to obtain help from outside sources (17). In warfare, these viewpoints influence the extent to which individuals carry their commitment as citizens to their own country's ideology, particularly when conflict arises with a nation they politically identify with (21). Strong support for the aims of one's own side has been shown to be a protective factor. Servan-Schreiber, Le Lin and Birmaher found increased resilience in Tibetan refugee children with a strong sense of participating in their nation's struggle against an oppressor (22).

Arab Israeli citizens (Muslims, Christians, Druze and Bedouins) comprise 20.3% of the Israeli population (23), speak a different language and have a distinct religious, cultural, historical and national identity from the mainstream Jewish society. While Jews and Arabs officially have equal rights, Arab citizens have lower socio-economic status, income and level of schooling, and schools have lower budgets and fewer available resources (24).

### **SCHOOL-BASED INTERVENTIONS FOR TREATING PTSD**

Mental health interventions are known to increase resilience in child survivors of disaster. However, during disaster situations the traditional mental health resources are overwhelmed (2). Therefore, a public health ecological approach should be adopted and schools should be used for screening and implementation of post-disaster programs (25, 26). School-based interventions are effective when delivered to individuals or small groups, but group treatment is associated with better completion rates (25). In a randomized controlled trial of a 10-session small-group intervention delivered by school clinicians, students reported fewer symptoms, and parents reported less psychosocial dysfunction among their children in comparison to a waitlist group (27).

Several reasons explain the effectiveness of school-based interventions, mainly the human resources available to strengthen the child's social network and self efficacy, and the ability to integrate a developmentally appropriate program within a familiar framework, increasing compliance while erasing possible stigma (28, 29).

In disaster situations, the limited number of professionals is insufficient to reach all the children in need. Therefore, Wolmer et al. proposed to empower "teachers" as "educators" serving as clinical mediators (29). Teachers occupy a central role in the child's life and are trusted by both youth and their parents. Empowering teachers to assist the children with their psychological distress promoted school revitalization and decreased symptoms following a severe natural disaster and resulted in improved adaptive functioning three years later compared to a control group (29, 30). A similar pattern was found following a teacher-delivered intervention in Sri Lanka (31).

The first aim of this study was to examine the effect of ethnic group affiliation on the development of PTSD symptoms in students following missile attacks and its interaction with gender and life stressors. We hypothesized that children living in Arab cities would display the most severe outcome, with the Jewish sample hav-

ing the least adverse reactions. The second aim was to assess whether ethnicity impacted on the effectiveness of a teacher-delivered intervention focusing on coping enhancement. The intervention was adapted for the Arab population and run by local Arab professionals. Therefore, we predicted it would be equally effective among Jewish and Arab schools.

## METHOD

### PARTICIPANTS

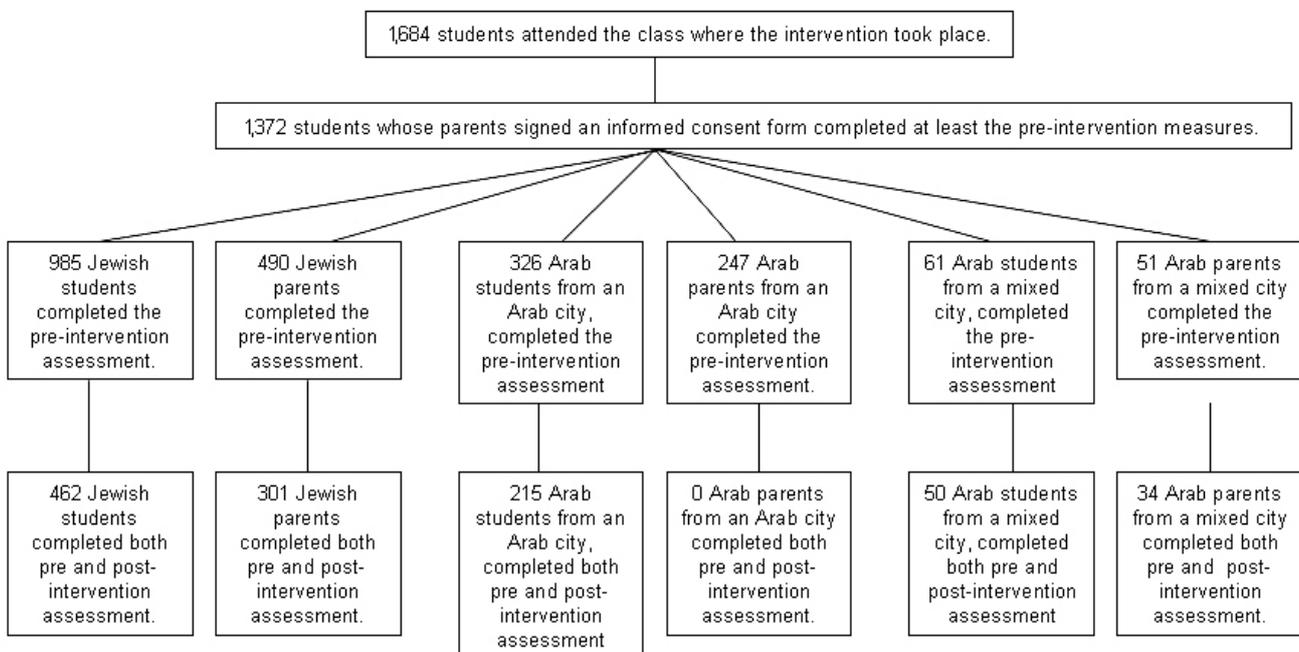
Participants were a convenience sample of Jewish and Arab Israeli children studying in 4th and 5th grade in schools located in northern Israel. All children had been exposed to rocket attacks during the war. There were 985 Jewish children from two Jewish cities and one mixed city (50.6% boys, 91% 4th grade), 61 Arab children from the mixed city (50.8% boys, 100% 5th grade), and 326 Arab children from an Arab city (50.9% boys, 100% 4th grade). All students participated in the intervention but only those whose parents signed an informed consent form were assessed. The baseline measurement (T1: 5 months after the war) was completed by 1,372 students, 727 (53%) of the students in the classrooms available four months later (T2) completed the post-intervention measurement (Figure 1).

### INSTRUMENTS

We used two questionnaires at T1 and T2 to collect data from the students and their parents. The **children's questionnaire** included: (a) Demographic information; (b) eight questions concerning stress and mood (e.g., "Are you scared that something would happen to you or your family?") and (c) five questions derived from the CPTSD Reaction Index (32) that were found to be highly associated with the total scale in a pilot study (e.g., "Do you have thoughts about the events even when you don't want to?") ( $r = .90$ ,  $p < .001$ ,  $n = 253$ ) (33). Scores in all items ranged from 1 (*very little*) to 5 (*a lot*) and the internal consistency of both scales was satisfactory (Cronbach's  $\alpha = .72$ ).

The **parents' questionnaire** included: (a) 14 questions regarding stressful life events (SLE) experienced by the child or the family in the two-year period prior to the war (e.g., severe illness in the family, divorce, exposure to terrorist attacks, witnessing injured or dead people, physical injuries). The sum of the stressful events assembled the child's SLE Index. (b) Questions concerning the perceived functioning of the child in six areas: school performance, social functioning, interpersonal relationships in the family, stress/anxiety, health and personal mood. The answers ranged from "not concerned at all" (1) to "very concerned" (4). The internal consistency for this scale was satisfactory (Cronbach's  $\alpha = .86$ ).

Figure 1. Student flow through the teacher-delivered intervention



**PROCEDURE**

The program was approved by the IRB of the Ministry of Education. Parents also signed a consent form allowing their children to participate in the program and complete the questionnaires. The students completed the questionnaire with the help of the school counselor and the teacher. Parents returned their completed questionnaire to the school counselor, who assigned a code for each child to ensure anonymity. The questionnaires were delivered in Hebrew or Arabic, depending on the school.

**THE INTERVENTION**

The manualized intervention (29, 30, 33) consisted of 14 sessions. It focused on strengthening adaptive coping mechanisms and socio-emotional competences. Topics included processing positive and negative experiences, managing stress, dealing with emotions, correcting negative

cognitions and implementing adaptive coping mechanisms such as humor (see Table 1 for a description of each meeting). Teachers completed a 20 hour training program and were supervised weekly by school counselors. The contents were presented to the students using letters from an imaginary character, Adam, in which he describes his experiences, labeling complex emotions and enabling the children to do likewise, as well as proposes activities to learn, process and internalize the skills covered. Skills were practiced with daily stressful experiences (e.g., exams) to integrate the emerging coping skills into routine life.

**DATA ANALYSIS**

The internal consistency of the scales was computed with the Cronbach’s alpha procedure. Principal components factor analysis (Varimax rotation) explored the factorial design of the children’s scale. Three-way MANOVA fol-

**Table 1.** *Description of the sessions of the teacher-delivered protocol*

<p><b>Session 1: Introduction and processing positive experiences:</b> Adam’s letter: Introduction, verbalization, legitimization. Processing a positive experience: Demonstration by teacher. Processing a positive experience in pairs. Sharing. A worksheet for personal positive processing. Writing in personal diary.</p>
<p><b>Session 2: Slow breathing using soap bubbles:</b> Adam’s letter: Psychoeducation. Breathing exercise to manage stress and regain control. Writing in personal diary.</p>
<p><b>Session 3: Breathing and processing unpleasant experiences:</b> Rehearsing slow breathing. Processing an unpleasant experience. Adam’s letter: Unpleasant experiences. Assessing one’s stress with emotions balloons. A worksheet for personal unpleasant processing. Writing in personal diary.</p>
<p><b>Session 4: Adaptive and maladaptive tension:</b> 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.</p>
<p><b>Session 5: Correcting negative thoughts:</b> Breathing exercise. Adam’s letter: Identifying negative thoughts. The Three Steps Model: A technique to identify and correct negative thoughts. Writing in personal diary</p>
<p><b>Session 6: A safe place: Enlisting the “dwarf-friend”:</b> Short breathing exercise and rehearsing thought correction. Adam’s letter: The dwarf-friend. Guided imagery: Creating our “dwarf-friend.” Writing in personal diary</p>
<p><b>Session 7: Progressive muscle relaxation:</b> Measuring stress with thermometer and balloon “stressometer.” Adam’s letter: Integration, introduction of “Simon says.” Slow breathing exercise and reassessment using both methods. Progressive muscle relaxation exercise and “Simon says” game. Reassessment using both methods. Writing in personal diary.</p>
<p><b>Session 8: “Uncle Harry’s positive experience bag”:</b> Rehearsing “Simon says.” Adam’s letter: The “positive experience bag.” Collecting positive thoughts. A guided imagery exercise using the “positive experience bag.” Writing in personal diary.</p>
<p><b>Session 9: The power of communication: Active listening and cooperation:</b> Breathing exercise and imagery. Adam’s letter: Listening. Group puzzle. Discussion: the power of cooperation.</p>
<p><b>Session 10: Perspective taking, distancing, and humor:</b> Breathing exercise and imagery. The “Zoom” exercise: Taking perspective and distancing. Adam’s letter: Humor. Creating humor: Cartoons on the wall and children’s humoristic reactions. Laugh meditation/yoga. Writing in personal diary.</p>
<p><b>Session 11: Rehearsing and integrating coping techniques:</b> 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.</p>
<p><b>Session 12: Violence: Connecting between stress, tension, and aggression:</b> Adam’s letter: Stress, anger, and aggression. Visual signs indicating ineffective reactions to anger situations. Identifying our reaction in a state of anger. Suggesting alternative ways to deal with anger situations. Discussion. Writing in personal diary.</p>
<p><b>Session 13: An integrated balance exercise and SMBIA:</b> An integrated balance exercise. Adam’s letter: The five-step method to effective reaction. SMBIA: Stop–muscle–breath–image–action. Writing in personal diary.</p>
<p><b>Session 14: Conclusion: The power of the group:</b> Adam’s letter: Summary, goodbye. Positive changes that derive from a crisis. Summary exercise: Measuring temperature biofeedback with the whole class. Festive releasing of balloons.</p>

lowed by Duncan post-hoc tests explored how ethnicity, SLE and gender (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 ethnicity, SLE and gender. Significance level was set at  $p < .05$ . For repeated measures analyses only participants present at both assessments were included.

## RESULTS

Factor analysis distinguished between the stress/mood and the trauma factors in the child's questionnaire that explained 22.6% and 19% of the variance, respectively (Eigenvalues = 3.86 and 1.54).

### ETHNICITY'S, SLE INDEX AND GENDER EFFECT ON PTSD, FUNCTIONING AND MOOD AT T1

SLE had a significant effect on mood/stress [ $F(5, 978) = 3.84, p < .01, \eta^2 = 0.02$ ]. Duncan post-hoc determined that the difference was between those with 0 through 4 SLE and those with more than 5 (Table 2). SLE also significantly affected PTSD symptoms [ $F(5, 978) = 5.17, p < .01, \eta^2 = 0.03$ ]. Children with 0 SLE had significantly less PTSD symptoms than those with 5 or more SLE. Moreover, SLE had a significant effect on the parent's concern for the child's functioning [ $F(5, 978) = 12.12, p < .01, \eta^2 = 0.06$ ]. Children with 0 SLE displayed better functioning than those with 4 or more SLE (Table 2).

Boys had lower mood/stress levels than girls [ $M = 3.89, Sd = 0.69$  and  $M = 3.62, Sd = 0.81$ ;  $F(1, 924) = 4.76, p < .05, \eta^2 = 0.01$ ] and also less PTSD symptoms [ $M = 1.22, Sd = 0.93$  and  $M = 1.79, Sd = 1.00$ ;  $F(1, 924) = 12.22, p < .05, \eta^2 = 0.01$ ]. Ethnicity had a significant effect on parental concern [ $F(2, 924) = 4.53, p < .05, \eta^2 = 0.01$ ]. The highest parental concern was found for Jewish children, followed by Arabs from an Arab city and then for Arabs from a mixed city ( $M = 1.55, Sd = 0.66, M = 1.46, Sd = 0.65$  and  $M = 1.39, Sd = 0.49$ , respectively).

Ethnicity and SLE interacted with mood/stress symptoms: in children with more than 5 SLE, Arabs from a mixed city had higher symptoms than Arabs from an Arab city [ $M = 2.38, Sd = 0.73$  and  $M = 3.81, Sd = 0.76$ ;  $F(2,$

$924) = 2.33, p < .05, \eta^2 = 0.02$ ]. Gender interacted with ethnicity [ $F(2, 1061) = 3.71, p < .05, \eta^2 = 0.01$ ]: parents from an Arab city reported more concern for boys than for girls ( $M = 1.54, Sd = 0.66$  and  $M = 1.38, Sd = 0.66$ ).

Arabs from an Arab city had significantly more PTSD symptoms ( $M = 1.68, Sd = 0.97$ ) than Arabs from a mixed city ( $M = 1.30, Sd = 0.90$ ) and Jewish children [ $M = 1.46, Sd = 1.01$ ;  $F(2, 1199) = 5.81, p < .01, \eta^2 = 0.002$ ]. In addition, a marginal effect for ethnicity appeared in regard to mood/stress symptoms [ $F(2, 1232) = 2.90, p = .06$ ]. Duncan post-hoc analysis showed that Arabs from a mixed city reported higher symptom levels ( $M = 3.60, Sd = 0.74$ ) than Jewish children ( $M = 3.80, Sd = 0.77$ ).

**Table 2.** Pre-intervention children's symptoms and parent's concern with child's functioning by Stressful Life Events (means and standard deviations)

Stressful Life Events	Ethnicity	N	PTSD		Mood/Stress		Adaptation	
			Mean	Sd	Mean	Sd	Mean	Sd
0	Jews	367	1.36	1.02	3.86	0.76	1.42	0.63
	Arabs - Arab city	139	1.56	0.97	3.71	0.75	1.27	0.51
	Arabs - mixed city	26	0.92	0.66	3.76	0.61	1.21	0.34
	Total	532	1.38	1.00	3.82	0.75	1.38	0.60
1	Jews	220	1.47	0.98	3.83	0.77	1.50	0.65
	Arabs - Arab city	83	1.82	0.94	3.75	0.76	1.42	0.58
	Arabs - mixed city	12	1.40	0.93	3.63	0.45	1.35	0.39
	Total	315	1.54	0.98	3.80	0.76	1.48	0.63
2	Jews	166	1.47	1.02	3.73	0.74	1.63	0.62
	Arabs - Arab city	33	1.95	0.78	3.71	0.72	1.41	0.60
	Arabs - mixed city	6	1.87	0.99	3.52	0.88	1.31	0.52
	Total	205	1.54	1.00	3.72	0.74	1.59	0.62
3	Jews	73	1.79	1.00	3.72	0.77	1.65	0.67
	Arabs - Arab city	20	1.62	1.12	3.71	0.61	1.48	0.64
	Arabs - mixed city	8	1.50	0.85	3.50	0.73	1.69	0.76
	Total	101	1.74	1.00	3.70	0.73	1.62	0.67
4	Jews	24	1.56	1.03	3.59	0.97	1.86	0.65
	Arabs - Arab city	15	1.17	0.84	3.40	0.89	1.96	0.67
	Arabs - mixed city	3	1.00	0.87	4.46	0.51	1.94	0.35
	Total	42	1.39	0.97	3.59	0.93	1.90	0.63
5+	Jews	16	1.71	1.02	3.23	0.77	2.28	0.83
	Arabs - Arab city	19	2.16	1.14	3.81	0.76	1.96	0.98
	Arabs - mixed city	5	2.20	1.12	2.38	0.73	1.67	0.49
	Total	40	1.94	1.06	3.40	0.88	2.05	0.89
Total	Jews	866	1.46	1.01	3.80	0.77	1.55	0.66
	Arabs - Arab city	309	1.68	0.97	3.71	0.75	1.46	0.65
	Arabs - mixed city	60	1.30	0.90	3.60	0.74	1.39	0.49
	Total	1235	1.49	1.00	3.77	0.76	1.52	0.65

### CHANGES IN SYMPTOMS AND FUNCTIONING FOLLOWING THE INTERVENTION

Multivariate Analysis of Variance with Repeated Measures showed a significant decrease in stress/mood (due to the direction of the scales in the Stress/Mood scale, a decrease in the symptoms is marked by a higher mean score in the second measurement) [ $M = 3.73$ ,  $Sd = 0.77$  and  $M = 3.83$ ,  $Sd = 0.75$ ;  $F(1, 712) = 7.62$ ,  $p < .01$ ,  $\eta^2 = 0.02$ ] and PTSD symptoms [ $M = 1.47$ ,  $Sd = 1.00$  and  $M = 0.81$ ,  $Sd = 0.77$ ;  $F(1, 661) = 155.56$ ,  $p < .001$ ,  $\eta^2 = 0.33$ ]. No significant change appeared in regard to children's functioning [ $M = 1.48$ ,  $Sd = 0.60$  and  $M = 1.44$ ,  $Sd = 0.60$ ;  $F(1, 311) = 0.36$ ,  $p > .05$ ].

A significant gender X PTSD change interaction [ $F(1, 661) = 10.00$ ,  $p < .01$ ,  $\eta^2 = 0.02$ ] revealed that boys had lower levels of PTSD symptoms than girls at both T1 and T2, but the difference was larger at T1 [ $M = 1.23$ ,  $Sd = 0.92$  and  $M = 1.80$ ,  $Sd = 1.00$  respectively;  $t(1180) = -10.19$ ,  $p < .05$ ,  $d = -0.59$ ] than at T2 ( $M = 0.68$ ,  $Sd = 0.72$  and  $M = 0.95$ ,  $Sd = 0.80$  respectively;  $t(695) = -4.59$ ,  $p < .05$ ,  $d = -0.35$ ].

There was a significant interaction between the cumulative number of lifetime stressors and PTSD symptom decrease [ $F(5, 650) = 1.47$ ,  $p < .01$ ,  $\eta^2 = 0.01$ ]: At T1, children who had no SLE had lower levels of PTSD than children with 5 or more SLE ( $M = 1.38$ ,  $Sd = 1.01$  and  $M = 1.89$ ,  $Sd = 1.04$  respectively). This difference was smaller at T2 ( $M = 0.75$ ,  $Sd = 0.75$  and  $M = 1.13$ ,  $Sd = 1.08$  respectively). Mood/stress change did not interact with SLE [ $F(5, 701) = 1.61$ ,  $p > .05$ ].

Additionally, ethnicity and PTSD decrease interacted significantly [ $F(2, 661) = 3.26$ ,  $p < .05$ ,  $\eta^2 = 0.01$ ]. Post-hoc analysis showed that at T1, students from the Arab city had more PTSD symptoms than Jewish and Arab students from the mixed city [ $M = 1.68$ ,  $Sd = 0.97$ ,  $M = 1.45$ ,  $Sd = 1.02$  and  $M = 1.30$ ,  $Sd = 0.90$  respectively;  $F(2, 1199) = 5.81$ ,  $p < .05$ ]. However, these differences disappeared after the intervention ( $M = 0.84$ ,  $Sd = 0.68$ ,  $M = 0.79$ ,  $Sd = 0.81$  and  $M = 0.82$ ,  $Sd = 0.73$ , respectively).

### DISCUSSION

The central aim of this paper was to establish the effectiveness of a teacher-delivered intervention on reducing students' adverse reactions after the Second Lebanon War and to investigate differential effects of the intervention across ethnic group. Although Arab students from an Arab city had the highest levels of initial PTSD, the intervention eliminated any group difference. In line with

previous research, girls at T1 reported higher PTSD and mood/stress symptoms and higher SLE was associated with increased symptoms and more parental concern with children's functioning (14, 16, 34, 35). However, the decrease in PTSD at T2 reduced the differences related to gender and stressful life events.

Our first hypothesis stated that PTSD symptoms, mood/stress and parental concern would be most severe among the Arab students from the Arab city. These students did report the highest levels of PTSD. In addition, a less than expected marginal difference in stress/mood symptoms showed that Arabs from the mixed city reported higher symptoms than Jewish children. However, contrary to our expectations, parents of Jewish children reported the highest concern for their children's functioning and the least concern was reported by Arab parents from the mixed city. This may support Wolmer, Laor and Yazgan's finding that after the 1999 earthquakes, Turkish children were expected to renounce their expression of grief in order to protect their caretakers (29).

As a group, Arab students, especially girls, may have found it culturally difficult to express painful experiences at home, explaining why parents from an Arab city reported more concern for boys than for girls. The extent to which the different level of concern of parents affects the children's initial reaction and that following the intervention remains an open question. In addition to the demonstrated parental tendency to under-appreciate the child's reaction to trauma, this may explain why Arab parents could not accurately estimate their children's functioning (36).

Arab students report of worse mental health in comparison to the Jewish majority is consistent with previous research (24, 37-40). Perhaps, as a discriminated minority, Arab children come from homes with lower levels of education and income, under-funded schools, and poorer access to healthcare and education resources. Fewer resources represent a reduced capability to buffer further losses (1).

Furthermore, the nationalistic atmosphere which may have supported the Jewish citizens, could have led to feelings of further isolation for Arabs with a dual Arab and Israeli identity, exposed to Arab suffering and traumatization on the other side. This could have been magnified in the mixed city, explaining why Arab students from the mixed city with multiple SLE reported more mood/stress symptoms than students from the Arab city. The shared ethnic identity with the "enemy," the concern for relatives who lived in Lebanon and the

unexpectedness of targeting Arab cities in Israel, may have led to further emotional turmoil.

As expected, students from an Arab city had the highest PTSD symptoms prior to the intervention. Several reasons may explain this finding. First, this group is the least integrated into mainstream Israeli society. This is consistent with Perilla et al.'s (17) study after hurricane Andrew in which the least acculturated group had the highest level of PTSD. Secondly, as a group they had the lowest socio-economic standing, and lower standards of education and housing. A third explanation focuses on their ethnic identity. Mossakowski found that a strong ethnic identity served a buffering function against the stress of perceived discrimination and was strongly associated with fewer depressive symptoms among Filipino Americans (41). Minority ethnic groups that live among a separate majority often have a strengthened sense of identification with their ethnicity, more ethnic pride, involvement in ethnic practices and cultural commitment to their ethnic group. This may act as a buffer at times of stress. Arab students from the mixed city may possess this heightened ethnic identity which would augment their social networks and the associated support, providing a sense of belonging which can be protective when confronting trauma. Lastly, citizens of Jewish and mixed cities have been targeted repeatedly in wars and periods of terrorism and may have generated coping mechanisms and a degree of resilience (39). Conversely, Arab cities have less previous experience with war and were less prepared, lacking shelters and secure areas, producing thereby a sense of lack of control and helplessness increasing their adverse outcomes.

Consistent with our second hypothesis, the teacher-delivered intervention was associated with a symptom decrease for all the ethnic groups that eliminated any symptoms difference between the groups. This is in line with a study of adult war veterans that found no differences between treatment effectiveness for White, Black or Hispanic patients (42). After the intervention, we also measured a reduction in the difference in PTSD levels between gender groups and high and low SLE groups, supporting prior research indicating that schoolchildren with more severe symptoms profit the most from school-based interventions (31, 33). Additionally, the training for the intervention may have assisted Arab schools and teachers in developing resources and techniques with which the Jewish schools were already familiar. Tatar and Horenczyk's study comparing Jewish and Palestinian counselors found that the latter focused on helping chil-

dren integrate their ethnic identity and legitimizing their minority identity, while the Jewish counselors had more experience implementing psychological assistance to reduce anxiety after terror attacks (43). This previous experience would have assisted the Jewish more than the Arab teachers to help their students after the war. The intervention, however, provided the necessary tools that may have been missing.

Overall, the universal teacher-delivered intervention was associated with symptom decrease but not with better functioning. Improved coping strategies and a strengthened peer network may enable the child to process the traumatic experiences. Parents are known to underestimate traumatic reactions of children (36). Perhaps the very little concern of parents' baseline reports regarding the children's functioning may have clouded their ability to detect changes after the intervention (flooring effect).

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## LIMITATIONS

Our main limitation was the lack of a control group to compare the effect of the intervention. However, a previous study found that the teacher-delivered intervention was more effective than waiting-list control when implemented following the Second Lebanon War (33) and preventively before Operation Cast Lead (44). Also, all children from the Arab city study in 4th grade and all Arab children from the mixed city study in the 5th grade. Although we do not expect to find developmental differences between children in 4th and 5th grades, a better distributed sample would add to the validity of the results.

Moreover, we had no information about the children's functioning before the war, and no long-term follow-up assessment of the effect of the intervention. Including pre-exposure assessment during disaster is extremely difficult. However, similar interventions demonstrated long-term positive outcomes in terms of children's adaptation (30, 33).

Future research may include additional parameters such as socioeconomic status, religiosity, family cohesion, perceived discrimination, and questions concerning cultural and ethnic identity. Also, due to administrative difficulties, no parent survey was obtained at T2 in the Arab city which would have impacted on the results.

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## CONCLUSION

While minority ethnic status is associated with increased risk of symptom development, there has been relatively

little research focusing on children. This study demonstrated that a minority status plays a role in the development of adverse psychiatric outcomes in children exposed to disaster. Further research is needed to elucidate how a minority ethnic status affects children and to determine mediating factors.

To the best of our knowledge, this is the first study comparing post-disaster school-based treatment efficacy between an ethnic minority and mainstream society. The encouraging results demonstrate the effectiveness of public health measures after disasters, particularly the role of empowered educators as clinical mediators. Moreover, the equalizing of posttraumatic symptoms associated with the program suggests that by improving children's coping skills, one can significantly diminish the vulnerability associated with being a minority. Preventive school-based programs successfully diminished post-traumatic cases in populations exposed to armed conflict (44). This should be a central component in implementing urban resilience programs aimed at preparing minorities at risk to face mass disasters.

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