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High school students' posttraumatic symptoms, substance abuse and involvement in violence in the aftermath of war

Miriam Schiff [a,*], Ruth Pat-Horenczyk [a,b], Rami Benbenishty [c], Danny Brom [a,b], Naomi Baum [b], Ron Avi Astor [d]

[a] The Hebrew University of Jerusalem, Paul Baerwald School of Social Work and Social Welfare, Jerusalem, Israel
[b] The Herzog Israel Center for the Treatment of Psychotrauma, Jerusalem, Israel
[c] Bar Ilan University, The Louis and Gabi Weisfeld School of Social Work, Israel
[d] University of Southern California (USC), School of Social Work and Education, USA

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ABSTRACT

This study examined one-year after effects of exposure to war events on adolescents' Posttraumatic Stress Symptoms (PTS) and risk behaviors (substance use and involvement in school violence). In addition, it addressed two potential vulnerability factors: at the micro level, it examined whether childhood trauma raised the vulnerability of Israeli adolescents to PTS and risk behaviors when exposed to war events. At the macro level, we explored whether ethnicity, i.e., being an Israeli Arab, is a vulnerability factor to PTS and risk behaviors. We used a representative sample of 7th to 11th grade students from the north of Israel that included 4151 students: 1800 Jewish (54.4% boys) and 2351 Arab (41.5% boys). We assessed exposure to war events and childhood traumatic events, PTS and PTSD, substance use (alcohol, cannabis, Ecstasy) and involvement in school violence. The findings revealed extensive exposure to war events among both Jewish and Arab students. A year after the war, its effects on adolescents were still manifested in PTS, and involvement in school violence and substance use. Exposure to child physical abuse was associated with higher levels of PTS symptoms, substance use and involvement in violence. Exposure to other traumatic events was also associated with greater PTS symptoms and involvement in violence but not with greater substance use. Arab students were a more vulnerable population. They reported higher PTS symptoms, more cannabis use and greater involvement in school violence than Jewish students. However, exposure to war events had similar effects on both Arab and Jewish students. We conclude that war effects include a broad range of psychological distress and risk behaviors that last long after the war ends, especially among youth who have experienced childhood trauma and high exposure to war-related stressors.

Introduction

The detrimental consequences of political violence for children's and adolescents' psychological distress have been documented in the United States (DeVoe, Klein, Bannon, & Miranda-Julian, 2011; Hoven, Duarte, & Mandell, 2003; Hoven et al., 2005; Pfefferbaum, Stuber, Galea, & Fairbrother, 2006) and worldwide (Moscardino, Scrimin, Capello, & Altoe, 2010; Pat-Horenczyk et al., 2009; Peltonen, Qouta, El Sarraj, & Punamaki, 2010; Punamaki, 2008). The most prominent and well-documented effects of exposure to war are Posttraumatic Stress Syndrome (PTS) and Posttraumatic Stress Disorder (PTSD) (Garbarino & Kostelny, 1996; Gurwitch, Pfefferbaum, & Leftwich, 2002; North & Pfefferbaum, 2002; Pat-Horenczyk, 2005). There is growing evidence that other behavioral dysfunctions, such as aggression (Cummings et al., 2010) and substance use (Boscarino, Adams, & Galea, 2006), are also associated with exposure to political violence. For example, a study with 254 Jewish Israeli adolescents (Even-Chen & Itzhaky, 2007) found that greater exposure to political, domestic, and community violence contributed significantly to self-reports of violent behavior in school. Similarly, a survey of 2328 Palestinian high school students in the West Bank found that exposure to political violence was strongly associated with involvement in school violence (Al-Krenawi, Graham, & Sehwail, 2007). However, much less is known about the after effects of war on adolescents' psychological distress and risk behavior.

This study was conducted a year after the second Lebanon War of July 2006 among a representative sample of Arab and Jewish

* Corresponding author. Tel.: +972 2 5881807; fax: +972 2 5823587.
E-mail address: msschiff@mscc.huji.ac.il (M. Schiff).

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adolescents residing in the north of Israel. During the war, civilians in the northern part of Israel, including the major city of Haifa, experienced severe rocket attacks from Lebanon. The intense war lasted 34 days, with a total of 4000 rockets falling almost entirely on civilians, who suffered 44 deaths and 2000 wounded. Many Jewish families fled the area and moved to the southern part of Israel or spent long periods in shelters or specially designed protected areas in their homes. Israeli Arab citizens were less likely to have shelters and protected areas in their homes or to move away from the war zone.

This study aimed to examine (a) the after effects of war on psychological distress, substance use and involvement in school violence; (b) potential differences between Israeli Arab and Jewish adolescents in exposure to war and its after effects; (c) two potential vulnerability factors. First, at the micro level, it examined whether childhood abuse and other trauma history raises the vulnerability of Israeli adolescents to PTS, substance use and involvement in school violence when exposed to war events. Second, on the macro level the study focused on ethnicity which, in Israel may intersect with ethnic or national identity and religiosity (Kaufman, Abu-Baker, & Sa'ar, 2012). It examined whether Israeli Arabs are more vulnerable than their Jewish peers to the negative psychological and behavioral consequences of exposure to war events.

Past studies conducted by the authors in large community samples of school students (Pat-Horenczyk, Abramovitz, et al., 2007; Pat-Horenczyk, Peled, et al., 2007; Schiff, 2006; Schiff, Zweig, Benbenishty, & Hasin, 2007) revealed that cumulative exposure to terrorism was associated with greater risk behaviors, including alcohol consumption (Schiff, 2006; Schiff et al., 2006) and cannabis use (Schiff et al., 2007). Adolescents with higher levels of posttraumatic symptoms reported greater levels of risk behavior (e.g., drinking alcohol, using drugs, driving dangerously, unprotected sex) than adolescents with lower levels of posttraumatic symptoms (Pat-Horenczyk, Abramovitz, et al., 2007; Pat-Horenczyk, Peled, et al., 2007). Exposure to terrorism was associated with higher levels of alcohol consumption and cannabis use even when posttraumatic symptoms were statistically controlled (Schiff et al., 2007). However, these studies were conducted during a period of repeated incidents of political violence. A recent study examining the after effects of cumulative exposure to seven years of political violence on adolescents found that greater exposure to cumulative political violence events was associated with greater psychological distress (Slone & Shechner, 2011). Less is known about the after effects of political violence such as war with regard to substance use and involvement in violence, especially among adolescents (Chemtob, Nomura, Josephson, Adams, & Sederer, 2009). Furthermore, little is known about factors that may contribute to vulnerability to the stresses of political violence.

History of child abuse and other traumatic events as a source of vulnerability

Adolescents' exposure to family violence is associated with later maladjustment including involvement in violence (Muller, Goebel-Fabbri, Diamond, & Dinklage, 2000). Other types of childhood adversities including neglect and death of close ones were also related to later maladjustment (Kessler, Davis, & Kendler, 1997). The Stress Sensitization Model (Hammen, Henry, & Daley, 2000) posits that the risk for distress following recent stressful life events is greater among individuals with a history of childhood adversity than those without such a history. Supportive evidence was found recently in the National Epidemiological Survey of Alcohol and Related Conditions ($n = 34{,}653$) (McLaughlin, Conron, Koenen, & Gilman, 2010). Given that exposure to war events in the past year is a major recent stressful or even traumatic event, this model implies that adolescents who were exposed to childhood adversity such as child abuse, accidents or sudden death in the family are likely to experience more psychological and behavioral distress, including substance use and involvement in violence, in the aftermath of war than those who did not experience such childhood diversity.

Being Israeli Arab as a source of vulnerability

Israeli Arabs comprise 20% of the population in Israel. Nonetheless, in northern Israel where this study was conducted Arabs are the majority of the population (Israel Central Bureau of statistics, 2008). Arabs and Jews in Israel have different sociodemographic backgrounds, cultures, religions and sources of support (Somer, Maguen, Or-Chen, & Litz, 2009). Arab Israelis' socio-economic status is lower and they have fewer social resources and suffer more discrimination than their Jewish counterparts (Hall et al., 2010; Hobfoll, Canetti-Nisim, & Johnson, 2006). Moreover, they experience a conflict between their Israeli citizenship and their Arab-Palestinian identity, which impacts the way they perceive acts of political violence against Israel (Shamir & Shikaki, 2002). Consequently, their psychological distress resulting from exposure to violence is different from that of Israeli Jews, and most often, greater (Gelkopf, Solomon, Berger, & Bleich, 2008). For example, a recent study that examined the effects of exposure to the seven years of the second *Intifada* (1998–2004) found that Israeli Arab adolescents reported higher rates of exposure to acts of political violence, and greater impact of this exposure, compared with their Jewish counterparts (Slone & Shechner, 2011). Nonetheless, Islam, which is the religion that the majority (about 80%) of Israeli Arabs hold, prohibits drinking while there is no such a restriction in Judaism (Weiss, 2002). Therefore, we do not expect that Arabs' greater distress will be reflected in higher drinking levels. The second Lebanon war may have deepened the duality that Israeli Arabs feel toward the Israel-Palestinian conflict. On one hand, similarly to Jewish Israelis, they were victims in this war, since most of them live in the north, in areas that were heavily bombarded by rockets fired by Arabs from Lebanon. On the other hand, they may have identified with the attackers, and may have seen these attacks as a legitimate fight against Israel's aggression and occupation (Shamir & Shikaki, 2002). This internal conflict may have intensified the already greater psychological distress that was previously found during the *Intifada* (Slone & Shechner, 2011). Thus, we hypothesized that Israeli Arab adolescents would experience greater distress and higher levels of risk behaviors (except for alcohol consumption). We further hypothesized that ethnic affiliation would moderate the effects of war exposure on adolescents distress and risk behavior.

In sum, this study examines one-year after effect of exposure to war events on adolescents PTS and risk behavior. Dependent variables are: PTS, substance use and involvement in school violence. Independent variables are exposure to war events, ethnicity (Jewish/Arab), and experiencing childhood abuse. The last two variables were also examined as moderating the relationship between levels of exposure to war and the dependent variables. Specifically, we addressed the following hypotheses and research questions.

(1) Greater exposure to war events is associated with higher levels of PTS and risk behaviors. (2) Arab adolescents experience higher levels of PTS and involvement in school violence and substance use (but no greater alcohol consumption) compared with their Jewish counterparts. (3) Adolescents who experienced childhood abuse and other types of traumatic events experience greater levels of PTS and risk behaviors. We further examined

whether: (a) child abuse and other traumatic events moderate the associations between exposure to war events and PTS and risk behaviors; (b) Ethnicity moderates the associations between exposure to war events and PTS and risk behaviors.

Methods

Participants

The current study was part of a larger survey conducted on a representative sample of Jewish and Arab Israeli elementary, junior high and high school students in northern Israel. This study focused on junior high and high school students (7th–11th grades; ages 13–17 years). The probability sampling method was a two-stage non-proportional stratified cluster sample. We defined six strata, which were the combinations of ethnicity (Arab/Jewish) and school level (elementary school, junior high or high school). In each stratum we randomly sampled 12 schools (for a total of 72 schools). Nine (7 Jewish and 2 Arab) schools refused to participate. In each school we randomly sampled two classes from each grade level and collected data from all the students attending the class on the day of the study. The sample included 4151 students: 1800 were Jewish (54.4% boys, 44.5% girls, 1.1% did not report their gender) and 2351 were Arab (41.5% boys, 51.1% girls, 7.4% did not report their gender). The total response rates among students within the schools were 81% in the Jewish sector and 94.4% in the Arab sector.

Data collection

The data were collected on May 2007, about a year after the second Lebanon war. The students in sample classrooms answered questionnaires anonymously in Hebrew (for the Jewish students) and Arabic (for the Arab students) during a 45-min classroom session. Most students completed the questionnaire in 25–30 min. Students were told that their participation in the study was completely voluntary and that there would be no consequences for non-participation. The study received approval from the ethics committee of the Hebrew University School of Social Work and Social Welfare. It was conducted with the full cooperation of the Ministry of Education. Parental consent was obtained through the following procedure. A month before the beginning of data collection, the school administration approached all parents of the students from the sampled classes with a letter from us, explaining the topic of the research and the questions that their children would be asked, and requesting their passive consent. Parents who declined their children's participation in the study were asked to mark it on a returning letter, put it in a stamped envelope and send it to the school secretary. Only a few parents declined their child's participation and we made sure that these students did not participate in the study.

Measures

Exposure to war

This scale includes 14 questions addressing various aspects of exposure to war, physical exposure (close and distance; being in the area or knowing people who were in the area and were injured or killed), and psychological exposure (close and distance; knowing people who were injured or killed and family member been injured or killed); in line with prior work in similar contexts (Pat-Horenczyk et al., 2006; Schiff et al., 2007). All the questions used a three-point scale: (0) never happened, (1) happened once, (2) happened more than once. We translated these questions into Arabic and used back-translation method and a pilot study to make sure the Hebrew and Arabic versions matched. As we were interested in the cumulative effect of exposure to war events, a composite score summing exposure to all war events was constructed (Cronbach $\alpha = 0.75$). The scale items are presented in Table 1.

PTSD

The students responded to the University of California at Los Angeles (UCLA) PostTraumatic Stress Disorder (PTSD) scale (Rodriguez, Stienberg, & Pynoos, 1999), which consists of 22 self-report items derived from DSM-IV PTSD criteria. This measure in Hebrew and Arabic was previously used in Israel (Pat-Horenczyk, Abramovitz, et al., 2007; Pat-Horenczyk, Peled, et al., 2007). The introduction to this questionnaire was adapted to the second Lebanon war as follows: "Below please find a list of feelings and thoughts that adolescents may experience in response to their exposure to severe events. Please think about the falling missiles in the last summer and indicate the response that fits your feelings most, during the past month". The respondents indicated how frequently they had experienced a symptom related to war events (e.g., "during the previous four weeks I thought about war events even when I didn't mean to") on a 5-point Likert scale ranging from (0) not at all to (4) very often. The internal consistency of this scale in the present study was highly satisfactory (Cronbach alpha = 0.92). A probable PTSD diagnosis was made when all the DSM-IV criteria were met. Additionally, the posttraumatic distress level (PTS) was assessed by the symptom severity score, which was computed by summing the scores of all the items (Pat-Horenczyk, Abramovitz, et al., 2007; Pat-Horenczyk, Peled, et al., 2007).

Childhood adversity

We used the short form of the Traumatic Events Screening Inventory for Children (Degenhardt et al., 2008; Ippen et al., 2002; Ribbe, 1996). It consists of 10 items detailing students' reports of their experiences of a variety of traumatic events (yes/no); serious

Table 1
Cumulative exposure to war events and trauma history among the total sample and separately for Arab and Jewish students.

	Total sample ($N = 4151$)	Jewish ($N = 1800$)	Arab ($N = 2351$)
Variables			
Exposure to war events (at least once)	%	%	%
You were near a place where a missile fell or where the siren was heard	84.2	93.8***	76.8
You were present at the scene of a fallen missile without getting hurt	37.0	40.8***	34.1
You heard the shrieking of falling missiles	76.7	71.6	80.6***
You felt the shock wave of a falling missile	71.5	63.4	77.6***
The house of someone you know was damaged by a missile	39.1	56.0***	25.6
Your house was damaged by a missile	5.3	6.5**	4.4
You saw people getting hurt (in reality, not on television) by a missile	14.1	9.0	18.1***
Someone you know (not a family relative) was present at the place where the missile fell without getting hurt	49.1	52.9***	46.2
Someone you know (not a family relative) was injured or killed by a missile	22.2	17.1	26.1***
A friend was present at the place where the missile fell without getting hurt	34.6	38.7***	31.5
A friend was injured or killed by a missile	5.5	3.8	6.7***
A family member was injured by a missile	7.4	5.4	9.0***
A family member was killed by a missile	4.2	2.0	6.0***
You were hurt by a missile	3.4	2.1	4.4***
Trauma history (at least one event)			
Childhood physical abuse	4.0	5.3***	3.0
Other major traumatic events	65.1	69.4***	61.8

**$p < 0.01$, ***$p < 0.001$ difference between Israeli Jews and Arabs.

illness of a family member (experienced by 22.2%); sudden unexpected death of family member (32.0%); parental separation or divorce (8%); being a victim of physical assault (4.0%; sexual abuse (7.9%, Jewish students only, see later); involvement in an event that risked their life such as an accident or natural disaster (e.g., fire; 15.5%); witnessing car accident, natural disaster, or other serious life threatening incident (28.5%); witnessing injury or death of a person in a car accident, natural disaster or other serious life threatening incident other than political violence (15.6%); suffering a serious illness that threatened his/her life (8.4%); out-of-home placement (10.0%). We eliminated parental divorce and out-of-home placement items from analyses for both Arab and Jewish students. Moreover, Arab principals did not permit their students to report childhood sexual abuse. In the analyses we therefore eliminated the sexual abuse question from the Jewish sample as well and created a 1-item measure for *childhood physical abuse* (yes/no). We also composed another measure: *child experienced at least one other major traumatic event*, based on a list of the six other traumatic events that students were asked to report on (Cronbach alpha = 0.49 was lower as expected because only 6 items out of the 10 original items were included and we did not anticipate the co-occurrence of various traumatic events).

Substance abuse

The items were modeled on questions from the World Health Organization (WHO) survey administered in Israel in Hebrew and Arabic (Harel, Alenboygen-Frankowitz, Molcho, Abu-Asaba, & Haviv, 2002; Harel-Fisch et al., 2010). Similar questions (with a somewhat different response scale) are used by national surveys funded by the Israel Anti-Drug Authority (Azaiza, Bar-Hamburger, & Moran, 2008; Hasin et al., 2002; Schiff, Rahav, & Teichman, 2005).

Alcohol use. Three questions extracted from the World Health Organization survey (Degenhardt et al., 2008) covered drinking wine (excluding religious observance), beer and hard liquor. Each was measured on a 5-point scale from (1) never to (5) every day. A composite scale based on the maximum consumption of the three alcohol beverages was created (Cronbach alpha = 0.88).

Cannabis use. Two questions (one for hashish and one for marijuana) covered cannabis use on a 5-point scale from (1) never to (5) every day. A composite scale based on the maximum use of the two types of cannabis was computed (Cronbach alpha = 0.94). For the logistic regression we dichotomized the scale to yes/no for cannabis use (0, 1).

Ecstasy use. One question covered Ecstasy use on a 5-point scale from (1) never to (5) every day. For the logistic regression, we dichotomized the use of Ecstasy yes/no (0, 1).

School violence

The respondents were asked four questions about various types of perpetration of school violence behaviors against other students over the last month on a 3-point scale from (1) never, (2) once or twice, (3) times or more: threatening to hit another student; grabbing or pushing, hitting; using a stick, stone or other object to hurt another student. The questions were extracted from a larger valid scale assessing perpetration and victimization in school violence that has been used in Hebrew and Arabic several times in large representative school-based studies in Israel (Benbenishty & Astor, 2007; Khoury-Kassabri, Astor, & Benbenishty, 2009; Khoury-Kassabri, Benbenishty, & Astor, 2005). The internal consistency of this scale in the present study was satisfactory (Cronbach alpha = 0.83). A composite score summing the responses to all the items was constructed.

Analysis

We use descriptive statistics (chi square, *t*-test, and Analysis of Variance) to determine the rate of exposure to war, child abuse and other traumatic experiences, and the levels of PTS and risk behavior among the total sample and Arab and Jewish students. To assess the contribution of ethnicity, childhood traumatic experiences and exposure to war events on students' psychological distress and risk behaviors a year after the war, we conducted a series of hierarchical linear and logistic regressions. The final steps in these regressions examined two potential interaction effects: a. exposure to war by ethnicity and b. exposure to war by childhood trauma. These interactions were included to test the hypotheses that ethnicity and/or childhood trauma moderate the associations between exposure to war and PTS and risk behavior.

Results

Exposure to war

Adolescents reported high rates of exposure to war events. For example, 76.7% of the total sample (80.6% among Arab students and 71.6% among Jewish students) reported hearing the shriek of falling missiles, while 37.0% of the total sample (40.8% of the Jewish students and 34.1% of the Arab students) reported being present at the scene of a fallen missile without getting hurt. The total sum of exposure to war events was higher among Jewish students (Mean = 4.58 SD = 2.43 and Mean = 4.37 SD = 2.59 among Jewish and Arab students, respectively $t(4122) = 2.69$, $p < .01$). The results are presented in Table 1.

Childhood trauma

Few (161 students) of the adolescents reported childhood physical abuse (5.3% or 93 Jewish students and 3.0% or 68 Arab students; ($\chi^2(1) = 13.57$, $p < 0.001$). 65.1% of adolescents reported experiencing at least one other traumatic event in their life (69.4% and 61.8% of Jewish and Arab students respectively; $\chi^2(1) = 25.69$, $p < 0.001$). See Table 1.

A probable PTSD diagnosis and PTS following exposure to war events

6.9% of adolescents (5.6% and 7.7% of boys and girls, respectively) reported symptoms that reflect a probable PTSD diagnosis. Arabs reported more symptoms than their Jewish peers (9.1% of Arab students and 4.1% of Jewish students, $\chi^2(1) = 40.90$, $p < 0.001$). The average reported PTS symptoms in the total sample were 12.69 (SD = 12.74). Two-way Analysis of Variance revealed that the level of PTS symptoms was higher among Arab students (Mean = 14.47, SD = 13.58) than Jewish students (Mean = 10.57, SD = 11.29), $F(1,3822) = 73.88$, $p < 0.001$, and among female students (Mean = 14.77, SD = 13.35 and Mean = 10.56, SD = 11.71 among female and male adolescents respectively), $F(1,3822) = 86.55$, $p < 0.001$, with no significant ethnicity by gender interaction effect, $F(1,3822) = 3.29$, $p = 0.070$.

Alcohol consumption

48.0% of adolescents reported consuming at least some amount of alcoholic drink. Two-way ANOVA (gender by ethnicity) reveal that the extent of alcohol consumption was much higher among Jewish students (Mean = 2.54, SD = 1.25) compared with Arab students (Mean = 1.62, SD = 1.22), $F(1,3696) = 461.31$, $p < 0.001$, and among boys (Mean = 2.45, SD = 1.44) more than girls (Mean = 1.65, SD = 1.05), $F(1,3696) = 315.95$, $p < 0.001$. Moreover,

the gender differences were greater among Arab than among Jewish students, $F(1,3696) = 6.43$, $p = 0.032$ for the interaction effect.

Cannabis use

7.8% of adolescents (8.3% and 7.3 for Arab and Jewish students respectively) reported using cannabis. The prevalence of cannabis use was greater among boys for both Arab, $\chi^2(1) = 118.87$, $p < 0.001$, and Jewish students, $\chi^2(1) = 37.61$, $p < 0.001$.

Ecstasy use

6.3% of adolescents reported using ecstasy (6.9% and 5.5% of Arab and Jewish students respectively), $\chi^2(1) = 3.15$, $p = 0.08$. The prevalence of Ecstasy use was greater among boys for both Arab, $\chi^2(1) = 99.15$, $p < 0.001$, and Jewish students, $\chi^2(1) = 32.37$, $p < 0.001$.

School violence perpetration

37.7% of adolescents were involved in some kind of act of school violence against peers. Arab students reported higher levels of involvement in school violence (Mean = 4.85, SD = 1.80 and Mean = 4.75, SD = 1.56 for Arab and Jewish students respectively), $F(1,3697) = 15.24$, $p < 0.001$. Boys reported greater levels of perpetrating school violence (Mean = 5.31, SD = 2.04 and Mean = 4.33, SD = 1.10 for boys and girls respectively), $F(1,3697) = 335.19$, $p < 0.001$. The discrepancy between boys and girls in perpetrating school violence was greater for Arab students (Mean = 5.51, SD = 2.23 for Arab males and Mean = 4.34, SD = 1.15 for Arab females versus Mean = 5.11, SD = 1.82 for Jewish males and Mean = 4.32, SD = 1.02 for Jewish females), $F(1,3697) = 12.68$, $p < .01$.

Predicting PTS

As can been seen in Table 2, regression analyses revealed that being an Arab student was associated with higher level of PTS ($\Delta R^2 = 0.02$, F change (1, 3822) = 76.01, $p < .001$). Childhood physical abuse and other major traumatic events had a significant contribution to the explained variance of PTS ($\Delta R^2 = 0.03$, F change (2, 3820) = 69.41, $p < 0.001$). Cumulative exposure to war events was significantly associated with PTS ($ß = 0.25$, $t = 15.79$, $p < 0.001$), adding another 6% (F change (1, 3819) = 249.15, $p < 0.001$) to the explained variance of PTS. The associations between war exposure and PTS were similar among Arab and Jewish students and those who reported versus those who did not report childhood trauma, as none of the interactions were significant.

Predicting alcohol consumption

Regression analyses (Table 3) revealed that being an Arab student was associated with lower levels of alcohol consumption ($\Delta R^2 = 0.10$, F change (1, 3696) = 480.35, $p < 0.001$). Childhood physical abuse and other traumatic events had a modest but significant contribution to the explained variance of alcohol consumption ($\Delta R^2 = 0.01$, F change (2, 3694) = 28.82, $p < 0.001$). Cumulative exposure to war events and PTS resulting from war events were significantly associated with alcohol consumption ($ß = 0.12$, $t = 8.06$, $p < 0.001$ for exposure to war events; $ß = 0.08$, $t = 5.09$, $p < 0.001$ for PTS), adding another 3% to the explained variance of alcohol consumption. The associations between war exposure, PTS, childhood trauma and alcohol consumption were similar among adolescents who reported childhood trauma and those who did not, and among Arab and Jewish students given that only one interaction was significant (being Jewish and experiencing other traumatic events had higher associations with alcohol consumption than being Arab and experiencing other traumatic events; $ß = -0.07$, $t = -3.00$, $p < 0.01$) and the interactions contributed very little to the explained variance.

Predicting cannabis use

Logistic regressions (Table 4) revealed that being an Arab was not significantly associated with more use of cannabis (OR = 1.29, Confidence Interval 0.99, 1.68). Students who reported experiencing child physical abuse were 4.37 (CI 2.74, 6.99; $p < 0.001$) more likely to use cannabis than students who reported no physical abuse. Reports of other major traumatic events were not associated with cannabis use. Adding exposure to war events and PTS resulting

Table 2
Adolescent posttraumatic stress symptom scores (PTS) as predicted by childhood adversity and past 12-month cumulative exposure to war events: hierarchical linear regression models.

Independent variables	ΔR^2	ß
Step 1	0.03***	
Gender (girl)		0.17***
Grade		0.01
Step 2	0.02***	
Ethnicity (Arab)		0.14***
Step 3	0.03	
Childhood physical abuse		0.10***
Other major traumatic events		0.14***
Step 4	0.06***	
Cumulative exposure to the 2nd Lebanon war		0.25***
Step 5 (interactions)	0.00	
Cumulative exposure × childhood physical abuse		0.00
Cumulative exposure × other major traumatic events		0.00
Ethnicity × childhood physical abuse		−0.02
Ethnicity × other major traumatic events		0.01
Ethnicity × cumulative exposure to the 2nd Lebanon war		0.04
Total R^2	0.14***	
N	3825	

***$p < 0.001$.

Table 3
Adolescent alcohol consumption as predicted by childhood adversity, past 12-month cumulative exposure to war events, and posttraumatic stress symptoms: hierarchical linear regression models.

Independent variables	ΔR^2	ß
Step 1	0.11***	
Gender (girl)		−0.31***
Grade		0.13***
Step 2	0.10***	
Ethnicity (Arab)		−0.32***
Step 3	0.01***	
Childhood physical abuse		0.09***
Other major traumatic events		0.05**
Step 4	0.03***	
Cumulative exposure to the 2nd Lebanon war		0.12***
Posttraumatic stress symptoms (PTS)		0.08***
Step 5 (interactions)	0.00	
Cumulative exposure × childhood physical abuse		0.00
Cumulative exposure × other major traumatic events		0.03
Ethnicity × childhood physical abuse		0.03
Ethnicity × other major traumatic events		−0.06**
Ethnicity × cumulative exposure to the 2nd Lebanon war		0.01
Ethnicity × PTS		−0.01
Total R^2	0.25***	
N	3699	

***$p < 0.001$.

Table 4
Logistic regressions for cannabis and ecstasy use as predicted by childhood adversity, past 12-month cumulative exposure to war events, and posttraumatic stress symptoms.

	Cannabis		Ecstasy	
Independent variables	OR	95% CI	OR	95% CI
Step 1	R^2 0.11*		R^2 0.10	
Gender (girl)	0.16***	0.11, 0.23	0.14***	0.10, 0.22
Grade	1.13*	1.02, 1.24	1.04	0.93, 1.17
Step 2	R^2 0.11*		R^2 0.11*	
Ethnicity (Arab)	1.29	0.99, 1.68	1.52**	1.13, 2.05
Step 3	R^2 0.13		R^2 0.13*	
Childhood physical abuse	4.37***	2.74, 6.99	4.14***	2.47, 6.94
Other major traumatic events	1.02	0.92, 1.12	0.99	0.88, 1.10
Step 4	R^2 0.19		R^2 0.19	
Cumulative exposure to the 2nd Lebanon war	1.15***	1.08, 1.21	1.12***	1.05, 1.19
Posttraumatic stress symptoms (PTS)	1.04***	1.03, 1.05	1.04***	1.03, 1.05
Step 5	R^2 0.20		R^2 0.20	
Cumulative exposure × childhood physical abuse	0.83	0.54, 1.26	1.12	0.69, 1.84
Cumulative exposure × other major traumatic events	1.13	0.84, 1.51	1.25	0.91, 1.72
Ethnicity × childhood physical abuse	1.61	0.59, 4.40	2.14	0.69, 6.67
Ethnicity × other major traumatic events	0.56	0.35, 0.88	0.60	0.36, 1.00
Ethnicity × cumulative exposure to the 2nd Lebanon war	1.12	0.84, 1.49	1.15	0.83, 1.58
Ethnicity × PTS	0.87	0.68, 1.11	0.80	0.61, 1.04
Hosmer-Lemeshow goodness of fit test	$p = 0.565$, 6.74		$p = 0.29$, 9.67	
N	3524		3544	

Note. OR = odds ratio; CI = confidence interval; R^2 = Nagelkerke R^2.
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

from exposure to war events were both significantly associated with more use of cannabis (OR = 1.15, CI = 1.08, 1.21; OR = 1.04, CI = 1.03, 1.05 for exposure and PTS respectively), and these effects were similar for adolescents who reported childhood trauma and those who did not, and for Jewish and Arab students as most interaction effects were not significant (except one where Arab students who were exposed to traumatic events other than physical child abuse were *less* likely to use cannabis; OR = 0.58, CI = 0.36, 0.91).

Predicting ecstasy use

Logistic regressions (Table 4) revealed that Arab students were 1.5 times more likely than Jewish students to use ecstasy (OR = 1.52, CI = 1.13, 2.05). Students who reported experiencing child physical abuse were 4.14 times (CI = 2.47, 6.94; $p < 0.001$) more likely to use ecstasy, than students who reported no physical abuse. Reports of other major traumatic events were not associated with ecstasy use. Adding exposure to war events and PTS resulting from exposure to war events were both significantly associated with more use of ecstasy (OR = 1.12, CI = 1.05, 1.19; OR = 1.04, CI = 1.03, 1.05 for exposure and PTS respectively), and these effects were similar for adolescents reported childhood trauma and those who did not, and for Jewish and Arab students as none of the interaction effects were significant.

Exposure to war events and involvement in violence

Regression analyses (Table 5) revealed that being an Arab student was associated with higher levels of involvement in school violence, although the contribution of ethnicity to the explained variance was negligible ($\Delta R^2 = 0.003$, *F* change (1, 3697) = 12.13, $p < 0.001$). Childhood physical abuse and other traumatic events had an additional contribution to the explained variance of involvement in school violence ($\Delta R^2 = 0.03$, *F* change (2, 3695) = 60.77, $p < 0.001$). Cumulative exposure to war events and PTS resulting from war events were significantly associated with involvement in school violence ($ß = 0.08$, $t = 5.08$, $p < 0.001$ for exposure to war events; $ß = 0.12$, $t = 7.54$, $p < 0.001$ for PTS), adding another 3% to the explained variance of school violence. The associations between war exposure, PTS, childhood trauma and involvement in school violence were similar among adolescents who reported childhood trauma and those who did not, and among Arab and Jewish students, as only one interaction was significant (being Arab and experiencing childhood physical abuse had higher associations with school violence than other groups; $ß = 0.05$, $t = 2.45$, $p = 0.014$) and the interactions contributed very little to the explained variance.

Table 5
School violence perpetration as predicted by childhood adversity, past 12-month cumulative exposure to war events, and posttraumatic stress symptoms: hierarchical linear regression models.

Independent variables	ΔR^2	ß
Step 1	0.08***	
Gender (girl)		−0.29***
Grade		0.03
Step 2	0.003**	
Ethnicity (Arab)		0.06**
Step 3	0.03***	
Childhood physical abuse		0.13***
Other major traumatic events		0.10***
Step 4	0.03***	
Cumulative exposure to the 2nd Lebanon war		0.08***
Posttraumatic stress symptoms (PTS)		0.12***
Step 5 (Interactions)	0.00	
Cumulative exposure × childhood physical abuse		0.035*
Cumulative exposure × other major traumatic events		0.00
Ethnicity × childhood physical abuse		0.05*
Ethnicity × other major traumatic events		−0.01
Ethnicity × cumulative exposure to the 2nd Lebanon war		−0.04
Ethnicity × PTS		0.02
Total R^2	0.144***	
N	3700	

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Discussion

This study investigated the effects of war on Israeli adolescents. As in previous studies conducted on the effects of the second Lebanon war (Yahav & Cohen, 2007), the results of this study revealed extensive exposure to war events among both Jewish and Arab students. Also similar to previous studies (Kimhi, Eshel, Zysberg, & Hantman, 2010), only a small portion of students reported a probable PTSD diagnosis as a result of their exposure to the second Lebanon war. However, the results of this study revealed that the consequences of war go beyond probable PTSD and PTS symptoms. Specifically, a year after the war was over, its effects on adolescents were apparent by their greater involvement in school violence and substance use. This is consistent with research from large-scale longitudinal studies of youth in Belfast, Northern Ireland where exposure to political violence was associated with long term community violence and use of substances (McAloney, McCrystal, Percy, & McCarton, 2009). Thus exposure to political violence is a risk factor for adolescents' well being in multiple domains of life and long after the war ends.

We examined two potentially vulnerable populations. The first was adolescents who experienced childhood physical abuse and other types of childhood trauma. According to the Stress

Sensitization Model (Hammen et al., 2000) when such adolescents are exposed to current trauma such as war, they are at risk for greater psychological distress and behavioral difficulties than adolescents who did not experience childhood trauma. Our data supported the hypothesis that adolescents who experienced childhood abuse and other types of traumatic events experienced greater levels of PTS, substance use and violence perpetration. Exposure to other traumatic events was also associated with greater PTS symptoms and involvement in violence but not with greater substance use. Our findings support previous studies suggesting childhood abuse as a risk factor for the onset and continuation of substance abuse (Douglas et al., 2010; Dube et al., 2003; Kendler et al., 2000). Nonetheless, in contrast with the Stress Sensitization Model, the impact of exposure to war was similar for those who reported experiencing childhood trauma and those who do not, as none of the interaction effects were significant.

The second vulnerable population was Arab adolescents. In accord with our hypothesis and similar to recent findings (Slone & Shechner, 2011), these adolescents reported higher levels of PTS than their Jewish peers despite experiencing lower war exposure compared to Jewish adolescents in their area. One potential explanation may be that although they were exposed less than their Jewish peers, Arab adolescents felt much less secure, as they did not have shelters and protected areas, and only a few were evacuated from the danger zone. This pattern of findings may also reflect the internal conflict of Arab adolescents between their fear of harm and their justification of the rocket shelling of Israel.

As predicted, Arab adolescents reported more involvement in school violence compared with their Jewish counterparts and greater use of non-alcoholic substances such as Ecstasy. We found little evidence for ethnicity as a moderating variable and it is safe to conclude that exposure to political violence affected Jewish and Arab students similarly.

The present findings extend previous findings (Pat-Horenczyk, Abramovitz, et al., 2007; Pat-Horenczyk, Peled, et al., 2007; Schiff, 2006; Schiff et al., 2006, 2007) suggesting that cumulative exposure to acts of political violence and PTS symptoms associated with such exposure are risk factors for involvement in violence and substance abuse, not only during the exposure or shortly after, but even a year later. Risk and protective factors that moderate the association between exposure and long term psychological and behavioral outcomes should be further explored. Cummings, Goeke-Morey, Schermerhorn, Merrilees, and Cairns (2009, 2010) suggest that the effects of political violence on children and adolescents are best understood from a social ecological perspective. Political violence (macro system) is mutually affected by community conflict and violence, intensity zone and ethnicity areas (all are excosystem factors) which in turn mutually effect marital conflict and violence, parental adjustment and child emotional security about family relations (microsystem factors). Child regulatory processes and adjustment (individual ontogeny), all effect child internalizing symptoms, externalizing symptoms and delinquency behaviors (Cummings et al., 2009 p. 19). In the Israeli context, the excosystem factors may be ethnicity and ethnic/political identity of Arab versus Jewish students, income and educational disadvantaged in the Arab population compared with Jewish population. While some evidence from Northern Ireland supports this model, the full model has not been tested yet in war zones.

Limitations

The present study has several limitations. First, the cross-sectional design does not allow for direct tests of causality – for example, ruling out the possibility that pre-exposure substance abuse and involvement in violence exacerbated reactions to individuals' exposure to war events, or that PTS somehow caused reports of more exposure. Similarly, unlike with adults, we cannot rule out the possibility that the reported childhood adversity in the present study occurred simultaneously with exposure to war events rather than before it. Longitudinal studies of participants exposed to political violence in which substance abuse, involvement in school violence, childhood adversity and psychopathology were assessed prior to the attacks are needed to address this issue. The increase in the amount of explained variance (R^2 change) following the inclusion of exposure to political violence to the regression models was modest. Arab students were not allowed by their school directors to report on childhood sexual abuse and reported lower levels of childhood physical abuse which might reflect their different perceptions of what constitutes abuse (Khoury-Kassabri, 2010) given they are coming from more conservative, patriarchal families (Kaufman et al., 2012). The present study did not explore such potential differences. This study used solely self-reports which are likely to inflate the results.

Conclusion

The present study shows that exposure to war events adds negatively to adolescents' previous exposure to traumatic events and to the belonging to a minority ethnic group with lower resources and identity complexities (Arab population). Its effects include a broad scope of psychological distress and risk behavior that lasts at least one-year after the war is over.

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