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Posttraumatic stress among Palestinian adolescents in the Gaza Strip: An analysis of event-related and demographic factors

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Abstract
Objective: This study investigates the impact of ongoing traumatic events on Palestinian adolescents' posttraumatic stress according to event-related and demographic factors. Method: A sample of 368 Palestinian adolescents (49.2% males, mean age 17.03) was drawn from different areas of the Gaza Strip. Students were investigated on exposure to traumatic events and posttraumatic stress symptoms (PTSS) and disorder (PTSD). *Results*: The mean number of traumatic events experienced by the adolescents was 9.9 (SD = 3.20). Boys were significantly more exposed than girls, as were adolescents living in villages compared to those living in Gaza city or refugee camps. Adolescents mainly and pervasively experienced objective, non-personal material exposure (such as witnessing bombardments) (85% to 96%) and media exposure (95%). Up to 17% of the adolescents experienced direct, physical exposure (7% personal injury), exposure through injury and death of relatives. In this context, two fifths of the adolescents experienced mild, two fifths moderate and one fifth severe PTSS. Remarkably, adolescents did not differ significantly in PTSS despite exposure differences across gender, place of residency and family income. *Conclusion*: Near half of the investigated adolescents living in the Gaza Strip experience moderate to severe levels of posttraumatic stress, for around one fifth this amounts to a probable posttraumatic stress disorder. These findings urge toward providing psychological support programs to Palestinian adolescents to enhance current wellbeing and limit further developmental risks. Furthermore, the findings suggest the need to investigate the role of appraisal and

coping to understand the pathways through which differences in trauma exposure lead to similar posttraumatic stress outcomes.

Keywords: Posttraumatic stress, traumatic events, adolescents, demographic, Gaza Strip, Palestinian

Introduction

Since the outbreak of the al-Aqsa Intifada in late September 2000, Palestinian youth have been extensively exposed to traumatic events. These have ranged from witnessing bombardment of homes, schools and streets, through hearing about the killing of friends and relatives, to being personally injured. Such ongoing exposure raises questions about the psychological effects it exerts on adolescents. Exposure to traumatic events is known to increase the risks of both short-term and long-term mental health problems (Saigh, 1991; Thabet, Abed, and Vostanis, 1999). Youngsters living in conditions of war and military violence have been described as growing up too soon and taking premature political responsibilities (Boothby, Upton, Sultan, 1992). They are also known to be at high risk of developing posttraumatic stress symptoms or disorder (PTSS/PTSD) (Dyregrov, Gjestad, and Raundalen, 2002). In the past years, research about psychological outcomes after traumatic events has increased. However, relatively few studies specifically examine how adolescents' continuing exposure to trauma impacts on their wellbeing. Also, research conducted so far has remained inconclusive as regards the range and the intensity of these outcomes according to event-related and demographic determinants.

This study examines the prevalence of posttraumatic stress in Palestinian adolescents living in the Gaza Strip. It also investigates to what extent these youth's stress reactions vary according to event-related and demographic factors. To this effect, we shall first briefly discuss the state of the literature regarding adolescents' PTSS after exposure to traumatic events and potential determinants in this context.

Posttraumatic stress in the face of chronic exposure to trauma: From theory to empirical evidence

Briefly circumscribed, posttraumatic stress consists of typical reactions that arise after experiencing 'severe' traumatic event(s) or situation(s). They mainly include intrusive re-experiencing of the event(s), hyper arousal, and avoidance and numbness symptoms. The persistence hereof for more than a month will amount to a posttraumatic stress disorder (PTSD) as described by the DSM-IV diagnostic criteria

(American Psychiatric Association, 2004; also see Instruments). From a more dynamic bio-psycho-social approach as conceptualized in the FACE©-model (Facilitating Adjustment of Cognition and Emotion), posttraumatic stress amounts to a series of cognitive and emotional adaptations reflecting the exposed individual's attempts to deal with overwhelming stressor(s). Posttraumatic stress is thus conceived as the more or less durable disruption, following traumatic experiences, of the adjustment between cognitive control and emotion regulation processes, with the first being bypassed (e.g. as regards executive functioning, memory and attention processes) by an intensified reactivity and modified biochemistry of the latter (e.g. as regards autonomous reactions, neurotransmitter functioning and neuronal connections) (Celestin-Westreich and Celestin, 2010). Overall, the evidence-base has demonstrated dose-response effects to this regard, namely, higher exposure levels trigger higher posttraumatic stress levels. However, while some events or situations will be overwhelmingly traumatic to most individuals, important variability also exists as to which experiences are traumatic to whom, to what extent and under which circumstances (Braun-Lewensohn, Celestin-Westreich, Celestin, Verleye, Verté, and Ponjaert-Kristoffersen, 2009a; Celestin-Westreich and Celestin, 2010; Kalantari and Vostanis, 2010; Powers, Halpern, Ferenschak, Gillihan, and Foa, 2010). From the above-cited FACE© perspective, this happens as a function of the balance of personal, relational and environmental risk factors and resources for a given individual at a given time as well as throughout the life span.

For adolescents, posttraumatic stress proves crucial to their developmental pathways. Adolescence indeed tends to imply both sources of resilience and vulnerability toward PTSS/D. On the one hand, youngsters' brains are still developing which may facilitate resiliency through neuroplasticity, especially when supported by proper prevention and intervention strategies. On the other hand, particularly from middle adolescence on, strong stressors may precipitate preexisting difficulties and/or (genetical) predispositions toward diverse forms of psychopathology. Posttraumatic stress may therefore interfere in multifinal ways with middle to late adolescents' developmental tasks of distancing from parents and family, experimenting with diverse roles and identities in society and engaging toward adult functioning, the more so in societies where such roles are taken up relatively early in life. For example, trauma exposure may provoke procrastination in some adolescents while aggravating acting out in others. Hence, posttraumatic stress reactions during adolescence are never negligible (e.g. Cummings, Davies and Campbell, 2000; Finkelhor, 1995; Powers et al., 2010; Qouta, Punamaki, Montgomery, and El Sarraj, 2007).

Despite these insights, the evidence-base concerning adolescents' pathways when confronted with continual exposure to sociopolitical disputes remains limited to date. In the first place, there is a clear need for empirical data as to which aspects of this exposure are determinant and under which circumstances.

Overall prevalence of posttraumatic stress in Palestinian youth

In recent years, a number of studies have started to assess the levels of PTSS or PTSD among Palestinian youth given their widespread exposure to trauma. Indeed, between September 2000 and November 2005, over 26000 Palestinians under the age of 18 years, representing about 7.5% of the child and adolescent population, were injured in the context of the Al-Aqsa Intifada. Approximately 12% of the injured youngsters are now suffering from a permanent disability (PCBS, 2006). Overall, PTSS levels seem to range from 10% to 70% among the youth from the Gaza strip (Thabet et al., 1999; Qouta, Punamaki, and El Sarraj, 2003). In a study on 1000 school-aged Palestinian children, 54.7% reported experiencing at least one intense traumatic event in their lifetime and 34% were diagnosed as having full PTSD (Khamis, 2000). In child populations from relatively comparable contexts, levels of PTSS ranged from 22 to 25% among Israeli and 27% among Lebanese children, through 48% among Cambodian refugee children and 52% among Bosnian youth (Kinzie, Sack, Angell, Manson, and Rath, 1986; Smith, Perrin, Yule, and Rabe 2001). Iraqi children whose shelter was destroyed by shelling showed the highest posttraumatic stress levels (78-88%) (Dyregrov et al., 2002).

The few studies specifically pertaining to Palestinian adolescents (aged 11 to 19 years) suggest that 11 to 16% suffer from low to mild, 33% to 49% from moderate and 33 to 54% severe levels of PTSS/D (e.g. Qouta et al., 2003).

Given these data, closer investigation is required to understand the wide range of posttraumatic stress reactions among Palestinian youth. For one, 'posttraumatic stress' levels tend to be diversely circumscribed across and even within studies, including either posttraumatic stress symptoms (PTSS), disorder (PTSD, as defined by DSM criteria) or both. In short, there is a need to distinguish between PTSS and PTSD when reporting Palestinian adolescents' posttraumatic stress levels. Furthermore, to date these levels have mainly been investigated as a function of the degree of exposure. The broader trauma literature suggests that PTSS outcomes may also vary according to types of exposure, personal and other demographic factors (such as gender, age, and place of residency and family characteristics), as discussed hereafter.

The role of levels of exposure

Regarding levels of exposure, the dose–response effects expected from the general trauma literature tend to be found in most studies on Palestinian youth. For example, when examining Palestinian children's (aged 9 to 16 years) responses to varying intensities of socio-political violence during the past six years, mean PTSS rates evolved from 40% after the end of the first intifada in the peace period, through 10% during the peace process and up again to 39% during the current intifada. PTSS peaked to 70% during recent shelling of the Gaza Strip (Thabet et al., 1999; Thabet, and Vostanis, 2000; Thabet, Al Gamal, Vand Vostanis, 2006; Thabet, Abu Tawahina, El Sarraj, and Vostanis, 2007). When comparing Palestinian and Israeli-Palestinian children's reactions to exposure to traumatic events, over one third of the former displayed severe to very severe PTSS compared to one fifth of the latter (Tamar and Solomon, 2005). Furthermore, some evidence also suggests a decrease in PTSS when the exposure subsides. This was the case, for example, with school-aged Israeli children whose PTSS dropped from 22% to 12% in one year when scud missile attacks ceased after the Gulf War (Schwarzwald, Weisenberg, Waysman, and Solomon, 1993). PTSS also decreased in a 30-month follow-up among displaced Israeli preschool children (Laor, Wolmer, Mayes, Gershon, Weizman, and Cohen, 1997). However, such trends are not necessarily linear. For example, PTSS was first found to increase among Iraqi children during the 13 months after their shelter had been bombed, to fall significantly only after two years (Dyregrov, and Raundalen, 1993). In short, exposure levels and more specifically dose-response effects warrant attention when attempting to understand posttraumatic stress responses in youth. Still, the current literature limits drawing conclusions about the persistency versus attenuation of symptoms because the types of trauma, length of follow-up, children's gender and age widely differ across studies. Especially regarding the latter, it should be noted that only few published studies appear to specifically pertain to Palestinian adolescents.

The role of types of exposure

Types of exposure merit further analysis given an increasing evidence-base on trauma resulting from military violence and socio-political adversities. More specifically, exposure in this context can be sub-typed into objective, subjective and media exposure (Braun-Lewensohn et al., 2009a). Objective exposure consists of observable facts that cannot be controlled by the individual. It can be further sub-typed in direct, physical exposure and indirect exposure (through witnessing and relationship with a victim). Subjective exposure refers to the individual's experience of the events (immediate appraisal), regardless of their objective characteristics.

Media exposure merits separate attention given its mix of both objective and subjective characteristics. Indeed, while watching the media implies some extent of objective exposure (namely watching real images of shelling, shooting and so forth), it is also partly controlled by the individual's choice to consult the media. In the Palestinian context, shifts in types of exposure may apply between the first (1987) and the second (2000) Al Aqsa Intifada. During the first Intifada, objective exposure appeared predominant in both its indirect-relational and direct-physical components, as evidenced by the frequency of tear gas attacks (93%), breaking into homes (90%), beatings of family members or self (70% to 62%) and being personally injured (37%) (Abu-Hein, Qouta, Thabet, and El-Sarraj, 1993). Research closer to the current study period suggests a shift toward the predominance of media and indirect, relational objective exposure. For instance, across studies, events cited by two-thirds to more than 90% of Palestinian children include seeing victims of violence on television, witnessing funerals, shootings, bombardments and shelling and injured or dead persons. A smaller proportion of youngsters report being shot by bullets (12.9%) (Qouta et al., 2003; Thabet, Abed, and Vostanis, 2001).

Adolescents' objective exposure to higher levels of physical traumatizing events has been, understandably, found to elicit more adverse psychological reactions, including higher rates of PTSD, functional impairments, anxiety and substance abuse. Research however also has shown that media and indirect objective exposure also strongly contribute to youth's PTSS (Braun-Lewensohn et al., 2009a, 2009b; Dyregrov et al., 2002; Punamaki, Komproe, Qouta, ElMasri and de Jong, 2005; Thabet & Vostanis, 2000). Taken together, these findings suggest that types of exposure may require attention when attempting to understand adolescents' psychological responses to ongoing trauma.

The role of gender

Regarding gender, girls generally appear to be more vulnerable toward PTSS than boys (Dyregrov et al., 2002; Braun-Lewensohn et al., 2009; Orla, 2003; Orlee, Boyle, and Yule,2000). Although this tendency also comes forward in the Palestinian context (e.g. Punamaki,and Puhakka, 1997; Qouta et al., 2003, Qouta, Punamaki, and El Saraaj. 2004; Thabet et al., 2001), its extent remains equivocal, with some studies suggesting no gender differences or even higher levels of posttraumatic stress in males, as in Punamaki et al.' (2005) study on peritraumatic reactions. Age may play a role in these mixed findings, since gender differences appear prevalent in studies focusing on the broad childhood period, as opposed to Punamaki et al's findings among 16 to 60 year olds. The extent of gender effects may also be trauma specific (e.g., natural disasters versus societal trauma) (Punamaki et al., 2005; Saigh,

1991; Thabet, Abu-Nada, Shivram, Millingen, and Vostanis, 2009). Thus, posttraumatic gender effects specifically among Palestinian adolescents merit further clarification.

The role of the current age cohort

The extent and type of age effects in youth's responses to chronic trauma exposure have remained equivocal too. While some studies have not found any age effects in such contexts (Saigh, 1991), according to others, both younger and older children appeared to be more vulnerable than their counterparts (e.g. Qouta et al., 2003). A child's age, therefore, may not be a risk factor in and of itself; rather, in each growth and developmental stage children and adolescents deal with both resiliencies and vulnerabilities (Berman, 2001; Braun-Lewensohn et al., 2009; Celestin-Westreich and Celestin, 2010; Finkelhor, 1995; Punamaki, 2002). Notably, the current cohort of Palestinian adolescents is characterized by having lived more than two thirds of their youth under ongoing traumatic events, having been around 10 years old when the current Al-Aqsa Intifada erupted in 2000. This implies a pronounced degree of vulnerabilities experienced throughout their childhood that may contribute toward elevated PTSS levels.

The role of other demographics

In an attempt to further differentiate influencing demographic factors, mainly place of residency has been considered through its simultaneous link with levels of exposure and environmental specificities. The Palestinian area of residency is mainly subdivided into Gaza city and refugee camps (both situated far away from the borders) and villages (close to the borders). Compared to those living in the villages, youth from Gaza cities or refugee camps are less likely to be exposed to physical incursions or artillery bombardments, but more to aircraft bombardments on homes, governmental buildings and streets (PCBS, 2006). The effect of place of residency on youngsters' PTSS has nonetheless yielded unclear findings to date. Thus, in one study Palestinian children living close to Israeli settlements were found to show acute levels of posttraumatic stress to an important extent (55%) (Quota et al., 2005), while other research found children meeting the criteria of PTSD to come mainly from urban areas (Thabet et al., 2001). Furthermore, the literature evidences that adolescents in war zones can be affected through various other demographic influences, such as a lack of basic health needs, loss of family members, disruption of social networking and displacements. Few studies have examined the relationship between such demographical characteristics and the level of PTSS among adolescents in the Palestinian society (Qouta, Punamaki, and El Sarraj, 1997; Thabet, Abed, and Vostanis, 2002).

In short, environmental and family demographic characteristics still need to be more extensively addressed when investigating Palestinian adolescents' posttraumatic responses.

Implications for current research

As comes forward from the current state of the literature, many aspects of adolescents' stress reactions to a chronic context of exposure to socio-political violence warrant further investigation. To this effect, the following research questions and hypotheses were addressed in the present study. It appeared relevant to first investigate levels and types of exposure, along with possible demographic variations hereof. Given the current evidence-base, we expected a majority of the Palestinian adolescents to have been exposed to more than one objective traumatic event. Given that the demographic and environmental characteristics of the Palestinian society have remained relatively understudied, possible differences in exposure according to place of residency and family demographics were to be explored. Our primary research goal then pertained to identifying the levels of posttraumatic stress specifically for Palestinian adolescents, with the expectation of these being higher than those in non-exposed populations. Finally, we set out to identify demographic factors that may affect these adolescents' PTSS. We hypothesized that girls would demonstrate higher levels of PTSS than boys, as would adolescents in higher exposed places of residency. Also, we hypothesized Palestinian adolescents' PTSS to be inversely correlated to family and environmental resources (the lower the resources, the higher the PTSS).

Method

Participants and context

This study comprised a sample of 368 Palestinian adolescents (11th Grade; M = 17.3 years; 49.2% male) living in the Gaza Strip, which is approximately 50 kilometers long and 5 to 12 kilometers wide. The Gaza strip spans a narrow zone of land along the Mediterranean Sea, between Israel and Egypt. The total population is one and a half million with a population density of 2.150 people per kilometer. Among these, 808.000 persons are registered refugees, over 55% of who live in eight refugee camps scattered across the Gaza Strip. Other inhabitants live in villages and cities of the Gaza Strip. The United Nations for Relief and Work Agency (UNRWA) provides education for 159.892 pupils, as well as health and relief services to refugees living inside and outside the camps (Thabet et al. 2006). Among the participants studied, 60% were refugee adolescents living in Jabalia refugee camp, which with a

population of approximately 120.000, lacks basic infrastructure. Approximately one fifth (21%) of the adolescents were from Bet-Hanon village, which is situated in a remote part of the Gaza Strip (close to the Israeli borders) and has around 45.000 inhabitants. The remaining adolescents (19%) were from Al-Remal city, which is a relatively more prosperous urbanized neighborhood of approximately 30.000 inhabitants.

Instruments

Participants completed a standardized battery that included the following questionnaires aimed at examining the initial hypotheses.

'Demographic & Socio-Economic Inventory'

Demographics were assessed by using a self-designed inventory that included questions regarding gender, place of residency, family size, family income, maternal and paternal education and occupation.

Gaza Traumatic Event Checklist (GTEC)

The GTEC was used to assess participants' exposure to traumatic events over the last six months. It consists of 20 traumatic events that commonly occur during the ongoing political and military violence in the Gaza Strip. The initial version was developed by the research department of the Gaza Community Mental Health Program (GCMHP) and has been used in previous studies on Palestinian children (Thabet et al. 1999, 2002). Items require dichotomous answers, yielding a range of total trauma scores from 0 to 20. This checklist has shown satisfactory split half reliability (R = 0.776) and internal consistency (Cronbach's alpha = 0.749), Thabet et al. 2002; 2009).

The Davidson Trauma Scale (DTS)

The DTS is a self-rated scale, comprising 17 items designed to measure posttraumatic stress reactions in youngsters aged 6 to 18 years. Tailored closely to the symptom definitions of the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV), these pertain to intrusive re-experiencing (DSM-IV criteria B), avoidance and numbness (DSM-IV criteria C) and hyper arousal reactions (DSM-IV criteria D) (American Psychiatric Association, 1994). Before application, adolescents must meet DSM-IV criteria A and E, namely experiencing or witnessing an extremely traumatic event. Rating is ordinal (from 'never' (0), through 'sometimes' (1) to 'often' (2)).

Participants were given a "probable current PTSD diagnosis" if they responded with 'often' to at least one of the four 'trauma re-experiencing' items, along with at least three of the seven 'avoidance of stimuli associated with trauma' items and at least two of the six 'increased arousal' items. The DTS theoretical sum score range lies between 0 and 34. In our sample, this range was further grouped into 'none or doubtful' (score 0-8), 'mild' (score 9-16), 'moderate' (17-24) or 'severe' (25 and above). The DTS has been translated into Arabic by professional bilingual translators. It shows satisfactory reliability with a split half R of 0.74 and internal consistency Cronbach's alpha of 0.75 (Thabet et al. 2002, Thabet et al. 2009). The reliability in our sample also shows satisfactory with a split-half R of 0.605 and Cronbach's alpha of 0.709.

Procedure

The ethical procedures applicable to this study were followed. As required by the Palestinian Ministry of High Education, the research proposal and questionnaires were submitted before the start of the study. After receiving their approval to proceed, permission to enter the schools was gathered from the principals. Students completed the self-report questionnaires during regular class hours in the first trimester of the academic year 2006-2007. Students were introduced to the study purpose and assured of the confidentiality of all data. The participants were informed that the researcher was interested in their experience of ongoing traumatic events, that participation was voluntary and anonymous, and that they were free to withdraw their participation for any reason and at any time during the questionnaire procedure. Completion time ranged from around 35 to 45 minutes.

As indicated, data were gathered from secondary schools located in the area of Jabalia refugee camp, Bet-Hanon village and Al-Remal city. A multistage random sample design was used to reach the potential study sample, in three main phases. First, cluster random selection was applied to include all the governmental secondary schools in the above cited areas. Second, stratified cluster selection was applied on classes in which the students had been given a participation invitation (450 adolescents). Third, among those who obtained parental consent and agreed to participate, adolescents were randomly selected by choosing those sitting on the right side of the classroom desk. Thus, a representative sample of 368 Palestinian adolescents was drawn from a total of 4551 students, distributed over 115 classes (11th grade) from 13 governmental secondary schools.

To avoid any dramatic changes in the political situation in Gaza that might have affected the adolescents' responses, all data were gathered within a time frame of

two consecutive weeks. The response rate was considered to be satisfactory, with 98% of the invited adolescents agreeing to participate in the study.

Data analysis

Analyses were computed using the statistical software SPSS version 13.0. The data were analyzed using descriptive and inferential analysis. The present analyses assessed several predictors (i.e., level of exposure to traumatic events and demographic factors) for the outcome variable 'posttraumatic stress reactions'. The inferential analyses included use of independent sample t-tests and one-way ANOVA.

Results

Demographics: descriptive

Consistent with the Palestinian demography, participating adolescents were from 'large' families with 72% comprising nine family members or more.

The vast majority of these families are characterized by low socio-economic levels (educational and employment), with 57.6% of fathers and 69% of mothers having completed low education (secondary school or less) in contrast to 21.5% of fathers and 13.9% of mothers having completed higher education (university graduation to postgraduate). Over one third of the adolescents' fathers were unemployed, while approximately one fourth worked as civil employees and the remainder as laborers. Approximately, four fifths of their mothers were house wives, slightly less than one fifth employees and the remainder laborers. Due to high levels of unemployment, 42% of the adolescents' families earn less than 100 euro's a month. Table 1 provides a complete overview of the sample's family demographics.

Table 1. Percentage and Frequencies of Demographic Characteristics (N= 368)

Demographic characteristics	%
Gender	
Male	49.2
Female	50.8
Place of residency	
City	18.5
Village	21.2
Refugee camp	60.3
Family size	
Small (4 and less)	0.8
Medium (5-8 members)	27.4
Large (9 or more)	71.7
Income	
< 100 Euro	41.8
101 - 300 Euro	32.1
301 - 600 Euro	16.8
> 600 Euro	9.2
Paternal education	
Low (≤ secondary school)	57.6
Medium (secondary school to entered university)	20.9
High (university (post)graduation)	21.5
Maternal education	
Low (≤ secondary school)	69.0
Medium (secondary school to entered university)	17.1
High (university (post)graduation)	13.9
Paternal job	
Unemployed	38.6
Worker	17.1
Handcraft	5.2
Employee	27.2
Farmer	3.0
Merchant	5.2
Other	3.8
Maternal job	
House wife	92.9
Worker	3.3
Employee	3.8
Other	0.0

Levels and types of exposure to traumatic events

This study first set out to examine the adolescents' levels and types of exposure to traumatic events. The mean number of traumatic events that any particular adolescent experienced was 9.9 (SD = 3.20). Table 2 furthermore shows that the vast majority of the adolescents were exposed to objective indirect traumatic events (implying no personal physical harm and not directly pertaining to their family) as well as media exposure. A smaller, yet sizeable proportion of adolescents were exposed to direct physical harm, through relationship with a victim, or material harm to personal belongings.

Table 2: Types of Traumatic Events experienced by Adolescents (N = 368)

Gaza Traumatic Event Checklist	Boys		Girls		Total	
	N	%	n	%	n	%
1. Hearing of sonic boom and artillery fire	177	48.1%	176	47.8%	353	95.9%
2. Watching the pictures of injured persons and killed on the television	174	47.3%	177	48.1%	351	95.4%
3. Watching homes explosions on television	169	45.9%	178	48.4%	347	94.3%
Hearing about an incursion to your land, town, homes or other	170	46.2%	164	44.6%	334	90.8%
4. Witnessing the bombardment of government buildings	165	44.8%	149	40.5%	314	85.3%
5. Witnessing targeted assassinations	157	42.7%	121	32.9%	278	75.5%
6. Witnessing an invasion to your land, town, homes or other	134	36.4%	132	35.9%	266	72.3%
7. Hearing about the killing of a friend	146	39.7%	85	23.1%	231	62.8%
8. Witnessing bombardment of other people homes	86	23.4%	93	25.3%	179	48.6%
9. Witnessing a friend being injured	96	26.1%	46	12.5%	142	38.6%
10. Witnessing the demolishing of your friends home	75	20.4%	67	18.2%	142	38.6%
12. Witnessing the invasion to your neighbor homes	53	14.4%	76	20.7%	129	35.1%
13. Witnessing the killing of a close relative	68	18.5%	54	14.7%	122	33.2%
14. Witnessing your land being destroyed	57	15.5%	47	12.8%	104	28.3%
15. Witnessing a friend being killed	62	16.8%	35	9.5%	97	26.4%
16. Witnessing the shelling of your home	26	7.1%	37	10.1%	63	17.1%
17. Hearing about the killing of a close family member	31	8.4%	32	8.7%	63	17.1%
18. Witnessing the killing of a close family member	26	7.1%	33	9.0%	59	16.0%
19. Witnessing the bulldozing of your own home	20	5.4%	24	6.5%	44	12.0%
20. Being personally injured, shot by bullets	18	4.9%	7	1.9%	25	6.8%

Note: The numbers and percentages of adolescents endorsing an item are given by row. Respondents can endorse as many items as relevant on the GTEC.

Variations in exposure according to demographics

Furthermore, possible variations in exposure to trauma according to gender, environmental and family demographics were assessed. As shown in Figure 1, gender differences emerged with boys reporting more intense exposure to traumatic events than girls (respectively, M = 10.5, SD = 2.9 and M = 9.2, SD = 3.3) (t = 3.93, df= .366, p= 0.000, d = .41).

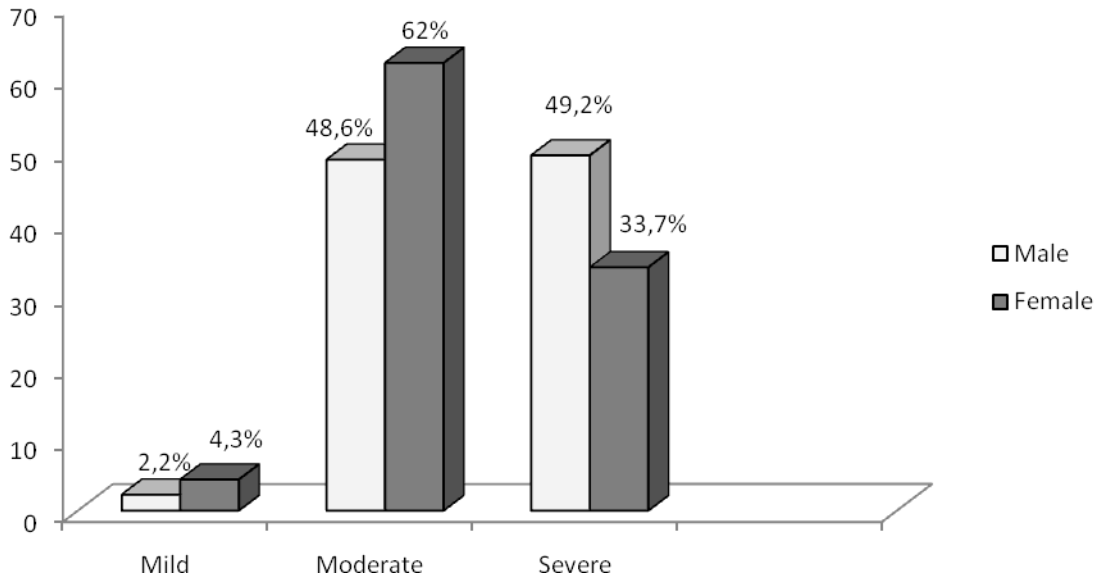

Figure 1: Exposure to Traumatic Events According to Gender

Note: Exposure is classified in mild (≤4 events), moderate (5-10 events) and severe (≥11 events) (Thabet et al., 2001, 2008)

The number of traumatic events experienced by adolescents also differed significantly across places of residency (Figure 2). More specifically, adolescents living in villages were more exposed (M = 11.1, SD = 3.0) than those living in the refugee camps (M = 10.1, SD = 3.2) or the city (M = 8.1, SD = 2.5) (F = 17.84 (2, 365), MSE= 9.40, p = 0.000).

Finally, only family income was significantly associated with the degree of exposure to traumatic events. Thus, we observed a negative linear trend between level of family income and number of traumatic events (r = -.16; p = 0.002).

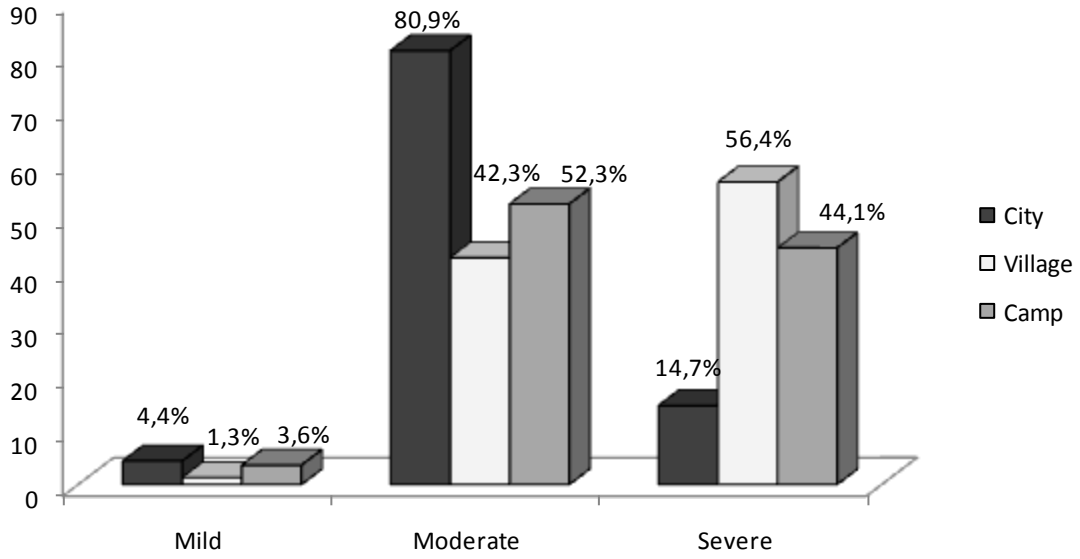

Figure 2: Exposure to Traumatic Events According to Place of Residency

Note: Exposure is classified in mild (≤4 events), moderate (5-10 events) and severe (≥11 events) (Thabet et al., 2001, 2008)

Levels of posttraumatic stress

The primary goal was to assess adolescents' posttraumatic stress levels. Our results indicate that only less than one-tenth (9.8%) of the adolescents showed no PTSS, whereas the majority showed mild to moderate (40.5% and 44,3% respectively) and 5.4% severe PTSS. Taken together, this corresponds to 17.1% of the participants displaying symptoms amounting to a probable PTSD according to DSM-IV diagnostic criteria.

As shown in Table 3, a majority of the adolescents (50% to 84%) reported sometimes or always suffering from re-experiencing, avoiding, or arousal symptoms related to their exposure to traumatic events. Only the ability to recall experiences and to project goals along the life span reportedly remained intact for most participants.

Table 3. Palestinian Adolescents' Posttraumatic Stress Symptoms (N = 368)

Davidson Trauma Scale (DTS)	Never		Sometimes		Always	
	n	%	n	%	n	%
1. Have you had painful images memories or thoughts of the event?	58	15.8	185	50.2	125	34.0
2. Have you had distressing dreams of the event?	119	32.3	142	38.6	107	29.1
3. Have you felt as though the event was re-occurring?	83	22.6	118	32.2	166	45.2
4. Have you been upset by something which remind you of the event?	65	17.7	109	29.6	194	52.7
5. Have you been avoiding thoughts or feelings about the event?	94	25.5	113	30.7	161	43.8
6. Have you been avoiding doing things or going into situations which remind you about the event?	98	26.6	125	34.0	145	39.4
7. Have you found yourself unable to recall important parts of the event?	310	84.2	35	9.5	23	6.3
8. Have you had difficulty enjoying things?	135	36.7	96	26.1	137	37.2
9. Have you felt distant or cut off from other people?	191	51.9	106	28.8	71	19.3
10. Have you been unable to have sad or loving feeling?	161	43.8	141	38.3	66	17.9
11. Have you found it hard to imagine along life span fulfilling your goals?	192	52.2	114	31.0	62	16.8
12. Have you had trouble falling asleep or staying a sleep?	110	29.9	116	31.5	142	38.6
13. Have you been irritable or had outbursts of anger?	136	37.0	138	37.5	94	25.5
14. Have you had difficulty concentrating?	118	32.1	160	43.4	90	24.5
Have you felt on edge, been easily distracted, or had to stay on guard?	78	21.2	161	43.7	129	35.1
15. Have you been jumpy or easily startled?	116	31.5	125	34.0	127	34.5
Have you been physically upset by reminders of the event?	171	46.5	141	38.3	56	15.2

Note: The numbers and percentages of adolescents endorsing an item as 'never', 'sometimes' or 'always'are given by row.

Differences in posttraumatic stress according to personal and demographic factors

Finally, we aimed to analyze whether PTSS levels varied according to personal and demographic factors.

Regarding gender, no significant differences in PTSS were found between boys (M = 16.3, SD = 5.3) and girls (M = 15.8, SD = 5.6) (t = 862; df = 366, p = 0.39). Similarly, adolescents showed no significant differences in PTSS levels across places of residency (with M = 15.9, SD = 5.0 for city, M = 16.6, SD = 6.0 for village and M = 15.9, SD = 5.4 for camp residents (F = 532, (2, 365), p = .588). Moreover, our findings showed no significant relationship between PTSS and the other investigated

demographic factors, i.e. respectively family size (F = .656, (2, 365), p = .519), family income (F = 1.839, (2, 365), P = .140), paternal education (F = 2.527, (3, 364), P = .057), paternal occupation (F = .488, (6, 361), p = .817), maternal education (F = 1.236, (3, 364), p = 297) or maternal occupation (F = .411, (2, 365), p = .664).

Discussion

This study set out to examine Palestinian adolescents' posttraumatic stress and possible situational and demographical determinants hereof. To do so, the levels and types of exposure, along with variations across personal, environmental and family demographics needed to be explored first, as discussed hereafter.

Levels and types of exposure

On average, the investigated 17-year old Palestinian adolescents had experienced around ten traumatic events during their lifetime. These findings are consistent with previous research showing that Palestinian youth have experienced significant exposure to socio-political violence (Macksoud, Aber, and Cohen, 1996; Punamaki, Qouta, and El Sarraj, 1997; Quota et al., 2005; Thabet et al., 2001). According to the classification of exposure levels convened by a consensus meeting of Palestinian mental health professionals, this corresponds to a mean level of moderate-to-severe exposure (Thabet et al., 2001,2008).

The vast majority of the investigated adolescents were exposed to objective yet indirect traumatic events (no personal physical or family harm) and media exposure, consistent with the expectation of a shift in type of exposure in this age cohort. The high levels of media exposure may furthermore indicate a lack of leisure activities for adolescents (Thabet et al., 2001).

Variations in levels of exposure according to demographics

Primarily, adolescents' gender and place of residency determined levels of exposure to trauma, with boys and those living in the villages experiencing more traumatic events. These findings appear consistent with other research (Qouta, Punamaki, and El Sarraj, 1995; Punamaki et al., 2005). Regarding gender, this difference in exposure may result from Palestinian girls being culturally more sheltered (kept inside the homes) and less likely to participate in political activities compared to boys. As indicated before, the higher exposure for adolescents living in villages seems to result from the political implications of their geographical location. These findings may also

suggest cohort influences, as they are consistent with the more recent research suggesting higher levels of exposure for children living in the rural area compared to earlier findings showing no relation hereof with place of residency (Qouta el al., 1995). Not surprisingly, low income families disposing of lesser resources were also at risk for higher levels of exposure to traumatic events, consistently with findings, for example, among low income families in Lebanon (Macksoud, 1996). Whether the absence of significant relationships of levels of exposure with the other family demographics is robust or dependent on the overall levels of exposure remains to be further investigated.

Levels of posttraumatic stress among Palestinian adolescents

Our main goal was to assess the levels of posttraumatic stress among the Palestinian adolescents. As expected, these appeared to be high, amounting to around one fifth of the adolescents displaying probable PTSD and a vast majority of them suffering from substantive re-experiencing, avoiding, and arousal symptoms. Given these adolescents' high levels of trauma exposure, these findings appear consistent at first sight with the current literature base concerning dose-response effects. Considering that their exposure included high levels of indirect objective events and the mixed-type media exposure, the findings especially concur with research showing that these types also exert adverse effects in settings of prolonged individually and collectively experienced sociopolitical violence. By themselves, these findings warrant the development of prevention and intervention programs geared at informing youth about PTSD and its implications and helping them deal with it (Braun-Lewensohn et al., 2009a; Celestin-Westreich & Celestin, 2010; Elbedour, Anthony, Ghannam, Janine and Abu Hien, 2007; Powers et al., 2010; Quota et al., 2007; Thabet et al., 2007).

Posttraumatic stress symptoms according to gender

The absence of significant gender differences in PTSS in our sample, despite boys' significant higher trauma exposure, in turn, appears to contrast with the general literature-based expectations. At closer analysis, it may result from a compensation effect, with boys' higher exposure contributing to higher PTSS, thus leveling out girls' typically higher PTSS levels. Together with the earlier discussed equivocal outcomes to this regard in the Palestinian context, our results may also suggest the need to take into account the contextual factors when considering gender effects. For example, a further explanation may lie in the combination with the age cohort, whereby dose-response effects possibly attain a ceiling after chronic exposure and thus level out stress responses between boys and girls.

Posttraumatic stress symptoms according to demographic factors

The investigated adolescents furthermore did not differ significantly in PTSS levels across place of residency, despite village residents being more exposed than refugee camp and city residents. These findings are consistent with some studies conducted on Palestinian children, which document more severe PTSS among children who are living in the more exposed areas such as those close to Israeli settlements, but not with others that document more PTSS in the urban areas or in refugee camps (Elbedour., 2007; Qouta et al., 2004; Thabet et al., 2002, 2009). Adolescents' PTSS-levels were not affected either by the negative link between family income and exposure levels. The absence of linkages with any of the other investigated demographics (such as family size, parental education and occupation) remains consistent in the first place with the absence of any differences in levels of exposure to this regard.

Taken together from the aforementioned risk-resiliency FACE model's perspective of youth's cognitive-emotional adjustments to trauma exposure, ceiling effects in the dose-response principle may provide a first explanation for a fading out of PTSS-differences among adolescents having experienced prolonged individual and collective exposure throughout childhood, even when coming from variously exposed residency and family income backgrounds. Stated differently, although not mutually exclusively, mediating dynamics such as adolescents' primary attribution and coping processes, may lead to equifinal PTSS outcomes across circumstances through different cognitive and emotional pathways, as evidenced in developmental psychopathology and recent research specific to chronic trauma exposure (Braun-Lewensohn et al., 2009a, Braun-Lewensohn et al., 2009b, Celestin-Westreich and Celestin, 2010; Cummings et al., 2000; Elbedour et al., 2007; Powers et al., 2010; Qouta et al., 2007). Evidently, such assumptions need to be tested in further research.

Study limitations and future direction

Several limitations apply to the present study. First of all, the data were not gathered from multiple data sources (e.g., teachers, parents, peers), but were based only on adolescents' own evaluations. The multi-informant method would contribute to achieving a more complete evaluation of these youths' functioning. Also, it should be noted that no Palestinian control group was available since the whole Palestinian population is affected by the ongoing Al-Aqsa Intifada. Particularly, this study utilized a cross-sectional design and, thus, it is difficult to infer any cause-effect relationships.

Finally, since only 11th grade or 17-year old adolescents were investigated, different outcomes may apply to younger or older adolescents.

Conclusion

This study analyzed the impact of ongoing traumatic sociopolitical events on Palestinian adolescents' posttraumatic stress reactions (PTSS and PTSD) according to event-related and demographic factors.

The investigated 11th grade adolescents experienced a mean number of around 10 traumatic events throughout their lifespan, with boys being significantly more exposed than girls, as were those living in villages compared to Gaza city or refugee camp residents. Adolescents mainly and pervasively reported objective, non-personal material and media exposure. Around one-fifth also experienced direct, physical exposure and exposure through injury and death of relatives. In this context of intense continual exposure, more than half of the investigated adolescents living in the Gaza Strip reported moderate to high levels of posttraumatic stress symptoms, for one fifth among them this amounted to a probable posttraumatic stress disorder. Remarkably, these PTSS levels were not primarily linked to their differences in exposure levels according to gender, place of residency and family income.

From a research perspective, these findings suggest two major pathways for enhancing comprehension of middle to late Palestinian adolescents' posttraumatic stress reactions. First, it may be that the dose-response principle attains a ceiling-effect when adolescents attempt to adapt to lifelong exposure. Second, primary attributions and coping strategies may moderate adolescents' cognitive-emotional dynamics, leading to similar posttraumatic stress responses despite different levels and types of exposure. From a practice perspective, these findings underscore the pervasive need for prevention and intervention programs to help Palestinian adolescents deal with the substantive challenges of growing into adults in a context of prolonged individual and collective exposure to sociopolitical trauma. Last but not least, since around one tenth of the investigated adolescents reported relatively low levels of posttraumatic stress, further identification of resiliency factors and dynamics is also strongly recommended.

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