Research report

Trajectories of posttraumatic stress symptoms (PTSS) after major war among Palestinian children: Trauma, family- and child-related predictors

Raija-Leena Punamäki [a,*], Esa Palosaari [a,b], Marwan Diab [a,c],
Kirsi Peltonen [a], Samir R Qouta [d]

[a] University of Tampere, Finland
[b] Aalto University, Finland
[c] Gaza Community Mental Health Programme, Gaza, Palestine
[d] Islamic University of Gaza, Palestine

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ABSTRACT

Objective: Research shows great individual variation in changes in posttraumatic stress symptoms (PTSSs) after major traumas of terrorist attacks, military combat, and natural disasters. Earlier studies have identified specific mental health trajectories both in children and adults. This study aimed, first, to identify potential PTSS-related trajectories by using latent class growth analyses among children in a three-wave assessment after the 2008/2009 War on Gaza, Palestine. Second, it analyzed how family- and child related factors (e.g., attachment relations, posttraumatic cognitions (PTCs), guilt, and emotion regulation) associate with the trajectory class membership.

Methods: The sample consisted of 240 Palestinian children (49.4% girls and 50.6% boys) of 10–13 years of age ($M = 11.29$, SD=0.68), who completed PTSS (CRIES) assessments at 3 (T1), 5 (T2), and 11 (T3) months after the war. Children reported their personal exposure to war trauma, attachment style, cognitive trauma processing, and emotion regulation, and their parents reported family war trauma exposure and attachment style.

Results: Results revealed a three-trajectory solution, a majority of children belonging to the Recovery trajectory ($n = 183$), and a minority belonged either to Resistant trajectory ($n = 29$) or to Increasing symptoms trajectory ($n = 28$). Low levels of negative posttraumatic cognitive appraisals, feelings of guilt and emotion regulation were characteristic of children in the Resistant trajectory as compared to Increasing symptoms trajectory. Father's attachment security was further associated with the Resistant trajectory membership. Children's attachment avoidance and high parental trauma were typical to children in Recovery trajectory (as compared to the Increasing symptoms trajectory).

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1. Introduction

Ample evidence shows that exposure to war and military violence increases mental health problems among children, including posttraumatic stress disorder (PTSD), depressive, and somatic disorders (for reviews, Attanayake et al., 2009; Dimitry, 2011). It is not uncommon to find exceptionally high PTSD prevalence (58–80%) among war-affected children in the Middle East (Dyregrov et al., 2002; Elbedour et al., 2007) and Africa (Betancourt et al., 2009; Schaal and Elbert, 2006). A systematic review of child mental health in ongoing or post-war situations showed elevated levels of PTSD (47%; seventeen studies), depression (43%; four studies) and anxiety (27%; three studies) (Attanayake et al., 2009).

Less is known about the long-term development of posttraumatic stress symptoms (PTSS) and other distress among war-affected children (Betancourt, 2011; Panter-Brick, 2010). High rates of symptoms are expected to decrease naturally with time when acute violence and life threat are over. Some evidence confirms that although most exposed children show severe immediate distress, intensive fears or even acute PTSD, majority shows substantial symptom reduction during the following 3 months to 1 year (Friedman et al., 2008; Thabet and Vostanis, 2000). Yet, follow-up studies among adults have revealed highly heterogeneous paths indicating gradual, drastic or delayed recovery, and chronicity of PTSD (Bonanno and Mancini, 2010). Resilience

research among children also emphasizes individual differences instead of typical or average recovery paths. Some children can dramatically improve or initially resist the negative trauma impacts (Masten and Tellegen, 2012; Tol et al., 2013). The aim of the present study is to delineate the timing and course of children's PTSS after a major war in the Middle Eastern context.

Bonanno (2004) provides a four-trajectory model that captures these differences in timing and course of trauma-evoked symptoms, involving chronic, resilience, and delayed trajectories. Múthen and Múthen, 2007) have tested the occurrence of these hypothesized trajectories using latent growth mixture modeling, LGMM, and have identified 3–4 of the prototypical trajectories with the resilient–resistant trajectories dominating (Bonanno and Mancini, 2010; Galatzer-Levy and Bonanno, 2012). For example, a majority (60%) of injured hospitalized trauma survivors ($N=330$) belonged to the resilient–resistant trajectory with consistently low levels of PTSS, whereas the chronic group of 22% had consistently high symptom levels across four-wave assessments until 6 months. The recovery trajectory (12%) typically had elevated but abating symptoms, and persons in the delayed trajectory (6%) showed first moderate and then sharply increasing PTSS (deRoon-Cassini et al., 2010, Mancini et al., 2010).

In military context a study among NATO soldiers (four-wave assessment with drop-out from $N=635$ to 171) provided partial evidence for four-trajectory pattern of PTSS from pre-deployment to 8–9 months post-deployment (Dickstein et al., 2010). Again the resilient trajectory dominated (84%), and quadratic recovery pattern (4%) showed first increase and then decrease, and delayed (3%) later emergence of symptoms. There was no chronic trajectory, but instead a novel 'unrealized anxiety' – pattern where symptoms were high in pre-deployment only. A prospective study by Bonanno et al., 2012 based on the Millennium cohort sample of US soldiers ($N=3393–4394$) identified robust four-trajectory solution: majority were assigned to low-stable (83–85%) trajectory of PTSS, and the rest to worsening-chronic (elevating symptoms since pre-deployment, 4.5–7%), moderate improving (8–8.5%), and chronic (2%) trajectories. (Double reporting of participants and percentages is due to separate analyses run among single and multiple deployers in Iraq and Afghanistan).

Concerning civilians, however, a study among Palestinian adults' PTSD and depression trajectories (three-wave assessment, $N=764$) could not identify resistance or intact groups (Hobfoll et al., 2011). Instead, two improving groups were found, 73% showing drastic recovering from very severe PTSD (named severe-improving), and 23% gradual recovery trajectory (moderate-improving). The third trajectory depicted severe-chronic (3.5%) patterns of constantly very high level of PTSD. These results on Palestinians differ from corresponding symptom trajectories found in an Israeli national sample (two-wave assessment, $N=709$) by Hobfoll et al. (2009). They identified a resistance trajectory (22%), indicating total lack of symptoms and a resilience trajectory (13.5%), assigning person who initially showed high symptom levels which then reduced. Yet, the identified chronic trajectory was relatively common (54%), and 10.3% of Israelis had delayed distress trajectory.

Hobfoll et al. (2011) consider the non-resistant trajectory solution among Palestinian civilians exceptional even under conditions of military violence and war. In western war context, the civilian trajectory solutions correspond with those of soldiers in the resilience or resisting trajectories dominating. For instance, Norris et al. (2009) identified a resilience–resistance group among the 9/11 survivors, as 40% of survivors showed no PTSD across a long period of time. They further found two recovering groups, one with some quadratic form and other with linear decreasing symptom levels. These results are based on an epidemiological data with four-wave assessments after the terrorist attack ($N=2752$), using semi-parametric group-based modeling with BIC criterion for best fitting trajectories.

We found five studies depicting mental health trajectories among trauma-exposed children and adolescents, including contexts of family violence (Nugent et al., 2009), pediatric traumatic injuries (Le Brocque et al., 2010), natural disasters (Greca et al., 2013; Self-Brown et al., 2013), and war and political violence (Betancourt et al., 2013a, 2013b). In their four-wave setting in Sierra Leone ($N=529$, 11–17 years, 25% girls) Betancourt et al. (2013a, 2013b) identified internalizing and externalizing symptom trajectories that depicted predominantly good mental health, despite harsh war conditions. They were low-stable levels of internalizing symptoms (41%) and improved mental health (48%). Minor groups showed continuously severe (4.5%) or worsening (4%) symptoms in long follow-up of 6 years.

Concerning natural disasters, three PTSS trajectory groups were identified among child survivors after Hurricane Andrew ($N=568$; Mean age 9.33 ± 0.98) at 3, 7, and 10 months post-disaster: resilient (27%), recovering (43%) and chronic distress (20%) (Greca et al., 2013). The resilient group showed a small yet significant improvement across the entire time from initially low levels of PTSS, whereas the recovering trajectory depicted elevated PTSS at 3-months that declined steeply by 10-months post-disaster. A study on child and youth survivors of Hurricane Katrina ($N=426$, mean age 10 ± 2.26; 51% girls) was conducted 13 months, 19 months, and 25 months post-disaster. Results identified the same three PTSS trajectories as Greca et al. (2013), but with different distribution: resilient (71%), recovering (25%) and chronic trajectory group (4%). The resilient trajectory group had very few benign symptoms that declined a little in two-year follow-up, while the recovering group had initially clinically significant symptoms that declined significantly over time. The minority of the children showed chronic PTSS that did not decline over time.

Emphasis on individual differences and heterogeneous outcomes among trauma survivors calls for analyzing factors that influence the symptom trajectories. The predictors of PTSD and recovery are commonly conceptualized as protective and risk factors or resilience-evoking and vulnerability-increasing psychological processes (Barber and Schluterman, 2008; Betancourt et al., 2013a, 2013b). A number of family-, child- and society-related factors have been found to predict PTSD (van Wesel, et al., 2012; Dubow et al., 2012). Optimal parenting practices involving love, structure, and supportive care are commonly thought to protect children's mental health from the negative impacts of war and military violence (Barber, 2001; Punamäki, 2006). Sensitive and emotionally available caregiver contributes to healthy child development, by enhancing secure attachment style (Weinfield et al., 2000) that in turn is an effective protector in traumatic conditions (Kanninen et al., 2000; Ein-Dor et al., 2011). A study among North-Irish children and parents ($N=700$) confirmed that secure emotional family relations predicted low levels of psychological distress under condition of political violence (Cummings et al., 2011). Survivors with secure attachment style showed lower levels of PTSS and somatic symptoms than preoccupied and avoidant in studies among Palestinian political prisoners (Kanninen, et al., 2003) and among Israeli soldiers (Solomon et al., 2008). Insecure attachment style in turn predicted depressive symptoms and poor social support among Israeli civilians exposed to war threat and shelling (Besser and Neria, 2010). In a Danish student sample ($N=328$) insecure-avoidant attachment style formed a risk for PTSD, and avoidant students reported low social support and generally malevolent world view (O'Connor and Elklit, 2008). Concerning natural disasters, Self-Brown et al. (2013) found that available peer support protected children from chronic symptoms course, and lack of support predicted the choric trajectory membership.

We could not detect research on the role of family attachment relations predicting symptom trajectory membership. Accordingly,

we analyze both parents' attachment availability and children's own attachment orientation in contributing to the PTSS trajectory membership in the context of a devastating war among Palestinian children in Gaza. Israeli military named the 2008/2009 war on Gaza as the Operation of Cast Lead, aiming at suppressing rocket fire from Gaza into Israel. The 22-day military campaign resulted 1417 Palestinian deaths (313 children), about 5303 injured persons (1855 children), and destruction of houses (completely 4000 and partially 16,000), and in 100,000 displaced people (UN:OCHA, 2009; B'tselem, 2009). The bombardment and shelling by the Israeli military using new warfare (e.g., phosphorous bombs) caused panic and life threat in families who were unable to escape. The border had been closed for 2 years since 2007, with disastrous consequences for the 1.5 million in habitants of Gaza.

Children's cognitive–emotional processing of traumatic events contributes to their mental health (Ehlers et al., 2003). Research has revealed multiple strategies that war-affected children use in order to cope with trauma, including distraction, cognitive manipulation, social affiliation, and emotion regulation (Pfefferbaum et al., 2014; Qouta, et al., 2008). Dysfunctional processing involves negative appraisals of trauma and own capacity to cope, as well as recalling the trauma in behavioral re-enactments rather than in coherent memories (Ehlers et al., 2003; Meiser-Stedman et al., 2009a, 2009b; Smith et al., 2013). Furthermore, narrowed and biased emotion regulation, feelings of guilt and anger, and blaming others and oneself predict mental health problems in general and also among trauma-affected children (Trickey et al., 2012). Except Greca et al. (2013), cognitive and emotional factors have not been studied as predictors of PTSS trajectories among children. They found that insufficient emotion regulation, especially that of anger, and ineffective coping strategies such as self-blame were characteristic of children in chronic distress trajectory.

2. Research questions

Our study had two goals. First, we identified distinct subgroups of children according to their posttraumatic stress symptoms (PTSS) after the War on Gaza 2008/ 2009. The PTSS trajectories were identified by their timing and course across 3 (T1), 5 (T2) and 11 months (T3) after the war using the latent class growth analysis, LCGA (Múthen, Múthen, 2007). Second, we analyze how the quality of family relations and children's cognitive–emotional trauma processing predict the trajectory membership. The family relations were assessed as parents' and children's attachment styles, and trauma processing by children's cognitive appraisals, and emotion regulation.

3. Method

3.1. Participants and procedure

Palestinian school children ($N=240$) and their parents ($N=170$) living in the Gaza Strip participated in the study after the War on Gaza War 2008/2009 (called Operation Cast Lead in Israeli military terms). Child age ranged between 10 and 12 years ($M=11.35$, SD$=0.57$), and the gender distribution was even. They constituted a waiting-list control group for a psychosocial intervention study (reference omitted). The child data were collected in schools and parents' data in their homes, after the study plan was agreed with the Ministry of Education and the school headmasters. Parents were provided information sheets explaining the purpose of the study and required verbal consent. The children were selected on the basis of a two phase cluster sampling. First, four government schools were randomly sampled from the schools in the

most war-affected areas of Gaza City and the North Gaza. Second, eighth, fifth and sixth grade classes were randomly sampled from the selected schools.

The first data collection was 3 months after the war (T1), follow-ups at 5 month (T2), and at 11 months (T3) after the war. Six research assistants did the field work, supervised by the last author (SQ). There were no dropouts between T1 and T2 because the children were reached in their school classes during the same semester. Instead, 43 (17.9%) children were lost between T2 and T3 due to their absence or change of schools. Dropout was unrelated to children's PTSS at earlier waves, the child age, place of residence, parents' employment, education level and parents' age, and family income. Yet, boys were more often dropouts than girls (χ^2 (1)$=8.19$, $p=0.004$). Seventy parents did not participate due to their absence or difficulties in reaching them. There was no difference in family education, work situation, or economic stand between participating and non-participating parents.

3.2. Measures

3.2.1. Post-traumatic stress symptoms (PTSS)

Post-traumatic stress symptoms (PTSS) were evaluated by the 13-item Children's Revised Impact Event Scale (CRIES-R; Dyregrov et al., 2002). The scale covers dimensions of re-experiencing (4 items), avoidance (4 items) and hyper-arousal (5 items) symptoms. Children indicated on a 4-point scale how often they had each symptom during the last 2 weeks (from 0$=$*not at all* to 4$=$*often*). A total score was constructed for each time (Cronbach's $\alpha=61$ at T1, $\alpha=0.72$ at T2, and $\alpha=0.63$ at T3).

3.2.2. Posttraumatic cognitive appraisals

Posttraumatic cognitive appraisals were measured using the 25-item Children's Post-Traumatic Cognitions Inventory (cPTCI; Meiser-Stedman, et al., 2009) that consists of statements relating to negative appraisals of the world and the self. They describe the trauma-exposed child as a feeble person in a scary world (e.g., "Anybody could hurt me"; "I can't stop bad things from happening to me") and their post-trauma life as disturbing and permanently negatively changed (e.g., "My life has been destroyed by the frightening event"; "Not being able to get over all my fears means that I am a failure"). Children responded by using a 4-point scale to indicate their agreement with the statements (1$=$*don't agree at all* to 4$=$*agree a lot*). A total sum variable was constructed for cPTCI scores at T1 ($\alpha=0.85$).

3.2.3. Emotion regulation

Emotion regulation was assessed by Emotion Regulation Questionnaire for Children (Rydell et al., 2003, 2007) that focuses on basic emotions (e.g., fear, anger, and sadness) in the contexts of school, family and peer relations. Children were presented 21 vignettes with alternatives of how they would regulate their emotions in that situation. Examples for fear regulation are "If I am scared by things I see or hear, I can think of something else to stop me from being scared", for anger regulation "If I am angry and my teacher tells me to calm down, I can control myself", and for sadness regulation "When I am sad, I can think of something to stop me from staying sad". Children responded by a four-point Likert scale (1$=$*Does not apply to me at all* to 4$=$*Applies very well to me*). A total sum score of emotion regulation at T1 was constructed ($\alpha=0.78$).

3.2.4. Children's attachment

The insecure-avoidant and insecure-preoccupied scales were measured by the Coping Strategies Questionnaire, CSQ (Finnegan et al., 1996), and secure attachment by the Security Scale (Kerns et al., 2000). Children's responses reflect their mothers as attachment

figure in helping, listening and caring for them in daily stressful situations, and their answers are depicted by the two stage forced-choices methods by Harter (1982). Both avoidant and preoccupied attachment was assessed by 10 every-day situations. For instance, for avoidance: "One day you come home from school and you are upset about something. Your mother asks you what the problem is", following with two alternatives: (1) *Some kids would not want to talk to her about it with their mother,* but (2) *Other kids would want to tell the mother about it.* An example of preoccupied attachment is "Your mother says she is thinking about going to visit a relative for a week or two", following with two alternatives (1) *Some kids would be upset that the mother is going away for so long and would try to talk her out of going,* but (2) *Other kids would not be upset and would not try to talk the mother out of going.* Under each of these two choices for the descriptions indicating avoidant and preoccupied attachment responses, children were asked to choose between two alternatives: (a) *Sort of true for me* or (b) *Very true for me*. The security scale consisted of eight items such as "Some kids are sure that their mom would never leave them", "Some kids find it easy to trust their mom", and "Some kids worry that their mom does not really love them." The children indicated on a 4-point scale whether the sentence or its opposite was either sort of true or very true for them. Averaged sum variables were formed for Avoidant ($\alpha=0.46$), Preoccupied ($\alpha=??$ 0.95) and Felt security ($\alpha=0.96$) attachments.

3.2.5. Parental attachment security

Parental attachment security was measured by 10-item Security Scale (Kerns et al., 2000) depicting mothers' and fathers' acceptance of and willingness to serve as an attachment figure and provide a secure base for the child. The parents of securely attached child show respectful and supportive attitudes. Examples of the items are: "I respect my child's opinions and encourage him/her to express them", "I feel a child should be given comfort and understanding, when she/he is scared or upset," and "I make sure my child knows that I appreciate what she/he tries to accomplish". Mothers and fathers responded how well the descriptions correspond their attitudes and behavior towards the target child by five point Likert scale (1=*Does not apply to me at all* to 5=*Applies very well to me*). Sum variables were formed for mothers ($\alpha=0.69$) and fathers ($\alpha=0.68$).

3.2.6. Children's war trauma

The measure consisted of 14 traumatic events that correspond to the criterion A1 of the diagnosis of PTSD in the DSM-IV. They include experiencing and witnessing actual or threatened serious injury or death. The children reported whether they had had the experience during the War on Gaza 2008/2009 ($yes=1$; $no=0$). A sum variable was constructed by counting the positive answers. In addition, children were inquired at T3 whether they had been experiencing a major loss, injury or other trauma after the war ($yes=1$; $no=0$).

3.2.7. Parent's war trauma

Parent's war trauma was assessed by 28 events during the War on Gaza in 2008/2009. Both mothers and fathers reported whether they experienced human and material losses and atrocities during the War on Gaza 2008/2009 ($yes=1$ or $no=0$). Examples are "Has a member of your family been killed?"; "Has your house been demolished by the military?"; "Have you witnessed people dying?" A sum variable was constructed by counting the yes-answers. At T3 children were asked whether they had experiences severe loss, hardship or other trauma since the war ($yes=1$ or $no=0$).

3.2.8. Demographic variables

Demographic variables of family SES, parental education and work situation, civic status and family size were reported by parents (either mother or father) and children's age and gender by themselves.

3.2.9. Translations

The research instruments for CRIES-13 and war trauma were available in Arabic. The children's and parents' attachment scales, CAPS-guilt, posttraumatic cognitive appraisal (cPTC) and emotion regulation tools were first translated by a bilingual psychologist from English into Arabic, and a researcher then made the back translation.

4. Statistical analyses

Latent Class Growth Analysis (LCGA) was used to identify groups or classes of individuals with different growth trajectories defined by estimates of growth parameters, intercept and slope. LCGA has performed relatively well compared to other classification methods (Twisk and Hoekstra, 2012). The assumption behind the method is that non-normal distributions of repeated measures of the variables reflect heterogeneity in the population. However, it is also possible that the observed irregular distributions are from a homogeneous population (Bauer and Curran, 2003). LCGA has performed relatively well compared to other classification methods (Twisk and Hoekstra, 2012). The assumption behind the method is that non-normal distributions of repeated measures of the variables reflect heterogeneity in the population. However, it is also possible that the observed irregular distributions are from a homogeneous population (Bauer and Curran, 2003). In LCGA, individuals within a class are assumed to be homogeneous with respect to their development and accordingly we set the variances of the intercept and slope and their covariance in the latent classes to zero (Kreuter and Muthen (2007)). We estimated only linear slope parameters because those were identifiable with the three measurement points.

The criteria for the appropriate class solution were lower values of the Bayesian, (BIC), sample-size adjusted Bayesian (SSBIC), and Aikaike (AIC) information criterion indices relative to other models, high entropy values (indicating high classification certainty when values approach 1.00), and significant *p*-values for the Lo–Mendell–Rubin (LMR), Vuong–Lo–Mendell–Rubin (VLMR), and bootstrap likelihood ratio tests (LTR: Lo et al., 2001). We used all of the criteria in combination with the interpretability of the results in the selection of the final model (Jung and Wickrama, 2008).

To analyze how family relations and children's cognitive and emotional responses predicting the trajectory memberships, multinomial logit regression analysis was used (SPSS 15, Chicago). It compares simultaneously two trajectories with the third one considering the differences of all predictors. Ward-statistics indicated the significance of each predictor (Odds ratio, OR; CI=95% confidence interval). The overall-likelihood tests tell whether all three comparisons (Resistant and Increasing symptoms trajectories vs. Recovery trajectory, and Increasing trajectory vs. Resistant trajectory) are significantly different from the OR being 1.00. The variables of family relations and trauma processing were first median split to the regressions, and the dependent variable was the trajectory solution.

5. Results

5.1. Descriptive statistics

A majority of the families (86%) lived in urban areas, 12% in refugee camps and 3% in villages. Parents had elementary (18% of mothers, 19% of fathers), preparatory (31% of mothers, 32% of

fathers), secondary (42% of mothers, 24% of fathers) or university (8% of mothers, 25% of fathers) level education. Mothers were on average 37.6 (SD=6.92) and fathers 42.4 (SD=7.75) years old. Family income was less than 1000 Israeli shekels (about 260 USD) a month for 60% of the families, between 1000 and 2000 shekels for 16% of the families and more than 2000 shekels for 24% of the families. There was a high rate of unemployed fathers (49%), which corresponds with general Palestinian statistics in the Gaza strip during the international siege and economic blockade (UN:OCHA, 2009). Over 90% of mothers' worked at home, which is higher than in epidemiological data from Gaza (UN:OCHA, 2009) .

5.2. Identifying PTSS trajectories

5.2.1. Number of latent classes

We tested the models by comparing one- to six-class models without covariates (unconditional models) for PTSS. The fit indices for the one- to six-class models are presented in Table 1. All of the likelihood ratio tests as well as BIC and SSBIC select the three-class solution but AIC is slightly lower for the four-class model and entropy is the highest in the five-class solution. We selected the three-class solution in agreement with the majority of the fit indices.

5.2.2. The trajectories

The estimated LCGA trajectories of the three latent classes are presented in Fig. 1. The first pattern is labeled *Resistant trajectory*. It is characterized by a relatively low amount of symptoms (intercept:

17.85, SE=1.84, $p < 0.001$) which do not change significantly over time (slope: -1.12, SE=0.64, $p=0.08$). The second pattern is labeled *Increased posttraumatic stress symptoms-trajectory,* characterized by a relatively high (intercept: 30.72, SE=2.52, $p < 0.001$) and elevating (slope: 2.64, SE=0.66, $p < 0.001$) amount of symptoms. The third pattern depicts Recovery trajectory, consisting of children with a relatively high amount of symptoms (intercept: 29.29, SE=0.75, $p < 0.001$) which decrease over time (slope: -0.99, SE=0.25, $p < 0.001$). Based on the most likely latent class membership, the majority of the children in the sample belonged to the *Recovery trajectory* group ($n=183$, 76%), whereas two minority groups of equal sizes were the *Resistant* ($n=29$, 12%) and the *Increased symptoms* ($n=28$, 12%) trajectories.

6. Predictors of the trajectory membership

The results of the family- and child-related factors contributing to the trajectory membership are presented in Table 2. Generally, both the attachment relations and children's cognitive–emotional processes contributed to the course and timing of posttraumatic stress symptoms. The significant OR (odd ratios) with CI (confidence intervals) indicate that characteristic to children in the Resistant trajectory were higher paternal secure attachment, and a lower level of negative posttraumatic cognitions in comparison to both Recovery and Increasing symptoms trajectories. Typical to children in the Recovery trajectory were lower parental war trauma and higher own avoidant attachment style as compared to Increasing symptoms trajectory. Children's own war trauma did not significantly differ between the trajectories.

7. Discussion

The aim was to identify children's trajectories of posttraumatic stress symptoms across three time points after a major war in the Middle Eastern context. A great majority (76%) of Palestinian 11–13-year-olds belonged to Improving mental health trajectory. This is a good news, because more than a half (58%) of the studied children showed clinically significant posttraumatic stress symptoms (PTSS) 3 months postwar (Qouta et al., 2012). Although very high, the

Table 1
Fit indices for one- to six-class latent class growth analyses for posttraumatic stress symptoms (unconditional).

	BIC	SSBIC	AIC	Entropy	VLMR	LMR	Bootstrap
1 Class	5133.10	5117.25	5115.69	–	–	–	–
2 Classes	5117.25	5091.90	5089.41	0.64	0.003	0.004	< 0.0001
3 Classes	**5103.57**	**5068.71**	5065.29	0.73	**0.005**	**0.007**	**< 0.0001**
4 Classes	5113.59	5069.21	**5064.86**	0.76	0.061	0.069	0.136
5 Classes	5124.06	5070.17	5064.89	**0.78**	0.296	0.314	0.217
6 Classes	5134.09	5070.70	5064.48	0.74	0.688	0.701	0.192

Table 2
Multinomial regression analysis for family- and child-related factors according to the membership in PTSS trajectories: OR (Exp(B)) and CI values.

	Resistant vs. Recovery trajectory[a]		Increasing symptoms vs. Recovery trajectory[a]		Increasing symptoms vs. Resistant trajectory		Overall likelihood-ratio test[b]
	OR (Exp(B))[c]	CI	OR (Exp(B))	CI	OR (Exp(B))	CI	χ^2 Resist vs. Incre.
Family-related factors							
Mother's attachment security	0.99	(0.22–4.37)	0.32	(0.07–1.44)	1.32	(0.42–3.43)	2.32
Father's attachment security	0.07**	(0.01–0.47)	1.33	(0.29–6.19)	8.31**	(1.84–18.87)	9.85**
Parental war trauma	1.86	(0.43–7.98)	0.15*	(0.08–2.33)	1.96	(0.34–11.41)	4.73+
Child-related factors							
Secure attachment	0.73	(0.27–2.01)	0.91	(0.32–2.54)	1.24	(0.31–4.95)	0.39
Insecure: avoidant	2.11	(0.71–6.21)	2.97*	(1.02–8.69)	1.41	(0.32–6.17)	5.73*
Insecure: ambivalent	1.10	(0.41–3.02)	0.92	(0.35–2.40)	0.83	(0.22–3.15)	0.07
Posttraumatic cognitions (neg.)	4.78**	(1.59–4.39)	0.71	(0.28–1.81)	0.15**	(0.04–0.60)	9.99**
Guilt cognitions	0.13**	(0.03–0.47)	2.25	(0.82–6.15)	0.05***	(0.06–1.90)	17.25***
Emotion regulation	2.20	(0.81–5.95)	0.50	(0.19–1.34)	0.23*	(0.06–0.87)	4.94+
Children's war trauma	1.64	(0.62–4.35)	0.46	(0.16–1.36)	0.28+	(0.07–1.13)	4.43

Notes: PTSS=Posttraumatic stress symptoms; OR=Odds ratio; CI=95% confidence interval.; $+p < .10$, $*p < .05$, $** p < .01$, $*** p < .001$.
[a] Resistant ($n=26$), Increasing symptoms ($n=25$), and Recovering ($n=158$) trajectories (lower numbers are due to missing values in predicting variables).
[b] The overall-likelihood tests whether or not all three separate ORs are significantly different from an OR of 1.00 (OR=1.00 when the predictor does not have any association with the trajectory membership).
[c] The multinomial regression simultaneously tests three logit models comparing each of the three PTSS trajectories, first Resistant and Increasing symptoms with Recovery trajectory, and then Increasing symptoms and Resistant trajectories. Significant OR greater (less) than 1.00 are associated with a higher (lower) likelihood of belonging to the compared trajectory (recovery in the models 1 and 2 and resistant in the 3 model).
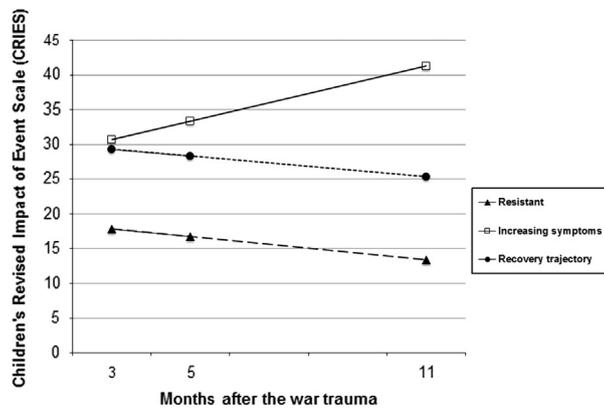
Fig. 1. Latent trajectories for the three trajectory conditional model.

level corresponds with the PTSS severity among Middle Eastern children in Iraq (Razokhi et al., 2006) and Palestine (Thabet et al., 2009). Health workers and parents expect a decrease in children's symptoms after ceasefire and attenuation of life threat, and here it was empirically evidenced.

The guidelines for PTSD treatment among both children and adult are based on normative curve showing that most survivors first suffer from severe distress, fears, and confusion, but show natural improvement from 3 months to a year (NICE, 2005; TENTS, 2008). Our results on Palestinian children concur with this view. The identified PTSS pattern is similar to Palestinian adults (Hobfoll et al., 2011) in depicting the improvement from very severe symptoms. We also detected the Resistant trajectory, indicating low levels of PTSS after the war, which also sustained over time. It was completely absent among Palestinian adults, and the share was also relatively low among the children in our study (12%). Contrary to the findings among adult war survivors, but similar to child disaster survivors, our studied Palestinian children did not develop delayed PTSS trajectory. Hobfoll et al. (2011) applied their Conservation of Resources (COR) theory to explain the absence or minor occurrence of the intact group among war-trauma survivors. The long-lasting Israeli military occupation, siege, and international boycott of Palestinian territories have deprived families from material assets and resources. Their lack of rights and freedoms absence of national self-determination depletes families' from providing their children safety, and puts them repetitiously to life threat that reflects in overburdening of family mental health (Hobfoll et al., 2011). Our results hint, however, that despite the accumulation of hardships and national humiliation, a minor group of children (12%) was intact, and a majority (76%) were recovering from the initially very severe posttraumatic stress symptoms.

Our Recovery trajectory corresponds with the recovery-trajectory detected in the context of natural disasters by Greca et al. (2013), Self-Brown et al. (2013), i.e., children initially showed high distress that gradually eased. The trajectory studies among disaster-exposed children suggest that the trauma-related damage, continuity of stress, and violence contribute to the trajectory membership. The Palestinian children in our study continued to live under international boycott and complete siege of the Gaza strip, and faced repetitious Israeli military operations, even if the intensive warfare was over. However, in this collective tragedy, children's own exposure to war-trauma did not significantly associate with the trajectory membership. Also when asked at T3, 24% children reported new trauma, but this was not associated with their trajectory membership. Yet, high family war-trauma, reported by mothers and fathers, was typical to children in the Increasing symptoms trajectory (as compared to Recovery trajectory). In other words, family's experiences of severe human and material losses, and witnessing atrocities predicted children's deteriorating mental health, indicated by increased PTSS. Low family war trauma,

instead, was more likely among children who managed to improve their mental health, reflected in the Recovery-trajectory. Our results of non-significance of child's own trauma somewhat contradicts suggestion that personal trauma has a direct impact on child PTSD, while the impacts of family trauma may be mediated though resource losses and problems in parenting and other human relations (Barber, 2001; Qouta et al., 2008).

Earlier research has mainly considered demographic and social factors, and earl mental state predictors of the PTSD trajectories, results confirming the beneficial role of good socio-economic status, male gender and social support (Bonanno et al., 2012; Greca et al., 2013; Le Brocque et al., 2010; Hobfoll et al., 2011). We analyzed the nature of children's cognitive–emotional processing and family attachment relations and as potential predictors of trajectory membership. In the lines of cognitive theories of PTSD (Ehlers et al., 2003; Meiser-Stedman et al., 2009), our results show that characteristics to children with stable good mental health, indicated by Resistant trajectory membership was positive and functional posttraumatic cognitive appraisals. On the contrary, children in the Increasing symptoms trajectory tended to appraise themselves as feeble persons in scary world and felt as devastated by the war trauma.

The results support the idea of attachment theory stating that children do well if parents are emotionally available and provide security. Furthermore, children's unique attachment-related responses seem to be activated in traumatic stress and life threat (Bowlby, 1980).

Literature provides two approaches to understand the dynamics between attachment style, trauma and mental health. Generally, secure attachment is conceptualized as protective shield that is an immunization against everything bad and a guarantee for multiple benevolent outcomes (O'Connor and Elklit, 2008). Others emphasize the attachment-style specific emotional and cognitive processes, and delineate goodness of fit between them and environmental demands in predicting bad or beneficial outcomes (Crittenden, 2000; Mikulincer et al., 2006). The former view suggests a causal role of attachment style, and the latter meaningfulness principle of relational expectations, emotion expression and regulation and behavior. The result that father's attachment security, but not mother's, was typical for the Resistant trajectory may reflect the paternal role in life threat and in Arab Islamic culture. Children may take the mothers' emotional availability and security as more self-evident, and therefore it did not especially contribute to their mental health. Mothers also tend to heighten their sensitive and caring behavior when children are at risk, which has been confirmed among mothers and children in peaceful societies (Korja et al., 2012). Fathers are considered protectors in patriarchal Middle Eastern societies, and this role becomes especially salient in life threat and when family is humiliated by foreign massive warfare, thus explaining significance of the father's attachment security for child mental health.

Children's own avoidant attachment responses were characteristic of the Recovery trajectory (as compared to Increasing symptoms trajectory). The result may reflect the goodness of fit between avoidant attachment and demands of post-war society and recovery from very severe trauma and actual life threat. Avoidant children typically suppress painful memories, deny bad feelings, and minimize their awareness of threat, which normally forms a risk for psychopathology (Mikulincer et al., 2006, 1999). Yet, apparently avoidant responses can have some short-term adaptive value, although their excessive use may undermines capacity to generate flexible response repertoire.

Our study reserves criticism, first, for the low reliability coefficient of children's attachment reports and initial PTSS. Also parental attachment security scales had only moderate reliabilities. Second, although we have family data, only children themselves reported their PTSS. Including multi-reports (parents and teachers) and

clinical interviews of children's posttraumatic responses would have strengthen the setting. Finally, current high quality research among war-affected children emphasize the importance of studying other kind of violent experience than military atrocities, emphasizing especially family violence and daily-life stressors (Dubow et al., 2012; Eggerman, and Panter-Brick, 2010; Panter-Brick, 2010). This aspect is missing from our analysis.

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