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Prevalence and determinants of PTSD among Palestinian children exposed to military violence

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■ **Abstract** The prevalence and determinants of PTSD were assessed among 121 Palestinian children (6–16 years; 45 % girls and 55 % boys) living in the area of bombardment. The mothers (21–55 years) and the children themselves reported their exposure to military violence (being personally the target of violence or witnessing it towards others) and symptoms of posttraumatic stress disorders (PTSD: intrusion, avoidance and hypervigilance). The results showed that 54 % of the children suffered from severe, 33.5 % from moderate and 11 % from mild and doubtful levels of PTSD. Girls were more vulnerable; 58 % of them suffered from severe PTSD, and none scored on the mild or doubtful levels of PTSD. The child's gender and age, mother's education and PTSD

symptoms were significant, and the exposure to traumatic experiences marginally significant determinants of children's PTSD symptoms. The most vulnerable to intrusion symptoms were younger girls whose mothers showed a high level of PTSD symptoms, whereas those most vulnerable to avoidance symptoms were children who had personally been targets of military violence and whose mothers were better educated and showed a high level of PTSD symptoms. The results are discussed in the context of military violence interfering with the protective function of family and home.

■ **Key words** Traumatic events – PTSD – Palestinians – children – mothers

Introduction

As in all modern wars, the victims of the latest Middle Eastern wars are mainly civilians. The Israeli army has systematically shelled and destroyed Palestinian residential areas during the Al Aqsa Intifada (since 2001). In the first year, 559 homes were destroyed and 3,669 homes were shelled in the Gaza Strip and West Bank (B'Tselem, 2002a, b). The army uses a variety of methods to destroy homes, including tank shells, bulldozing, helicopter gunships, and fighter aircraft. As homes have been bombarded and made uninhabitable, many Palestinian families are living in tents.

Witnessing the destruction of one's own home by enemy soldiers can have serious psychological consequences. Loss of home can be a traumatic experience not only as a material loss but also for its psychological implications. Home means a shelter and the heart of family life, and contains memories of joy and pain as well as attachment to family objects. Home is often associated with feelings of security and consolation. This study examines the prevalence and determinants of posttraumatic stress disorder (PTSD) among Palestinian children in the Gaza Strip who have lost their homes.

We have an accumulated body of knowledge about children's psychological responses and mental health in conditions of war and military violence. It involves re-

search on children's acute responses to air raids, bombardment, and family losses during the Second World War (Brander 1941; Dunsdon 1941; Freud and Burlingham 1943), and on maternal and child mental health during the Middle Eastern wars (Baker 1990; Bryce et al. 1989; Macksoud and Aber 1996; Milgram and Milgram 1976; Punamäki 1987; Saigh 1991; Ziv and Israeli 1973). Research has been especially intensive on Kuwaiti children during 9-months of Iraqi occupation (Abdel-Khalek 1997; Hadi and Llabre 1998; Llabre and Hadi 1994; Macksoud et al. 1996; Nader and Pynoos 1993; Naber et al. 1993) and on Israeli children during the Iraqi Scud missile bombardment (Lavee and Ben-David 1993; Laor et al. 2001; Laor et al. 1997; Weisenberg et al. 1993; Rahav and Ronen 1994; Rosenthal and Levy-Shiff 1993). Finally, the impact of war atrocities on children's mental health has been carefully studied in the former Yugoslavia (Kuterovac-Jagodic 2003; Rosner et al. 2003; Smith et al. 2002; Smith et al. 2001).

Children's responses to danger and life-threatening situations include anxiety, somatization and withdrawal symptoms, while younger children especially may regress into the earlier stages of development. While almost all children respond with excessive fear, sleeping disturbances and clinging to parents in acute trauma, a smaller minority develop posttraumatic disorder (PTSD). The percentages of PTSD diagnosis vary from 22 to 25% among Israeli (Laor et al. 1997; Weisenberg et al. 1993) and 27% among Lebanese children (Saigh 1991) to 41% among Palestinian children from Gaza (Thabet and Vostanis 1999), 48% among Cambodian refugee children (Kinzie et al. 1996; Sack et al. 1995), and 52% among children from Bosnia-Herzegovina (Smith et al. 2002). Especially high levels of PTSD (78–88%) were found among Iraqi children whose shelter was destroyed by the Western allies' air force (Dyregrov et al. 2002).

Longitudinal studies on PTSD are rare, and they reveal that once the fighting and danger are over, the post-traumatic symptoms decrease considerably (Laor et al. 2001; Punamäki et al. 2001). Among Kuwaiti children, the share of severe level of PTSD was 4% one year after the traumatic events (Hadi and Llabre 1998), and among Israeli children 0% five years after the missile shelling (Laor et al. 2001). Dyregrov et al. (2002) followed the development of PTSD among Iraqi children at 6 months, 1 year and 2 years after the shelling, and showed first an increase (84% to 88%), and then a decrease (78%) of severe PTSD.

The determinants of children's mental health, including PTSD, relate to the traumatic situation, the child's characteristics, and the way their mothers respond to life-threatening situations. The physical and emotional proximity, severity and nature of the traumatic events determine the nature and severity of the psychological problems (Macksoud et al. 1996; Smith et al. 2001). For

example, Bryce et al. (1989) found that displacement from home especially increased depression among Lebanese children and women during the 1982 Israeli invasion. Laor et al. (1997, 2001) found among Israeli children that while posttraumatic stress symptoms generally decreased after the Iraqi shelling, the symptoms increased among displaced children. Whether children are witnesses or targets of military violence is psychologically important. Personal exposure to trauma is generally considered harmful (Breslau et al. 1998; Jensen and Shaw 1993), but for children especially also witnessing atrocities against and humiliation of their family members connotes with deep despair and emotional insecurity.

Considering the demographic factors predicting PTSD, researchers agree that girls are more susceptible to symptoms than boys. Girls have been shown to suffer more from intrusion, avoidance and hypervigilance symptoms after exposure to trauma both in war zones (Dyregrov et al. 2002; for review, Pfefferbaum 1997; Smith et al. 2002) and peaceful areas (Pfefferbaum 1997). Yet, research on Middle Eastern children has found no differences between boys and girls regarding susceptibility to PTSD (Saigh 1991; Weisenberg et al. 1993).

Research shows contradictory results regarding the association between child's age and PTSD: both younger (Weisenberg et al. 1993) and older (Nader et al. 1993; Sack et al. 1995) children have been found to be vulnerable in war situations. Other researchers have not found age-specific effects for PTSD (Saigh 1991). Young children have been suggested to be protected due to their less accurate perception and understanding of trauma (Jensen and Shaw 1993; Pfefferbaum 1997), while others argue that young children are more vulnerable due to their less effective coping capacities (Weisenberg et al. 1993; Punamäki and Puhakka 1997).

Maternal responses to trauma are considered crucial for a child's mental health. Mother's good mental health is assumed to function as a protective shield for children in conditions of war (Freud and Burlingham 1943). However, empirical research is inconclusive showing both associations (Laor et al. 1997, 2001; Smith et al. 2001) and absence of association (Hadi and Llabre, 1998) between maternal symptoms such as PTSD and depression, and child's distress.

In the present study, we examine first the prevalence of PTSD among Palestinian children who have been exposed to bombardment and shelling of their place of residence. Second, we examine how the severity and nature of trauma (being the target of military violence and witnessing military violence towards others), child's characteristics of gender and age and mother's post-traumatic symptoms, and demographic characteristics determine the severity of children's PTSD.

Method

Subjects and procedure

The sample consisted of 121 Palestinian children and their mothers. The majority (87.5%) were refugees from the 1948 war and 12.5% native citizens of the Gaza Strip. The ages of the children ranged between 6 and 16 years (8.2 ± 3.4), and 45.4% were girls and 54.6% boys. With regard to the mothers, their ages ranged between 21 and 55 years (34 ± 8.2). At the time of the interviews almost all of them worked at home. Half (52.5%) of the women had completed secondary education, 23.1% preparatory level, and 14.2% had only primary school education. Ten per cent were university graduates.

Two psychologists approached the families in their homes or tents in January and February 2002. The shelling of their houses had taken place in autumn 2001. They selected every third house in two badly damaged residential areas in the South of the Gaza strip (Khan Yunis and Rafah communities). In each house the mother was interviewed and one child selected according to an age-related number list (in order to guarantee a normal age distribution). The shelling, bombardment and restriction of movement constantly interrupted the field-work. The psychologists were working in the area and were, therefore, familiar to the participants. This might explain the fact that there were no refusals. In most of the houses selected people were also at home because of the restriction of movement (B'Tselem 2000a).

Measurements

The check-list of experiences of military violence was developed for the purpose of this study (by the Research Department at the Gaza Community Mental Health Programme). It consists of 12 traumatic events that were typical during the "Al-Aqsa Intifada". The scale involves seven items on being personally the target of military violence and five events on witnessing military violence towards others (for the item contents, see Table 1). The interviewer presented the same scale separately to the mother and the child.

PTSD symptoms of mothers were assessed by a scale on 15 symptoms derived from DSM-III by Allodi (1985). This had been used in epidemiological and clinical studies on Palestinian populations (El-Sarraj et al. 1996; Qouta et al. 1997), and the three-dimensional structure of intrusion, avoidance and hyperarousal symptoms is both reliable and valid (Allodi 1991, 1985). The interviewer inquired whether the mothers had been suffering for more than a month from the symptoms [1] not at all, [2] to some degree, or [3] most of the time. In these data, the Cronbach's α were 0.70 for intrusion (five items), $\alpha = 0.56$ for avoidance (six items) and only $\alpha = 0.47$ for

Table 1 Prevalence of exposure to military violence among children and their mothers

	Child ¹		Mother ²	
	N	%	N	%
Target of military violence				
Shelling of the home	117	99.2	120	99.2
Being tear-gassed	112	94.9	118	97.5
Suffering from severe burns	2	1.7	3	2.5
Shot by live bullets	1	0.8	5	4.2
Shot by plastic bullets	5	4.2	2	1.7
Head injury with loss of consciousness	3	2.5	3	2.5
Deprivation of medical help	2	1.7	3	2.5
Witnessing military violence				
Saw shooting, fighting or explosion	114	96.6	121	100
Saw stranger being injured or killed	61	51.7	74	62.2
Saw friend or neighbour being injured or killed	42	35.6	61	50.4
Saw family member being injured	27	22.9	39	32.2
Saw funerals	113	95.8	116	95.9

¹ N = 118; ² N = 120

hyperarousal (four items). Because of the insufficient reliabilities of the PTSD dimensions, we use here only the total score ($\alpha = 0.70$).

PTSD symptoms of children were assessed by the Pynoos-Nader version of the Reaction Index (PTSD_RI; Pynoos et al. 1987). The 20-symptom scale covers intrusive re-experiencing of the event, avoiding related memories and numbing feelings and increased hyperarousal. It can be used either as an interview tool or as a self-report questionnaire to assess the level of a child's reactions to a selected traumatic event. We used it as an interview tool, and as the children in our sample had multiple recent trauma exposures, the shelling and destruction during the recent weeks were referred to as sources of traumatic experiences. The interviewer inquired whether the children had been suffering in recent weeks from the symptoms (0) none of the time, (1) little of the time, (2) some of the time, (3) much of the time, or (4) most of the time. The theoretical maximum sum score is 80 and minimum 0; in our sample the range was 12–69. The threshold scores for the severity of PTSD are: none or doubtful = 12 and below; mild = 13–24; moderate = 25–39, and severe = 40 and above. The reliability of the scale has been successfully tested among Middle Eastern children: Palestinians (Miller et al. 2000; Punamäki et al. 2001; Qouta et al. 2001; Thabet and Vostanis 1999), Kuwaitis (Nader et al. 1993; Nader and Pynoos 1993; Hadi and Llabre 1998), and Israelis (Weisenberg et al. 1993), and elsewhere (Nader et al. 1990; Goenjian et al. 1995). The PTSD_RI is suggested to have a modest validity as a semi-structured interview

for making a categorical diagnosis of PTSD, and an excellent test-retest reliability (Pynoos et al. 1987). We used it both categorically and dimensionally, and counted variables for intrusion (nine items; $\alpha = 0.80$), avoidance (six items; $\alpha = 0.70$) and hyperarousal (five items; $\alpha = 0.66$), and the total score ($\alpha = 0.76$).

Results

■ Descriptive statistics

Table 1 presents the prevalence of experiences of military violence among children and mothers. In addition to having their homes shelled, a substantial number of children had been tear-gassed (94.9%), and had witnessed shooting (97%) and seen funerals (96%). Half of the children had witnessed strangers being injured or killed (51.7%). All the mothers had witnessed shooting (100%), and almost all had been the targets of tear-gas (97.5%), and had seen funerals (95%). A significant positive correlation was found between the child's and the mother's PTSD symptoms ($r = 0.258$, $p < 0.007$; $N = 119$). This means that the more PTSD symptoms the mothers reported, the more likely the children were to suffer from PTSD, and vice versa.

■ PTSD prevalence and determinants

Table 2 shows the severity of PTSD among children. More than half (54%) of them had severe PTSD scores, while less than 2% (1.7%) scored no or doubtful symptoms. A third of the children were suffering from a moderate (33.5%) and 9.1% from a mild level of PTSD. The gender differences ($\chi^2(3) = 12.02$, $p < 0.007$, $N = 118$) indicate that girls suffered more from PTSD than boys. None of the girls had no PTSD and doubtful or mild levels of such, but all of them scored either moderate (42%) or severe (58%) PTSD. The level of PTSD symptoms

did not differ according to the children's age [$F(3,111) = 0.33$, $p = ns$].

Hierarchical multiple regression analysis was used to examine the determinants of PTSD symptoms among children. The scores of total PTSD, and intrusion, avoidance and hyperarousal symptoms were the dependent variables. In the first step, being personally the target of military violence, and in the second, witnessing military violence towards others were added as independent variables. In the third step, the child's gender and age were added, and in the final step, the mother's PTSD symptom total score, age and education were added to the model.

Results are shown in Table 3. The model explained 20% of the variance of the total PTSD symptoms, the child demographic factors (6%) and mother characteristics and responses (11%) being the significant contributors. The β values indicate that girls who had witnessed military violence towards others (marginally) and whose mothers were better educated and suffered from a high level of posttraumatic stress symptoms reported the highest level of general PTSD.

The explanatory models were to some extent symptom-specific: β values indicate that intrusion symptoms were highest among younger girls whose mothers reported a high level of PTSD symptoms. The avoidance symptoms in turn were the function of personal exposure to war trauma (marginally) and mother's characteristics, but not child's characteristics. Children who had been personally the targets of military violence and whose mothers were better educated and suffered from posttraumatic stress symptoms were at risk of avoidance symptoms. The model for hyperarousal was non-significant.

Discussion

This article reports the level of PTSD among Palestinian children currently exposed to bombardment, and the role of trauma-, child- and mother-related determinants of the symptoms. The results revealed a high level of PTSD: more than half (54%) of the children were suffering from a severe level of PTSD symptoms, and a third from a moderate level. The percentage corresponds with the levels of PTSD among Cambodian (Kinzie et al. 1986; Sack et al. 1995), and Bosnia-Herzegovian (Smith et al. 2002) refugee children fleeing atrocities in their respective home countries. The level of PTSD was considerably higher than that reported among Lebanese and Israeli children (Laor et al. 1997; 22%), but lower than that reported among Iraqi children (Dyregrov et al. 2002; 84%).

There are some practical and psychological characteristics of the military situation that may explain the children's high level of PTSD. First, acuteness of trauma

Table 2 Severity of PTSD according to the child's gender

	Girls		Boys		All	
	%	N	%	N	%	N
PTSD severity score						
None or Doubtful (< 12)			3.0	2	1.7	2
Mild (12–24)			16.7	11	9.1	11
Moderate (25–39)	41.8	23	30.3	19	35.5	43
Severe (> 40)	58.2	32	50.0	33	53.7	65
Total					100	121

For gender: $\chi^2 = 12.33$, $df = 3$, $p < 0.006$, $N = 121$

Table 3 Hierarchical multiple regression models for the effects of military violence, demographic factors and mother's characteristics on children's PTSD symptoms

Predictors	Posttraumatic symptoms															
	Total score			Intrusion symptoms			Avoidance symptoms			Hyperarousal symptoms						
	R ²	Increase in R ²	β-values in the final step	t-value	R ²	Increase in R ²	β-values in the final step	t-value	R ²	Increase in R ²	β-values in the final step	t-value				
1. Target of military violence	0.00	0.00	0.09	0.93	0.02	0.02	0.04	0.43	0.02	0.02	0.19	1.82 ^a	0.01	0.01	0.05	0.43
2. Witnessing military violence	0.03	0.03	0.17	1.76 ^a	0.02	0.00	0.08	0.83	0.03	0.01	0.06	0.62	0.01	0.00	0.04	0.37
3. Demographic factors	0.09	0.06 ^b	0.29	3.06 ^c	0.07	0.05 ^b	0.21	2.17 ^b	0.03	0.00	0.03	0.33	0.03	0.02	0.18	1.76
Gender			-0.18	1.60			-0.21	-2.85 ^a			0.04	0.39			0.02	0.18
Age																
4. Mother's characteristics	0.20	0.11 ^c	0.15	1.44	0.12	0.04	0.12	1.08	0.13	0.10 ^c	0.00	0.06	0.06	0.03	-0.06	-0.54
Age			0.24	2.53 ^c			0.05	0.56			0.20	2.05 ^b			0.14	1.35
Education			0.31	3.36 ^d			0.21	1.12 ^b			0.32	3.31 ^d			0.03	0.29
Posttraumatic symptoms																
Total model																

^a p < 0.10; ^b p < 0.05; ^c p < 0.01; ^d p < 0.001

naturally resulted in a high level of PTSD. The families were interviewed while the military action was still going on, and they continued to live in acute danger and threat. The siege of the Palestinian cities and restriction of movement in the Gaza strip badly disrupted the children's social life, schooling and family ties. Researchers agree that only when the acute trauma and dangers are over does children's PTSD start to decline (Laor et al. 2001).

Second, the shelling and bombardment happens suddenly, without warning. It is unpredictability that is considered to be the most traumatic for both humans and primates (Seligman 1975). The methods that the Israeli army employs in shelling, attacks and demolition are psychologically devastating, as the army carries them out suddenly in the middle of the night or sometimes at midday when people are engaged in their daily lives.

Third, during the bombardment the Israeli army systematically prevents people from helping their wounded family members, and from burying their dead with dignity and according to the religious rules (B'Tselem 2002c). The grieving process may, thus, be complicated and strong feelings of guilt, helplessness, despair and anger emerge. Unfinished mourning and guilt feelings are considered a severe psychological risk factor for PTSD (Horowitz 1993). The following description depicts some of the reality of the families studied.

"I can't forget that day when my husband had been injured after our home had been hit by a missile. My home is near an Israeli checkpoint and one day they started to shell our home. My husband, kids and I tried to cross the wide street which is close to the checkpoint to another street where we would be able to escape to a safer place. I arrived at the street first with my kids and my husband was behind us. He had almost arrived at that street when a missile hit his leg, knocking him down. My husband's brothers ran to him and tried to give him some first aid. The ambulance could not get through to take him to the hospital because of the shelling. Our house is on a wide street and the checkpoint is on high ground, so the Israeli soldiers can see everyone passing in the street. Finally, one of our neighbors came with his car and took my husband to the hospital. In the hospital they had to amputate my husband's leg because he was too late getting to the hospital." (A mother of four, 37 years).

Our results confirmed the classical argument that the way mothers respond to danger and threat influences their offspring. The mothers' own PTSD symptoms and educational level were important determinants of their children's PTSD, together with child's gender and witnessing traumatic events: girls witnessing military violence towards others and having well-educated mothers with high PTSD showed the highest overall level of PTSD symptoms.

The results revealed some symptom-specific models. Intrusion symptoms were most common among

younger girls whose mothers reported a high level of PTSD, whereas avoidance symptoms were common among all children who had personally been the target of military violence, and whose mothers were better educated and reported a high level of PTSD. None of the expected determinants explained the variation of hyperarousal symptoms. The results contribute to the notion that PTSD is a dynamic and multi-dimensional concept, and that different models explain the occurrence of intrusion and avoidance (Horowitz 1993).

Girls were more susceptible to PTSD, which concurs with earlier research on children living in war zones (Dyregrov et al. 2002; for review, Pfefferbaum 1997; Smith et al. 2002). In our sample, the gender differences were evident for both categorical (diagnostic) and dimensional symptom levels of PTSD. Concerning the specificity of symptoms, girls reported more intrusion than boys, whereas no gender differences were found in avoidance and hyperarousal. There are some suggestions that women have a lower absolute threshold for most senses, including the visual sense (Peterson 1996), which could explain girls' higher intrusive symptoms. However, other researchers did not find symptom-specific gender differences in intrusive and avoidance symptoms (Dyregrov et al. 2002; Hadi and Llabre 1998).

The result that the age of the child was not associated with general dimensional or categorical PTSD disagrees with other Middle Eastern research (Weisenberg et al. 1993). However, the age of the child predicted the occurrence of intrusion symptoms; younger girls suffered more from intrusion symptoms than older girls. Our knowledge of the developmental dynamics of posttraumatic response is still scarce. Clinical experiences indicate that intrusion symptoms can be especially frightening for young children. Palestinian children reported, for instance, that 'the fighting is going on in my head in the night', when describing their nightmares. This may explain why younger children were more susceptible to intrusion symptoms especially, the more so when their mothers were suffering from intrusion, avoidance and hyperarousal symptoms.

The result that mothers' high level of education associated with a high level of PTSD among children is contrary to the general view that socio-economic adversity, involving low level of education, contributes to PTSD (Breslau et al. 1998). It is not easy to explain our results. One possibility is to suggest that better educated mothers are younger ($r^2 = -0.19$, $p < 0.04$), and young mothers, being less experienced, may contribute to children's insecurity and fear in life-endangering situations. However, mother's age was not significantly associated with children's PTSD, neither separately nor in the regression model. Another explanation might be that better-educated women, who usually work outside the home, may have felt even more frustrated due to the siege, bom-

bardment and restriction of movement. Finally, better-educated mothers may discuss their children's nightmares, flashbacks and other PTSD symptoms more readily. Consequently, the children are more capable of recognizing them and reporting them to the interviewer.

Our results contradict the findings among Kuwaiti children (Hadi and Llabre 1998; Pynoos 1993) suggesting that only the severity of personal exposure to direct violence and witnessing violent acts lead to PTSD. However, they concur with Israeli and European research emphasizing the important role of maternal responses in determining children's PTSD in life-endangering situations (Rosenthal and Levy-Shiff 1993; Smith et al. 2001). The high level of PTSD found among Palestinian children and the crucial role of the mothers in determining their severity emphasize the importance of the home fulfilling the basic needs for secure and adaptive child development. The protective shield is tragically destroyed when children face shelling and the destruction of their homes.

The relatively modest trauma-symptom link was to some extent trauma-specific. Witnessing violence towards others was marginally associated with total PTSD score, whereas being personally a target of a direct trauma associated with avoidance symptoms. Most notably, being a girl and witnessing others suffering was predictive for PTSD symptoms. This concurs with findings on adult Palestinians showing that women appraised assaults committed against family members as the most traumatic, while men appraised direct military violence, such as being a target of gunfire and imprisonment, as the most traumatic (Punamäki et al. submitted).

Our study has many shortcomings and the results can be generalized only to families living in acute traumatic stress. First, our sample is relatively small and focused, thereby precluding all epidemiological conclusions on the national level. Second, to gain a genuine view of how families survive extreme life-endangering situations, the responses of the fathers are also essential. Moreover, a more comprehensive setting including family resiliency and vulnerability factors could have been more informative.

■ **Authors' Notes** Samir Qouta and Eyad El Sarraj are in The Gaza Community Mental Health Program (GCMHP), Gaza, Palestine. Raija-Leena Punamäki is at the Department of Psychology, University of Tampere, Finland.

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