

Loss of social resources predicts incident posttraumatic stress disorder during ongoing political violence within the Palestinian Authority

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Abstract

Background Exposure to ongoing political violence and stressful conditions increases the risk of posttraumatic stress disorder (PTSD) in low-resource contexts. However, much of our understanding of the determinants of PTSD in these contexts comes from cross-sectional data. Longitudinal studies that examine factors associated with incident PTSD may be useful to the development of effective prevention interventions and the identification of those who may be most at-risk for the disorder.

Methods A 3-stage cluster random stratified sampling methodology was used to obtain a representative sample of 1,196 Palestinian adults living in Gaza, the West Bank and East Jerusalem. Face-to-face interviews were conducted at two time points 6-months apart. Logistic regression analyses were conducted on a restricted sample of 643 people

who did not have PTSD at baseline and who completed both interviews.

Results The incidence of PTSD was 15.0 % over a 6-month period. Results of adjusted logistic regression models demonstrated that talking to friends and family about political circumstances (aOR = 0.78, $p = 0.01$) was protective, and female sex (aOR = 1.76, $p = 0.025$), threat perception of future violence (aOR = 1.50, $p = 0.002$), poor general health (aOR = 1.39, $p = 0.005$), exposure to media (aOR = 1.37, $p = 0.002$), and loss of social resources (aOR = 1.71, $p = 0.006$) were predictive of incident cases of PTSD.

Conclusions A high incidence of PTSD was documented during a 6-month follow-up period among Palestinian residents of Gaza, the West Bank, and East Jerusalem. Interventions that promote health and increase and forestall loss to social resources could potentially reduce the onset of PTSD in communities affected by violence.

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Introduction

Identifying key risk and resiliency factors for posttraumatic stress disorder (PTSD) in contexts of political violence and instability is an important public health priority. Within the Palestinian Authority, loss of life and freedoms due to political conflict is extreme. During the first and second *Intifadas*, over 6,200 Palestinians were killed [1, 2] and more than 65,000 were detained [3]. Palestinians are also exposed to internecine violence from within factious Palestinian groups [1]. These exposures are associated with ratings of poor general health [4], loss of valued economic

and social resources [5–7], and prevalence estimates of PTSD in the West Bank, Gaza and East Jerusalem range from 6.6 to 25.4 % [6, 8–12].

Direct exposure to conflict and violence are important potentially traumatic events (PTEs), but Palestinians are also exposed to the downstream consequences of political violence and military occupation. Stressors associated with poverty, lack of resources and marginalization may modify, and potentiate, the effect of PTEs on PTSD in conflict-affected populations [13]. Within the Palestinian Authority, detention, harassment, and the punitive destruction of homes by the Israeli military create another category of stresses that may contribute to PTSD incidence.

It is critical to understand the role of potentially modifiable exposures that contribute to psychiatric morbidity in conflict-affected regions. Utilizing the framework provided by Hobfoll's conservation of resources theory [14], the present study extends prior research by evaluating the central role of psychosocial resources and losses to these resources, while also considering potentially traumatic event (PTE) exposures, stressors, and candidate individual-level characteristics for PTSD onset.

Conservation of resource theory (COR) posits that one consequence of PTEs is the actual or threatened loss of psychosocial resources, which in turn creates stress that can lead to poor mental health outcomes [15]. Studies in Israel and the Palestinian Authority repeatedly demonstrated the relationship between psychosocial resource loss and poor mental health [6, 11, 15, 16]. Losses of economic resources are also associated with poorer functioning and worse PTSD-related outcomes [11, 12, 17]. COR theory posits that psychosocial resource loss begets further losses via a 'loss spiral' whereby declining psychosocial resources lead to mental health problems, which in turn, lead to greater psychosocial resource loss [7, 18], indicating the need to intervene before losses accrue. Our previous longitudinal analyses of the current study population showed that social resource loss was related to worse trajectories of PTSD symptoms [7, 19]. We, therefore, expect that resource loss will contribute to PTSD incidence.

In this paper, we centrally consider the role of psychosocial resource loss while taking into consideration other factors known to be associated with the development and maintenance of PTSD. Individual-level factors associated with increased prevalence of PTSD include ethnicity [11], and factors related to residency such as degree of urbanization, settlement conditions, and geographical region [6, 10, 17]. Demographic characteristics associated with prevalent PTSD in Israeli and Palestinian populations include older age [17] and female sex [6, 8, 17]. Individual variation in the way PTEs are experienced may also alter susceptibility to PTSD. Ongoing perceived threat of violence to family members [20, 21] can increase risk of

PTSD. The perception of future-oriented threat within the context of ongoing political instability would, therefore, be expected to confer increased risk for PTSD. Indirect exposure to violence via media outlets was shown to affect prevalent PTSD following the September 11, 2001 terror attacks in the US [22]. However, the effects of this exposure have not yet been evaluated as a factor associated with incident PTSD.

Factors associated with prevalent PTSD extend beyond the individual to community and social networks. A meta-analysis found statistically significant effects of lower social support on PTSD symptoms and diagnosis [23]. This relationship is evidenced in populations exposed to trauma [24, 25] and within the Palestinian Authority [4, 11] specifically. Alternatively, high levels of social support have demonstrated a protective effect against poor mental health outcomes [25, 26]. In one of few longitudinal studies of PTSD completed in Israel, low levels of social support were found to moderate the impact of immediate emotional response to PTEs on PTSD among Jewish residents [9]. In other studies of community-wide disasters, social support was longitudinally associated with less severe PTSD symptoms [27]. Together, this evidence suggests that social support may be related to PTSD incidence.

To our knowledge, no study has examined risk factors for incident PTSD in a multiply exposed population experiencing continued threat of political violence. The purpose of the current investigation is to evaluate the role of psychosocial resource losses as potentially modifiable risk factors that can specifically be targeted by prevention efforts in resource limited, conflict-affected settings.

Methods

Baseline interviews were conducted from September 16th to October 16th, 2007 and 6-month follow-up interviews from April 24, 2008 to May 17, 2008. All structured interviews were conducted face-to-face and participants and interviewers were of the same sex. A stratified 3-stage cluster random sampling strategy was utilized such that 60 clusters were selected with populations of 1,000 or more individuals (after stratification by district and type of community—urban, rural, and refugee camp) with probabilities proportional to size. Within each cluster, 20 households were selected and then one individual in each household was selected using Kish Tables. To ensure a high response rate, three attempts were made to complete the interview. Written informed consent was obtained and participants were provided compensation equivalent to approximately \$5 (U.S.D). The study was approved by the institutional review boards of Kent State University, Rush University Medical Center, and the University of Haifa.

Of the 1,902 people approached for the first study wave, 702 refused to participate and four terminated the interview early, yielding a sample of 1,196 people (a response rate of 63 %). Of this number, 889 people participated in the 6-month follow-up interview. Non-contact was accounted for by change of address (18), refusals (249), unavailability (36), being in prison (2), or being “martyred,” (2), yielding a response rate of 89 % that mirrored census and population demographics by age, region (the West Bank, Gaza and East Jerusalem), type of locality (cities, villages and refugee camps) and sex [28, 29], suggesting that we were successful in contacting a representative sample of the target population. At baseline, 918 people did not meet algorithmic criteria for PTSD and a total of 673 of these people participated in the 6-month follow-up. Of this number, 643 (70 % of total baseline sample) provided complete data and were included in the multivariable analysis. We restricted our analysis to only people who did not meet criteria for PTSD at baseline to evaluate the incidence of PTSD within the 6-month follow-up period and to evaluate the predictors of these incident cases. Our subsample ($n = 643$) was similar to the overall sample of those free of PTSD at baseline ($n = 918$), except they were less likely to be in the highest income category ($p = 0.01$) (please see the description of the income measure below) and were 1.44 times more likely to experience financial loss ($p = 0.02$).

Study instruments

Incident Posttraumatic stress disorder occurring within the past month was assessed with the 17-item PTSD Symptom Scale Interview format which demonstrated 86 % sensitivity and 78 % specificity when compared to clinician interviews (PSS-I) [30]. The extent these symptoms were experienced were rated from 0 (not at all) to 3 (very much). Diagnosis consistent with *DSM-IV-TR* [31] criteria was given when moderate or severe symptom severity was reported for at least one re-experiencing symptom, three avoidance symptoms, two hyperarousal symptoms, and when respondents reported moderate or severe impairment in occupational or social functioning related to those symptoms. This algorithmic scoring was applied at baseline and 6-month follow-up to identify cases.

Loss of psychosocial resources

Loss of social resources related to socio-political stressors and political violence was assessed using a 4-item average scale score from the Conservation of Resources Evaluation (COR-E) [32]. Participants were asked “To what extent have you lost any of the following resources in the past year as a result of the occupation or violence among

factions?” Items included: “Feeling that you are a person of great value to other people,” “Stability of your family,” “Intimacy with at least one friend,” and “Intimacy with at least one family member.”

Losses to faith in government were assessed by asking whether participants lost faith in the ability of the Palestinian governing authorities to protect their family. Participants indicated the degree of their loss to social resources and loss to faith in government on a 4-point scale with item responses ranging from 0 (did not lose at all) to 3 (lost very much).

Economic resource loss was assessed by asking participants whether they suffered significant financial losses (e.g., to money or property) as a result of either violence among Palestinian factions or Israeli attacks. Responses were coded 0 = no, 1 = yes.

Exposure to political violence was assessed for five events occurring in the past year as a result of Israeli attacks or violence among Palestinian factions: (1) death of a family member or friend, (2) injury to a family member or a friend, (3) injury to themselves, (4) torture, or (5) witnessed Israeli attacks or violence among Palestinian factions. Items were summed and responses were trichotomized into three groups roughly equal in size: “no exposure,” “exposure to 1 event,” and “exposure to 2 or more events.”

Experiencing socio-political stressors during the past year was assessed by four dichotomous items accounting for whether: (1) their family’s home was demolished, (2) they were forced to leave their home, (3) they experienced physical harassment by military or paramilitary forces, and if (4) they had been incarcerated for political activity. These four items were summed and dichotomized into a total scale due to few reported experiences.

Media exposure was assessed by asking participants how often they followed political affairs through television, radio or newspapers. Responses ranged from 0 (never) to 5 (very high frequency).

Indirect exposure to events through friends and family was assessed by asking how frequently participants talked to friends and family about political conditions. Responses ranged from 0 (never) to 5 (very high frequency).

Social support satisfaction. Participants were asked about how satisfied they were with the support available from friends to family. These two items were rated from 0 (not at all satisfied) to 3 (very satisfied).

Perceived threat of future attacks was measured by averaging responses to two items: “in general, how concerned are you about the possibility (1) that you or a family member will be victims of a large scale attack on the Palestinians and (2) that you or a family member will be victims of violence among Palestinian factions?” Responses ranged from 0 (not at all) to 3 (very much).

Subjective health was assessed by asking participants “How would you rate your overall health during the past 30 days.” The scale ranges from 1 (very good) to 5 (poor).

Demographic and personal characteristics included: sex, marital status (single, divorced/separated, widowed, married), age, education (less than high school, high school graduate, some college, college graduate), religiosity (not religious, somewhat religious, and very religious), and income. Participants reported their income in relation to the average monthly household income (i.e., 2,500 New Israeli Shekel) in the Palestinian Authority (low: much lower than average or a little lower than average; medium: average; high: a little higher than average or much higher than average).

Statistical analysis

We examined incident cases of PTSD by restricting our study sample to only people who did not have PTSD at baseline ($n = 918$). Utilizing multivariable logistic regression, we included predictors that have been found to be associated with PTSD diagnosis in past studies, or were thought to be potential confounders. Our final analysis included theoretically related independent variables representing five categories of risk and protective factors: loss of resources (e.g., faith in government, economic, and social); direct exposure to PTEs (i.e., political violence and socio-political stressors occurring during the year leading up to baseline assessment); indirect exposure to PTEs (i.e., talking to friends and family, amount of exposure to media coverage about political conditions); personal characteristics (i.e., sex, age, income, education, marital status, religiosity, perceived threat of future political violence, health status); and social resources (i.e., family and friend social support). All analyses were conducted using STATA version 12.1MP [33].

Results

Table 1 characterizes study participants at baseline. Our study population included similar numbers of men and women and the average age was 34.65 (SD = 12.62). The majority reported being married (67.76 %), having a lower than average income (52.13 %), and high school or less than high school education (65.46 %). The majority of participants did not report exposure to political violence (58.6 %) or socio-political stressors (90.7) in the past year. The cumulative incidence of PTSD was 15 % at 6-month follow-up.

The bivariate and multivariable logistic regression analyses for incident PTSD are displayed in Table 2. Results from unadjusted analysis demonstrated that less than high

Table 1 Participant characteristics and means and standard deviations of study variables

	%	<i>M</i>	<i>SD</i>	Range
Sex				
Female	52.07			
Age		34.65	12.62	18–80
Income				
High	23.04			
Medium	24.83			
Low	52.13			
Education				
College	23.72			
Some college	10.82			
High school	32.35			
Less than HS	33.11			
Marital status				
Married	67.76			
Not married	32.24			
Location				
City	53.76			
Refugee camp	15.49			
Village	30.75			
Religiosity		1.58	0.60	0–3
Threat perception		1.74	1.02	0–3
Health status		2.05	0.99	0–5
Political violence				
No exposure	58.6			
1 exposure	21.1			
2 or more	20.3			
Socio-political stressors				
No stressors	90.7			
1 or more	9.3			
Media exposure		3.51	1.42	0–5
Talking to friends/family		4.25	1.47	0–5
Support from family		2.38	0.87	0–3
Support from friends		1.98	1.00	0–3
Financial loss				
No loss	68.35			
Faith in government loss		1.61	1.13	0–3
Loss of social resources		0.60	0.62	0–3

school education, [OR = 2.04, (1.10,3.76), $p = 0.022$], threat perception [OR = 1.47, (1.18,1.84), $p < 0.001$], poor health status [OR = 1.52, (1.25,1.85), $p < 0.001$], and loss of social resources [OR = 1.74, (1.26,2.40), $p = 0.001$] increased the odds of developing PTSD. Family support satisfaction [OR = 0.76, (0.61,0.95), $p < 0.001$] was protective against incident PTSD.

Results from the adjusted multivariable model showed that female sex [aOR = 1.76, (1.07,2.90), $p = 0.025$], threat perception [aOR = 1.50, (1.15,1.94), $p = 0.002$],

Table 2 Crude and adjusted logistic regression analysis for predictors of incident PTSD at 6-month follow-up ($N = 643$)

Characteristic	Crude OR	95 % CI	<i>p</i> value	Adjusted OR	95 % CI	<i>p</i> value
Personal characteristics						
Sex						
Male	1.00	Referent		1.00	Referent	
Female	1.48	0.96, 2.28	0.073	1.76	1.07, 2.90	0.025
Age	1.01	0.99, 1.03	0.207	1.00	0.98, 1.02	0.902
Income						
High	1.00	Referent		1.00	Referent	
Medium	1.30	0.67, 2.51	0.427	1.67	0.80, 3.48	0.171
Low	1.30	0.72, 2.34	0.368	1.19	0.61, 2.31	0.605
Education						
College	1.00	Referent		1.00	Referent	
Some college	1.55	0.68, 3.53	0.300	1.05	0.41, 2.67	0.921
High school	1.29	0.68, 2.48	0.436	1.02	0.50, 2.06	0.962
Less than HS	2.04	1.10, 3.76	0.022	1.28	0.62, 2.62	0.497
Marital status						
Married	1.00	Referent		1.00	Referent	
Not married	0.89	0.56, 1.43	0.639	1.15	0.67, 1.97	0.607
Location						
City	1.00	Referent		1.00	Referent	
Refugee camp	1.05	0.58, 1.89	0.876	0.92	0.47, 1.80	0.808
Village	0.75	0.46, 1.23	0.255	0.84	0.47, 1.49	0.548
Religiosity	1.08	0.75, 1.56	0.727	1.34	0.89, 2.03	0.159
Threat perception	1.47	1.18, 1.84	0.001	1.50	1.15, 1.94	0.002
Health status	1.52	1.25, 1.85	0.001	1.39	1.10, 1.76	0.005
Direct exposure						
Political violence						
No exposure	1.00	Referent		1.00	Referent	
1 exposure	1.37	0.82, 2.31	0.223	1.21	0.67, 2.20	0.522
2 or more	1.49	0.88, 2.52	0.136	1.73	0.92, 3.30	0.091
Socio-political stressors						
No stressors	1.00	Referent		1.00	Referent	
1 or more	0.71	0.32, 1.62	0.420	0.50	0.20, 1.24	0.136
Indirect exposure						
Media exposure	1.10	0.94, 1.28	0.220	1.37	1.12, 1.68	0.002
Talking to friends/family	0.93	0.81, 1.07	0.302	0.78	0.65, 0.94	0.010
Social resources						
Support from family	0.76	0.61, 0.95	0.016	0.78	0.58, 1.03	0.081
Support from friends	0.86	0.70, 1.05	0.138	1.00	0.78, 1.29	0.986
Loss to resources						
Financial loss						
No	1.00	Referent		1.00	Referent	
Yes	1.18	0.76, 1.84	0.461	1.09	0.74, 1.15	0.736
Faith in government	1.03	0.85, 1.24	0.765	0.92	0.74, 1.15	0.463
Social resource loss	1.74	1.26, 2.40	0.001	1.71	1.67, 2.52	0.006

poor health status [aOR = 1.39, (1.10,1.76), $p = 0.005$], media exposure [aOR = 1.50, (1.15,1.94), $p = 0.002$], and loss to social resources [aOR = 1.71, (1.67,2.52),

$p = 0.002$] increased the odds of PTSD, while talking to friends and family decreased the odds of PTSD [aOR = 0.78, (0.65,0.94), $p = 0.01$].

To assess the effect of using list-wise deletion to account for missing data, a sensitivity analysis was conducted using multiple imputations by chained equations to account for item missingness and inverse probability weighting [33] to account for loss to follow-up. This approach led to no major qualitative difference in results or changes in statistical inference, so the simple model without weighting or imputation is reported.

Discussion

This study tested the association between the loss of individual and social resources on incident PTSD within a large longitudinal sample of conflict-affected Palestinians living in the West Bank, Gaza, and East Jerusalem while adjusting for a number of confounding factors. To our knowledge, this is the first study exploring factors associated with PTSD incidence within a context of ongoing political violence.

Among the losses we evaluated, economic loss and loss of faith in government did not predict incident PTSD as expected. Economic resource loss may not be important in this context given that economic deprivation is ongoing and existed years before this study was conducted. The loss of faith in government may have similarly eroded over the course of internal Palestinian violence, and therefore may not be a salient predictor of PTSD. However, loss of social resources significantly predicted incident PTSD.

The loss of social resources within low- and middle-income contexts is particularly important as it increases the vulnerability for continued or worsening psychological distress [7]. Our present finding contributes to the larger PTSD and trauma literature by bringing into focus the importance of the post-trauma social environment to recovery from PTSD [24]. Indeed, with the lack of social support being implicated as a primary predictor of PTSD [23], it is surprising that leading evidence-based interventions remain focused at the level of the individual, while seeming to ignore vital interpersonal and community-level processes clearly implicated in the onset, development, and maintenance of PTSD. Research on interventions that can improve the social resources and social environments of trauma-affected communities is needed.

Exposure to political violence and socio-political stressors were not significantly associated with incident PTSD. This may be related to measurement of these exposures being limited to only the previous year. However, exposure through the media conferred an increased risk. This was consistent with a previous study conducted in the United States following the terrorist attacks of 9/11

[22]. Media exposure was only significant in the adjusted models suggestive that this effect could be due to negative confounding [34]. A limited sensitivity analysis to test whether the media effect was present in the absence of the talking to friends/family variable. Indeed, when the talking to friends/family variable was removed from the analysis, the media effect was non-significant. This suggests that when people do not talk to loved ones about the events, media coverage can increase PTSD risk. Conversely, when people do not watch media coverage, talking to loved ones decreases PTSD risk.

A number of included covariates were related to incident PTSD. Significant individual-level factors predictive of PTSD were female sex, threat perception of future attacks, and poor health. Women's vulnerability in their risk for PTSD may be attributable to differential measurement [35] and the degree to which men and women express psychopathology [36]. Continued work to understand sex differences in trauma-related symptoms is needed.

Studies show that increased threat perception of future violence is associated with exposure to political violence and psychological distress [37]. This is supported by the shattered assumptions model [38] that suggests trauma poses challenges to basic assumptions about the world as meaningful, predictable, and safe. Psychological distress resulting from traumatic events is thus associated with an unrealistic shift toward perceiving the world as malevolent, dangerous, and threatening.

Consistent with our previous analysis, poor health leads to increased risk for PTSD in this study [4]. A growing literature supports the association between poor physical health and PTSD [39]. According to the shared vulnerability model, somatic hypervigilance may account for a shared vulnerability to PTSD and poor general health, by creating a bias toward threatening external stimuli and exaggerated startle [40]. Another possibility is that under conditions of ongoing stress and adversity, allostatic load, the body's response to ongoing stressors, may lead to physical disease and disability [41].

Social support resources were not protective against PTSD in the adjusted models. This finding contrasts with previous findings in this study population that showed initial levels of social support predicted whether participants were in moderate or severe symptom trajectories [19]. However, the previous study did not control for the same model covariates, and in the present study, the unadjusted models demonstrated this significant inverse association. Moreover, talking to friends and family about political events did significantly mitigate the risk of incident PTSD in the adjusted model. This suggests that enacted support rather than perceived support is a more potent in buffering against PTSD in this context.

Limitations

The present study has several important limitations. Many of the risk factors included were measured using single items, which limits reliability and may fail to capture the multidimensional nature of some of these constructs. Lay in-person interviews may not be as accurate as clinician diagnosis of PTSD. Dropouts and refusals may be a concern in our sample (26.69 %), but this concern is lessened given that the sensitivity analysis did not reveal qualitative differences in our study estimates.

Conclusions

Our findings identify key risk factors for incident PTSD that could be modified through intervention. Poor health, threat perceptions and social resource loss can all be targeted with community-based prevention strategies. Future research specifically examining potential mediators of resource loss could yield especially important insights into how to prevent or delay losses from accruing by targeting these mechanisms. Targeted cognitive therapy interventions for trauma in low-resource contexts show efficacy for reducing fear-based cognitions and improving social resources [42]. Although our study offers useful insights into the role of social resource loss and PTSD, future research is needed to further unpack the social support construct and allow for a finer-grained analysis of the role of these resources to promote mental health. Rather than relying on broad measures of social support satisfaction, specifically examining the composition and quality of social networks of trauma survivors can also further understanding of how and why losses to social resources occur.

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Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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