Lifetime Events and Posttraumatic Stress Disorder in 4 Postconflict Settings

Joop T. V. M. de Jong, MD, PhD
Ivan H. Komproe, PhD
Mark Van Ommeren, PhD
Mustafa El Masri, MD
Mesfin Araya, MD
Noureddine Khaled, PhD
Willem van de Put, MA
Daya Somasundaram, MD, MRCPsych

Context Little is known about the impact of trauma in postconflict, low-income countries where people have survived multiple traumatic experiences.

Objective To establish the prevalence rates of and risk factors for posttraumatic stress disorder (PTSD) in 4 postconflict, low-income countries.

Design, Setting, and Participants Epidemiological survey conducted between 1997 and 1999 among survivors of war or mass violence (aged ≥16 years) who were randomly selected from community populations in Algeria (n=653), Cambodia (n=610), Ethiopia (n=1200), and Gaza (n=585).

Main Outcome Measure Prevalence rates of PTSD, assessed using the PTSD module of the Composite International Diagnostic Interview version 2.1 and evaluated in relation to traumatic events, assessed using an adapted version of the Life Events and Social History Questionnaire.

Results The prevalence rate of assessed PTSD was 37.4% in Algeria, 28.4% in Cambodia, 15.8% in Ethiopia, and 17.8% in Gaza. Conflict-related trauma after age 12 years was the only risk factor for PTSD that was present in all 4 samples. Torture was a risk factor in all samples except Cambodia. Psychiatric history and current illness were risk factors in Cambodia (adjusted odds ratio [OR], 3.6; 95% confidence interval [CI], 2.3-5.4 and adjusted OR,1.6; 95% CI, 1.0-2.7, respectively) and Ethiopia (adjusted OR, 3.9; 95% CI, 2.0-7.4 and adjusted OR, 1.8; 95% CI, 1.1-2.7, respectively). Poor quality of camp was associated with PTSD in Algeria (adjusted OR, 1.8; 95% CI, 1.3-2.5) and in Gaza (adjusted OR, 1.7; 95% CI, 1.1-2.8). Daily hassles were associated with PTSD in Algeria (adjusted OR, 1.6; 95% CI, 1.1-2.4). Youth domestic stress, death or separation in the family, and alcohol abuse in parents were associated with PTSD in Cambodia (adjusted OR, 1.7; 95% CI, 1.1-2.6; adjusted OR, 1.7; 95% CI, 1.0-2.8; and adjusted OR, 2.2; 95% CI, 1.1-4.4, respectively).

Conclusions Using the same assessment methods, a wide range of rates of symptoms of PTSD were found among 4 low-income populations who have experienced war, conflict, or mass violence. We identified specific patterns of risk factors per country. Our findings indicate the importance of contextual differences in the study of traumatic stress and human rights violations.

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MOST OF MENTAL HEALTH research on refugees and displaced people and violence-torn populations has taken place in the West.[1] In low-income countries, refugees and displaced people often face an uncertain future with respect to food, shelter, physical security, and human rights violations. In contrast, refugees living in the West are more likely to face problems related to asylum status[2,3] and acculturation.[4,5] Because research on selected refugees settled in the West may not generalize to the majority of the world's refugees, several authors called for more research in the developing world.[1,6-9] The few published epidemiological surveys on refugees and ex-refugees living in the developing world indicate that emotional sequelae are common.[10,11] Also, recent epidemiological studies conducted in the Balkans revealed elevated psychiatric morbidity among civilian and refugee populations affected by mass violence.[12-14]

Posttraumatic stress disorder (PTSD) is the most frequently reported psychiatric consequence of traumatic events[15] and of human-made disasters in particular.[16] Estimates of lifetime prevalence of PTSD among specific western groups of trauma survivors range between 15% and 24%,[17] as compared with 8% in the general US population.[18]

This article addresses 2 questions. First, what are the prevalence rates of lifetime PTSD in community samples from low-income countries where people have experienced war, conflict, or mass violence? In a review[14] of 170 epidemiological surveys of PTSD, only a few population studies covered

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Author Affiliations: Transcultural Psychosocial Organisation (TPO) WHO Collaborating Centre, Amsterdam, the Netherlands (Drs de Jong, Komproe, and Van Ommeren); the Vrije Universiteit, Amsterdam (Drs de Jong and Komproe); Centre for Victims of Torture, Kathmandu, Nepal (Dr Van Ommeren); Société Algerienne de Recherche en Psychologie (SARP)/TPO Algeria, Algiers (Drs El Masri and Khaled); Gaza Community Mental Health Program (GCMHP), Gaza (Dr El Masri); TPO Ethiopia, Addis Ababa, Ethiopia (Dr Araya); TPO Cambodia, Phnom Penh, Cambodia (Mr van de Put and Dr Somasundaram); HealthNet International, Amsterdam (Mr van de Put); and University of Jaffna, Jaffna, Sri Lanka (Dr Somasundaram).
Corresponding Author and Reprints: Ivan H. Komproe, PhD, Transcultural Psychosocial Organisation (TPO), Keizersgracht 329, 1016 EE, Amsterdam, the Netherlands (e-mail: ikomproe.tpo@pom.nl).

survivors of war or mass violence or refugees living in low-income countries. For example, Mollica et al[10] studied 993 Cambodian refugees on the Thai-Cambodian border and estimated a 15% PTSD prevalence rate; El Sarraj et al[19] found PTSD among 20% of 550 survivors of torture in Gaza; and Somasundaram and Sivayokan[20] found 14% with PTSD in a random community sample in northern Sri Lanka.

A number of studies have shown that multiple exposure to traumatic events or cumulative trauma is associated with higher levels of psychopathologic conditions.[21-23] Despite evidence for multiple exposure, few studies control for multiple exposure when evaluating the relative impact of individual traumatic events.[21] Breslau and colleagues[17] have argued that the assumption that the worst-ever experienced trauma is the one most likely to cause PTSD leads to an overestimation of the conditional risk for PTSD given exposure, because the worst trauma represents only the extreme end of the distribution of experiences regarded as potential antecedents of PTSD. A less biased estimate of PTSD may be obtained by evaluating complete accounts of all traumas experienced by respondents.[17]

The second question addressed in this article is what adverse events are associated with PTSD in nonwestern settings where people have experienced multiple exposures to trauma, prolonged exposure to trauma, or both? The literature shows a variety of risk factors associated with PTSD, including the history of exposure to traumatic events[24] and the severity of trauma exposure.[25,26] Bremner et al[27] found that Vietnam veterans with PTSD reported higher rates of childhood physical abuse compared with Vietnam veterans without PTSD. Bromet et al[28] identified trauma in childhood, previous psychiatric history, and parents and siblings with mental illness as risk factors for PTSD in the general US population. Steel et al[29] studied Tamil asylum seekers in Australia and found that 20% of the PTSD symptoms could be explained by premigration factors (eg, captivity and torture) and 14% by postmigration factors (eg, general health and daily hassles).

In this article, we present data from 4 different postconflict situations in low-income countries (Algeria, Cambodia, Ethiopia, and Gaza) using the same methods and same application of variables across countries. We expect that risk factors of PTSD are conjointly related. Moreover, because of differences in the context of the settings, we expect that a different pattern of risk factors will emerge for each setting. This article is part of the Multi-site Impact of Human-made disaster study by the Transcultural Psychosocial Organization, a World Health Organization (WHO) Collaborating Centre for Refugees and Ethnic Minorities, which implements psychosocial and mental health programs among adults and children in postconflict situations in Africa, Asia, and Europe.

In Algeria, after the cancellation of the elections in 1991, violence arose. Increased use of terrorist activities by the Islamic Salvation Front's armed groups developed into a series of population massacres near the capital Algiers. During all massacres, maimed people and some children were left alive to tell the story.[30]

Cambodia at the end of the 1960s was torn by civil war, which was followed by carpet bombing by US planes. In 1975 the Khmer Rouge started its infamous nationwide genocidal experiment in social engineering that has come to be known as "the killing fields." The Khmer Rouge regime was toppled by a Vietnamese invasion in 1979, but low-intensity warfare continued throughout the 1980s. During the 1990s the political situation slowly began to improve.[31]

At the end of the war leading to the separation of Eritrea from Ethiopia in 1991, people in these countries were forced to choose between Eritrean or Ethiopian citizenship. Thousands of people from Eritrea who chose Ethiopian citizenship experienced a dangerous flight before they found refuge in Ethiopia's capital Addis Ababa, where they continue to live in temporary shelters under minimal conditions (ie, the density of living space, including private living areas; public buildings like the schoolhouse, latrines, and stores; and public walkways).[32]

Since the Israeli occupation in 1967, more than 400 000 Palestinians have been detained or imprisoned. During the Intifada, a mass uprising, more than 1100 Palestinians were shot, 2200 were physically injured, and 55 000 detained during a 33-month period.[33] More recently, the Palestinian National Authority has launched several collective imprisonment campaigns against Palestinian opposition parties. The number of political prisoners has been estimated to be 1600.[34,35]

METHODS

Participants

We conducted an epidemiological survey between 1997 and 1999 in 4 different low-income regions: Southeast Asia (Cambodia, settled community [permanent places of living]), North Africa (Algeria, settled community [such as the periurban area of Algiers]), East Africa (Ethiopia, refugee camps), and the Middle East (Gaza, temporary shelters). These 4 countries were selected on the basis of the following criteria: (1) the presence of an intervention program, (2) sufficient security (eg, absence of ongoing high-intensity conflict), and (3) availability of local staff and facilities to collect data.

In Algeria, all inhabitants of the Gouvernorat d'Algiers (a periurban area of Algiers with 2 million inhabitants) were considered survivors of armed conflict because the whole area has been confronted with random terrorist attacks, involving massacres of hundreds of people. Two thousand addresses were randomly selected from local government lists of the area. Only 42.5% of people on the list of addresses were approached because the names of people on the remainder of the addresses did not match with the names of the persons living there. Of the 850 persons approached, 653 (76.7%) participated.

In Cambodia, 3 areas were selected: (1) Odambang I commune in Sangke

District in the Battambang province, which is considered an area with a large number of returnees from the Thailand border refugee camps, and which has modal standard of living; (2) Veal Pong Commune in Udong District in the Kampong Speu province, with a relatively poor population, who have faced continued civil strife up to recent times; and (3) Sang Kat Psar Doeum Kor in the capital, Phnom Penh, which has a relatively higher standard of living. Lists of residents in the areas were obtained from the local authorities, and a 2-step random sampling procedure was used to obtain samples from the 3 areas. First, addresses were randomly selected from the lists; second, a person was randomly selected from those living on the list of addresses. At least 200 addresses were randomly selected per area. In Odambang I, 205 respondents were approached and 201 (98%) participated; in Veal Pong Commune, of the 215 respondents 207 (96%) participated; in Sang Kat Psar Doeum Kor, of the 255 respondents 206 (81%) participated. In the latter sample, 10% of the approached respondents had moved to an unknown address, and another 9% of the approached respondents were unwilling to participate. Across the total Cambodian sample, 4 respondents were excluded because of missing data.

In Ethiopia, respondents (registered refugees) were selected from the Kaliti and Koremeda temporary shelters in Addis Ababa with refugees from Eritrea. Three thousand respondents were randomly selected from a list consisting of 8909 registered displaced persons. From these preselected respondents, 1208 respondents were approached for participation. Because of psychosis (n=2) and lack of registration (n=6), 8 interviews were discarded. The response rate was 99%.

In Gaza, 3 refugee camps, 3 cities, and 2 resettlement areas were randomly selected. Neighborhoods were randomly selected from these preselected areas. Households then were selected on the base of even (left side of the street) or odd (right side) random numbers, and participants were randomly chosen from the selected households. Six hundred persons were approached for participation in the study, and 585 persons (98%) participated.

People younger than 16 years and those with severe functional impairment due to gross cognitive impairment or severe psychosis were excluded. Oral rather than written informed consent was obtained because of the population's illiteracy and fear of signing forms. All research procedures were consistent with the Declaration of Helsinki.[36] Local program directors, their boards, and local authorities approved and agreed with the study procedures.

Instruments

Traumatic events were evaluated by an adapted version of the Life Events and Social History Questionnaire.[37] Other life events were included based on previous local studies of relevant events. The adapted instrument covers the domains of death or separation in the family, youth domestic events, conflict-related events, and general life events. The main characteristic of the instrument is its inquiry of events throughout the life span of the survivor from childhood to the present. The instrument was locally adapted to categorize traumatic events within a specific historical period. This approach was chosen because illiterate respondents may have difficulties recalling dates of events. For example, in Cambodia, episodes used in the instrument are the time of the Khmer Rouge regime followed by the period of the Vietnamese occupation. In Gaza, we distinguished the period during or after the first or second period of forced displacement in refugee camps followed by resettlement. Endorsement of an event was followed by questions ascertaining the time the event took place.

Posttraumatic stress disorder was evaluated in relation to adverse events from the aforementioned life events interview. In contrast to the procedure to relate only the worst trauma to the symptoms of PTSD, we used the complete list of reported events as reference for assessing PTSD. The PTSD section of the WHO's Composite International Diagnostic Interview 2.1[38] (CIDI) was used to assess lifetime PTSD according to *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (*DSM-IV*) criteria.[39] Moreover, symptom clusters of PTSD[40] were estimated. *Partial PTSD* was defined as meeting the criteria for 1 of the 3 *DSM-IV* PTSD symptom clusters.[39] The reliability and validity of CIDI assessments by lay interviewers has been shown in several studies.[41,42] Although the CIDI/*DSM-IV* PTSD diagnosis has not yet been validated in a general population sample, a validation study of CIDI/*Diagnostic and Statistical Manual of Mental Disorders, Revised Third Edition*[43] PTSD, containing symptom questions similar to those used in our study, found good agreement between the CIDI PTSD module and independent clinical reinterviews.[44]

Instruments in all countries were translated and back-translated with concern for content, criterion, technical, conceptual, and semantic equivalence.[45] The process of translating and adapting the instruments consisted of the following steps: (1) examination of the instruments by 2 to 4 bilingual experts on content and concept equivalence, (2) translation of the instruments into the local language, (3) literal back-translation of the instruments by other translators, (4) examination of the translation by monolingual experts not familiar with the local language, (5) back-translation of all those items amended by the monolingual group, (6) examination of the back-translation by a bilingual group informed by the discussion in the monolingual group, and (7) testing in a pilot study for all 4 countries for each language.

Examination of Variables

The lifetime adverse events were grouped into the following domains.

- Torture: This variable covers experience of torture.
- Youth domestic stress: This domain of 14 variables captures adverse experiences (eg, insulting, threatening, beating) in the family before age 12 years.

• Death or separation within the family before age 12 years: This domain of 6 variables covers death of parents and separation from parents and family before age 12 years.
• Conflict-related events before and after age 12 years: Two domains of 17 events refer to these different periods in life.
• History of psychiatric illness: Four questions capture psychiatric history of respondents and their families.
• Health events: Two questions evaluate the respondent's current illness and general health.
• Current events: Two questions refer to daily hassles and the quality of camp conditions. However, the quality of the camp was not assessed in Cambodia, where people no longer live in camps. Moreover, in Ethiopia, data were collected about conflict-related events during the flight.

Adverse domains with more than 1 event were dichotomized. Domains were scored positively when at least 1 event of that domain was experienced and negatively when no event of that domain was experienced.

Statistical Analysis

Univariate and sequential logistic regression analyses were performed as follows on the 4 data sets. First, the dichotomized domains of adverse events were entered in separate univariate logistic regression analyses as statistical predictors for PTSD. In these analyses of risk factors for exposure, odds ratios (ORs), 95% confidence intervals (CIs), and *P* values were calculated. Subsequently, to understand the relative importance of the experienced domains within the context of multiple exposure of trauma, adjusted ORs were calculated using sequential logistic regression analyses. To correct for potential bias caused by differences in demographics, the variables sex, age, marital status, having children, education, and religion were entered in step 1 as predictors of PTSD. In step 2, all statistically significant predictors from the separate univariate logistic regression analyses were entered to adjust for spuriousness in the prediction of PTSD by controlling for the effects of all other predictors. The estimates obtained from these multiple logistic regression analyses reflect the adjusted odds of adverse domains for PTSD. All analyses were performed with SPSS version 10.0.7.[46]

Table 1. Sociodemographic Characteristics of the Samples in Algeria, Cambodia, Ethiopia, and Gaza*

	Algeria, % (n = 653)	Cambodia, % (n = 610)	Ethiopia, % (n = 1200)	Gaza, % (n = 585)
Sex				
Male	54.3	43.1	37.6	46.8
Female	45.7	56.9	62.4	53.2
Age, mean (SD), y	40.6 (20.6)	36.3 (12.9)	33.9 (9.9)	31.6 (11.6)
Marital status				
Married	48.2	64.4	36.3	67.0
Widowed	4.1	7.9	16.9	0.9
Separated	0.6	1.5	19.0	0.2
Divorced	1.4	2.3	6.6	1.2
Never married	45.7	24.0	21.2	30.8
Children				
No., mean (SD)	2.6 (3.3)	3.8 (2.2)	3.3 (2.0)	5.2 (3.1)
No children	48.7	29.7	21.8	37.3
Education				
University	13.3	6.7	1.1	26.0
Secondary	25.4	36.1	29.5	36.4
Preparatory	22.8	4.1	1.6	19.8
Primary	21.0	35.9	41.8	7.5
No education	17.5	17.2	26.1	10.3
Religion				
Muslim	100	0	3.2	96.2
Christian	0	1.5	2.5	1.9
Orthodox	0	0	92.6	0
Buddhist	0	98.2	0	0
None	0	0.3	0	1.8
Other	0	0	1.7	0
PTSD *DSM-IV* diagnosis	37.4	28.4	15.8	17.8
Men	32.2	20.6	16.6	22.6
Women	43.8	34.2	15.2	13.5
PTSD symptom clusters				
Re-experiencing	80.4	72.8	63.8	49.6
Avoidance/numbing	52.4	59.3	44.4	27.5
Hyperarousal	71.4	37.7	33.1	39.7

*PTSD indicates posttraumatic stress disorder; *DSM-IV*, *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition.*[39]

RESULTS

Demographics

TABLE 1 presents the demographic characteristics of the 4 samples. All samples, except the Algerian sample, contained more women than men ($P<.001$ for within-sample comparisons in Cambodia, Ethiopia, and Gaza). Analysis of variance showed that the mean ages of the 4 samples differed from each other ($F_{3,3197}=179.8$, $P<.001$; all age comparisons between pairs of samples were significant [$P<.05$] according to Scheffé post hoc test). The distributions of marital status, number of children, education, and religion were also significantly different across the 4 samples ($P<.001$, for all between-sample comparisons of these variables).

Prevalence of PTSD

Table 1 shows that the prevalence rates of symptoms of *DSM-IV* PTSD differed across countries: 15.8% in Ethiopia, 17.8% in Gaza, 28.4% in Cambo-

dia, and 37.4% in Algeria. Women had more PTSD symptoms than men both in Cambodia and in Algeria ($P<.005$). In Gaza, men had more PTSD symptoms than women ($P<.005$). Partial PTSD[40] rates were highest for the reexperiencing cluster in all samples. In Algeria and Gaza, the lowest rates were found for the avoidance/numbing cluster, whereas in Cambodia and Ethiopia the lowest rates were found for the hyperarousal cluster.

Exposure to Traumatic Events

Across country samples, there was a different likelihood for people to have been exposed to the different traumatic events (TABLE 2). In Ethiopia, 25.5% of the respondents reported experiencing torture compared with 15.0% in Gaza, 9.0% in Cambodia and 8.4% in Algeria. Twenty nine percent of the respondents in Ethiopia, 36.6% in both Gaza and Cambodia, and 55.3% in Algeria experienced domestic adverse events during their youth. The experience of conflict-related events after age 12 years was reported by 59.3% of the Palestinians and up to 91.9% by the Algerians. Almost half of the Ethiopians (43.8%) reported additional traumatic events during their flight; this rate points out the relevance of these events for the Ethiopian refugees. In Cambodia, 25.7% of the respondents reported that their parents had a psychiatric history. A self-reported psychiatric history was not frequently present in the Gaza (0.2%), Algeria (3.4%), and Ethiopia (4.1%) samples compared with the Cambodia (33.6%) sample. The reported rate for daily hassles was higher in Ethiopia (88.6%) and Algeria (78.3%) than in Gaza (56.6%) and Cambodia (48.7%).

Relationships Between Adverse Events and PTSD

In TABLE 3, the relationships between experienced adverse domains and lifetime PTSD are presented in terms of ORs resulting from univariate logistic regression. The 4 samples showed a different pattern of significant relationships. Adverse domains were significantly related to PTSD in 8 of 13 domains for Algeria, 11 of 12 for Cambodia, 12 of 14 for Ethiopia, and 8 of 13 for Gaza. Torture, conflict events occuring after age 12 years, current illness, and daily hassles were significantly related to PTSD in all 4 samples.

TABLE 4 shows the adjusted relationships between domains of adverse events and lifetime PTSD, resulting from sequential regression analyses. Again, different patterns of significant relationships emerged. Only conflict-related events after age 12 years were significantly related to PTSD in all 4 samples. Torture was related to PTSD in Algeria, Ethiopia, and Gaza but not in Cambodia. Psychiatric history of the respondent and current illness were both related to PTSD in Cambodia and Ethiopia. Poor quality of camp housing was positively related to PTSD in Algeria and Gaza. Domestic adverse events during youth, death or separation within the family, and parental alcohol abuse were related to PTSD in Cambodia. Good general health protected against PTSD in Algeria, and daily hassles were positively related to PTSD in Algeria. Conflict-related events experienced before age 12 years were not related to PTSD in any sample. Conflict-related events during the flight were only assessed in the Ethiopian sample and showed a relation with PTSD.

COMMENT

In this article, we provide rates of lifetime PTSD and identified the relative importance of several domains of adverse events on PTSD in community samples of survivors of war, conflict, or mass violence in low-income countries. These findings, in particular the unique risk factors per sample, suggest that public mental health programs need to consider that symptoms of PTSD in different populations could result from different determinants.

Table 2. Prevalence of Lifetime Domains of Adverse Events in Algeria, Cambodia, Ethiopia, and Gaza*

Adverse Event	Algeria (n = 653)	Cambodia (n = 610)	Ethiopia (n = 1200)	Gaza (n = 585)
Torture	8.4 (1.1)	9.0 (1.2)	25.5 (1.3)	15.0 (1.5)
Youth domestic stress	55.3 (1.9)	36.6 (1.9)	28.8 (1.3)	36.6 (2.0)
Death or separation in family	7.8 (1.1)	17.5 (1.5)	8.3 (0.8)	4.6 (0.9)
Conflict events				
Before age 12 y	71.8 (1.8)	2.6 (0.6)	25.3 (1.2)	33.3 (1.9)
After age 12 y	91.9 (1.1)	74.4 (1.8)	78.0 (1.2)	59.3 (2.0)
During flight	NA	NA	43.8 (1.4)	NA
History of psychiatric illness	3.4 (0.7)	33.6 (1.9)	4.1 (0.6)	0.2 (0.2)
Parent	2.8 (0.6)	25.7 (1.8)	5.5 (0.7)	1.2 (0.4)
Sibling	4.3 (0.8)	7.9 (1.1)	3.2 (0.5)	2.4 (0.6)
Alcohol abuse by parent(s)	10.6 (1.2)	8.2 (1.1)	6.5 (0.7)	0.7 (0.3)
Current illness	40.1 (1.9)	55.6 (2.0)	31.8 (1.3)	23.9 (1.8)
General health (good)	95.3 (0.8)	61.5 (2.0)	22.5 (1.2)	94.4 (0.9)
Quality of camp (poor)	40.6 (1.9)	NA	95.2 (0.6)	31.5 (1.9)
Daily hassles	78.3 (1.6)	48.7 (2.0)	88.6 (0.9)	56.6 (2.0)

*Values are percentage (SE). NA indicates not applicable.

Compared with the National Comorbidity Survey[18] in the United States and other studies among western community samples,[47,48] we found relatively high rates of *DSM-IV* PTSD and partial PTSD. In addition, compared with previous studies in populations affected by war, conflict, and violence (20% PTSD among survivors of torture in Gaza[19] and 14% among survivors in a community sample in Sri Lanka[20]), we identified prevalence rates that are comparable (Ethiopia and Gaza) or higher (Algeria and Cambodia). An explanation for the relatively high rate among the Algerians may be the fact that terrorist attacks were still taking place during the time of data collection. Moreover, in Algeria more than 90% of respondents had experienced a conflict-related event after age 12 years, a type of experience associated with a high-conditional risk for PTSD. The high rate of PTSD in the Cambodian sample is not surprising in light of the country's particular horrific history during the Pol Pot era, followed by the Vietnamese invasion, and an aftermath of ongoing insecurity that was caused by the political turmoil that continued until the arrival of the United Nations peacekeep-

Table 3. Lifetime PTSD and Odds Ratios of Lifetime Domains of Adverse Events in Algeria, Cambodia, Ethiopia, and Gaza*

	Algeria (n = 653)		Cambodia (n = 610)		Ethiopia (n = 1200)		Gaza (n = 585)	
Adverse Event	OR (95% CI)	*P* Value†	OR (95% CI)	*P* Value†	OR (95% CI)	*P* Value†	OR (95% CI)	*P* Value†
Torture	2.3 (1.3-4.1)	.003	2.7 (1.5-4.7)	.001	4.2 (3.0-5.7)	<.001	5.0 (3.0-8.1)	<.001
Youth domestic stress	1.1 (0.8-1.5)	.50	2.1 (1.5-3.0)	<.001	1.9 (1.4-2.6)	<.001	2.6 (1.7-4.0)	<.001
Death or separation in family	0.8 (0.5-1.5)	.54	1.7 (1.1-2.6)	.02	0.9 (0.5-1.6)	.65	1.3 (0.5-3.4)	.54
Conflict events								
Before age 12 y	1.8 (1.3-2.6)	.002	2.6 (0.9-7.0)	.06	2.1 (1.5-3.0)	<.001	3.0 (1.9-4.7)	<.001
After age 12 y	4.3 (1.9-9.7)	<.001	7.4 (3.9-14.0)	<.001	4.9 (2.7-8.9)	<.001	12.8 (5.8-28.1)	<.001
During flight	NA	NA	NA	NA	2.5 (1.8-3.5)	<.001	NA	NA
Psychiatric history	3.0 (1.3-7.4)	.01	5.2 (3.6-7.6)	<.001	5.7 (3.2-10.3)	<.001	0.03 (0 to ≥100)	.79
Parent	2.1 (0.8-5.5)	.11	1.6 (1.1-2.4)	.02	2.3 (1.3-4.0)	.003	0.8 (0.1-6.5)	.81
Sibling	1.5 (0.7-3.2)	.31	3.3 (1.8-6.1)	<.001	3.3 (1.7-6.5)	<.001	3.6 (1.2-10.7)	.02
Alcohol abuse of parent(s)	1.0 (0.6-1.7)	.95	2.3 (1.3-4.2)	.005	2.9 (1.8-4.8)	<.001	4.7 (0.6-33.7)	.12
Current illness	1.4 (1.1-1.9)	.046	3.3 (2.2-4.9)	<.001	2.2 (1.6-3.1)	<.001	1.9 (1.2-3.0)	.005
General health (good)	0.4 (0.2-0.8)	.007	0.3 (0.2-0.4)	<.001	0.5 (0.4-0.7)	<.001	1.6 (0.5-4.6)	.39
Quality of camp (poor)	2.0 (1.4-2.7)	<.001	NA	NA	33.7 (0 to >100)	.79	2.5 (1.6-3.9)	<.001
Daily hassles	1.9 (1.3-2.9)	.002	1.7 (1.2-2.5)	.003	2.3 (1.2-4.3)	.01	2.6 (1.6-4.1)	<.001

*PTSD indicates posttraumatic stress disorder; OR, odds ratio; CI, confidence interval; and NA, not applicable.
†Wald test.

Table 4. Lifetime PTSD and Adjusted Odds Ratios of Lifetime Domains Adverse Events in Algeria, Cambodia, Ethiopia, and Gaza*

	Algeria (n = 653)		Cambodia (n = 610)		Ethiopia (n = 1200)		Gaza (n = 585)	
Adverse Event	Adjusted OR (95% CI)†	*P* Value‡	Adjusted OR (95% CI)†	*P* Value‡	Adjusted OR (95% CI)†	*P* Value‡	Adjusted OR (95% CI)†	*P* Value‡
Torture	2.0 (1.1-3.5)	.02	1.6 (0.8-3.0)	.15	2.7 (1.9-3.9)	<.001	2.3 (1.4-4.0)	.002
Youth domestic stress	NA	NA	1.7 (1.1-2.6)	.01	1.1 (0.7-1.6)	.67	1.2 (0.7-1.9)	.50
Death or separation in family	NA	NA	1.7 (1.0-2.8)	.049	NA	NA	NA	NA
Conflict events								
Before age 12 y	1.4 (0.9-2.0)	.09	NA	NA	1.2 (0.8-1.8)	.28	1.1 (0.7-1.9)	.63
After age 12 y	3.0 (1.3-6.8)	.01	4.0 (2.0-7.9)	<.001	2.7 (1.4-5.1)	.002	7.9 (3.4-18.3)	<.001
During flight	NA	NA	NA	NA	1.5 (1.1-2.1)	.03	NA	NA
Psychiatric history	2.4 (0.9-5.9)	.07	3.6 (2.3-5.4)	.001	3.9 (2.0-7.4)	.001	NA	NA
Parent	NA	NA	0.8 (0.5-1.3)	.29	1.4 (0.7-2.6)	.34	NA	NA
Sibling	NA	NA	1.9 (0.9-3.9)	.09	1.5 (0.6-3.3)	.36	2.0 (0.6-6.9)	.28
Alcohol abuse of parent(s)	NA	NA	2.2 (1.1-4.4)	.03	1.8 (0.9-3.1)	.06	NA	NA
Current illness	1.0 (0.7-1.4)	.89	1.6 (1.0-2.7)	.05	1.8 (1.1-2.7)	.01	1.5 (0.9-2.4)	.15
General health (good)	0.4 (0.2-0.9)	.047	0.7 (0.5-1.2)	.17	1.3 (0.8-2.0)	.35	NA	NA
Quality of camp (poor)	1.8 (1.3-2.5)	.001	NA	NA	NA	NA	1.7 (1.1-2.8)	.03
Daily hassles	1.6 (1.1-2.4)	.04	1.1 (0.7-1.7)	.61	1.7 (0.9-3.4)	.12	1.2 (0.7-2.1)	.46

*PTSD indicates posttraumatic stress disorder; OR, odds ratio; CI, confidence interval; and NA, not applicable or was not significant in unadjusted analyses.
†Adjusted ORs from Table 3 are adjusted for other domains, sex, age, marital status, having children, education, and religion.
‡ Wald test.

ing force United Nations Transition Authority in Cambodia.

A number of studies have shown that multiple exposure to traumatic events—either to the same type of event or to different types of events—is associated with higher levels of symptoms of PTSD.[21-24,49,50] We suggest an explanation for the range of PTSD prevalence rates across countries: if the level of symptoms is a function of experienced traumatic events then the different compositions of multiple trauma per country may be responsible for the different rates of disorder. Further research is needed to clarify this issue.

In contrast to studies in the West,[17,18] we found that female respondents in Ethiopia had equal and in Gaza had less PTSD symptoms than male respondents. These findings may be explained by the fact that male respondents in these 2 samples are more likely to have been directly involved in conflict situations than women. In Ethiopia, most male respondents were former soldiers and had experienced more war trauma. In Gaza, male respondents may have participated in riots during the Intifada and were more at risk of experiencing adverse events. Additional analyses reveal that Ethiopian and Palestinian male respondents reported experiencing more torture and trauma during their flight than their female counterparts (data available from I. H. K.). The relationships between age and PTSD (older age was associated with PTSD) and education and PTSD (lower level of education was associated with PTSD) are consistent with findings from the West.[18]

In the present study, we used a novel approach to assess PTSD. We used a complete history of trauma events as a reference instead of assessing the consequences of only the most traumatic event. On the basis of this approach, we were able to study the roles of various domains of adverse events. The adjusted ORs reflect the relative importance of the different adverse events per sample. Our findings suggest that in nonwestern conflict situations, PTSD is associated with a number of lifetime traumatic events. The presence of some predictors in particular samples reflects the contextual uniqueness of some adverse events in the development of PTSD.

Limitations of this study include our definition of adverse events. In some cases, complete lists of different events (eg, the conflict events) were reduced to 1 variable. Although we used dichotomous variables referring to the presence or absence of at least 1 event of a particular domain, it is unclear to what extent this operationalization is biased by the loss of information on context, quantity, and duration of the events. Another limitation is that without data from other sources, we are not certain about the accuracy of these self-reported data. For example, respondents may have difficulties recalling events and traumatic experiences that occurred decades ago.[51,52] With the 4 countries having different time periods related to the atrocities, there are likely differences in respondent recall of trauma and their lifetime sequelae. We tried to minimize possible recall bias by encouraging respondents to tell about their life as a narrative history. However, it remains unclear to what extent this approach succeeded in avoiding recall bias. Moreover, we did not use the term *torture* according to an international definition, and it is possible that the term torture was interpreted differently in different countries. In future studies, it is better to define such terms to ensure that the interpretation by respondents is consistent across settings.

Unlike recent western national representative studies, such as the National Comorbidity Survey,[18] our study could not provide national representative data. Rather, our study indicates the extent of trauma sequelae in selected catchment areas affected by conflict. The nonrandom selection of catchment areas may have introduced bias. In Algeria, addresses were selected from government lists, the only address lists available. Unfortunately, these address lists were not accurate or complete because we were only able to find 42.5% of the correct people at the listed addresses. It is not clear to what extent this may have biased findings, but we do not expect systematic bias.

In summary, we studied self-reported symptoms of PTSD among large community samples from 4 low-income countries. Different prevalence rates and different risk factors were identified despite using the same methods and variables. The determinants and prevalence of PTSD vary with context. An important finding of this study is the association between the range of prevalence rates of PTSD and the diversity of risk factors for PTSD in different postconflict countries. The findings of this study contribute to the theory that trauma may be the direct cause of the onset of PTSD and that a multiplicity of other adverse events determine the development of this disorder.[29,53,54]

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Acquisition of data: El Masri, Araya, Khaled, van de Put, Somasundaram.
Analysis and interpretation of data: de Jong, Komproe, Van Ommeren.
Drafting of the manuscript: de Jong, Komproe, Van Ommeren.
Critical revision of the manuscript for important intellectual content: de Jong, Komproe, Van Ommeren, El Masri, Araya, Khaled, van de Put, Somasundaram.
Statistical expertise: Komproe.
Obtained funding: de jong, Komproe.
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Study supervision: de Jong, Komproe.
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