Exposure to War Crimes and Implications for Peace Building in Northern Uganda

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Context Since the late 1980s, the Lord's Resistance Army has waged war against the Ugandan People's Democratic Army and the people of northern Uganda. Ending the conflict and achieving peace have proven to be challenges. In this context, it is important to examine population-based data on exposure to war crimes to understand how survivors perceive mechanisms aimed at achieving a lasting peace.

Objectives To assess the level of exposure to war-related violence and the prevalence of posttraumatic stress disorder (PTSD) and depression symptoms in northern Uganda and to determine how these variables are associated with respondents' views about peace.

Design, Setting, and Participants Multistage, stratified, random cluster survey of 2585 adults aged 18 years or older conducted in villages and camps for internally displaced persons in 4 districts of northern Uganda in April and May 2005.

Main Outcome Measures Rates and patterns of exposure to trauma; symptom criteria for PTSD, assessed via the PTSD Checklist–Civilian Version with a total severity score of 44; symptoms of depression, assessed via the Johns Hopkins Depression Symptom Checklist with a cutoff of 42; and opinions and attitudes about peace.

Results Among the respondents, 1774 of 2389 (74.3%) met PTSD symptom criteria and 1151 of 2585 (44.5%) met depression symptom criteria. Four patterns of exposure to trauma were distinguished: those with low exposure (group 1; 21.4%), witnesses to war-related violence (group 2; 17.8%), those threatened with death and/or physically injured (group 3; 16.4%), and those abducted (group 4; 44.3%). Respondents in groups 3 and 4, who experienced the most traumatic exposures, were more likely to have PTSD symptoms compared with group 1 (group 3 vs group 1: odds ratio [OR], 7.04 [95% confidence interval {CI}, 5.02-9.87]; group 4 vs group 1: OR, 6.07 [95% CI, 4.77-7.71]). Groups 3 and 4 were also more likely to meet depression symptom criteria (group 3 vs group 1: OR, 5.76 [95% CI, 4.34-7.65]; group 4 vs group 1: OR, 4.00 [95% CI, 3.16-5.06]). Respondents who met the PTSD symptom criteria were more likely to identify violence as a means to achieve peace (OR, 1.31; 95% CI, 1.05-1.65). Respondents who met the depression symptom criteria were less likely to identify nonviolence as a means to achieve peace (OR, 0.77; 95% CI, 0.65-0.93).

Conclusions Our study found high prevalence rates for symptoms of PTSD and depression in a conflict zone. Respondents reporting symptoms of PTSD and depression were more likely to favor violent over nonviolent means to end the conflict.

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SINCE THE LATE 1980S, THE Lord's Resistance Army (LRA), a spiritualist rebel group with no clear political agenda, has waged a war against the Ugandan People's Democratic Army and the people of northern Uganda. Known for its extreme brutality, the LRA has killed and mutilated countless civilians and abducted tens of thousands of adults and children to serve as soldiers, porters, and sexual partners for its commanders. Up to a million and a half people have been displaced in camps, where they live in poverty and despair.[1,2]

Ending the conflict and achieving peace in northern Uganda have proven to be challenging tasks. The government of Uganda has successively and sometimes simultaneously pursued military actions, peace negotiations, and amnesty for the rebels. In 2003, Ugandan President Yoweri Museveni referred the situation in northern Uganda to the International Criminal Court, which in October 2005 unsealed arrest warrants and indictments against LRA leader Joseph Kony and 4 of his rebel commanders.[3]

Recent studies that have examined the prevalence of psychological effects after conflict suggest that traumatic exposure and resultant symptoms of posttraumatic stress disorder (PTSD) and depression can influence social functioning and how individuals perceive mechanisms aimed at promoting justice and reconciliation, such as amnesties, criminal trials, and truth commissions.[4-10] However, few studies have looked at how exposure to war crimes affects attitudes toward mechanisms aimed at peace building. Yet, such

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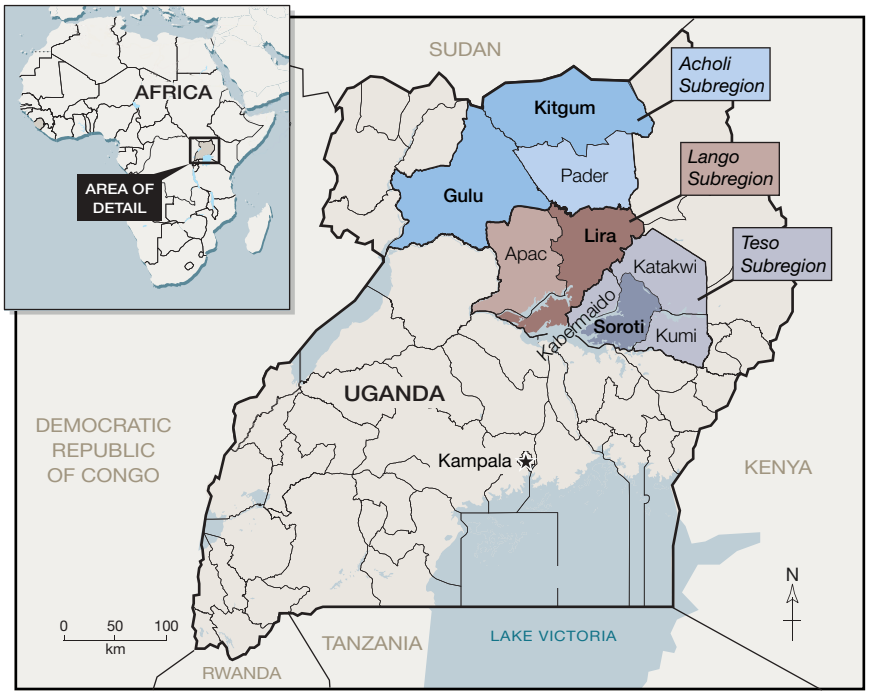
Figure 1. Sampled Districts in Northern Uganda—Gulu, Kitgum, Lira, and Soroti



information has important implications for the rebuilding of societies after mass violence. If psychological trauma affects support for peace building and if no services are provided to treat those affected, then efforts to promote social reconstruction may be undermined.

The purpose of this study was to assess the level of exposure to war-related violence and the prevalence of PTSD and depression symptoms among study participants in 4 districts of northern Uganda, and to determine if these factors are associated with respondents' views as to whether violent or nonviolent means should be pursued to end the armed conflict in northern Uganda.

METHODS

Survey Sites and Sample Selection

This research is based on a cross-sectional study conducted in April and May 2005 in northern Uganda. Three teams of 20 trained interviewers, each familiar with the local language and representing a diversity of age and sex, carried out data collection using a standardized questionnaire. Four northern districts of Uganda—Gulu (population, 634 474) and Kitgum (population, 286 122) in the Acholi subregion, Lira (population, 724 531) in the Lango subregion, and Soroti (population, 486 109) in the Teso subregion—were selected to represent a diversity of ethnic composition (Acholi, Langi, and Teso) and varying degrees of exposure to the war as illustrated in FIGURE 1. Those most affected by the conflict are the Acholi population, who live in the districts of Gulu, Kitgum, and Pader. Neighboring populations, including the Langi (Lira and Apac districts) and the Teso (Kabermaido, Soroti, Katakwi, and Kumi districts), have also been affected.

The sampling universe included adults (≥18 years old) living in the 4 selected districts of northern Uganda. Population data for the camps were based on food distribution registration data collected by the World Food Program in March 2005 and on the 2002 census data of the Uganda Bureau of Statistics adjusted for annual population growth of subcounties, which are administrative subdivisions of districts.

Respondents were selected using a multistage sampling strategy as illustrated in FIGURE 2. In the subcounties of the Gulu and Kitgum districts and the parts of the Lira and Soroti districts where the population was displaced, approximately 25% (range, 21%-33%) of the camps for internally displaced persons were selected from a list of camps using probability sampling proportionate to the population size. Three of the selected camps in the Gulu district were inaccessible for security reasons and were replaced by alternative camps selected proportionate to the population size. In the subcounties of the Lira and Soroti districts where the population had returned to their homesteads or had not been displaced, approximately 25% (range, 21%-33%) of the subcounties were selected from a list of subcounties using probability sampling proportionate to the population size. Within these subcounties, 2 parishes and then 2 villages in each parish were randomly selected from comprehensive lists of parishes. Since there is no comprehensive list of villages in northern Uganda, a list of villages was established with local authorities after selection of the higher administrative units. Each of the 4 districts had 1 municipality, which was included in the sample.

Households were selected from predetermined "zones" of the camps and villages. (Local authorities divide camps and villages into zones to facilitate logistical and administrative matters.) Interviewers were randomly assigned to zones. Once they arrived in the zone, they were directed to the center of the zone, where they randomly selected a direction by spinning a pen. Once that direction was chosen, they selected every other household in that direction until they reached the limit of the zone. Once they reached the limit, they repeated the procedure. A household was defined as a group of people sleeping under the same roof and eating together. In each

household, interviewers randomly selected 1 adult (≥18 years old) to be interviewed from a list of all eligible adults. After 3 attempts over the course of 1 day, when a selected household or individual was unable or refused to participate, the next available household using the sampling procedure, or another individual within the selected household, was selected. Because of the sensitivity of some of the questions, the interviewers were assigned to same-sex respondents.

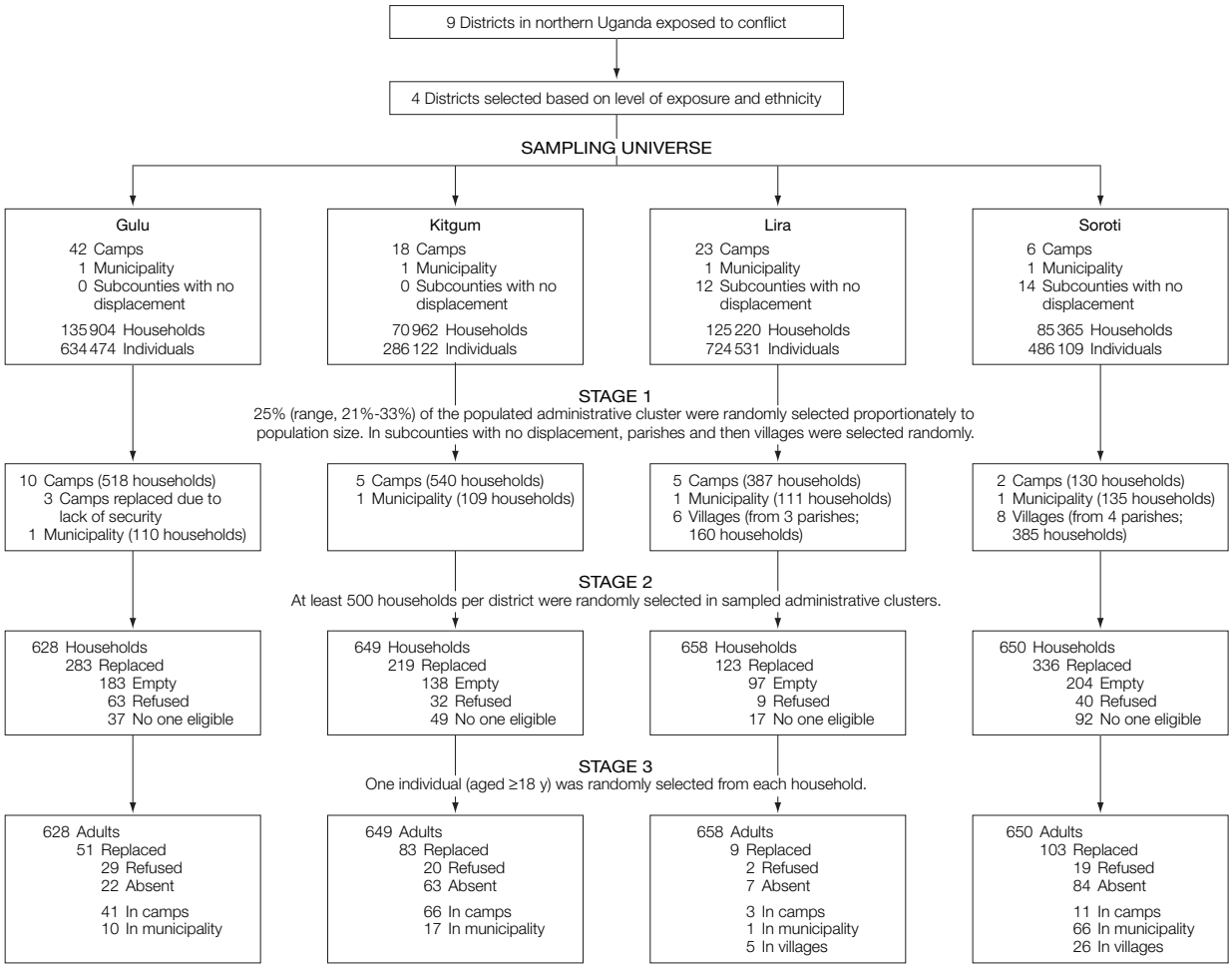
For each of the 4 districts, a minimum of 500 households were sampled in the camps and villages. One adult (≥18 years old) was interviewed, chosen by the name closest to the beginning of the alphabet within the selected household. One-to-one interviews were conducted anonymously in a setting that offered privacy and confidentiality, typically inside the housing unit. No other individuals were allowed to be present during the interview. Oral rather than written consent was obtained because of the high illiteracy rate. Respondents were provided with contact information if they had any questions. If a participant requested referral for emotional distress, referral could be made to local nongovernmental organizations; however, the violence and insecurity in the area made such referrals unlikely. The Committees for the Protection of Human Subjects at Tulane University, New Orleans, Louisiana, and Makerere University. Kampala, Uganda, and Ugandan local government officials approved the research protocols.

Sample size was determined using the proportion estimate formula for an assumed level of precision of 10% with 80% power. The minimum sample size was adjusted for design effect due to cluster sampling using a factor of 2 and increased by 20% for nonresponse rate. Retrospective power for the logistic regressions was computed using PASS software (NCSS, Kaysville, Utah)[11] and ranged from 71% to 87%.

Data Collection Instruments and Scale

Interviews were conducted using a structured questionnaire covering 8

Figure 2. Sample Selection



topics: socioeconomic information, priorities and peace, human rights and accountability, amnesty, justice, reconciliation, security and exposure to trauma, and psychological response to trauma. A team with expertise in human rights, law, transitional justice, epidemiology, psychiatry, anthropology, survey research, and the conflict in northern Uganda developed and reviewed the survey instrument. The instrument was first developed in English and was then translated into Acholi, Lango, and Ateso by graduates of the Language Department at Makerere University and local translators. To ensure the quality of the translation, the instrument was back-translated. Discrepancies were resolved following extensive discussion among the translators, back-translators, and survey designers. Where agreement on a particular word or phrase could not be reached, a content expert was consulted. The Acholi version was used in Gulu and Kitgum, the Lango version was used in Lira, and the Ateso version was used in Soroti. The instrument was pilot tested throughout its development and during the training of the interviewers. Revisions were made accordingly. Response options were provided to the interviewer but not read to the participant unless otherwise indicated. An "other" category was available to record responses when necessary or when the interviewers were unsure of the appropriate response option. The "other" category was recoded during analysis.

Interviewers were university students or professionals with experience in data collection, working for various international agencies such as the World Food Programme. One group was selected for the Acholi districts of Gulu and Kitgum; 1 group for the Lira district (Lango); and 1 group for Soroti (Teso). The interviewers were from the region in which the survey was conducted and, thus, were of the ethnic and language groups being studied. The interviewers were trained for 1 week; training included interview techniques (stressing issues of privacy and confidentiality and use of a consent form), respondent selection techniques, background on the study objectives and subject matter, and questionnaire content. In addition, a psychologist with experience in northern Uganda provided background training on PTSD and depression symptoms. The questionnaire was first reviewed in group discussion. It was then practiced through mock interviews among interviewers.

After consultation with local experts and interviews with survivors of the conflict living in camps and villages in northern Uganda, a list of 11 war-related acts of violence was established to assess exposure to trauma. The list does not represent all possible traumatic events but rather focuses on commonly reported events.

After consultation with several psychologists and psychiatrists working with nongovernmental humanitarian aid agencies in northern Uganda, we chose to use the 17-item PTSD Checklist–Civilian Version (PCL-C) to assess symptoms of PTSD.[12] Investigators for this study have previously used the PCL-C to assess symptoms of PTSD in Rwanda.[7] In this study, we added all of the ratings of the 17 items to determine a total severity score and used a cutoff score of 44 to classify individuals as meeting PTSD symptom criteria. The estimated Cronbach α (a measure of internal reliability) for the 3 PCL-C symptom clusters in this study were as follows: reexperiencing, $\alpha = 0.85$; avoidance, $\alpha = 0.84$; and hyperarousal, $\alpha = 0.81$.

The 15-item depression section of the Johns Hopkins Depression Symptom Checklist was used to assess depression, with a cutoff score of 42.[13] The estimated Cronbach α for the depression scale in this study was 0.90. The anxiety component of the Depression Symptom Checklist was not used since the PCL-C scale was used to assess PTSD. In addition, some of the wording of the Depression Symptom Checklist was adapted to adjust for cultural and language differences. For example, "loss of sexual interest or pleasure" was culturally sensitive. The wording used in the local version of the questionnaire would translate in English as "loss of interest in intimate relationship with spouse/partner" which, according to the experts consulted, has the same meaning as the original sentence. Another example is "feeling blue." We modified it to "feeling sad." The modifications were minor and mainly associated with translating in a manner that was understandable by the target population.

The measure of attitudes toward peace was conceptualized by 2 indicators, respondents' definition of peace and how respondents believed peace could be achieved. Respondents were asked how they defined peace. The answers were recoded at the analysis stage in 3 variables reflecting the range of responses: the absence of violence (yes or no); unity—eg, togetherness, living together (yes or no); and human/social development—eg, education, economic development (yes or no). Respondents were then asked how they believed peace could be achieved. The range of responses was recoded during the analysis stage in 2 variables: identified nonviolent mechanisms, such as peace talks and amnesties (yes or no); and identified violent mechanisms, such as killing enemy combatants and their leaders (yes or no). Respondents had the option to provide more than 1 response to both questions. Some respondents provided definitions of peace that included various combinations of absence of violence, unity, and human/social development. Some respondents identified both violent and nonviolent mechanisms to achieve peace. The variables were therefore treated as separate outcomes.

Statistical Analysis

Internal reliability measures for the PCL-C and Depression Symptom Checklist were calculated using SPSS, version 13.0 (SPSS Inc, Chicago, Illinois). Double data entry was implemented with Epi Info software, version 6.0 (a free data entry and analysis

software developed by the Centers for Disease Control and Prevention and the World Health Organization), and cross-checked with the validate duplicate entry function. Epi Info C-Sample Analysis, version 6.0, which adjusts for design effect, was used to calculate frequencies, means, and proportional sampling error. SPSS, version 13.0, was used to calculate odds ratios (ORs), 95% confidence intervals (CIs), and all other statistical analysis. Sampling was conducted proportionate to population size; hence, no weighting was used.

Latent class analysis was conducted on the traumatic events using CDAS/MLLSA (Categorical Data Analysis System/Maximum Likelihood Latent Structure Analysis).[14] Given a number of cases, latent class analysis explores a series of variables to determine a small number of groups in which those cases can be classified.[15] Four classes were identified. Distribution of the prevalence of the 11 traumatic events in the 4 classes allowed us to identify the 3 pivotal variables characteristic of each group: experiencing abduction, being threatened with death, and witnessing violence. Individuals were then manually assigned to 4 survivor groups defined by those 3 pivotal variables: group 1 (low exposure to war-related violence); group 2 (witnesses to war-related violence); group 3 (threatened with death and/or physically injured); and group 4 (abducted). The groups showed a progression: those who had been abducted (group 4) had also typically been threatened with death (group 3). Those threatened with death (group 3) had typically witnessed violence (group 2). This method allowed reducing the number of variables from 11 traumatic events to 4 survivor groups. The groups reflect patterns of exposure rather than total exposure, as would be the case with summative scales.

Five separate multivariate stepwise logistic regressions were performed to examine the relationships among exposure to violent events, symptoms of PTSD and depression, and attitudes toward peace. Because the categories for the definition and mechanisms to achieve peace were nonexclusive categories (eg, respondents could provide ≥1 response), logistic regression was performed separately for each outcome. For the 5 models, the dependent (outcome) variables were the 3 definitions of peace and the 2 mechanisms identified to achieve peace and the independent (predictor) variables were age, sex, marital status, education, income category, pattern of exposure by group, PTSD and depression symptoms, and district of residence. (District of residence was used rather than ethnicity because the distribution of ethnic groups closely follows administrative divisions and because it allowed us to distinguish between Acholi in the district of Gulu and Acholi in the district of Kitgum.) The predictors of greatest interest were patterns of exposure to trauma, PTSD symptoms, and depression symptoms. For each of the logistic regression models, univariate analyses were performed for each combination of dependent and independent variables to examine the strength of association. Both forward- and backward-stepwise logistic regressions were performed by testing the goodness of fit for each predictor model. Only the statistically significant predictors were included in the final models.

RESULTS

The target sample size for each district was 500 interviews. A total of 3546 households were approached and 2585 adults aged 18 years or older were interviewed in 4 selected districts of northern Uganda: Gulu (n=628), Kitgum (n=649), Lira (n=658), and Soroti (n=650), as illustrated in Figure 2. In the sampled camps and villages, 27% of the selected households were replaced because no one was home (18%), because they refused (4%), or because no one was eligible (5%). Within selected households, 246 (9.5%) of the sampled individuals were replaced by the next sampled individual in that household because they were not available or refused to participate.

General Characteristics of Respondents

The sample (n=2585) was composed of approximately equal numbers of men (49.8%) and women (50.2%) as a result of assigning equal numbers of male and female interviewers to same-sex respondents. Sixty-one percent of the sampled individuals lived in camps, 21% in villages, and 18% in municipalities (capital towns of the districts). As shown in TABLE 1, the mean age of the respondents was 37 years (SD, 13.8 years) and the median age was 34 years, with 95% of the respondents between ages 23 and 45 years. A majority of the respondents were involved in a marital relationship, either married (72.8%) or in a partnership (3.6%). The ethnic composition of the sample reflected the stratification in the 4 districts, with the main ethnic groups being Acholi in Gulu and Kitgum (96.5% and 99.4%, respectively), Lango in Lira (96.3%), and Teso in Soroti (92.9%). Acholi therefore represented 48.6% of the sample; Lango, 25.0%; and Teso, 23.6%. A majority of the respondents (58.2%) identified themselves as Roman Catholic and 30.8% as belonging to the Anglican Church.

Patterns of Exposure to Trauma

Complete data on exposure to 11 trauma events were assessed among 2569 respondents (99.4% of all 2585 respondents) (TABLE 2). Of the respondents, 78.5% reported having experienced displacement because of the conflict. The strategy of the LRA to target civilians is reflected in the frequency of self-reported exposure to war-related violence by the LRA: 1018 respondents (39.6%) reported being abducted, 585 (22.8%) being injured, 834 (32.5%) being forced to carry a heavy load, and 186 (7.2%) having experienced sexual violence. In Gulu and Kitgum, more than 50% of the respondents reported having been abducted by the LRA for varying periods of time. Some former abductees had been with the LRA for years, while others had been held for only a few days or hours. Experiences as a witness were among the most frequently re-

ported exposure to war crimes: 1498 respondents (58.3%) witnessed the abduction of a child; 1229 (47.8%) witnessed a friend killed; 1144 (44.5%) witnessed a family member killed; and 639 (24.9%) witnessed sexual violence. Forty-nine percent of the respondents (n=1259) reported being threatened with death and 31.1% (n=799) reported having a child abducted.

TABLE 3 presents the 4 patterns of exposure based on survivor group: 21.4% reported low exposure to war-related violence (group 1); 17.8% reported witnessing war-related violence but not being threatened with death or physically injured (group 2); 16.4% reported being threatened with death and/or physically injured (group 3); and 44.3% reported being abducted (group 4). Among group 1, only displacement was reported frequently (43.7%), and 9.3% reported having a child abducted. Respondents in group 2 were 7 times more likely to be displaced compared with those in group 1 (OR, 7.78; 95% CI, 5.69-10.62). In group 2, 66.6% reported witnessing child abduction, 54.1% witnessed a friend killed, and 50.9% witnessed a family member killed. On average, group 3 had similar exposure as group 2. In addition, 84.3% of respondents in group 3 reported being threatened with death, 32.3% reported being injured, and 6.2% reported being sexually assaulted. Respondents in group 3 were twice as likely to have witnessed someone being sexually violated as respondents in group 2 (OR, 2.18; 95% CI, 1.55-3.06).

Group 4 was characterized by the experience of abduction by the LRA. Ninety percent reported being abducted and 73.2% reported being forced to carry loads. Some respondents in this group did not report being abducted but were forced to carry loads by the LRA, an activity associated with abduction. Compared with respondents in group 3, respondents in group 4 were 1.7 times more likely to have witnessed someone being sexually violated (OR, 1.75; 95% CI, 1.35-2.27) and more than 3 times more likely to have been sexually violated themselves (OR, 3.25; 95% CI, 1.94-5.44), an exposure reported by 14% of those in group 4. Finally, 39.4% of respondents in group 4 reported being injured by the LRA. Respondents in this group were twice as likely to have been injured by the LRA than respondents in group 3 (OR, 2.35; 95% CI, 1.78-3.11).

Total traumatic exposures increased across survivor groups. Group 1 on average reported less than 1 exposure (mean, 0.5 [SD, 0.63]). The means were 3.0 (SD, 1.13) for group 2 and 4.4 (SD, 1.58) for group 3. For group 4, the average total number of reported exposures was 6.8 (SD, 2.11). The average number of reported events was significantly different between groups (F_3=1906.4; $P<.01$) and for every pair combination of groups ($P<.05$).

Table 1. Sociodemographic Profile of Respondents, April-May 2005[a]

Characteristics	Gulu (n = 628)	Kitgum (n = 649)	Lira (n = 658)	Soroti (n = 650)	Total [95% CI] (n = 2585)
Female (n = 2585)	313 (49.8)	328 (50.5)	332 (50.5)	325 (50.0)	1298 (50.2) [48.2-52.1]
Age, mean (SD), y (n = 2518)	36.2 (13.1)	37.5 (14.2)	37.8 (14.7)	35.3 (12.8)	36.7 (13.8)
Marital status (n = 2551)					
Couple (married or partnered)	458 (74.5)	456 (71.4)	570 (87.6)	466 (72.1)	1950 (76.4) 74.8-78.1]
Isolated	157 (25.5)	183 (28.6)	81 (12.4)	180 (27.9)	601 (23.6) [22.0-24.2]
Education (n = 2563)					
No schooling	156 (25.2)	179 (27.9)	156 (23.9)	139 (21.5)	630 (24.6) [22.9-23.0]
Some primary	250 (40.4)	233 (36.3)	277 (42.4)	255 (39.4)	1015 (39.6) [37.8-41.5]
Completed primary/some secondary	89 (14.4)	94 (14.6)	80 (12.2)	90 (13.9)	353 (13.8) (12.5-15.1]
Completed secondary or higher	124 (20.0)	136 (21.2)	141 (21.6)	164 (25.3)	565 (22.0) [20.4-23.6]
Monthly income (n = 2257)					
<UGS 50 000 (≈US $25)	414 (70.9)	427 (80.6)	535 (89.9)	443 (80.8)	1819 (80.6) [78.8-82.3]
>UGS 50 000 (≈US $25)	170 (29.1)	103 (19.4)	60 (10.1)	105 (19.2)	438 (19.4) [18.4-20.8]
Religion (n = 2578)					
Catholic	466 (74.7)	415 (64.0)	314 (47.7)	305 (47.1)	1500 (58.2) [56.4-60.1]
Protestant	97 (15.5)	200 (30.9)	292 (44.4)	206 (31.8)	795 (30.8) [29.0-32.5]
Born-again Christian	35 (5.6)	25 (3.9)	41 (6.2)	94 (14.5)	195 (7.6) [6.6-8.7]
Other	26 (4.2)	8 (1.2)	11 (1.6)	43 (6.6)	88 (3.4) [0.9-3.9]
Ethnicity (n = 2575)					
Acholi	601 (96.5)	642 (99.4)	7 (1.1)	1 (0.2)	1251 (48.6) [48.1-49.1]
Langi	8 (1.3)	3 (0.5)	633 (96.3)	0	644 (25.0) [24.6-25.5]
Teso	1 (0.2)	0	4 (0.6)	603 (92.9)	608 (23.6) [23.1-24.1]
Baganda	0	0	0	2 (0.3)	2 (0.1) [0-0.6]
Mixed	70 (1.1)	1 (0.2)	5 (0.8)	23 (3.5)	36 (1.4) [0.9-1.8]
Other	6 (1.0)	0	8 (1.2)	20 (3.1)	34 (1.3) [0.9-1.8]

Abbreviations: CI, confidence interval; UGS, Ugandan shillings.
[a]Data are expressed as No. (%) of respondents unless otherwise indicated. Sample sizes vary because of item-level missing data.

Prevalence of PTSD and Depression Symptoms

Among respondents who responded to all items on the PCL-C (n=2389; 92.4% of all respondents), 74.3% met PTSD symptom criteria. Among those who responded to all items on depression section of the Johns Hopkins Symptom Checklist (n=2585; 100% of all respondents), 44.5% met depression symptom criteria. Table 2 shows the prevalence of PTSD and depression symptoms across districts. Table 3 shows the prevalence of PTSD and depression symptoms among the survivor groups. Differences between all survivor groups with respect to PTSD and depression symptoms were significant at the $P<.01$ level, except between group 3 (threat/injured) and group 4 (abducted), in whom no significant difference existed for PTSD symptoms and a difference existed at the $P<.05$ level for depression symptoms. Among all the survivor groups, respondents in group 1 exhibited the lowest level of symptoms of PTSD (47%) and depression (21%). Among respondents in group 2, the frequency of PTSD symptoms was 71% and the frequency of depression was 42%. In group 3, frequencies of PTSD and depression symptoms were 86% and 61%, respectively. In group 4, frequencies of PTSD and depression symptoms were 84% and 52%, respectively. Respondents in groups 3 and 4 were more than 6 times as likely to have PTSD symptoms compared with group 1 (group 3 vs group 1: OR, 7.04 [95% CI, 5.02-9.87]; group 4 vs group 1: OR, 6.07 [95% CI, 4.77-7.71]). They were also more than 4 times as likely to meet depression symptom criteria (group 3 vs group 1: OR, 5.76 [95% CI, 4.34-7.65]; group 4 vs group 1: OR, 4.00 [95% CI, 3.16-5.06]).

Definitions of Peace and Means for Achieving Peace

The frequency of the 3 definitions of peace and the 2 categories of mechanisms identified to achieve peace provided by the respondents are shown in Table 2 and Table 3. Respondents could provide multiple definitions of peace and mechanisms to achieve it. Of the 2581 respondents who provided a definition of peace (99.8% of all respondents), the majority (61%) included absence of violence, 16% included the notion of unity, and 45% used terms related to human development, such as economic development or education.

Table 2. Exposure to War-Related Violence, PTSD and Depression Symptoms, and Attitudes Toward Peace[a]

Variables	Gulu (n = 628)	Kitgum (n = 649)	Lira (n = 658)	Soroti (n = 650)	Total [95% CI]
Exposure (n = 2569)					
Displaced	557 (89.4)	578 (90.0)	481 (73.2)	407 (62.9)	2023 (78.5) [77.0-80.1]
Abducted by LRA	296 (52.5)	295 (54.0)	195 (29.7)	149 (23.0)	1018 (39.6) [37.8-41.4]
Injured by LRA	122 (19.6)	116 (18.1)	203 (30.9)	144 (22.3)	585 (22.8) [21.2-24.4]
Forced to carry loads by LRA	301 (48.3)	262 (40.8)	145 (22.1)	126 (19.5)	834 (32.5) [30.8-34.2]
Sexually violated	64 (10.3)	46 (7.2)	42 (6.4)	34 (5.3)	186 (7.2) [6.2-8.2]
Threatened with death	370 (59.4)	347 (54.0)	243 (37.0)	299 (46.2)	1259 (49.0) [47.1-50.9]
Had a child abducted	223 (35.8)	158 (40.2)	195 (29.7)	123 (19.0)	799 (31.1) [29.4-32.9]
Witnessed a child abduction	429 (68.9)	417 (65.0)	352 (53.6)	300 (46.4)	1498 (58.3) [56.4-60.2]
Witnessed a family member killed	192 (46.9)	298 (46.4)	349 (53.1)	205 (31.7)	1144 (44.5) [42.6-46.4]
Witnessed a friend killed	245 (39.3)	279 (43.5)	406 (61.8)	299 (46.2)	1229 (47.8) [45.9-49.7]
Witnessed sexual violation	182 (29.2)	117 (18.2)	167 (25.4)	173 (26.7)	639 (24.9) [23.3-26.6]
Cumulative exposures, mean (SD)	5.0 (2.7)	4.8 (2.7)	4.2 (3.2)	3.5 (3.0)	4.4 (3.0)
Symptoms of depression (n = 2585)	194 (30.9)	213 (32.8)	412 (62.6)	332 (51.1)	1151 (44.5) [42.7-46.4]
Men (n = 1287)	80 (25.4)	90 (28.0)	169 (51.8)	119 (36.6)	458 (35.6)
Women (n = 1298)	114 (36.4)	123 (37.5)	243 (73.2)	213 (65.5)	693 (53.4)
Symptoms of PTSD (n = 2389)	400 (70.7)	431 (69.6)	516 (82.6)	427 (73.7)	1774 (74.3) [72.6-76.1]
Men (n = 1191)	182 (63.4)	168 (55.1)	235 (76.3)	185 (63.6)	770 (64.7)
Women (n = 1004)	218 (78.1)	263 (83.8)	281 (88.6)	242 (84.0)	1004 (83.3)
Cluster: reexperiencing	560 (89.2)	594 (91.5)	612 (93.0)	567 (87.2)	2333 (90.3)
Cluster: avoidance/numbing	436 (69.4)	409 (63.0)	486 (73.9)	488 (75.1)	1819 (70.4)
Cluster: hyperarousal	538 (85.7)	565 (87.1)	561 (85.3)	491 (75.5)	2155 (83.4)
Definition of peace (n = 2581)					
Absence of violence	300 (47.9)	326 (50.2)	561 (85.3)	388 (59.9)	1575 (61.0) [59.2-62.8]
Unity	106 (16.9)	60 (9.2)	76 (11.6)	171 (26.4)	413 (16.0) [14.6-17.4]
Human/social development	375 (59.9)	386 (59.5)	230 (35.0)	181 (27.9)	1172 (45.4) [43.6-47.2]
Means to achieve peace (n = 2551)					
Nonviolent	534 (85.9)	439 (68.8)	327 (50.3)	384 (59.9)	1684 (66.0) [64.2-67.8]
Violent	56 (9.0)	173 (27.1)	288 (44.3)	169 (26.4)	686 (26.9) [25.3-28.6]

Abbreviations: CI, confidence interval; LRA, Lord's Resistance Army; PTSD, posttraumatic stress disorder.
[a]Data are expressed as No. (%) of respondents unless otherwise indicated. Sample sizes vary because of item-level missing data.

Looking at the combination of definitions, 39% of the respondents used only absence of violence and 25% used only human development; 16% of respondents defined peace as a combination of human development and absence of violence. Three percent of the respondents combined absence of violence, unity, and human development in their definition.

When asked how peace could be achieved, 66.0% (1684/2551) believed that peace could be achieved through nonviolent means. Twenty-seven percent (686/2551) said that peace could be achieved through violent means. Among them, 7% said that both nonviolent and violent means could achieve peace. Thirteen percent of respondents did not identify means that could be classified as violent nor nonviolent. This is because respondents did not believe that peace could be achieved, did not know how peace could be achieved, or proposed means that could not be categorized in terms of violent or nonviolent policies, such as "the intervention of God" (Table 2 and Table 3). Such answers did not provide sufficient cases to be analyzed separately.

TABLE 4 shows that, after controlling for other significant variables in the final logistic regression model, the means for achieving peace provided by the respondents were significantly associated with PTSD and depression symptoms but not with patterns of exposure. Respondents who met the PTSD symptom criteria were more likely to identify violent means as a way to achieve peace (OR, 1.31; 95% CI, 1.05-1.65). Respondents who met the depression symptom criteria were less likely to identify nonviolent means as a way to achieve peace (OR, 0.77; 95% CI, 0.65-0.93). After controlling for other significant variables, respondents' place of residence was significantly associated with mechanisms to achieve peace. Compared with respondents in Gulu, respondents in Kitgum were 4 times more likely to identify violent mechanisms as a mean to achieve peace (OR, 4.06; 95% CI, 2.88-5.74); those in Lira were more than 8 times more likely to do so (OR, 8.52; 95% CI, 6.09-11.93); and those in Soroti were about 4 times more likely to do so (OR, 3.84; 95% CI, 2.71-5.45). Compared with Gulu, respondents in Kitgum were 3 times less likely to identify nonviolent mechanisms as a mean to achieve peace (OR, 0.36; 95% CI, 0.27-0.48); respondents in Lira were more than 5 times less likely to do so (OR, 0.18; 95% CI, 0.13-0.24); and those in Soroti were 4 times less likely to do so (OR, 0.25; 95% CI, 0.19-0.33). The level of education of respondents was also associated with the mechanisms identified to achieve peace. We did not find a significant association between the mechanisms to achieve peace and sex, age, or income.

In the final logistic regression model, the 3 definitions of peace were found to be significantly associated with the district of residence (TABLE 5). Respondents in Kitgum were less likely to include unity in their definition

Table 3. Survivor-Group Exposure to War-Related Violence, PTSD and Depression Symptoms, and Attitudes Toward Peace[a]

Variables	Group 1 (Low Exposure) (n = 551)	Group 2 (Witnesses) (n = 458)	Group 3 (Threatened/Injured) (n = 421)	Group 4 (Abducted) (n = 1139)	Total Among Survivor Groups
Exposure (n = 2569)					
Displaced	241 (43.7)	393 (85.8)	366 (86.9)	1023 (89.8)	2023 (78.7)
Abducted by LRA	0	0	0	1018 (89.4)	1018 (39.6)
Injured by LRA	0	0	136 (32.3)	449 (39.4)	585 (22.8)
Forced to carry loads by LRA	0	0	0	834 (73.2)	834 (32.5)
Sexually violated	0	0	26 (6.2)	160 (14.0)	186 (7.2)
Threatened with death	0	0	355 (84.3)	904 (79.4)	1259 (49.0)
Had a child abducted	51 (9.3)	116 (25.3)	130 (30.9)	502 (44.1)	799 (31.1)
Witnessed a child abduction	0	305 (66.6)	288 (68.4)	905 (79.5)	1498 (58.3)
Witnessed a family member killed	0	233 (50.9)	203 (48.2)	708 (62.2)	1144 (44.5)
Witnessed a friend killed	0	248 (54.1)	253 (60.1)	728 (63.9)	1229 (47.8)
Witnessed sexual violation	0	66 (14.4)	113 (26.8)	460 (40.4)	639 (24.9)
Cumulative exposure, mean (SD)	0.5 (0.6)	3.0 (1.1)	4.4 (1.6)	6.8 (2.1)	4.4 (3.0)
Symptoms of depression (n = 2569)	116 (21.1)	191 (41.7)	255 (60.6)	588 (51.6)	1150 (44.8)
Symptoms of PTSD (n = 2388)	241 (47.1)	304 (70.9)	332 (86.2)	896 (84.4)	1773 (74.2)
Definition of peace (n = 2567)					
Absence of violence	337 (61.2)	302 (65.9)	263 (62.5)	669 (58.8)	1571 (61.2)
Unity	95 (17.2)	80 (17.5)	72 (17.1)	164 (16.0)	411 (16.0)
Human/social development	234 (42.5)	206 (45.0)	163 (38.7)	564 (49.6)	1167 (45.5)
Means to achieve peace (n = 2540)					
Nonviolent	360 (66.3)	295 (65.0)	269 (64.2)	752 (66.9)	1676 (66.0)
Violent	139 (25.6)	132 (29.1)	114 (27.2)	301 (26.8)	686 (27.0)

Abbreviations: LRA, Lord's Resistance Army; PTSD, posttraumatic stress disorder.
[a] Data are expressed as No. (%) of respondents unless otherwise indicated. Sample sizes vary because of item-level missing data; 16 individuals could not be assigned to survivor groups, resulting in differences between Table 2 and Table 3.

compared with those in Gulu (OR, 0.50; 95% CI, 0.36-0.70). Compared with Gulu, respondents in Lira and Soroti were more likely to include the absence of violence and socioeconomic development factors in their definition. Compared with Gulu, respondents in Lira were less likely to include unity (OR, 0.64; 95% CI, 0.47-0.88) and those in Soroti were more likely to do so (OR, 1.76; 95% CI, 1.34-2.31).

Level of education of respondents was associated with the definition of peace. Those who completed primary education were more likely to include an end to violence in their definition of peace compared with those with no education (OR, 1.63; 95% CI, 1.21-2.19).

We did not find a significant association between the definitions of peace and PTSD and depression symptoms, age, sex, income, or survivor groups.

COMMENT

The prevalence of symptoms of PTSD and depression among the sample of northern Uganda residents in this study is consistent with earlier reports of high prevalence rates for depression and PTSD symptoms in war-affected populations.[4-10] While we do not have baseline data for the prevalence of these symptoms in the population in northern Uganda, the variation across sites suggests that the war-related violence has had a major impact on psychological well-being. About three-quarters of the respondents (74.3%) met PTSD symptom criteria and almost half (44.5%) met depression criteria. In comparison, de Jong and colleagues,[16] using survey methods to study PTSD symptoms in postconflict countries, found PTSD symptom prevalence rates of 37.4% in Algeria, 28.4% in Cambodia, 15.8% in Ethiopia, and 17.8% in Gaza. In a study conducted in Rwandan and Burundian refugee camps 6 years after the 1994 genocide,[17] de Jong and colleagues found PTSD prevalence rates of 50% using the General Health Questionnaire. In Afghanistan, Cardozo and colleagues[9] found a prevalence of PTSD symptoms of 32% among men and 48% among women and symptoms of depression among 73% of women and 59% of men. However, measures of the prevalence of PTSD in these studies may reflect methodological discrepancies, differences in adaptation to trauma, and different cultural factors.[18] The high prevalence of symptoms of PTSD and depression found in northern Uganda in this study may be explained by the duration of exposure (>19 years of conflict), the terror-based nature of exposure (eg, abduction, mutilation, abductees forced to commit crimes), and massive displacement. The fact that the conflict was ongoing, with possible exposure to violence at the time of the survey, may also have contributed to the high prevalence rate.

Among all the survivor groups, the most frequently reported event was displacement, usually as a result of insecurity and/or governmental policies. Forty percent of respondents said they had been abducted by the LRA for varying periods of time (a few hours to several years). The vast majority had witnessed the murder of a friend or family member. The high exposure to trauma highlights the LRA's use of abduction to recruit its rank and file and its attacks against civilians as a means of terrorizing the population. It is further possible that respondents were exposed to additional war-related violence not assessed in this study.

We found a significant association between survivor group and psychological trauma. Those with low exposure and witnesses to violence showed less frequent symptoms of PTSD and depression compared with those who experienced death threats, direct war-related violence, and/or abduction. This supports findings that increased exposure to violence can lead to significantly more psychological symptoms (dose-effect).[5,19,20] That said, the level of PTSD symptoms was not signifi-

Table 4. Variables Associated With Means Identified to Achieve Peace

	Violent Mechanisms (n = 2364)[a]		Nonviolent Mechanisms (n = 2531)[a]	
Independent Variables	OR (95% CI)	*P* Value	OR (95% CI)	*P* Value
Age per 10-y increase	1.00 (0.99-1.01)	.06	0.99 (0.97-1.00)	.09
Female	0.97 (0.76-1.24)	.80	0.81 (0.64-1.02)	.07
Marital status couple (vs isolated)	1.05 (0.79-1.37)	.74	1.01 (0.85-1.42)	.48
Children at home (vs none)	1.17 (0.92-1.49)	.21	1.98 (0.78-1.23)	.84
Monthly income >UGS 50 000	1.16 (0.85-1.58)	.36	1.01 (0.75-1.36)	.95
Education (vs no school)				
Some primary	0.90 (0.68-1.21)	.49	1.26 (1.01-1.56)[b]	.04
Completed primary	0.89 (0.61-1.32)	.56	1.49 (1.11-1.99)[b]	.008
Higher than primary	0.71 (0.49-1.02)	.07	1.62 (1.25-2.09)[b]	<.001
District (vs Gulu)				
Kitgum	4.06 (2.88-5.74)[c]	<.001	0.36 (0.27-0.48)[b]	<.001
Lira	8.52 (6.09-11.93)[c]	<.001	0.18 (0.13-0.24)[b]	<.001
Soroti	3.84 (2.71-5.45)[c]	<.001	0.25 (0.19-0.33)[b]	<.001
Symptoms of PTSD (vs none)	1.31 (1.05-1.65)[c]	.02	1.14 (0.85-1.53)	.38
Symptoms of depression (vs none)	1.10 (0.84-1.42)	.52	0.77 (0.65-0.93)[b]	.005
Survivor group (vs group 1)[d]				
Group 2	1.01 (0.71-1.44)	.96	0.84 (0.60-1.19)	.29
Group 3	0.97 (0.66-1.41)	.86	0.97 (0.68-1.40)	.88
Group 4	1.18 (0.85-1.62)	.32	0.76 (0.56-1.03)	.07

Abbreviations: CI, confidence interval; OR, odds ratio; PTSD, posttraumatic stress disorder; UGS, Ugandan shillings.
[a] Denominators may vary because of item-level missing data.
[b] Odds ratios are adjusted for the effect of education, district, and symptoms of depression.
[c] Odds ratios are adjusted for the effect of district and symptoms of PTSD.
[d] Other group comparisons were examined but were not statistically significant.

cantly different among those threatened with death and/or physically injured (group 3) and those abducted (group 4). Symptoms of depression were statistically higher among witnesses who had been threatened with death and/or physically injured compared with those who had been abducted. This suggests that symptoms of PTSD and depression vary with type of exposure, as we have proposed in earlier studies.[7] Finally, although the conflict has taken place predominantly in the Acholi subregion, PTSD and depression symptoms were more prevalent in the Teso and Langi district, suggesting that culture may play a role in the experience and reporting of traumatic effects.

After adjusting for the variables being studied, symptoms of PTSD and depression were associated with attitudes toward peace. Respondents with symptoms of PTSD and/or depression were less likely to identify nonviolent means and more likely to identify violent means as a way to achieve peace. In this population, psychological symptoms associated with the trauma may be associated with a desire for retribution rather than restorative ways to deal with past violence. However, how a respondent defined peace with regard to end of violence, unity, and human development was more closely associated with demographic and sociocultural factors than with exposure to violence and frequency of symptoms of PTSD and depression. Most significantly, the district of origin influenced both the definition of and mechanisms identified to achieve peace. Districts are closely associated with ethnicity, since virtually all residents of Gulu and Kitgum are Acholi, and those in Lira and Soroti are, respectively, Langi and Teso. The Acholi, living in Gulu and Kitgum and considered to have the most exposure to the conflict, were least likely to identify violent means to achieve peace. However, significant differences existed among Acholi living in the districts of Gulu and Kitgum. This suggests that local cultures, beliefs, and social factors may play a role in shaping attitudes and opinions toward peace and points to the need to consider such factors in policy making.

This study has several limitations. The data for this study were collected in 4 districts of northern Uganda and are not nationally representative. The 4 districts were selected to represent a diversity of cultures and exposure to the conflict. Insecurity at the time of data collection limited the access to survey sites, and 3 selected camps could not be visited and were replaced by the next selected camp using the same procedure as the initial selection. Insecurity further limited the time available in each survey site. Among the visited households, 18% were empty and 4% refused to be interviewed. It is unknown whether the opinions of those individuals would have significantly differed from

Table 5. Variables Associated With Definitions of Peace

	Absence of Violence (n = 2368)[a]		Unity (n = 2581)[a]		Human/Social Development (n = 2515)[a]	
Independent Variables	OR (95% CI)	*P* Value	OR (95% CI)	*P* Value	OR (95% CI)	*P* Value
Age per 10-y increase	1.00 (0.99-1.01)	.94	1.00 (0.99-1.01)	.89	1.09 (1.04-1.15)[b]	.003
Female	1.13 (0.90-1.42)	.30	1.01 (0.76-1.35)	.93	0.88 (0.71-1.10)	.88
Marital status couple (vs isolated)	1.05 (0.83-1.34)	.67	0.79 (0.58-1.07)	.12	0.97 (0.76-1.24)	.81
Child at home (vs none)	0.87 (0.70-1.10)	.30	0.94 (0.71-1.25)	.68	1.20 (0.96-1.49)	.11
Monthly income >UGS 50 000	0.83 (0.63-1.08)	.16	1.02 (0.73-1.44)	.90	1.03 (0.79-1.34)	.84
Education (vs no school)						
Some primary	1.25 (1.00-1.57)[c]	.05	1.23 (0.86-1.75)	.25	1.16 (0.89-1.50)	.29
Completed primary	1.63 (1.21-2.19)[c]	.01	1.07 (0.67-1.70)	.79	0.94 (0.66-1.33)	.71
Higher than primary	1.53 (1.18-1.99)[c]	.01	1.011 (0.72-1.71)	.65	1.23 (0.88-1.71)	.22
District (vs Gulu)						
Kitgum	1.12 (0.89-1.41)[c]	.35	0.50 (0.36-0.70)[d]	<.001	0.98 (0.78-1.23)[b]	.71
Lira	6.66 (5.02-8.83)[c]	<.001	0.64 (0.47-0.88)[d]	.006	0.36 (0.29-0.45)[b]	<.001
Soroti	1.64 (1.29-2.07)[c]	<.001	1.76 (1.34-2.31)[d]	<.001	0.26 (0.20-0.33)[b]	<.001
Symptoms of PTSD (vs none)	1.23 (1.00-1.50)[c]	.045	1.04 (0.74-1.48)	.81	0.79 (0.61-1.03)	.08
Symptoms of depression (vs none)	0.86 (0.67-1.01)	.22	0.87 (0.64-1.19)	.38	1.24 (0.98-1.57)	.08
Survivor group (vs group 1)[e]						
Group 2	1.11 (0.80-1.55)	.53	1.06 (0.70-1.60)	.78	1.04 (0.76-1.43)	.80
Group 3	1.00 (0.71-1.44)	.94	0.87 (0.56-1.34)	.52	0.91 (0.64-1.28)	.58
Group 4	1.07 (0.80-1.44)	.64	0.87 (0.60-1.27)	.48	1.01 (0.76-1.33)	.97

Abbreviations: CI, confidence interval; OR, odds ratio; PTSD, posttraumatic stress disorder; UGS, Ugandan shillings.
[a] Denominators may vary because of item-level missing data.
[b] Odds ratios are adjusted for the effect of age and district.
[c] Odds ratios are adjusted for the effect of education and district.
[d] District was the only significant predictor in the model.
[e] Other group comparisons were examined but were not statistically significant.

that of the respondents. At the time of data collection (April-May 2005), there was no clear ongoing peace process. It is possible that opinions and attitudes would have differed if a concrete peace process had been under way. Exposure to trauma and symptoms of PTSD and depression were self-reported, with respondents stating "yes" or "no" to listed trauma events and a standardized checklist. Inaccurate recall and social desirability may have affected the validity of the response. The use of standard scales to measure the symptoms of psychological disorders such as PTSD and depression has been widely debated. Critics generally stress the lack of validity of those measurements because they are applied in different cultural environment and in conflict situations.[21-23] Those measures were nevertheless included in our analysis because they are validated[24,25] measures of psychological trauma outside clinical diagnostic interviews and have been applied in war-affected countries, such as the former Yugoslavia, Rwanda, Algeria, Cambodia, and Ethiopia, among other countries.[7-9,16] Threats to the validity of the findings may have been reduced through the use of a consent form emphasizing that no direct benefit was to be expected from participating in the study, the anonymous character of the survey, the extensive training of the interviewers, and the administration of the survey in the local languages.

CONCLUSIONS

We found symptoms of PTSD and depression to be highly prevalent in 4 districts in northern Uganda, affecting three-quarters and about half of the respondents to our survey, respectively. Prevalence of PTSD and depression symptoms varied significantly among survivor groups exposed to different levels of trauma and was associated with attitudes toward peace. Those who met PTSD symptom criteria were more likely to favor violent means to end the conflict and those who met depression symptom criteria were less likely to identify nonviolence means to achieve peace.

The study findings have important implications for health care professionals, aid workers, diplomats, and policy makers for several reasons. First, as the findings suggest, maintaining security and protecting civilians is imperative in times of war. It is one of the principal tenets of the Geneva Conventions of 1949, which regulate the use of force in armed conflicts. Security in times of war trumps everything: it is the central pedestal that supports all else. Without some level of security, the delivery of food aid, health care, and social programs is severely hampered.

Second, programs aimed at addressing psychological trauma should be a priority during conflicts and in postwar settings. Too often, humanitarian organizations neglect the psychosocial needs of war-affected communities because of limited resources or because they regard such programs as beyond their purview. Our study suggests that psychological trauma is a key health indicator in populations exposed to high levels of personal violence in protracted armed conflicts. Our research suggests that more collaborative research by clinicians, anthropologists, and other experts may be needed to determine which psychosocial programs work and for which subgroups of the population.

Third, international and national peace-building policies must take into account the psychological well-being of those most affected by war-related violence. Psychological trauma may influence whether individuals are optimistic about their future, how they will view measures to change their situation, and whether such measures recognize and acknowledge the nature and extent of their suffering during the war. When policy makers introduce policies aimed at building a lasting peace, they should be mindful that a large portion of the population may not support such measures. For example, when amnesties are granted to those responsible for war crimes, some individuals with psychological trauma may feel that the authorities have failed to consider their desires for reparation or to see those responsible for such crimes punished or required to apologize publicly for their actions. As a result, they may reject programs aimed at postwar reconciliation or even decide to seek revenge against those pardoned for past abuses.

Finally, local cultures, beliefs, and social factors play a role in shaping attitudes and opinions toward peace. Efforts to establish peace and accountability mechanisms must be informed by population-based data that reflect the opinions, attitudes, and needs of all sectors of a society. Such research should identify how patterns of war-related exposure to violence, psychosocial trauma, and cultural and political factors influence the process of social reconstruction and peace building in the aftermath of mass violence.

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Study concept and design: Vinck, Pham, Stover, Weinstein.
Acquisition of data: Vinck, Pham.
Analysis and interpretation of data: Vinck, Pham, Stover, Weinstein.
Drafting of the manuscript: Vinck, Pham, Stover, Weinstein.
Critical revision of the manuscript for important intellectual content: Vinck, Pham, Stover, Weinstein.
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The fight against disease has often been likened to war. It is war; it is the one war which is not barbaric. It is the only valid war. And we have the enemy on the run in so many directions.

—Lord Thomas Horder (1871-1955)

