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Posttraumatic stress disorder, trauma, and reconciliation in South Sudan

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Abstract

Purpose—South Sudan is embroiled in a conflict that erupted in December 2013. This study examines what people in South Sudan think is necessary to achieve reconciliation and how trauma exposure and PTSD are associated with those beliefs.

Methods—1525 participants (51.0% female) were selected using random and purposive sampling in six states and Abyei. Participants reported on traumatic events, PTSD symptoms, and attitudes towards reconciliation mechanisms.

Results—Results indicated that 40.7% met symptom criteria for probable PTSD. Most participants thought reconciliation was not possible without prosecuting perpetrators or compensating victims and did not support amnesty. Participants with probable PTSD were more likely to endorse confessions (OR 2.42 [1.75, 3.35]), apologies (OR 2.04 [1.46, 2.83]), and amnesty (OR 1.58 [1.21, 2.08]), and to report that compensation (OR 2.32 [1.80, 3.00]) and prosecution (OR 1.47 [1.15, 1.89]) were not necessary for reconciliation. The more traumatic events people experienced, the more they endorsed criminal punishment for perpetrators (OR 1.07 [1.04, 1.10]) and the less they endorsed confessions (OR 0.97 [0.95, 0.99]).

Conclusions—People with PTSD may prioritize ending violence via opportunities for reconciliation, while those with more trauma exposure may support more punitive mechanisms. Policy makers should take mental health treatment and trauma into account when designing conflict mitigation, peace building, and justice mechanisms.

Keywords

PTSD; Reconciliation; Displacement; Peace; War and armed conflict

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Introduction

The conflict in South Sudan that began in December 2013 continues to rage, despite a peace agreement signed in August 2015. All sides have committed human right violations, including mass killings, rape, torture, and recruitment of child soldiers [1]. Three million people have been displaced, of which approximately two million are internally displaced. As the country paves the way toward peace, it will need to tackle underlying problems, including a culture of impunity and a legacy of violence from two successive civil wars [2]. This study was developed as a platform for citizens to lend their voice to the complex process of developing a justice and reconciliation strategy.

The presence of trauma and posttraumatic stress disorder (PTSD) may hinder reconciliation. Research in South Sudan prior to the recent conflict found probable PTSD rates of 36–48% [3–5], and women with more trauma exposure had less optimistic views of the probability of peace [6]. Studies in Rwanda, Uganda, the Democratic Republic of Congo, Kosovo, and Cambodia have found that people with PTSD have less positive attitudes toward trials for people suspected of atrocities [7], less positive beliefs in a communal or interdependent vision of the future [7, 8], more feelings of revenge and hatred and less willingness to forgive or reconcile [9–14], less satisfaction with punishment of perpetrators, apologies by perpetrators, and remuneration for suffering [13], and are more likely to endorse violent means of ending conflict [15]. In contrast, one study in Afghanistan did not find a relationship between PTSD symptoms and feelings of hatred [16].

This is a secondary data analysis of a survey conducted by the South Sudan Law Society, in partnership with the United Nations Development Programme, on the prevalence of PTSD and community perceptions of truth, justice, reconciliation, and healing in South Sudan [17]. The primary questions addressed were: (1) what do people in South Sudan think is necessary to achieve reconciliation? and (2) how do trauma exposure and PTSD predict what people believe is necessary for reconciliation?

Methods

Participants

Eligibility criteria included being aged 18 or older and having South Sudanese nationality. Seven people approached for participation declined. In total, 1525 participants were interviewed; 51.0% were females (see Table 1 for complete descriptive results). The mean age of participants was 36.93 years (SD 13.90, range 18–86). Approximately 80% of participants were married and had children. Half had at least some education and were literate. Approximately 70% earned less than \$1.25 per day, with one-fifth reporting no income at all. Almost 95% were Protestant or Catholic. Approximately 90% had been displaced, including 41.0% who were currently internally displaced persons (IDPs). Almost one in five was a combatant during their lifetime, including 7.5% who were currently combatants. Participants did not receive any compensation.

Interviewers

The survey was administered by 29 interviewers, a little under half of whom were female. All interviewers were South Sudanese nationals, familiar with the local context, proficient in English, fluent in languages spoken in survey locations, and with experience collecting sensitive data in South Sudan. Interviewers received 5 days of training on the protection of human subjects, gender and trauma sensitivity, administering quantitative surveys, and using the software and smartphones by BL, MP, and DD. BL supervised the interviewers in the field. Most respondents were interviewed by an interviewer of the same sex, though in some locations, male interviewers interviewed female respondents when female interviewers were not available.

Study design and sampling plan

Data were collected between December 2014 and April 2015, approximately 1 year after the start of the most recent conflict. Data were collected on smartphones. Participants were not identified by name or code. The nonrandom sample plan was designed to account for limited access researchers had to certain areas of the country due to the ongoing conflict, as well as the fact that large-scale displacement reduced the potential for a nationally representative sample. A five-stage cluster sampling approach combining purposive and random sampling techniques was employed to enroll participants from different ethnic groups, socio-economic statuses, geographic locations, and exposure to conflict (both historical and recent). Researchers sought to interview 100 randomly selected participants in each field site as well as participants who were purposively sampled to increase the diversity of the sample.

First, researchers purposively stratified the population of South Sudan at the state, county, and payam (administrative districts) levels by ethnicity, socio-economic status, livelihood, exposure to conflict, and security of access. Given the impact of large-scale displacement on previous population structure, researchers relied primarily on data from grey literature (conflict mapping and weekly updates from multiple humanitarian clusters), media monitoring, key informants throughout the country, and extensive field experience in South Sudan and other conflict zones to conduct the stratification. Eleven sites were selected to represent each of these strata. These 11 locations included sites in six of South Sudan's ten states (Central Equatoria, Jonglei, Upper Nile, Western Equatoria, Eastern Equatoria, and Lakes) and Abyei, which has a special administration status. Within these locations, Protection of Civilian (PoC) sites, Internally Displaced Persons (IDP) camps, and rural and urban communities were included. Second, payams within each of the six states and Abyei were randomly selected. Third, within each selected payam, individual households were selected using a random walk method with a built-in skip pattern [18], such that each day, the research team started from a different location within the selected payam and used a series of 'Random Walk' tables to locate respondent households. Random Walk tables were designed using three separate random number generators to select respondent households. Fourth, individuals within each randomly selected household were identified using the 'Hagan–Collier alternative' method with 50–50 gender parity [19, 20]. In each selected location, 100 participants were randomly sampled to facilitate analysis within and between locations. Fifth, randomly selected interviews were followed by a series of purposively sampled interviews to overcome issues of over and under-representation caused by forced

migration and the inability of research teams to safely access key areas of the country and to ensure that participants from varied backgrounds were included. Specifically, researchers purposively sampled members of minority and subgroups groups [e.g., smaller ethnic groups, sub-ethnic (clan) groups with different conflict experiences, youth, elders, etc] using snowball and criterion sampling. Groups were identified by key stakeholders in South Sudan including members of civil society, development organizations, and members of a technical committee which was composed of representatives from relevant government institutions and independent bodies, including the South Sudan National Bureau of Statistics (NBS), Ministry of Justice, National Police Service, National Legislative Assembly, Juba University, and a Committee on National Healing, Peace, and Reconciliation. When possible, every other interview was conducted with a woman to achieve 50% gender parity.

Survey instrument

The survey instrument drew on previous surveys throughout South Sudan [21], ongoing research into justice and human rights, as well as truth, justice, and reconciliation studies employed in other post-conflict environments [22–24]. The complete survey consisted of 114 questions including questions about demographics, the peace process, reconciliation, remembrance of victims, justice mechanisms and reparations, and trauma and PTSD. The survey took approximately 40 min to complete. A preliminary version of the survey instrument was pretested with several dozen respondents in Juba to refine questions according to the quality of the data collected, comfort and security of participants, and length of the survey. The pre-test was accompanied by a stakeholder validation workshop, where researchers shared their methodology and select questions with civil society actors involved with issues of truth, justice, and reconciliation in South Sudan. The technical committee also reviewed and approved the questionnaire. Questionnaires were then translated from English into six South Sudanese languages: Classical Arabic, Juba Arabic, Dinka, Nuer, Shilluk, and Bari. One professional translator was used for each language. The project timeline did not allow for back translation. However, the translations were reviewed by the interviewers for errors, style, and the ability to effectively communicate technical terms.

Study measures

Demographics—The survey assessed gender, age, marital status, number of children, level of education, income, occupation, literacy, religion, ethnicity, combatant status, history of displacement, location, and rural, urban, or PoC/IDP camps.

Trauma exposure—The Harvard Trauma Questionnaire-revised (HTQ-R) [25] assessed 16 traumatic events and how often each event was experienced. The number of events was grouped into categories of once = 1, 2 to 5 times = 2, 6 to 10 times = 6, and more than 10 = 10. Two of the 16 trauma items (“Has a family member disappeared”, “Ill without medicine”) were added in the middle of data collection and so were only asked of 1036 and 722 participants, respectively. These items were not initially included, because they were thought to represent stressful but not traumatic events in the target population. They were included later to ensure that the complete HTQ-R was administered. Due to these discrepancies, total trauma exposure was calculated as the sum score of the number of times

the other 14 items were experienced. All participants were assessed for PTSD symptoms regardless of their endorsement of trauma exposure.

Probable PTSD—The HTQ-R [25] assessed PTSD symptoms. Although no PTSD measures have been validated in South Sudan using standardized diagnostic interviews by trained professionals, the HTQ-R has been translated into Classical and Juba Arabic and is the most commonly used measure to assess PTSD symptoms in South Sudan and with South Sudanese refugees [5, 26–29]. The HTQ-R had good internal reliability with a Cronbach’s alpha of 0.89 in this sample.

The items on the HTQ-R correspond to the DSM-IV criteria for PTSD [30]. Participants were determined to have reported a symptom of PTSD if they scored a 3 (quite a bit affected) or 4 (extremely affected) on a corresponding item, and were determined to have met the threshold for probable PTSD if their symptoms met DSM-IV criteria. Although two of the five re-experiencing symptoms (intense psychological distress on exposure to cues and physiological distress on exposure to cues) were combined into one item on the HTQ-R, only one re-experiencing symptom was required to meet the re-experiencing criteria. In addition, the HTQ-R assesses symptoms within the past week rather than the past month and does not assess associated clinically significant distress or impairment. Due to these limitations and the lack of validation in South Sudan, positive PTSD results should be interpreted as being indicative of probable rather than definite PTSD.

Preconditions for reconciliation (unity): open-ended—One open-ended question asked, “In your view, what is necessary to achieve reconciliation (unity)?” “Unity” was used to assist with translation when a language did not have a parallel term for reconciliation. Interviewers were trained to group participant responses into common response categories that had been developed from earlier unpublished qualitative work on reconciliation and healing in South Sudan. The response categories were reviewed by the technical committee. These categories were forgiveness, confessions, apologies, a peaceful context, healing/therapy, traditional ceremonies, compensation/reparations, or prison/criminal punishment. Responses could be grouped into more than one category. Two of the categories compensation/reparations and prison/criminal punishment were only included as category options later in the data collection due to emerging trends from the data, and so data are only available for these categories for 702 participants.

Preconditions for reconciliation (unity): close-ended—To specifically assess participant attitudes towards prosecution, compensation/reparations, and forgiveness/amnesty, three closed-ended (yes/no) questions were asked: “Can there be reconciliation (unity) without prosecuting the perpetrators of conflict-related abuses?” “Do you think reconciliation is possible without compensating victims for their loss?” and “Should people who have committed serious abuses be forgiven and not prosecuted (amnesty)?” To facilitate translation and to make the question more accessible to respondents who might not be familiar with the technical term, researchers used the terminology “forgiven and not prosecuted” as a simplified formulation of the more technical term “amnesty”.

Statistical analyses

Descriptive analyses were run for all study variables. To assess whether PTSD and trauma exposure predicted attitudes towards reconciliation, each reconciliation outcome was predicted by PTSD and trauma exposure using multiple logistic regressions. To identify possible confounding demographic variables, the “change-in-estimate” approach was used [31]. This approach compares the odds ratio of PTSD and trauma exposure predicting each outcome controlling for one potentially confounding variable. If the effect estimate changes by more than 10%, the confounding variable is included in the final multiple logistic regression. Sex and age were included as confounding variables, regardless of whether they met the above criteria. In addition, since data were sampled by location, location was included as a covariate in all regressions. Multiple imputation using 20 imputed data sets was used to account for missing data. Given the use of 11 primary outcomes, to reduce Type-I error, a Bonferroni-corrected significance level at $\alpha < 0.005$ was calculated by dividing the conventional alpha level of 0.05 by the number of study outcomes. To assist with interpretation of results, marginal effects for PTSD and trauma that were significant in the multiple regressions using the imputed data were calculated from complete cases. All analyses were conducted using Stata version 14 [32].

Results

Traumatic events

Participants reported experiencing an average of 7.62 (SD 7.55) traumatic events (range 0–63) during their lifetime, and 89.4% of participants reported experiencing at least one of the 14 trauma events asked of all participants (see Table 2). More than 40% reported having their home or property destroyed, having a close family member killed or witnessing a close family member or friend be killed, and witnessing war-related fighting. Many participants experienced the same type of traumatic event repeatedly. More than one quarter of participants reported experiencing traumatic events, since the recent conflict began in 2013.

Probable PTSD

Results indicated that 40.7% participants met criteria for probable PTSD (see Table 1). Exposure to traumatic events positively predicted increased risk of PTSD ($r_{pb} = 0.15$, $p < .001$; OR 1.03, $p = .003$). The relative risk of PTSD for each reported traumatic event was 1.018 (95% CI 1.01, 1.02). Therefore, for each additional traumatic event, the rate of probable PTSD increased by 1.8%. Participants who reported experiencing 7–8 events (the mean number of reported traumatic events) had a PTSD rate of 36.1%, and those who reported experiencing 15 traumatic events (one SD above the mean) had a PTSD rate of 39.3%.

Logistic regressions (adjusted for gender and location) indicated that probable PTSD was more prevalent in men, older people, those who were married and widowed, parents, those with at least some income, and those who reported no religion (see Table 1 for detailed results). Compared to people living in rural areas, people in urban areas were more likely to have probable PTSD, while those living in PoCs and IDP were less likely. PTSD rates were similar across ethnic groups. Location predicted probable PTSD rates, with people in Bor

PoC, Mvolo, Malakal, and Bor reporting higher rates of probable PTSD, and people in Abyei, Juba PoC, and Rumbek reporting lower rates. Education, employment, displacement history, and combatant status were not significantly associated with rates of probable PTSD.

Preconditions for reconciliation by probable PTSD and trauma exposure

See Table 3 for complete results. The most frequently reported open-ended preconditions for reconciliation were forgiveness (40.3%), confessions (33.3%), apologies (25.2%), criminal punishment (19.0%), and a peaceful context (18.2%). Compensation (10.8%) and healing/therapy (8.5%) were reported less frequently. Only 2.6% of participants endorsed the need for traditional ceremonies. Given the low level of endorsement, multiple regression was not run for this outcome. When asked close-ended questions of whether (1) reconciliation was possible without prosecuting perpetrators of conflict-related abuses or (2) compensating victims for their losses, less than half of participants said yes (40.9 and 41.8%, respectively) (see Table 3). Similarly, when asked a close-ended question whether people who have committed abuses should be granted amnesty, only 41.3% said yes.

Results of multiple logistic regressions assessing the ability of probable PTSD and trauma exposure to predict preconditions for reconciliation after adjusting for potential confounders are presented in Table 4. Using a conservative Bonferroni-corrected alpha of 0.005, results indicated that participants with probable PTSD were more likely to spontaneously report that confessions (41.2 vs. 28.3%; OR 2.42, $p < .001$) and apologies (32.3 vs. 23.7%; OR 2.04, $p < .001$) are necessary for reconciliation. In response to close-ended questions, people with probable PTSD were more likely to state that reconciliation was possible without compensating victims for their losses (52.1 vs. 34.4%; OR 2.32, $p < .001$) or prosecuting perpetrators (46.3 vs. 37.7%; OR 1.47, $p = .003$), and were more likely to support amnesty (46.8 vs. 37.9%; OR 1.58, $p < .001$). In contrast, the more traumatic events people experienced, the more likely they were to spontaneously report that criminal punishment is necessary for reconciliation [zero events (one SD below the mean) = 13.7%, seven events (mean) = 17.8%, 16 events (one SD above the mean) = 24.4%; OR 1.07, $p < .002$] and the less likely they were to report the need for confessions (zero events = 37.0%, seven events = 34.1%, 16 events = 30.4%; OR 0.97, $p < .001$).

Discussion

The study provided a platform for South Sudanese citizens who have been directly impacted by violence to voice their opinions on justice and reconciliation. Study participation was extremely high, although participants did not receive compensation. Anecdotal evidence from the field suggested that people were eager to participate to share their experiences, as there are not many other opportunities to do so. Many participants wanted their stories recorded and several pleaded for their names to be included. The strong desire to participate in this study suggests that citizens in South Sudan want their voices and opinions to be heard and acted upon.

Participant views on reconciliation were diverse and varied substantially by location. No particular approach was endorsed by the majority of participants. However, when presented with options, most participants reported that reconciliation would not be possible without

prosecution or compensation, and less than half supported amnesty. These findings suggest that there is a significant demand for justice among some populations and that if a practical and effective mechanism for holding people criminally accountable were proposed, it could receive wide support. However, the diversity of opinion may also reflect that respondents view of prosecution and compensation to be necessary, but not sufficient for reconciliation and that policy makers should consider a holistic approach to justice and reconciliation that adopts a variety of strategies, including but not limited to criminal and reparative mechanisms.

The results also confirmed previous findings regarding widespread human rights violations and traumatic events in South Sudan and very high rates of PTSD symptoms, with 40.7% of participants endorsing symptoms consistent with a probable diagnosis of PTSD. Moreover, trauma exposure and probable PTSD were associated with attitudes towards reconciliation. Overall, greater trauma exposure predicted support of more punitive and less forgiving justice mechanisms. This finding parallels results of studies in other countries and suggests that trauma exposure itself is associated with increased desire for punishment of perpetrators [7, 9, 13].

However, in contrast to previous studies, participants with probable PTSD were less likely to require punitive or reparative justice mechanisms and were more likely to favor opportunities for confessions and apologies. This may reflect the environment in which the current study was conducted. Unlike previous studies that were done years after the fighting, this investigation took place as South Sudan was embroiled in war. Perhaps people with PTSD, while in the midst of conflict, prioritize ending violence via opportunities for reconciliation over more punitive justice mechanisms. It is also possible that this finding reflects a disconnect between a desire for retribution and the reality that judicial mechanisms in South Sudan are severely underdeveloped and out of reach for many in the country due to such factors as geographic inaccessibility or cost. The inaccessibility of justice services, especially for crimes of the magnitude that the country has witnessed during the current conflict, may partly explain why respondents do not emphasize criminal punishment above other approaches as necessary preconditions for reconciliation.

One limitation of the survey is the use of a convenience sample, because attaining a nationally representative sample was not possible during the war. Therefore, results may not be representative of the broader South Sudanese population. In addition, only self-reported assessments were used, which can lead to bias or underreporting, particularly of sensitive information. Reconciliation and justice mechanisms were also only assessed through single-item responses and open-ended questions were grouped in the field by interviewers. While this introduces bias and may limit reliability and validity, it was the most efficient approach given limited funds, time, and a high conflict environment. Despite this limitation, results from the open-ended and closed-ended questions produced parallel results. Moreover, we believe that the open-ended questions strengthened the study, because they allowed participants to generate their own responses to questions, which was particularly critical given the lack of data available on community attitudes towards justice and reconciliation in South Sudan. In addition, the participation of local stakeholders helped ground the research

in the current context and South Sudan Law Society's strong background in justice and reconciliation research strengthened the study.

An additional limitation was the inability to conduct a thorough validation of the finalized survey instrument and translations due to funding and time constraints. However, the questionnaire was refined through survey pretesting and a stakeholder workshop and the HTQ-R had excellent internal reliability. Although the HTQ-R has not been updated to reflect the changes in the DSM-5 [33], it was selected, because it has been used in the majority of the studies investigating PTSD conducted in South Sudan, Sudan, or with Sudanese refugees [3, 5, 27–29] and has performed well in this population.

Conflict in South Sudan has devastated populations throughout the country and exposure to trauma plays a significant role in determining how people perceive solutions to the crisis. Thus, trauma healing should be integrated into conflict-transformation strategies. Policy makers should take note of how PTSD and mental health issues affect the way people perceive solutions to conflict and how those perceptions might change over time. By engaging populations on an ongoing basis, the evolution of perceptions can be captured and incorporated into the design of policies and programs. The findings support the idea that South Sudan should invest efforts into developing a holistic approach to justice and reconciliation that pursues multiple goals simultaneously by creating space for forgiveness and social healing while also promoting accountability and remedying the harms that people have suffered.

Ethical review

This study was conducted by researchers from the South Sudan Law Society. All participants gave informed consent. Verbal rather than written consent was given by all participants due to the high rate of illiteracy. Due to insecurity and instability in South Sudan during the study, the South Sudan Research Ethics Committee was inaccessible. However, the technical committee worked with team leaders to ensure the protection of human subjects, vet the research methods and survey instrument, and validate research findings and recommendations. The NBS was consulted on the methodology to help determine the optimal approach in the current context. These analyses were conducted on the previously collected de-identified data. The secondary analyses were reviewed by the Institutional Review Board of Partners Healthcare and were deemed not human subjects.

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Table 1

Demographic variables by probable PTSD diagnosis

Demographic variables	Total		Probable PTSD			
	n ^b	%	n	%	OR	95% CI
PTSD (<i>n</i> = 1520) ^a	618	40.66	-	-	-	-
Female	778	51.02	280	45.31	0.67 ^{***}	[0.54, 0.85]
Age (<i>n</i> = 1506); mean (SD)	36.93	13.78	-	-	1.01 ^{**}	[1.004, 1.02]
18-24	324	21.51	80	13.18	Ref	
25-34	404	26.83	164	27.02	1.76 ^{**}	[1.24, 2.50]
35-47	414	27.49	185	30.48	1.73 ^{**}	[1.22, 2.46]
48 and older	364	24.17	178	29.32	2.004 ^{***}	[1.41, 2.85]
Marital status (<i>n</i> = 1523)						
Never married	259	17.01	68	11.02	Ref	
Married	979	64.28	420	68.07	1.55 ^{**}	[1.11, 2.16]
Polygamous	238	15.63	105	17.02	1.94 ^{***}	[1.29, 2.91]
Divorced	21	1.38	7	1.13	1.21	[0.45, 3.28]
Widowed/abandoned	26	1.71	17	2.76	3.46 [*]	[1.26, 9.51]
Parent (<i>n</i> = 1488)	1255	84.34	548	90.58	1.94 ^{***}	[1.38, 2.73]
Literate (<i>n</i> = 1525)	727	47.67	287	46.44	1.16	[0.89, 1.50]
Education (<i>n</i> = 1497)						
None	716	47.83	307	50.83	Ref	
Primary	321	21.44	124	20.53	0.94	[0.68, 1.30]
Secondary	318	21.24	122	20.2	0.89	[0.63, 1.26]
University	142	9.49	51	8.44	0.84	[0.52, 1.35]
Employed (<i>n</i> = 1523)	927	60.87	361	58.51	1.01	[0.79, 1.30]
Daily income (<i>n</i> = 1520); mean (SD), in South Sudanese pounds (SSD)	10.18	23.62	-	-	1	[0.998, 1.008]
Zero	315	20.72	188	30.57	Ref	
\$0-\$1.24	752	49.47	243	39.51	0.47 ^{***}	[0.33, 0.68]
\$1.25	453	29.8	184	29.92	0.65 [*]	[0.43, 0.99]

Demographic variables	Total		Probable PTSD			95% CI
	n	%	n	%	OR	
Displacement (n = 1509)						
Never displaced	332	22	122	19.81	Ref	
Previously displaced	558	36.98	213	34.58	0.94	[0.68, 1.30]
Currently an IDP	619	41.02	281	45.62	0.81	[0.54, 1.19]
Location (N = 1525)						
Juba town	297	19.48	101	16.34	Ref	
Juba PoC	98	6.43	13	2.1	0.29 ^{***}	[0.15, 0.54]
Nimule	94	6.16	41	6.63	1.45	[0.90, 2.34]
Terekaka	212	13.9	85	13.75	1.27	[0.88, 1.83]
Bor	106	6.95	52	8.41	1.85 ^{**}	[1.18, 2.91]
Bor PoC	104	6.82	103	16.67	202.01 ^{***}	[27.76, 1470.16]
Malakal	99	6.49	52	8.41	2.12 ^{**}	[1.33, 3.37]
Abyei	115	7.54	6	0.97	0.11 ^{***}	[0.05, 0.26]
Awerial	100	6.56	29	4.69	0.77	[0.47, 1.27]
Rumbek	100	6.56	22	3.56	0.53 [*]	[0.31, 0.91]
Mvolo	200	13.11	114	18.45	2.59 ^{***}	[1.78, 3.75]
Setting (n = 1525)						
Rural	755	49.51	325	52.59	Ref	
Urban	538	35.28	167	27.02	1.64 [*]	[1.02, 2.66]
PoC/IDP camp	232	15.21	126	20.39	0.29 ^{**}	[0.13, 0.64]
Religion (n = 1507)						
Protestant	788	52.29	341	55.45	Ref	
Traditional African religion	11	0.73	6	0.98	6.34	[0.59, 68.75]
Catholic	638	42.34	240	39.02	1.1	[0.84, 1.45]
Muslim	35	2.32	14	2.28	0.99	[0.47, 2.08]
No religion	35	2.32	14	2.28	2.95 [*]	[1.10, 7.90]
Ethnicity (n = 1525)						
Dinka	461	30.23	124	20.06	Ref	

Demographic variables	Total		Probable PTSD			95% CI
	n ^b	%	n	%	OR	
Bari	73	4.79	20	3.24	0.65	[0.29, 1.42]
Madi	98	6.43	43	6.96	1.11	[0.50, 2.46]
Mundari	211	13.84	87	14.08	1.19	[0.48, 2.93]
Nuer	204	13.38	115	18.61	1.11	[0.27, 4.50]
Shilluk	112	7.34	58	9.39	1.41	[0.43, 4.60]
Jur	142	9.31	93	15.05	2.77*	[1.17, 6.55]
Other	224	14.69	78	12.62	0.88	[0.46, 1.68]
Combatant (n = 1509)						
Never combatant	1234	81.78	512	83.25	Ref	
Past, but not present combatant	162	10.74	53	8.62	0.68	[0.46, 1.01]
Present combatant	113	7.49	50	8.13	1.1	[0.71, 1.69]
Traumatic events (n = 1525), mean (SD)	7.62	-7.55	-	-	1.03**	[1.01, 1.04]

All logistic regressions predicting probable PTSD were adjusted for gender and location *PoC/IDP* Protection of civilian/internally displaced persons, *PTSD* posttraumatic stress disorder

* $p < .05$,

** $p < .01$,

*** $p < .001$

^aNumber of participants with complete data for each item

^bNumber of participants endorsing the category

Table 2

Reported exposure to traumatic events

Traumatic event	Ever happened		Since Dec 2013		Once		2–5 times		6–10 times		>10 times		
	Total	N	%	N	%	N	%	N	%	N	%	N	%
Any traumatic event ^a	1525	1363	89.38										
Abducted	1517	156	10.28	19	1.25	103	66.45	44	28.39	7	4.52	1	0.65
Had a child abducted	1509	266	17.63	53	3.51	122	45.86	103	38.72	16	6.02	25	9.40
Had a family member disappear	1036	337	32.53	11	1.06	194	40.76	237	49.79	32	6.72	13	2.73
Imprisoned	1514	222	14.66	41	2.71	150	67.87	65	29.41	4	1.81	2	0.90
Witnessed war-related fighting	1522	647	42.51	83	5.45	247	38.47	337	52.49	39	6.07	19	2.96
Witnessed friend or family member killed	1519	625	41.15	82	5.40	252	40.65	305	49.19	40	6.45	23	3.71
Close family member killed	1521	965	63.45	131	8.61	370	38.58	478	49.84	70	7.30	41	4.28
Threatened with death	1518	463	30.50	62	4.08	254	54.98	161	34.85	17	3.68	30	6.49
Seriously injured	1520	198	13.03	30	1.97	136	68.69	61	30.81	1	0.51	0	0.00
Raped	1511	59	3.90	4	0.26	38	66.67	19	33.33	0	0.00	0	0.00
Family member raped	1475	170	11.53	15	1.02	99	58.58	59	34.91	8	4.73	3	1.78
Witnessed rape	1511	134	8.87	11	0.73	87	64.93	41	30.60	4	2.99	2	1.49
Tortured	1513	217	14.34	27	1.78	121	56.28	80	37.21	5	2.33	9	4.19
House destroyed	1517	841	55.44	108	7.12	469	55.83	329	39.17	34	4.05	8	0.95
Property destroyed	1517	967	63.74	262	17.27	474	49.17	444	46.06	25	2.59	21	2.18
Ill without medicine	722	345	47.65	121	16.76	147	42.86	159	46.36	13	3.79	24	7.00

^aNot including having a family member disappear and being ill without medicine

Table 3

Preconditions for reconciliation

	Total	
	<i>n</i>	%
Preconditions (<i>N</i> = 1525)		
Forgiveness	614	40.26
Confessions	508	33.31
Apologies	384	25.18
Peaceful context	278	18.23
Healing/therapy	129	8.46
Traditional ceremonies	40	2.62
Compensation (<i>N</i> = 702)	76	10.83
Criminal punishment (<i>N</i> = 702)	133	18.95
Reconciliation w/o prosecution (<i>N</i> = 1437)	588	40.92
Reconciliation w/o compensation (<i>N</i> = 1497)	626	41.82
Amnesty (<i>N</i> = 1466)	606	41.34

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Table 4

Multiple logistic regressions predicting preconditions for reconciliation

	<u>Probable PTSD</u>		<u>Trauma</u>	
	OR	95% CI	OR	95% CI
Open-ended responses				
Forgiveness ^a	1.25	[0.90, 1.74]	0.98 [*]	[0.96, 1.00]
Confessions ^a	2.42 ^{***}	[1.75, 3.35]	0.97 ^{***}	[0.95, 0.99]
Apologies ^a	2.04 ^{***}	[1.46, 2.83]	0.98	[0.96, 1.00]
Peaceful context ^a	0.68 [*]	[0.49, 0.95]	1.02 [*]	[1.00, 1.04]
Compensation ^b	0.81	[0.45, 1.47]	1.01	[0.97, 1.06]
Criminal punishment ^c	1.01	[0.63, 1.64]	1.07 ^{***}	[1.04, 1.10]
Closed-ended responses				
Unity is possible without compensation ^a	2.32 ^{***}	[1.80, 3.00]	1.01	[0.99, 1.02]
Unity is possible without prosecution ^d	1.47 ^{**}	[1.15, 1.89]	1.02	[1.00, 1.03]
People should be forgiven and not prosecuted (amnesty) ^c	1.58 ^{***}	[1.21, 2.08]	1.00	[0.98, 1.01]

*
 $p < .05$,**
 $p < .01$,***
 $p < .001$ ^a Adjusted for sex, age, location, ethnicity, and urban/rural/PoC setting^b Adjusted for sex, age, location, ethnicity, and displacement status^c Adjusted for sex, age, location, and ethnicity^d Adjusted for sex, age, and location