Community-Implemented Trauma Therapy for Former Child Soldiers in Northern Uganda
A Randomized Controlled Trial

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I
T IS CURRENTLY ESTIMATED THAT approximately 250 000 children younger than 18 years are actively involved as child soldiers in hostilities in 14 countries or territories worldwide.[1,2] The civil war in Northern Uganda, between the rebel group Lord's Resistance Army (LRA) and government forces, lasted more than 2 decades and has affected virtually the entire Northern Ugandan population. The dominant strategy of the LRA was the abduction of children and their forced recruitment as helpers, combatants, and sexual slaves.

As a consequence of the conflict, approximately 1.8 million individuals had been forced to resettle in camps for internally displaced persons (IDP). Individuals have hesitantly left these camps since 2008, after a gradual calming of the conflict.[3] Throughout the war and thereafter, the Northern Ugandan communities have been confronted with large numbers of formerly abducted children, adolescents, and young adults returning after their rescue, flight, or release.

The successful reintegration of these former child soldiers continues to be a major challenge. Trained for survival in the bush, the former abductees were often met with suspicion and distrust from families and communities. They returned to unstable conditions in terms of livelihood and security, and difficulties were aggravated in that their education had been interrupted by their forced con-

Context The psychological rehabilitation of former child soldiers and their successful reintegration into postconflict society present challenges. Despite high rates of impairment, there have been no randomized controlled trials examining the feasibility and efficacy of mental health interventions for former child soldiers.

Objective To assess the efficacy of a community-based intervention targeting symptoms of posttraumatic stress disorder (PTSD) in formerly abducted individuals.

Design, Setting, and Participants Randomized controlled trial recruiting 85 former child soldiers with PTSD from a population-based survey of 1113 Northern Ugandans aged 12 to 25 years, conducted between November 2007 and October 2009 in camps for internally displaced persons. Participants were randomized to 1 of 3 groups: narrative exposure therapy (n=29), an academic catch-up program with elements of supportive counseling (n=28), or a waiting list (n=28). Symptoms of PTSD and trauma-related feelings of guilt were measured using the Clinician-Administered PTSD Scale. The respective sections of the Mini International Neuropsychiatric Interview were used to assess depression and suicide risk, and a locally adapted scale was used to measure perceived stigmatization. Symptoms of PTSD, depression, and related impairment were assessed before treatment and at 3 months, 6 months, and 12 months postintervention.

Intervention Treatments were carried out in 8 sessions by trained local lay therapists, directly in the communities.

Main Outcome Measures Change in PTSD severity, assessed over a 1-year period after treatment. Secondary outcome measures were depression symptoms, severity of suicidal ideation, feelings of guilt, and perceived stigmatization.

Results PTSD symptom severity (range, 0-148) was significantly more improved in the narrative exposure therapy group than in the academic catch-up (mean change difference, −14.06 [95% confidence interval, −27.19 to −0.92]) and waiting-list (mean change difference, −13.04 [95% confidence interval, −26.79 to 0.72]) groups. Contrast analyses of the time × treatment interaction of the mixed-effects model on PTSD symptom change over time revealed a superiority of narrative exposure therapy compared with academic catch-up ($F_{1,234.1}=5.21$, $P=.02$) and wait-listing ($F_{1,228.3}=5.28$, $P=.02$). Narrative exposure therapy produced a larger within-treatment effect size (Cohen d=1.80) than academic catch-up (d=0.83) and wait-listing (d=0.81).

Conclusion Among former Ugandan child soldiers, short-term trauma-focused treatment compared either with an academic catch-up program including supportive counseling or with wait-listing resulted in greater reduction of PTSD symptoms.

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scription.[4] Most significantly, the excessive exposure to violence in the rebel army, often involving torture, forced participation in atrocities, sexual violence, and the loss of loved ones, leaves affected children and young adults vulnerable to behavioral problems as well as psychological and physical impairment.[5-10]

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Researchers reporting on the rehabilitation and reintegration of former child soldiers recommend that efficient treatment programs targeting posttraumatic stress disorder (PTSD), depression, and other psychological problems must be a component of rehabilitation and reintegration efforts.[11-18] However, to date there is no available treatment with proven efficacy for the treatment of PTSD or depression in former child soldiers.[12]

Research on interventions with children and youths traumatized by war and organized violence is still scarce. The most promising results have been school-based programs in which treatments are carried out in classrooms or with groups of affected children and youths. Some programs have begun to include evidence-based therapeutic components, such as cognitive-behavioral techniques and trauma-focused elements.[19-25]

In the current randomized controlled trial, we tested the efficacy of narrative exposure therapy for the treatment of former child soldiers with PTSD. We chose an individual-based over a group-based treatment, because we expected this approach to better meet the requirements of former child soldiers, who present with high levels of PTSD as well as mistrust. Narrative exposure therapy is a short-term, trauma-focused treatment developed for use in low-resource countries affected by crises and conflict. Intended for survivors of multiple trauma, this therapy results in the detailed documentation of the patients' lives as part of the therapy process. Across a variety of contexts and cultures, narrative exposure therapy has proven more effective than no treatment, supportive counseling, and anxiety management techniques.[26-29] It has shown positive effects when applied by trained lay counselors in children as well as adults[27,30] and has been tested with refugee children[31] and child and adolescent survivors of organized violence in East Africa.[32-34] Trials suggest that there might be positive effects beyond the reduction of PTSD on symptoms of depression and feelings of guilt.[29,33,35] An overview of the current evidence base has been reported by Robjant and Fazel.[36]

The aim of this study was to examine whether individual-based, trauma-focused narrative exposure therapy is feasible and effective in reducing PTSD symptoms in traumatized former child soldiers living in the IDP camps of Northern Uganda when carried out by trained local lay therapists directly in the communities.

METHODS
Procedure and Participants

During July 2007 and April 2008, an epidemiologic survey using a cluster sampling approach was used to assess exposure to war, abduction, and atrocities; mental and physical health status; perceived stigmatization; and sociodemographic characteristics among 1113 randomly selected children and young adults aged 12 to 25 years in 3 regions of northern Uganda. The 3 survey areas—Anaka, Awer, and Padibe—were chosen according to their degrees of war exposure and distance from Gulu, the largest town in Northern Uganda. Awer represents a relatively safe area close to Gulu; Padibe is a long distance from Gulu and was more affected by the war; and Anaka was chosen to represent the rural areas with the most documented rebel activity.

To reflect the estimated ratio of Northern Ugandan civilians living in areas with varying war exposure, we approached 357 households in Awer, 514 in Padibe, and 572 in Anaka. Interviews were carried out in all IDP camps and new settlement sites within the study areas. Former child soldiers in the epidemiologic survey with a positive screening result for PTSD as assessed by the Posttraumatic Stress Diagnostic Scale[37] applying *Diagnostic and Statistical Manual of Mental Disorders* (Fourth Edition) (*DSM-IV*) criteria for PTSD and meeting the cut-off score of 15 or greater on this scale were revisited. Former child soldiers whose PTSD diagnoses were confirmed by clinical experts according to the Clinician-Administered PTSD Scale (CAPS) were invited to participate. Participants were randomized into 3 treatment groups: narrative exposure therapy, an intervention comprising academic catch-up with counseling, and a waiting-list control group. To keep the trial naturalistic we did not exclude patients with suicidal ideation, substance abuse, or depression. Two former child soldiers were not enrolled because of the presence of psychotic symptoms.

The primary outcome measure was change in PTSD severity, assessed over a 1-year period after treatment. Secondary outcome measures were depression symptoms, severity of suicidal ideation, feelings of guilt, and perceived stigmatization. We expected narrative exposure therapy to be superior to academic catch-up and wait-listing in reducing PTSD symptoms. In addition, we anticipated both active treatments to be superior to no treatment concerning secondary outcomes.

The study protocol was approved by the ethics committee of the University of Konstanz, Konstanz, Germany, as well as by the ethics committee of the Mbarara University of Science and Technology, Mbarara, Uganda. Screening interviews and treatment sessions were started after a comprehensive explanation of the study was provided and after written (signature or fingerprint) informed consent was obtained. In cases in which the participant was underaged, informed consent was also obtained from an adult guardian. All 85 formerly abducted youths asked to participate were willing to take part and provided formal agreement. Pretreatment assessments as well as follow-up assessments at 3 months, 6 months, and 12 months after treatment were conducted by 13 clinical psychologists blinded to treatment conditions. Final follow-up data were collected in October 2009.

Treatment

Treatments were carried out by 14 (7 women, 7 men) intensively trained local lay counselors. Treatment fidelity and therapeutic competence were monitored by case discussions in supervision meetings, observation and evaluation of treatment sessions via video recordings, and review of the obliga-

tory treatment process notes for each session. In the case of narrative exposure therapy, testimonies were additionally reviewed to check for trauma focus and richness of detail. No deviations from the study protocol were noted.

Irrespective of treatment condition, the first session included psychoeducation on PTSD, its symptoms and consequences for the individual, and explanation of the rationale for narrative exposure therapy or academic catch-up. Both approaches were directly carried out in 8 individual sessions in the homes of the participants in the IDP camps. Sessions lasted between 90 and 120 minutes and were scheduled 3 times a week. Training in and performance of narrative exposure therapy were as outlined by an adapted field version of the manual. Detailed accounts of the techniques and modes of action of narrative exposure therapy for adults as well as for children and adolescents (KidNET) are available elsewhere.[38,39] In brief, during narrative exposure therapy the participant constructs a detailed chronological account of his or her own biography in cooperation with the therapist to reconstruct fragmented memories of traumatic events and to achieve habituation.

To examine the specificity of the effects of narrative exposure therapy, we chose a control intervention based on the needs expressed by the target group. The intervention comprising academic catch-up with counseling was carried out according to written guidelines that summarized basic counseling skills and session outlines for the academic catch-up training. Missing out on education was one of the main topics mentioned by formerly abducted youths, because educational and economic challenges are tightly linked and are fundamental to successful economic and social readjustment. Therefore, an intensive English catch-up course using the official Ugandan schoolbooks for different skill levels was developed. The evaluation of process notes revealed that the counselors spent 55% of the total time allocated for academic catch-up doing academic training. The rest of the time was equally dedicated to psychoeducation, conducting discus-

sions on coping with symptoms, and dealing with current problems. None of the counselors deviated from the restriction that they should not focus on traumatic experiences in this condition. In the last session, the participants received the English textbooks and exercise books they had been working on with their counselors.

Participants randomized to the waiting-list group were not provided with any psychosocial or therapeutic intervention, except those who exhibited high levels of suicidal ideation (n = 10), for whom suicide intervention was provided. Participants in the waiting-list condition were reassessed in parallel with the narrative exposure therapy and academic catch-up groups. After the 12-month follow-up, each waiting-list and academic catch-up participant still presenting with PTSD was offered narrative exposure therapy.

Apart from providing participants with the written documentation of their lives or with the English textbooks and exercise books, no incentives were offered. During follow-up periods, individuals who had relocated far from the former IDP camps were refunded travel expenses.

Measures

The first part of the screening interview consisted of sociodemographic questions about individual and household characteristics. Age, sex, marital status, ethnicity, religious denomination and practice, level of education, economic status, and history of displacement and abduction were recorded for each participant.

The Violence, War and Abduction Exposure Scale is a 34-item checklist of potentially traumatic events that was developed especially for use in the Northern Ugandan context, based on in-depth interviews with 30 former child soldiers. It consists of 18 general event types, adapted from the event checklist of the CAPS,[40] 6 LRA-specific event types that capture events related to the rebel army (eg, "Have you ever been forced to eat human flesh by the LRA?"), 6 forced-perpetration event types (eg, "Have you ever been forced

to kill someone by the LRA?"), 4 event types related to family violence, and the possibility to document 1 other event type experienced or witnessed (overall range, 0-36).

Clinical experts used the CAPS, revised version for *DSM-IV*, to assess PTSD diagnoses and PTSD symptom severity.[41] For each symptom 2 separate dimensions (frequency and intensity) were rated on scales ranging from 0 (never/none) to 4 (daily or almost daily/extreme). Items coded with a frequency of 1 or higher and an intensity of 2 or higher were considered valid symptoms. A diagnosis was reached, according to these threshold recommendations for screening purposes combined with the *DSM-IV* algorithm for PTSD (presence of ≥ 1 traumatic event, ≥ 1 symptom of the intrusion cluster, 3 symptoms of the avoidance cluster, 2 symptoms of the hyperarousal cluster, symptom duration of ≥ 4 weeks, and impairment of functioning).[41] Symptom severity was determined by the sum of frequency and intensity ratings (range, 0-148) and was the primary outcome. CAPS diagnoses and symptom severity scores have demonstrated good reliability and validity when applied in different populations and settings. Interrater reliability for frequency and severity ratings is repeatedly reported to be better than 0.90 and internal consistency (Cronbach α) to be better than 0.80 for each of the 3 symptom subscales.[40,41] Cronbach α for this study was 0.88. According to the authors of the CAPS, a 15-point change on the total severity score for the 3 symptom clusters can be used as a marker of clinically meaningful change.[41]

The section for major depression (module A) of the Mini International Neuropsychiatric Interview (MINI, English Version 5.0.0)[42] was administered to diagnose major depression. The MINI is a standardized instrument following diagnostic categories and criteria of the *DSM-IV* and is routinely used in a wide variety of cultures and settings.[42,43] All items of module A were coded for every participant to gain knowledge about the range of participants' symptoms of depression. The

sum of present symptoms was used as the depression score in analyses (range, 0-9). Cronbach α on the MINI score for depression was 0.84 for this study.

Suicide risk was assessed according to module C of the MINI. Current suicidal ideation and risk levels were determined by adding the standard numeric weights of the 6 items as specified by the instrument. Participants were categorized into the risk levels low (range, 1-5), medium (range, 6-9), and high (range, 10-33) according to these weights.

Two CAPS items measured trauma-related guilt related to acts committed or omitted and survivor guilt. Frequency and intensity of each of these items were coded on 5-point scales ranging from 0 (never/none) to 4 (daily or almost daily/extreme). The resulting guilt score was the sum of severity and frequency ratings for both CAPS guilt symptoms (range, 0-16).

The Perceived Stigmatization Questionnaire[44] was shortened to a 12-item version representing the 2 factors "confused, staring and hostile behavior" (eg, "People act surprised or startled when they see me"; "People call me names") and "absence of friendly behavior" (eg, "People treat me with respect" [reverse coded]). Respondents' answers concerning the frequency of stigmatizing behavior during the 4 weeks prior to the screening were coded on a 5-point Likert scale from 0 (never) to 4 (always). One item was deleted because of frequent misunderstandings. The adapted version of the questionnaire revealed good internal consistency of the scale scores (α = .83; score range, 0-4).

All measures, except for the demographic questionnaire and the event checklist, were administered at each time point. In addition, at each follow-up point any new potentially traumatic events occurring in the periods between 3-month follow-up and 12-month follow-up were recorded.

Data Analyses

We expected a between-treatment effect size (Cohen d) of 0.80 for the primary outcome. At a power level of .80 (1 − β error probability), we calculated the sample size per treatment group at an adjusted α error probability of .025 because of multiple testing. Assuming equally sized groups, a sample size of 26 per treatment group was calculated using G*Power.[45] We anticipated low loss to follow-up because our experiences from prior studies in the area were that individuals are readily traceable within the boundaries of the IDP camps. Therefore, and because of logistical and resource constraints to extend epidemiologic screening, we aimed for a sample size of 28 per group.

Baseline characteristics of the groups were compared using likelihood ratio χ² tests for categorical variables and analyses of variance and nonparametric Mann-Whitney U tests for continuous variables to examine any pretreatment differences that might have been present despite randomization. All participants randomized were included in the outcome analyses. We applied mixed-effects models that allowed the inclusion of all available data; ie, analysis was by intent-to-treat. The models predict treatment response using group as a fixed factor, time point as a within-participants repeated factor, and participants as a random factor with random intercepts and slopes for each participant. Mixed-effects models have several advantages. They account for serial correlation within participants, are relatively robust to randomly missing data, and can incorporate certain nonrandom missing data without biasing model estimates. Thus, replacement or imputation routines for missing values were rendered unnecessary.[46] We calculated mixed-effects models for the primary outcome of PTSD severity, including participant as random effect and treatment, time, and treatment × time as fixed effects, whereby each participant was nested in treatment. This procedure was repeated for the secondary outcomes of depression symptoms, suicidality, functioning impairment, feelings of guilt, and stigmatization.

For descriptive analyses of mean change differences (12-month follow-up − pretreatment), between-groups independent-sample t tests were calculated on a treatment-completer basis.

Additionally clinical significance was estimated by calculating within- and between-treatment effect sizes (Cohen d) for the primary and secondary outcome measures. Within-treatment effect sizes were calculated by dividing the difference between the means of the pretreatment and final (12-month) follow-up scores by the pooled standard deviation for these means. Between-treatment effect sizes were corrected for pretest differences between the groups. Effect sizes were considered large with a d of 0.80 or greater, moderate with a d of 0.50 to 0.79, and small with a d of 0.20 to 0.49. To explore differences between groups concerning clinically meaningful improvement according to the 15-point change threshold in CAPS score,[41] we calculated likelihood ratio χ² tests comparing narrative exposure therapy with academic catch-up and narrative exposure therapy with wait-listing.

Bonferroni-Holm adjustment of significance levels was applied for multiple comparisons; accordingly, statistical significance was set at P < .025. Data analyses were carried out with JMP version 8.0 (SAS Institute Inc, Cary, North Carolina).

RESULTS

Randomized allocation placed 29 participants in the narrative exposure therapy group and 28 in the academic catch-up and waiting-list groups, respectively (FIGURE). TABLE 1 summarizes the sociodemographic, clinical, and traumatic exposure characteristics of the participants. There were no systematic pretreatment differences in sociodemographic data, traumatic load, and psychological impairment between the 3 groups. Mean age of participants was 18 years, and the majority had some primary education. All participants were diagnosed with PTSD. The duration of abduction ranged from several hours to 7.42 years, with a median of 2.47 months. Other than abduction, the most common traumatic event types reported by 81 or more of the 85 participants were exposure to a war zone, witnessing someone being killed, witnessing abduction, witnessing physi-

cal assault, and assaults with weapons (see eTable available at http://www.jama.com for information on exposure to specific trauma types). The likelihood of an event being indicated as the worst if present was highest for being forced to kill (55%), followed by witnessed killing (31%) and seeing someone being mutilated or seeing dead bodies (13%). On average, worst events happened 6.71 (SD, 3.80 [range, 0-18]) years before assessment, when participants were aged 11.65 (SD, 3.77 [range, 5-22]) years. In addition to PTSD, 18 of 85 participants were diagnosed with depression and 52 of 85 reported current suicidal ideation.

In the narrative exposure therapy group, 1 participant disappeared before sessions could start after a major familial conflict and could not be traced, 1 participant went into hiding after session 6 because of a pregnancy that was not tolerated by her family, 1 discontinued treatment after session 7 because she was sent to work in a remote and distant area where she could not be reached for the last session and follow-up, and we could not trace 1 participant at 12-month follow-up. In the academic catch-up group, 1 participant moved far away before sessions could start, 1 chose to discontinue after session 4, 1 was sent to work in a location where she could not be reached for continuous sessions after session 2, 1 participant committed suicide shortly before 3-month follow up, and 1 could not be traced at 6-month and 12-month follow-up. There were no dropouts in the waiting-list condition at any time point (Figure).

TABLE 2 shows the mean symptom scores for PTSD and the secondary outcomes for each group at baseline and at 3, 6, and 12 months, as well as the mean change scores (12-month follow-up–pretreatment) for each group (eFigure). PTSD symptom severity (according to the CAPS) showed a mean change difference (12-month follow-up–pretreatment) of –14.06 when comparing narrative exposure therapy with academic catch-up and of –13.04 when comparing narrative exposure therapy with wait-listing (TABLE 3). For a true

Figure. Flow of Participants Through the Study
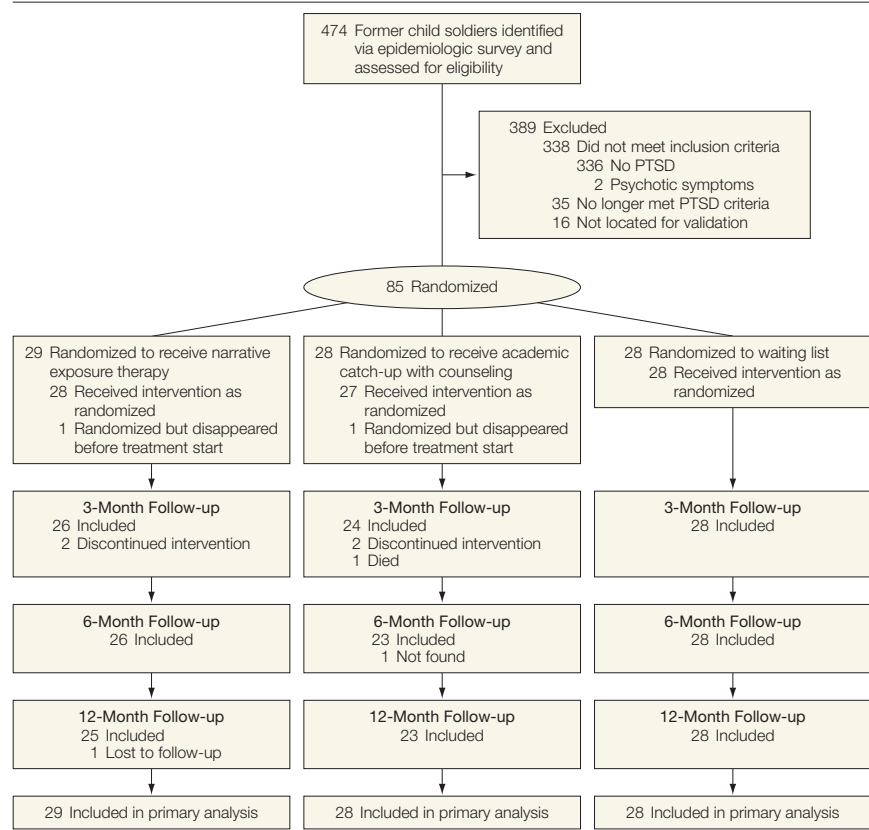
PTSD indicates posttraumatic stress disorder.

test of differences between the 3 groups over time, mixed-effects models were calculated, including all time points and using the data from all 85 participants. The time × treatment interaction was not significant ($F_{6, 227.6} = 1.35$, $P = .24$). Two planned contrast analyses of the time × treatment interaction were calculated to test the hypothesis that narrative exposure therapy was more effective in reducing symptom severity. Narrative exposure therapy was found to be significantly more effective than academic catch-up ($F_{1, 234.1} = 5.21$, $P = .02$) and wait-listing ($F_{1, 228.3} = 5.28$, $P = .02$).

Mean change differences for the secondary measures are reported in Table 3. The mean change differences in functional impairment were –2.15 for narrative exposure therapy vs academic catch-up and –2.63 for narrative exposure therapy vs wait-listing. A mixed-effects model with functioning impairment as outcome revealed a significant time × treatment in-

teraction ($F_{6, 229.3} = 3.16$, $P = .005$). Contrast analyses of the time × treatment interaction indicated a superiority of narrative exposure therapy vs academic catch-up ($F_{1, 235.8} = 7.20$, $P = .008$) and of narrative exposure therapy vs wait-listing ($F_{1, 229.5} = 12.63$, $P < .001$).

Concerning feelings of guilt as secondary outcome, the mean change differences were –1.41 for narrative exposure therapy vs academic catch-up, –3.16 for narrative exposure therapy vs wait-listing, and –1.76 for academic catch-up vs wait-listing. A mixed-effects model showed a significant time × treatment interaction ($F_{6, 223.8} = 3.48$, $P = .003$). Contrasts for the guilt score were $F_{1, 224.5} = 11.20$ ($P < .001$) for narrative exposure therapy vs wait-listing and $F_{1, 230.8} = 1.94$ ($P = .16$) for narrative exposure therapy vs academic catch-up, indicating a superiority of narrative exposure therapy vs wait-listing but no advantage of narrative exposure therapy

vs academic catch-up. The contrast analysis for academic catch-up vs wait-listing did not yield a significant result.

Mixed-effects models with symptoms of depression, suicidal ideation, and stigmatization as outcome variables resulted in nonsignificant time × treatment interactions. Further contrast analyses of the time × treatment interactions did not

Table 1. Sociodemographic Characteristics, Traumatic Event Load, Psychopathology, and Indicators of Functioning by Group (n = 85)

Characteristic	No. (%)			Statistic	P Value
	Narrative Exposure Therapy (n = 29)	Academic Catch-up (n = 28)	Waiting List (n = 28)		
Female sex	16 (55.2)	19 (67.9)	12 (42.9)	LR χ² = 3.58	.17
Age, mean (SD), y	18.66 (3.77)	18.32 (4.30)	18.07 (3.55)	Z = .46[a]	.79
Marital status					
Single	20 (69.0)	22 (78.6)	19 (47.9)		
Married/cohabiting	7 (24.1)	4 (14.3)	9 (32.1)	LR χ² = 10.05	.26
Separated	1 (3.4)	2 (7.1)			
Widowed	1 (3.4)				
Household members, mean (SD)	7.31 (2.85)	8.15 (3.95)	7.88 (4.31)	F = .37	.69
Main source of food					
Agriculture	11 (37.9)	11 (40.7)	9 (34.6)		
Food aid	13 (44.8)	8 (29.6)	10 (38.5)	LR χ² = 2.04	.73
Market	5 (17.2)	8 (29.6)	7 (26.9)		
Economic status per person, mean (SD), €[b]	54.04 (37.95)	47.40 (30.89)	43.38 (27.47)	Z = 1.74[a]	.60
Highest level of education					
No schooling	3 (10.4)	2 (7.1)	2 (7.1)		
Some primary	23 (79.3)	21 (75.0)	20 (71.4)		
Completed primary	1 (3.4)	3 (10.7)	1 (3.6)	LR χ² = 5.09	.75
Vocational training	0	0	1 (3.6)		
Some secondary	2 (6.9)	2 (7.1)	4 (14.3)		
Abduction duration, mo					
Mean (SD)	15.14 (21.35)	7.76 (10.69)	5.69 (9.77)	Z = 2.05[a]	.36
Median (range)	5.00 (0.07-89.00)	2.35 (0.01-36.00)	2.00 (0.02-50.00)		
Event load total (VWAES), mean (SD)[c]	22.21 (4.62)	19.79 (4.65)	21.21 (3.76)	F = 2.21	.12
Experienced	9.21 (1.92)	7.86 (2.52)	8.25 (1.62)	F = 3.27	.04
Witnessed	8.69 (1.31)	8.18 (1.28)	8.79 (1.10)	Z = 4.31[a]	.12
Events with forced perpetration	3 (1.95)	2.61 (1.69)	3.14 (1.53)	Z = 1.30[a]	.52
Severe domestic violence	1.31 (0.89)	1.14 (1.15)	1.04 (1.04)	Z = 1.35[a]	.51
PTSD symptom load (CAPS), mean (SD)[d]	67.03 (14.74)	62.54 (13.87)	63.61 (16.42)	F = .70	.50
Symptoms of depression (MINI)[e]					
Mean (SD)	2.76 (2.87)	2.82 (2.65)	1.71 (1.98)	Z = 2.70[a]	.26
Median (range)	2.00 (0.00-9.00)	2.00 (0.00-9.00)	1.00 (0.00-7.00)		
Functional impairment (CAPS), mean (SD)[d]	6.34 (2.09)	5.71 (2.17)	5.46 (2.56)	F = 1.13	.33
Suicidal ideation (MINI)					
Low (range, 1-5)	1 (3.4)	6 (21.4)	3 (11.1)		
Medium (range, 6-9)	3 (10.4)	1 (3.6)	4 (14.8)	LR χ² = 6.58	.36
High (range, 10-33)	13 (44.8)	11 (39.3)	10 (27.0)		
Guilt (CAPS)[d]					
Mean (SD)	4.00 (4.62)	1.71 (2.83)	2.54 (3.10)	Z = 3.96[a]	.14
Median (range)	2.00 (0.00-15.00)	0.00 (0.00-10.00)	0.00 (0.00-10.00)		
Stigmatization (PSQ), mean (SD)[f]	1.35 (0.90)	1.37 (0.64)	1.28 (0.83)	F = .10	.90
Unfriendly	1.34 (1.21)	1.46 (0.94)	1.33 (1.22)	Z = .67[a]	.71
Hostile/confused	1.35 (0.91)	1.28 (0.57)	1.22 (0.83)	F = .20	.81

Abbreviations: CAPS, Clinician-Administered PTSD Scale; LR, likelihood ratio; MINI, Mini International Neuropsychiatric Interview; PTSD, posttraumatic stress disorder; PSQ, Perceived Stigmatization Questionnaire; VWAES, Violence, War and Abduction Exposure Scale.
[a] Nonparametric Mann-Whitney U-test.
[b] Household possessions weighted by the current local market prices divided by household size.
[c] Overall maximum score, 36. Maximum score for eventload experienced, 15; for eventload witnessed, 11; for eventload events with forced perpetration, 6; for eventload severe domestic violence, 4.
[d] Maximum score for PTSD symptom load, 148; for functional impairment, 12; for guilt, 16.
[e] Maximum score, 9.
[f] Maximum score, 4.

show significant superiority of narrative exposure therapy in comparison to academic catch-up and wait-listing in any of these measures.

Applying the 15-point change in CAPS score threshold for clinically significant change, 20 of 25 participants (80.0%) in the narrative exposure therapy group were found to have improved with regard to PTSD severity. In the academic catch-up and waiting-list conditions, 11 of 23 (47.8%) and 14 of 28 (50.0%), respectively, showed clinically relevant improvement. Subgroup comparisons revealed that improvement was significantly greater in the narrative exposure therapy group vs the academic catch-up group (n=48;

likelihood ratio $\chi_1^2=5.54$; $P=.02$) and the narrative exposure therapy vs the waiting-list groups (n=53; likelihood ratio $\chi_1^2=5.33$; $P=.02$). Clinically relevant aggravation of symptoms according to the threshold for clinically meaningful change was present in 0 of 25 participants in the narrative exposure therapy group, 1 of 23 (4.4%) in the academic catch-up group, and 3 of 28 (10.7%) in the waiting-list group. Subgroup comparisons revealed no significant differences concerning clinically significant worsening of symptoms.

In the narrative exposure therapy group, a larger within-treatment effect size (d=1.80) was seen, with a 51.6% reduction in the PTSD symptom score

from pretreatment assessment to 12-month follow-up compared with the academic catch-up group (d=0.83, 30.9% symptom severity reduction) and the waiting-list group (d=0.81, 30.4% symptom severity reduction). Between-treatment effect sizes were d=0.72 comparing narrative exposure therapy vs academic catch-up and d=0.66 comparing narrative exposure therapy vs wait-listing.

At baseline, all participants were diagnosed with PTSD as assessed by the CAPS using the *DSM-IV* algorithm for PTSD (presence of ≥1 traumatic event, ≥1 symptom of the intrusion cluster, 3 symptoms of the avoidance cluster, 2 symptoms of the hyperarousal cluster,

Table 2. Mean Scores, Mean Change Scores Within Treatment, and Within-Treatment Effect Sizes (Cohen d) of Primary and Secondary Dependent Variables by Group

Variable	Mean (SD)				Change, Mean (SE)[a]	Cohen d, Pretreatment to 12 Months[b]
	Pretreatment Assessment	3 Months	6 Months	12 Months		
Sample size						
Narrative exposure therapy	29	26	26	25		
Academic catch-up	28	24	23	23		
Waiting list	28	28	28	28		
PTSD symptom load (CAPS)[c]						
Narrative exposure therapy	67.03 (14.74)	46.73 (19.24)	43.00 (21.49)	32.44 (22.84)	−32.36 (4.33)	1.80
Academic catch-up	62.54 (13.87)	45.67 (21.53)	45.65 (25.96)	43.22 (30.01)	−18.30 (4.91)	0.83
Waiting list	63.61 (16.42)	52.93 (20.83)	48.61 (23.74)	44.29 (29.56)	−19.32 (5.19)	0.81
Symptoms of depression (MINI)[d]						
Narrative exposure therapy	2.76 (2.87)	3.96 (2.72)	3.08 (2.95)	1.8 (2.18)	−0.52 (.68)	0.38
Academic catch-up	2.82 (2.65)	3.21 (2.86)	3.30 (3.39)	2.22 (2.95)	−0.61 (.53)	0.21
Waiting list	1.71 (1.98)	3.68 (2.86)	3.21 (3.01)	1.75 (2.56)	0.04 (0.48)	−0.02
Functional impairment (CAPS)[c]						
Narrative exposure therapy	6.34 (2.09)	4.27 (2.11)	5.04 (2.66)	2.92 (2.69)	−3.24 (0.65)	1.42
Academic catch-up	5.71 (2.17)	4.33 (2.43)	4.39 (2.89)	4.48 (3.13)	−1.09 (0.57)	0.46
Waiting list	5.46 (2.56)	5.64 (2.15)	4.96 (2.46)	4.86 (3.70)	−0.61 (0.78)	0.19
Suicidal ideation (MINI)[d]						
Narrative exposure therapy	10.90 (11.76)	6.27 (8.55)	4.81 (8.53)	4.16 (7.13)	−7.36 (2.89)	0.69
Academic catch-up	8.32 (10.48)	6.91 (10.32)	4.13 (7.61)	3.35 (7.13)	−4.26 (1.78)	0.55
Waiting list	8.22 (9.06)	3.79 (7.27)	7.04 (9.66)	5.57 (9.45)	−3.15 (2.62)	0.29
Guilt (CAPS)[c]						
Narrative exposure therapy	4.00 (4.62)	1.46 (2.60)	3.19 (3.51)	1.72 (3.06)	−1.84 (0.85)	0.58
Academic catch-up	1.71 (2.83)	2.00 (3.16)	2.17 (3.71)	1.13 (2.30)	−0.43 (0.61)	0.22
Waiting list	2.54 (3.10)	2.50 (3.50)	2.11 (3.38)	3.86 (4.44)	1.32 (0.65)	−0.34
Stigmatization (PSQ)[e]						
Narrative exposure therapy	1.35 (0.90)	0.91 (0.70)	0.59 (52)	0.52 (0.60)	−0.75 (0.19)	1.09
Academic catch-up	1.37 (0.64)	0.87 (0.89)	0.62 (0.70)	0.60 (0.62)	−0.77 (0.16)	1.22
Waiting list	1.28 (0.83)	1.10 (0.88)	0.96 (0.85)	0.86 (0.70)	−0.44 (0.18)	0.55

Abbreviations: CAPS, Clinician-Administered PTSD Scale; MINI, Mini International Neuropsychiatric Interview; PSQ, Perceived Stigmatization Questionnaire; PTSD, posttraumatic stress disorder.
[a] 12-month follow-up−pretreatment, treatment completers only.
[b] Effect sizes were considered large with a d of 0.80 or greater, moderate with a d of 0.50 to 0.79, and small with a d of 0.20 to 0.49. Negative values indicate worsening.
[c] Maximum score for PTSD symptom load, 148; for functional impairment, 12; for guilt, 16.
[d] Maximum score for symptoms of depression, 9; for suicidal ideation, 33.
[e] Maximum score, 4.

symptom duration of $\geq$ 4 weeks, and impairment of functioning). At 12 months, 68.0% of the narrative exposure therapy participants, 52.2% of the academic catch-up participants, and 53.6% of the waiting-list participants no longer fulfilled criteria for PTSD. Differences in diagnostic status between groups were not significant.

Changes in symptoms of depression included a 34.8% reduction of the MINI depression score in the narrative exposure therapy group (d=0.38), a 21.3% decrease in the academic catch-up group (d=0.21), and a 2.3% worsening in the waiting-list group (d=−0.02). Although participants did not differ significantly in pretreatment scores of depression, they did differ in diagnoses of depression. Pretreatment, 24.1% had depression in the narrative exposure therapy group, whereas 32.1% and 7.1% had depression in the academic catch-up and waiting-list groups, respectively (n=85; likelihood ratio χ^2_2=6.14; P=.05). Counting allocated but untreated participants and those with incomplete data as unchanged, cases of depression decreased from 7 to 6 in the narrative exposure therapy group and from 9 to 6 in the academic catch-up group and increased from 2 to 4 in the waiting-list group at 12-month follow-up (n=85; likelihood ratio χ^2_2=0.59; P=.74). Score changes over time, as well as within- and between-treatment effect sizes for the other secondary outcome measures, are reported in Tables 2 and 3.

COMMENT

This randomized controlled trial showed that narrative exposure therapy is an effective treatment for PTSD in former child soldiers. In addition, we demonstrated that narrative exposure therapy can be applied successfully by community-based lay therapists without a mental health or medical background. The effects of narrative exposure therapy can be fully attributed neither to spontaneous recovery nor to unspecific effects, because such therapy was superior to a waiting-list control as well as an academic catch-up program that included elements of psychoeducation and counseling focusing on current problems. Moreover, results indicated that there were additional positive effects of treatment on associated problems not primarily targeted, such as depression, suicidal ideation, feelings of guilt, and important indicators of readjustment such as stigmatization and functioning.

The within-treatment effect size for the primary outcome of PTSD severity (d=1.80) reached a higher value than effect sizes reported in most of the previous trials of narrative exposure therapy,[27-29,33] and it was similar to those reported in trials with refugee children or children exposed to war.[30,31] However, because symptoms declined considerably in all 3 groups over the 1-year period, between-treatment effect sizes were in the medium range.

No negative effects of narrative exposure therapy were observed in this trial. Clinically reliable aggravation of symptoms was not present in the narrative exposure therapy group but was present in 4.4% of the academic catch-up and 10.7% of the waiting-list participants. Twenty of 25 of the former child soldiers who received narrative exposure therapy experienced improvement in PTSD severity, exceeding the threshold of clinically significant change. Smaller improvement rates were found in the academic catch-up (11/23) and waiting-list (14/28) groups.

Table 3. Mean Change Difference Scores and Between-Treatment Effect Sizes (Cohen d) of Primary and Secondary Dependent Variables by Group

Variable	Change Difference, Mean (SE) [95% CI][a]	Cohen d, Pretreatment to 12 Months, Between-Treatment[b]
PTSD symptom load (CAPS)[c]		
Narrative exposure therapy	−14.06 (6.53) [−27.19 to −0.92][d]	0.72[d]
Academic catch-up	1.02 (7.26) [−13.57 to 15.60][e]	−0.03[e]
Waiting list	−13.04 (6.85) [−26.79 to 0.72][f]	0.66[f]
Symptoms of depression (MINI)[g]		
Narrative exposure therapy	0.09 (0.87) [−1.67 to 1.85][d]	0.14[d]
Academic catch-up	−0.64 (0.72) [−2.09 to 0.80][e]	0.30[e]
Waiting list	−0.56 (0.82) [−2.21 to 1.10][f]	0.40[f]
Functional impairment (CAPS)[c]		
Narrative exposure therapy	−2.15 (0.87) [−3.91 to −0.40][d]	0.83[d]
Academic catch-up	−0.48 (0.97) [−2.43 to 1.47][e]	0.22[e]
Waiting list	−2.63 (1.03) [−4.70 to −0.56][f]	0.97[f]
Suicidal ideation (MINI)[g]		
Narrative exposure therapy	−3.10 (3.40) [−9.67 to 3.77][d]	0.12[d]
Academic catch-up	−1.11 (3.17) [−7.50 to 5.27][e]	0.26[e]
Waiting list	−4.21 (3.89) [−12.03 to 3.61][f]	0.42[f]
Guilt (CAPS)[c]		
Narrative exposure therapy	−1.41 (1.07) [−3.55 to 0.74][d]	0.38[d]
Academic catch-up	−1.76 (0.90) [−3.57 to 0.61][e]	0.47[e]
Waiting list	−3.16 (1.06) [−5.29 to −1.04][f]	0.93[f]
Stigmatization (PSQ)[h]		
Narrative exposure therapy	0.02 (0.25) [−0.48 to 0.53][d]	0.11[d]
Academic catch-up	−0.33 (0.25) [−0.83 to 0.17][e]	0.51[e]
Waiting list	−0.31 (0.26) [−0.83 to 0.21][f]	0.60[f]

Abbreviations: CAPS, Clinician-Administered PTSD Scale; CI, confidence interval; MINI, Mini International Neuropsychiatric Interview; PSQ, Perceived Stigmatization Questionnaire; PTSD, posttraumatic stress disorder.
[a]12-month follow-up−pretreatment, treatment completers only; n=25 for narrative exposure therapy, n=23 for academic catch-up, n=28 for waiting list.
[b]Effect sizes were considered large with a d of 0.80 or greater, moderate with a d of 0.50 to 0.79, and small with a d of 0.20 to 0.49.
[c]Maximum score for PTSD symptom load, 148; for functional impairment, 12; for guilt, 16.
[d]Narrative exposure therapy vs academic catch-up. Positive Cohen d values indicate superiority of narrative exposure therapy.
[e]Academic catch-up vs waiting list. Positive Cohen d values indicate superiority of academic catch-up.
[f]Narrative exposure therapy vs waiting list. Positive Cohen d values indicate superiority of narrative exposure therapy.
[g]Maximum score for symptoms of depression, 9; for suicidal ideation, 33.
[h]Maximum score, 4.

In comparison with the waiting-list condition, both active treatments resulted in improvements in the secondary outcome variables, with narrative exposure therapy showing somewhat larger effects than academic catch-up. Narrative exposure therapy was associated with more improvement in functioning, with large within-treatment and between-treatment effect sizes. Improved functioning in social, academic, and occupational domains is of vital importance for the successful readjustment and reintegration of former child soldiers. Almost equal effects of the active treatments were found on depression symptoms, suicidal ideation, and stigmatization.

Guilt has rarely been included as an outcome in research involving former child soldiers. Guilt may be associated with perpetration and surviving among former child soldiers and might play an important role in the development and maintenance of PTSD symptoms.[13] Similar to the 2009 study by Schaal et al,[33] we found the strongest reduction in guilt feelings in the narrative exposure therapy group. Narrative exposure therapy does not specifically target guilt feelings; however, the detailed trauma narration established during the therapy process may facilitate the reappraisal of past events and a restructuring of the cognitive biases that previously promoted feelings of guilt.[47]

Effect sizes indicated a greater reduction of perceived stigmatization in both active-treatment groups compared with the waiting-list control group; however, the difference was not statistically significant. Further studies are needed to identify processes that reliably decrease stigmatization in these communities.

In this study we observed improvements in treated, but also in untreated, individuals. Although rarely discussed, similar improvements of PTSD symptoms in untreated control groups have been previously reported in trials with children[24,48] and adults.[27] Such improvements might be attributed to regression to the mean and spontaneous recovery, as well as to a potentially remediating effect of repeated assessments. Still, the rate of recovery was unusual given that worst events had on average occurred 6.7 years before assessment, an average of 5.6 years had elapsed since the child soldiers' release from captivity, and PTSD symptoms had already persisted for 6.1 years. Some of the recovery in the waiting-list group (and possibly also in the active-treatment groups) might be attributable to a delayed spontaneous remission effect, because the trial took place when Northern Uganda started its transition from the conflict era to the postconflict era. Many participants mentioned that the gradual reduction of trauma reminders and conflict-related stressors (eg, fewer soldiers moving in the streets, fewer radio broadcasts about ambushes by the rebels, less sounds of fighting around the camps at night) alleviated the frequency of their PTSD symptoms. The absence of a multitude of external triggers may have led to a reduction in PTSD symptoms, particularly among individuals with PTSD whose symptoms had been mainly triggered by external rather than internal stimuli.

This trial had some important limitations. When designing the trial, we expected less variation of the primary outcome measure over time in the untreated group than was observed. Cases of PTSD were assumed to be chronic and symptom severities to be more stable, because worst events, as well as release from captivity, had on average taken place more than 5 years before the start of the trial. To investigate possible mechanisms behind this phenomenon, follow-up time points beyond a 1-year period would have been helpful to investigate whether improvements in the waiting-list condition would have remained stable. Additionally, investigations into the longitudinal development of PTSD and related psychopathology in changing political and social contexts such as the transition from a conflict to a postconflict era are required. Further, the trial might have been underpowered to detect significant treatment effects for most of the secondary outcome variables. Larger trials have to be carried out to more thoroughly investigate any possible additional benefits of individual-based, trauma-focused treatment beyond PTSD, including effects on related psychopathology and indicators of readjustment. These trials would benefit from inclusion of more objective assessment methods rather than an exclusive reliance on self-ratings. For example, ratings by significant others, eg, parents, peers, or teachers, could be included as well as more objective indicators of functioning and stigmatization.

Nevertheless, the main strength of this trial is that it was designed to be naturalistic, with broad inclusion criteria, lay personnel from the local communities serving as therapists, and treatments taking place within the communities. This trial replicates previous findings that narrative exposure therapy is effective in the treatment of PTSD in postconflict populations[28,30,33] and when disseminated to and carried out by lay personnel.[27] In addition, this trial included former child soldiers whose PTSD was stemming from experiences as survivors as well as perpetrators, included an active control condition as well as a waiting-list control, and assessed changes in mental health outcomes beyond PTSD. In summary, this trial supported the efficacy of narrative exposure therapy as a disseminable, community-based treatment for PTSD and related functioning impairment in formerly abducted children and youths.

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