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## Research report

## The impact of group counseling on depression, post-traumatic stress and function outcomes: A prospective comparison study in the Peter C. Alderman trauma clinics in northern Uganda

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## ABSTRACT

**Background:** The effectiveness of group interventions for adults with mental distress in post-conflict settings is less clear in sub-Saharan Africa.**Aim:** To assess the impact of group counseling intervention on depression, post-traumatic stress and function outcomes among adults attending the Peter C. Alderman Foundation (PCAF) trauma clinics in northern Uganda.**Methods:** 631 War affected adults were enrolled into PCAF trauma clinics. Using a quasi-experimental design, assessments were conducted at baseline, at 3 and 6 months following initiation of care. Multivariate longitudinal regression models were used to determine change in depression, post-traumatic stress and function scores over time among group counseling participants and non-participants.**Results:** In comparison to non-participants, participants had faster reduction in depression scores during the 6-month follow-up period [ $\beta = -1.84$ , 95%CI (-3.38 to -0.30),  $p = 0.019$ ] and faster reduction in post-traumatic stress scores during the 3-month follow-up period [ $\beta = -2.14$ , 95%CI (-4.21 to -0.10),  $p = 0.042$ ]. At 3-month follow up, participants who attended two or more sessions had faster increase in function scores [ $\beta = 3.51$ , 95%CI (0.61–6.40),  $p = 0.018$ ] than participants who attended only one session.**Limitations:** Selection bias due to the use of non-random samples. Substantial attrition rates and small sample sizes may have resulted in insufficient statistical power to determine meaningful differences.**Conclusion:** The group counseling intervention offered in the PCAF clinics may have considerable mental health benefits over time. There is need for more research to structure, standardize and test the efficacy of this intervention using a randomized controlled trial.

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## 1. Introduction

The burden of depression and post-traumatic stress symptoms in post-conflict settings is a major public health concern worldwide

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(de Jong et al., 2003; Betancourt et al., 2013; Luitel et al., 2013). While several studies have consistently shown a positive association between war-related trauma and post-traumatic stress disorder (PTSD) (Steel et al., 2009), emerging data from prospective evaluations of mental disorders before and after conflicts indicate that depression may be more related to the persisting conditions of poverty and structural adversity than war-related trauma (Kohrt et al., 2012). Regardless of the etiology, both depression and post-traumatic stress are associated with comorbid psychiatric disorders and substance use problems (Norman et al., 2010; Zatzick et al.,

2012) and often are disruptive to social, interpersonal, academic and work functioning (Milenkovic et al., 2013). It is imperative that adequate, empirically supported interventions are available to treat individuals diagnosed with significant levels of these symptoms, and thus prevent progression to full blown psychiatric syndromes.

Population surveys in the northern region of Uganda which experienced two decades of civil wars (1987–2008) indicate high prevalence estimates of both depression and post-traumatic stress symptoms (Roberts et al., 2008; Vinck et al., 2007). In order to enhance mental health service delivery in this post-conflict region, the Ugandan government institutions (Ministry of Health/Butabika National Referral Hospital and the Makerere University Department of Psychiatry) and the Peter C. Alderman Foundation (PCAF) initiated a public–private partnership which led to the establishment of four PCAF trauma clinics in four districts in the region (Nakimuli-Mpungu et al., 2013). Given the evidence that combined pharmacological and psychosocial interventions are optimal for treating mental neurological and substance use (MNS) disorders (Patel and Thornicroft, 2009), the partnership has endeavored to provide routine psychological treatments to individuals initiating care in the trauma clinics. PCAF, the private partner recruits, supports training and provides salary support to social workers and trauma counselors who deliver psychosocial interventions, thereby boosting the numbers of patients receiving both pharmacological and psychosocial treatments.

Group interventions have become increasingly popular for supporting persons affected by chronic illness (Sherman et al., 2004a, 2004b). In Uganda, clinical trials of adapted western psychotherapeutic interventions have focused on the impact of group interpersonal therapy on post-traumatic stress symptoms in highly selective samples of children in post-conflict settings (Bolton et al., 2007; Verdelli et al., 2008) and adults in non-conflict settings respectively (Bolton et al., 2003; Bass et al., 2006). While there is growing evidence that group psychosocial interventions are helpful, the effectiveness of these interventions for adults with depression and post-traumatic stress symptoms in post-conflict setting is less clear especially in sub-Saharan Africa.

In this paper, we describe the evaluation of a group counseling intervention on depression, post-traumatic stress and function outcomes among adults attending the Peter C. Alderman trauma clinics in northern Uganda. Further, we investigated the feasibility of the intervention by assessing participant attendance and adherence to the intervention.

## 2. Methods

### 2.1. Setting and participant recruitment

Between August and December 2011, a cohort of 631 adult men and women with a history of war traumatic experiences was enrolled into four Peter C. Alderman Foundation (PCAF) trauma clinics situated in four districts (Arua, Kitgum, Gulu and Soroti) in northern Uganda. These four districts comprise different ethnic populations (Alur in Arua; Itesots in Soroti; and Luo in Gulu and Kitgim). They form part of a post-conflict northern region of Uganda that has endured more than two decades of brutal civil wars.

Individuals enrolled in PCAF trauma clinics receive a baseline assessment which includes obtaining demographic information and exposure to traumatic events, conducting a full clinical assessment including a structured psychiatric interview based on DSM-IV criteria, mental state examination and a general medical examination. Depending on need, social and psychological assessments are made by the social worker and trauma counselor respectively. The PCAF team reviews the entire evaluation and determines therapy. Individuals are invited to participate in

various forms of counseling (individual, family and group) and psychotropic medications are prescribed if needed. In addition, home visits are made by the social workers where appropriate.

Use of patient data from this prospective evaluation of patients for research was approved by the Makerere University College of Health Sciences Research Ethics Committee and the Uganda National Council of Science and Technology. Given that it was impracticable to obtain informed consent for all service users receiving routine mental health care, that the research posed minimal risk, that the rights or interests of the patients would not be violated, and that their privacy and confidentiality or anonymity would be assured, both institutions waived the requirement of a signed consent form.

### 2.2. The group counseling intervention

The structure of the group counseling intervention has been evolving over the past 6 years as the PCAF staff gained more skills in psychological management of war traumatized individuals through annual training workshops organized by PCAF. It is yet to be manualized and standardized across the four trauma clinics. Currently, the domains of the group counseling intervention are based on common problems observed in the clinic population including high trauma load, lack of knowledge about the precipitants, presentation and consequences of untreated common mental disorders, lack of coping skills and high prevalence rates of sexual risk behavior and HIV infection.

Generally, group counseling sessions are held monthly and may comprise five sessions. In the first session participants share trauma stories, and in the next two sessions, participants are taught relaxation techniques, positive coping skills and negative coping is discussed. In the fourth session the participants receive psycho-education on the common mental health problems in the community so as to encourage medication compliance and promote relapse prevention. Also, pre-test and post-test voluntary counseling and testing for HIV/AIDS is done. In the last session participants share stories of beneficial outcomes resulting from group counseling.

The order in which sessions are conducted and duration of sessions vary from clinic to clinic. The sessions are facilitated by the trauma counselor and/or the social worker. Both facilitators have received training in basic principles and practices of group counseling. The group composition may be homogeneous—for example, a group of women who have suffered sexual violence or heterogeneous—a group of adult men and women with various mental health problems.

## 3. Study measures

### 3.1. Exposure variable

The main exposure variable was participation in at least one session of group counseling. The variable was dichotomized as “participation in group counseling versus non-participation in group counseling”.

### 3.2. Covariates

A standardized structured questionnaire administered in the local language of each clinic population was used to collect data on a number of covariates in one-on-one, face-to face interviews.

#### 3.2.1. Socio-demographic variables

Socio-demographic variables were assessed using a standardized demographic questionnaire. The questionnaire asked about

descriptive information including age, gender, and employment status. Age in years was dichotomized into “less than 30 years versus 30 years and older”. Employment status was categorized into “unemployed versus employed versus peasant farmer”. Marital status was categorized into “single versus married versus previously married (divorced, separated or widowed)”.

### 3.2.2. Vulnerability groups

Among various vulnerabilities, we examined whether an individual was formerly abducted (Yes or No); was a former combatant (Yes or No); experienced sexual violence (Yes or No); experienced domestic violence (Yes or No); lived in an internally displaced camp (Yes or No).

### 3.2.3. Trauma events

War traumatic experiences were assessed using a locally developed 16-item trauma event checklist. Participants were asked whether they had experienced a given traumatic event or not. The trauma event checklist included items such as, “Has the patient been forced to torture others? Has the patient witnessed torture/killing of another person? Has the patient been forced to kill?” A variable indicating the number of traumatic events experienced by an individual was created and categorized as “less than three trauma events versus 3–6 trauma events versus more than 6 trauma events”.

### 3.2.4. HIV serostatus

Individuals were asked if they were aware of their HIV status. For those patients whose HIV serostatus was not known, pre-test counseling was given before HIV serology was done.

### 3.2.5. Clinical variables

Clinical diagnoses, pharmacological and psychotherapeutic interventions were recorded in a clinical data form for each individual enrolled in a PCAF clinic. Variables indicating the presence or absence of a given clinical diagnosis, psychotropic medication and psychotherapeutic intervention were created.

### 3.2.6. Social worker home visits and use of traditional or faith healers

We asked individuals enrolled in PCAF trauma clinics to report whether they were concurrently receiving spiritual healing sessions from either a traditional healer or faith healer (Yes or No). Additionally, we noted whether individuals received social worker home visits (Yes or No).

## 3.3. Outcome variables

### 3.3.1. Depression symptoms

Depression symptoms were assessed using the self-reporting questionnaire (SRQ-20). The SRQ-20 has been successfully translated into at least 20 languages in several developing countries, with acceptable measures of reliability and validity (WHO, 1994). The SRQ-20 has been adapted and validated among individuals enrolled in the PCAF clinic. In this study population, the measure attained a reliability coefficient (Cronbach  $\alpha$ ) of 0.97.

### 3.3.2. Post-traumatic stress symptoms

Post-traumatic stress symptoms were assessed using the locally adapted Harvard Trauma Questionnaire (HTQ). It has been successfully translated into several languages, with acceptable measures of reliability and validity (Mollica et al., 2004). In this study population, the measure attained a reliability coefficient (Cronbach  $\alpha$ ) of 0.95.

### 3.3.3. Functioning level

Functioning levels of individuals enrolled in PCAF clinics were assessed using a locally-developed function assessment instrument (Nakimuli-Mpungu et al., 2012). Items were derived from qualitative interviews with individuals and their caregivers who were attending PCAF trauma clinics about their expectations regarding function outcomes. A five-item function assessment tool was piloted and field tested among 514 individuals randomly recruited from four PCAF clinics. The overall Cronbach's  $\alpha$  across the four clinic populations (Gulu, Kitgum, Soroti, and Arua) was 0.71. Work functioning and social functioning were the two factors of the assessment tool that were identified by principal component analysis. In each domain the respondent indicates their ability to perform a given task. Answers are coded on a three-point scale in which the responses were ‘No, I am not able’ (0), ‘Yes, but not like before’ (1), and ‘Yes, I am able to...’ (2).

## 3.4. Statistical analyses

Patient data was entered into an EPIDATA database and analyzed using STATA statistical software (v 10; Stata Corp, College Station, TX). Analyses were conducted in four stages. First, we conducted bivariate analyses using simple logistic regression models to compare baseline demographic, clinical and treatment variables between individuals who participated in group counseling in addition to receiving other interventions in the PCAF program (GC participants) and those who received PCAF program interventions without participating in group counseling (GC non-participants). Multivariate logistic regressions were used to determine variables independently associated with group counseling participation.

Second, we used multivariate longitudinal regression models to examine the effects of group counseling participation and other PCAF program interventions on depression, post-traumatic stress and functional outcomes measured across three time periods (baseline, 3-month and 6-month). In these models, we used the generalized estimating equation analysis to account for correlated repeated measures within subjects, assuming a normal distribution for the mean function scores, and a binomial distribution for the dichotomous outcomes of elevated depressive and post-traumatic stress symptoms.

Three separate models were analyzed in which the dependent variables were change in depression symptom scores, change in post-traumatic stress scores and change in function scores across the three study assessments. In each model, the independent variables included group counseling participation status (representing whether there is a group difference in the dependent variable at baseline), time (ordinal variable representing the change in the dependent variable for each additional unit of time [i.e., 3 months] over the three periods, and which is attributed to mental health interventions offered in the PCAF program), and the interaction of group counseling status by time (represents the additional change in the dependent variable with each additional unit of time among group counseling participants relative to non-participants). Covariates that were added to the model included patient baseline demographic, clinical and treatment characteristics that were independently associated with group counseling participation at baseline (age, marital status traumatic experiences such as being abducted, exposure to sexual violence, living in internally displaced camps, use of other psychotherapeutic interventions, HIV sero-status and baseline function scores).

Third, we tested whether attrition was random or non-random by computing the predicted probability of attrition in which the dependent variable takes the value of one for individuals who dropped out of the sample after 3 months and zero otherwise. Explanatory variables were all baseline variables that could potentially affect the outcome variable of interest.

Given that the standard tests indicated that attrition for the three separate models was non-random, we proceeded to calculate inverse probability weights for each model. All multivariate longitudinal regression models included attrition weights to account for attrition bias.

Fourth, we assessed the impact of attendance of group counseling on the rate of change in outcome variables over the initial 3-month follow up period.

## 4. Results

### 4.1. Sample characteristics at baseline

The baseline sample consisted of 613 adult men and women enrolled across four PCAF clinics in northern Uganda. One hundred and one (27%) were enrolled from Gulu, 113 (30%) from Kitgum, 64

(17%) from Arua and 97 (26%) from Soroti. Sixty-nine (11%) voluntarily accepted to participate in the group counseling intervention baseline characteristics of the total sample, the group counseling participants and non-participants subgroups, are listed in Table 1 which also illustrates variables associated with group counseling participation in the unadjusted analyses.

Results from multivariate analysis indicate that compared with the non-participants group, the group counseling participants had higher depression symptom scores [OR=2.66, 95%CI (1.10–6.70)], and higher function scores [OR=3.60, 95%CI (1.88–6.80)], were younger (less than 30 years) [OR=2.40, 95%CI (1.15–4.76)], more likely to be widowed, divorced or separated [OR=1.70, 95%CI (1.10–2.66)], more likely to have been exposed to traumatic experiences including abduction [OR=3.20, 95%CI (1.69–6.02)], sexual violence [OR=2.35, 95%CI (1.24–4.45)], and residing in internally displaced people's (IDP) camps [OR=2.40, 95%CI (1.10–5.23)]. These factors associated with group counseling

**Table 1**

Demographic and clinical profiles of PCAF program participants by group counseling (GC) participation (N=613).

Characteristics	Total N=613 N (%)	GC participants N=69 N (%)	GC non-participants N=544 N (%)	Unadjusted OR (95%CI)
Age > 30 years	348 (56.77)	33 (47.83)	315 (57.9)	0.67 (0.4–1.1)
Males	261 (42.58)	29 (42.03)	232 (42.65)	0.98 (0.59–1.62)
<b>Marital status</b>				
Single	194 (31.65)	25 (36.23)	169 (31.07)	
Married	266 (43.39)	23 (33.33)	243 (44.67)	0.64 (0.35–1.17)
Divorced/separated/widowed	153 (24.96)	21 (30.43)	132 (24.26)	0.08 (0.58–2)
<b>Employment status</b>				
Unemployed	110 (17.94)	14 (20.29)	96 (17.65)	
Employed	190 (31)	26 (37.68)	164 (30.15)	1.09 (0.54–2.18)
Peasant farmers	313 (51.06)	29 (42.03)	284 (52.21)	0.7 (0.36–1.38)
<b>Vulnerable groups</b>				
Formerly abducted	226 (36.87)	44 (63.77)	182 (33.46)	3.5 (2.07–5.9) **
Victim of domestic violence	233 (38.01)	39 (56.52)	194 (35.66)	2.35 (1.41–3.89) **
Suffered sexual violence	136 (22.19)	32 (46.38)	104 (19.14)	3.66 (2.18–6.15) **
Living in an IDP camp	412 (67.21)	57 (82.61)	355 (65.26)	2.53 (1.32–4.83) **
Former combatants	77 (12.56)	18 (26.09)	59 (10.85)	2.9 (1.59–5.29) **
HIV infection	139 (22.68)	10 (14.49)	129 (23.71)	0.55 (0.27–1.09) *
<b>No. of traumatic events experienced</b>				
≤3	243 (39.64)	19 (27.54)	224 (41.18)	
4–6	225 (36.7)	17 (24.64)	208 (38.24)	0.55 (0.22–1.38)
> 6	145 (23.65)	33 (47.83)	112 (20.59)	0.75 (0.24–2.33)
<b>Clinical diagnoses</b>				
Depression	362 (59.05)	44 (63.77)	318 (58.46)	1.25 (0.74–2.1)
Epilepsy	87 (14.19)	12 (17.89)	75 (13.79)	1.32 (0.67–2.57)
PTSD	404 (65.91)	59 (85.91)	345 (63.42)	3.4 (1.7–6.8) **
Alcohol/substance use disorders	76 (12.4)	5 (7.25)	71 (13.05)	0.52 (0.2–1.34)
Non-lethal suicidal behavior	20 (3.26)	2 (2.9)	18 (3.31)	0.87 (0.19–3.84)
Bipolar disorder	26 (4.28)	3 (4.48)	23 (4.25)	1.06 (0.31–3.62)
Schizophrenia	17 (2.8)	1 (1.49)	16 (2.96)	0.49 (0.06–3.81)
Other psychotic disorders <sup>a</sup>	54 (8.81)	7 (10.14)	47 (8.64)	0.98 (0.45–2.15)
Other mental disorders <sup>b</sup>	72 (11.75)	8 (11.59)	64 (11.76)	1.19 (0.52–2.76)
<b>Other psychosocial interventions</b>				
Individual counseling	547 (89.23)	61 (88.91)	486 (89.34)	0.91 (0.12–3.80)
Family counseling	170 (27.73)	19 (27.54)	151 (27.76)	0.95 (0.22–4.12)
Spiritual healing	141 (23)	15 (21.74)	126 (23.16)	0.87 (0.13–3.62)
Received social worker home visits	107 (17.46)	26 (37.68)	81 (14.89)	3.90(1.22–6.80) **
<b>Psychotropic medications</b>				
Anti-psychotics	137 (22.35)	13 (18.84)	124 (22.79)	0.79 (0.42–1.48)
Antidepressants	453 (73.9)	62 (89.86)	391 (71.88)	3.47 (1.55–7.74) **
Benzodiazepines	68 (11.09)	5 (7.25)	63 (11.58)	0.59 (0.23–1.54)
Anti-convulsants	23 (3.75)	2 (2.9)	21 (3.86)	0.74 (0.17–3.24)
2 or more psychotropic medications	21 (3.43)	3 (4.35)	18 (3.31)	1.29 (0.37–4.15)

<sup>a</sup> Includes organic psychosis, paranoid psychosis, post-partum psychosis.

<sup>b</sup> Includes somatoform disorders, insomnia, bereavement and other anxiety disorders such as generalized anxiety, panic anxiety.

\*\* p-Value≤0.05.

\* 0.05 < p-Value < 0.10.

**Table 2**  
Longitudinal analysis of depression symptom scores, post-traumatic stress symptom scores and functioning scores over time.

Characteristics	Depression symptom scores		Post-traumatic stress symptom scores		Functioning scores	
	$\beta$ Coefficient	SE	$\beta$ Coefficient	SE	$\beta$ Coefficient	SE
Intercept	8.80	0.66**	26.22	1.52**	0.83	0.39**
Group counseling	1.61	0.84**	1.43	1.48	1.25	0.39**
Age > 30 years	-0.02	0.45	0.2	0.99	-0.45	0.28
Previously married	1.91	0.63**	1.81	1.32	-0.41	0.39
Formerly abducted	0.66	0.39**	2.90	0.85**	-0.12	0.24
Suffered sexual violence	0.54	0.45**	3.75	1.01**	-0.28	0.28
Living in an IDP camp	0.78	0.41**	1.01	1.00	-0.30	0.34
HIV positive	0.51	0.43	-1.41	0.94	-0.25	0.31
Baseline functioning scores $\geq 8$	-1.21	0.38**	-3.01	0.89**	-	-
Received social worker home visits	0.35	0.51	1.44	1.38	0.40	0.34
<b>Slope terms</b>						
Overall change in outcome in 3 months	-3.78	0.28**	-6.68	0.55**	1.46	0.19**
Overall change in outcome in 6 months	-6.45	0.38**	-9.52	0.73**	2.88	0.52**
Difference in slope for GC in 3 months	-2.52	0.81**	-2.15	1.05**	-0.46	0.52
Difference in slope for GC in 6 months	-2.44	0.82**	-3.50	1.86	-0.66	1.20

\*\*  $p$ -Values  $\leq 0.05$ .

participation in multivariate logistic regression models were adjusted for in multivariate longitudinal regression models assessing the impact of group counseling on depression, post-traumatic stress and function outcomes (Table 2). Medication use including anti-depressant use and all clinical diagnoses were not associated with group counseling participation in multivariate logistic regression analyses.

#### 4.2. Loss to follow-up

Attrition was substantial but similar across the two groups, with 44% and 40% of the group counseling participants and non-participants, respectively, completing 6 month assessments. Compared with completers, study dropout rates were higher among males than females [ $\beta = 0.51$ , 95%CI (0.15–0.87,  $p = 0.005$ )]; lower among those with a telephone contact than those without [ $\beta = -0.74.03$ , 95%CI (-1.10 to -0.40),  $p < 0.001$ ]; higher among those using mono-therapy (medication only or counseling only) than those using combination therapy [ $\beta = 1.28$ , 95%CI (0.38–2.18),  $p = 0.005$ ]; lower among the employed than the unemployed [ $\beta = -0.45$ , 95%CI (-0.86 to -0.04),  $p < 0.001$ ]; and higher among those who reported concurrent use of traditional or faith healing practices than those who did not [ $\beta = 0.55$ , 95%CI (0.03–1.12),  $p < 0.06$ ] for all three outcome variables.

#### 4.3. Impact of group counseling on depression symptoms, post-traumatic stress symptoms and functioning levels

Group counseling participants had significantly higher depression symptom scores at baseline than non-participants [ $\beta = 1.42$ , SE=0.68,  $p = 0.037$ ]. Although the sample as a whole had a significant decrease in depression symptom scores both at three months [ $\beta = -3.71$ , SE=0.26,  $p < 0.0001$ ] and at 6 months [ $\beta = -6.68$ , SE=0.36,  $p < 0.0001$ ], the rate of reduction in depression symptom scores was greater among the group counseling participants than non-participants both at 3 months [ $\beta = -2.34$ , SE=0.67,  $p < 0.0001$ ] and at 6 months [ $\beta = -1.84$ , SE=0.82,  $p = 0.019$ ] as shown in Fig. 1a.

Both group counseling participants and non-participants had comparable post-traumatic stress symptoms at baseline. Although the sample as a whole had a significant decrease in post-traumatic stress symptom scores both at 3 months [ $\beta = -6.82$ , SE=0.46,

$p < 0.0001$ ] and at 6 months [ $\beta = -9.76$ , SE=0.74,  $p < 0.0001$ ], the rate of reduction in post-traumatic stress symptom scores was significantly greater among the group counseling participants than non-participants at 3 months [ $\beta = -2.14$ , SE=1.06,  $p = 0.042$ ] but was comparable between the two groups at 6 months [ $\beta = -2.04$ , SE=1.84,  $p = 0.265$ ] as shown in Fig. 1b.

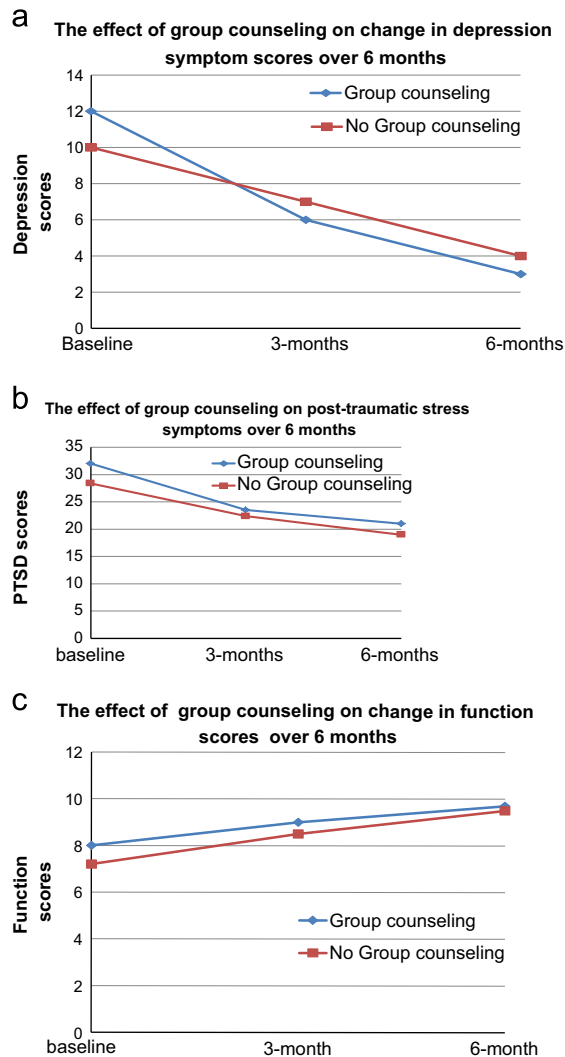
Group counseling participants had significantly higher functioning scores at baseline than non-participants [ $\beta = 0.58$ , SE=0.22,  $p = 0.008$ ]. The sample as a whole had a significant increase in function scores both at 3 months [ $\beta = 1.21$ , SE=0.16,  $p < 0.0001$ ] and at 6 months [ $\beta = 2.06$ , SE=0.18,  $p < 0.0001$ ]. Fig. 1c illustrates that the rapid increase in functioning scores among non-participants resulted in comparable function scores at 6-month follow-up between the two groups.

#### 4.4. Impact of group counseling attendance on outcome variables

On average, individuals attending PCAF trauma clinics attended two sessions (mean=2.0; SD=1.35). Thirty-one (52%) of these attended two or more group counseling sessions (high attendance group) while 29 (48%) attended only one session (low attendance group). Baseline depression symptoms, post-traumatic stress symptoms and functioning levels were comparable among the two groups. Given that the group counseling sessions were conducted monthly and the average attendance was only two sessions, we assessed the impact of attendance on outcomes over a 3-month follow up period. The interaction of time and attendance group status was significant for the outcomes of post-traumatic stress and functioning levels, indicating that, in comparison to the low attendance group, the high attendance group had a significantly higher rate of reduction in post-traumatic stress symptoms [ $\beta = -1.76$ , 95%CI (-3.50 to -0.02),  $p = 0.04$ ] and a higher rate of increase in functioning levels [ $\beta = 3.51$ , 95%CI (0.61–6.40),  $p = 0.02$ ]. The rate of reduction in depression symptoms was comparable among the two groups [ $\beta = -0.47$ , 95%CI (-2.20 to 1.26),  $p = 0.59$ ]

## 5. Discussion

Although the group counseling intervention described is neither manualized nor standardized across the four trauma



**Fig. 1.** (a) Change in depression scores over 6 months among group counseling participants versus non-participants attending the four PCAF trauma clinics in northern Uganda. (b) Change in post-traumatic stress symptom scores over 6 months among group counseling participants versus non-participants attending the four PCAF trauma clinics in northern Uganda. (c) Change in function scores over 6 months among group counseling participants versus non-participants attending the four PCAF trauma clinics in northern Uganda.

clinics, the results of this evaluation indicate that group counseling for traumatized adults with mental disorders who are currently being treated with medication is feasible and potentially effective in relieving mental distress. In comparison to non-participants, participants had significant faster reduction in depression scores during both follow-up periods and significant faster reduction in post-traumatic stress scores during the 3-month follow-up period. At 3-month follow up, participants who attended two or more sessions had significant faster reduction in post-traumatic stress scores and increase in function scores than participants who attended only one session.

These results are in keeping with what other researchers have reported about the effects of group psychosocial interventions on depression. A recent systematic review and meta-analysis of twenty three studies that evaluated the efficacy of group-based psychological therapies for depression in primary care and the community indicated that group cognitive behavioral therapies conferred benefit for individuals who were clinically depressed over that of usual care alone (Huntley et al., 2012). Other systematic reviews which have examined the effectiveness of

psychosocial interventions for HIV positive populations have shown that they are effective in not only reducing depression and anxiety symptoms but also improving coping skills and quality of life (Crepaz et al., 2008; Himelhoch et al., 2007; Scott-Sheldon et al., 2008).

The potential effectiveness of group counseling in this post-conflict population is an important finding. Given the large numbers of patients seen in health centers and the limited number of health workers especially mental health workers, this intervention would be a great cost-effective approach to deal with emotional problems among individuals living with MNS disorders. Although medication has typically been the standard and most effective treatment for MNS disorders, results from this study are in keeping with research findings which show that individuals taking medical treatments for MNS still benefit from psychosocial interventions (Otto et al., 2005). Additionally, this study supports the feasibility of such additional treatment as indicated by the finding that more than half of those who chose to participate in group counseling completed two or more sessions.

To our knowledge, this is the first study to report on the effects of a group counseling intervention on depression and post-traumatic stress symptoms as well as functioning among adults with MNS disorders in a post-conflict setting in sub-Saharan Africa. Other published group counseling treatment models for individuals with mental illness have focused on HIV positive women and have shown improvements in HIV disclosure rates (Mundell et al. 2011) and depression symptoms (Kaaya et al., in press). Our group counseling intervention was offered to both HIV positive and negative men and women. Furthermore, in this study, there were no exclusion criteria. Consequently, individuals with comorbid diagnoses such as bipolar disorder, schizophrenia, epilepsy and alcohol and substance use were part of the study population. Its main components aimed at enhancing ability to process past traumatic events and enhancing positive coping skills to improve mood symptoms and functioning.

This study has substantial limitations worth noting. First, as the study sample consisted of only individuals from selected districts in northern Uganda, we cannot generalize our findings to other post-conflict areas in Uganda or other sub-Saharan developing countries. Thus, the results should be replicated in other post-conflict populations. Second, our analyses are potentially affected by selection bias given the use of non-random samples and the fact that the PCAF staff that collected data also facilitated counseling sessions. Third, the small sample size of group counseling participants coupled with high attrition rates may have limited power to detect statistically significant differences especially in functioning at 6-months follow-up. Further, the small sample size could not allow for sub-group analysis in which we would compare the effect of group counseling in different sub-populations such as former child soldiers, victims of sexual and domestic violence, former abductees and HIV positive individuals. Lastly, the fact that the study population included individuals with various MNS disorders instead of, for example of focusing on depression or post-traumatic stress disorder, limits the specificity of our findings.

Despite these limitations, our study has important implications for mental health interventions for MNS disorders among individuals in post-conflict settings in sub-Saharan Africa. First, there is a need to develop structured and manualized group psychosocial interventions within the context of the local population characteristics, culture and preferences which can be used to treat and, potentially, prevent depression and post-traumatic stress symptoms. Developing such interventions in consultation with the local community and within the existing government health structures would enhance community and health worker sense of ownership of these interventions and facilitate the roll out of the interventions.

Future studies should include randomized control trials with larger samples to evaluate the efficacy of locally developed psychosocial interventions for individuals in post-conflict regions. Additionally, manualized interventions should be developed for and tested with specific vulnerable sub-populations including former child soldiers, victims of sexual and domestic violence, and HIV positive populations who have a higher risk of developing mental health problems. For example, in order to address the need for psychosocial interventions with specific vulnerable sub-populations, we have developed and are currently testing a culturally sensitive standardized group support psychotherapy model to treat and prevent depression in HIV positive individuals in a post-conflict setting. Lastly, mental health education for communities must be scaled up to enhance early diagnosis and early uptake of interventions.

In conclusion the group counseling intervention offered in the PCAF trauma clinics is feasible and potentially effective in alleviating depression and post-traumatic stress symptoms as well as improving functioning.

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#### Conflict of interest

SM is a paid consultant to the Peter C. Alderman Foundation. All other authors have declared that no competing interests exist. SA is the co-founder of the Peter C. Alderman Foundation. JSA is son to SA and brother to Peter C. Alderman.

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