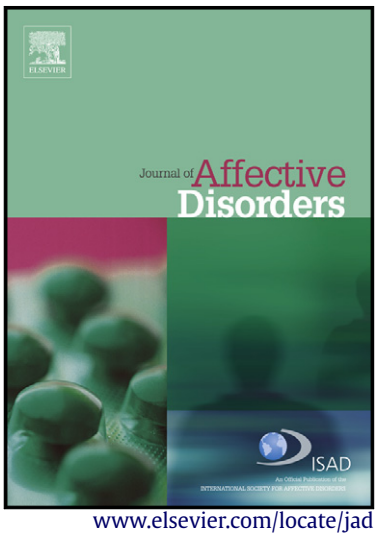

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PII: S0165-0327(14)00277-8
DOI: http://dx.doi.org/10.1016/j.jad.2014.05.005
Reference: JAD6750

To appear in: *Journal of Affective Disorders*

Received date: 4 December 2013
Revised date: 26 March 2014
Accepted date: 2 May 2014

Cite this article as: Etheldreda Nakimuli-Mpungu, Kizito Wamala, James Okello, Stephen Alderman, Raymond Odokonyero, Seggane Musisi, Ramin Mojtabai, Edward J. Mills, Outcomes, feasibility and acceptability of a group support psychotherapeutic intervention for depressed HIV affected Ugandan adults: A pilot study, *Journal of Affective Disorders,* http://dx.doi.org/10.1016/j.jad.2014.05.005

Title

Outcomes, feasibility and acceptability of a group support psychotherapeutic intervention for depressed HIV affected Ugandan adults: A pilot study

Authors

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Abstract:

Background: Psychotherapy is the recommended first line treatment for mild to moderate depression. However, its availability in low resource settings is limited. We developed a manualized culturally sensitive group support psychotherapeutic intervention for depressed HIV affected Ugandan adults. In this study, we aimed to assess its feasibility, acceptability and impact on depression, functioning, social support and self-esteem.

Methods: A total of 77 depressed individuals were assigned to the group intervention (n =48) and a wait-list control group (n = 29), and assessed before, during and at the end of the intervention. The self-reporting questionnaire, a locally relevant function assessment instrument, the Rosenberg self-esteem scale, and the multiple dimensions perceived social support scale were administered to assess depression symptoms, functioning, self-esteem and social support at three assessment periods. Multivariate longitudinal regression models were used to determine change in outcomes over time between the two groups. Participants were asked to evaluate the intervention.

Results: Post –intervention assessments indicate that, in comparison to the wait-list control group, the intervention group had a faster reduction in depression symptom scores [OR=0.00,95% CI, 0.00 to 0.003] and faster increase in functioning scores [OR=4.82, 95%CI, 2.39 to 9.75, social support scores [OR=2.68, 95% CI, 1.50 to 4.78] and self-esteem [OR=1.90, 95% CI 1.48 to 2.44]. Sixty-three percent of participants strongly agreed that the intervention had reduced their depression and would recommend it to other depressed individuals.

Limitations: Inadequate study power due to small sample sizes may result in imprecise confidence intervals even when there are significant differences. The use of non-random samples could have resulted in selection bias.

Conclusions: This intervention appears feasible, acceptable and promising in treating depression and restoring function, enhancing social support and self-esteem. Larger and randomized evaluations are warranted.

Key words: Group support psychotherapy; HIV/AIDS; Depression; Function; Social support ; Self-esteem; northern Uganda

Introduction

Conflict and post conflict settings not only bear the burden of psychological effects of war but are increasingly challenged by the HIV/AIDS epidemic (Hanson et al., 2008). For example, HIV infection rates in post-conflict northern Uganda are estimated at 13% which is almost twice the national HIV infection rate of 7 % (UNAIDS 2012). Among war-affected individuals receiving care from the Peter C. Alderman trauma clinics in northern Uganda, HIV infection rates range from 10% among children to 15% among adults (Nakimuli-Mpungu et al., 2013b) . Given the well documented associations between HIV/AIDS and mental health(Collins et al., 2006;Nakimuli-Mpungu et al., 2011), there is an urgent need for mental health interventions to address psychological sequel of HIV/AIDS including depression without increasing the burden of medications in these conflict-affected populations.

The World health Organization recommends psychotherapy as the first line treatment for mild to moderate depression in primary care settings (WHO, 2010). However, the vast majority of individuals who need these treatments in low resource settings do not have access to them(Patel et al., 2011b) Further, it was observed that individual counseling interventions may not be the best way to deal with the way HIV/AIDS disrupts the social fabric of communities (UNAIDS/WHO, 2004). Given that the majority of African cultures view their communities as an extension of themselves, decision-making processes or interventions that involve the community are more likely to enhance the acceptability and ownership of these interventions.(Haegert, 2000;Patterson, 1999). Other researchers have reported that group interventions offered a better form of support for those with HIV, even better than the support provided by friends and family (Balmer, 1994).

Randomized controlled trials of adapted "western" psychological treatments in developing countries have shown significant mental health benefits when compared with usual care (Bass et al., 2013a; Bolton et al., 2003). However, access to these evidence based treatments has been impeded by a lack of skilled human resources and the acceptability of treatments across cultures (Patel et al., 2011b) . In our work with war affected individuals receiving care in the Peter C Alderman Foundation (PCAF) trauma clinics, we have observed that individuals initiating care in these clinics who opted for group counseling had better clinical outcomes than participants who opted for individual or other forms of counseling. Group counseling participants were significantly more likely to have faster reduction in depression and post-traumatic symptoms and faster increase in functioning especially if they attended three or more sessions of group counseling (Nakimuli-Mpungu et al., 2013b).

Studies in other populations have revealed that interventions that not only focus on psychopathology but also on the more favorable characteristics such as social support and enhanced self-image may boost acceptability of such interventions (Schaie, 1993). Studies reveal that individuals with high self-esteem are less likely to have depression than those with low self-esteem (Nima et al., 2013) Social support is postulated to alter cognitions, attitudes, self-attributions, and coping, which, in turn, leads to a reduction in depressive symptoms (Lloyd & Brugha, 1995). These observations prompted us to develop a culturally sensitive group support psychotherapy intervention that would not only be effective in treating depression but also enhance social support and self-esteem among HIV affected adults in northern Uganda (Nakimuli-Mpungu et al., 2014 in Press).

In this paper, we describe a pilot cohort study wherein we aimed to further train the intervention facilitators, fine-tune the intervention manual and to refine recruitment and

treatment procedures. Additionally, we sought to evaluate feasibility, acceptability and whether the intervention had an impact on not only depression and functioning but also social support and self-esteem among HIV affected adults in northern Uganda. In comparison to non-participants, we hypothesized that participation in the intervention would significantly increase functioning, self-esteem, social support, as well as decrease levels of depression.

Methods

Study Setting

Our pilot study was conducted at the Gulu and Kitgum Peter C Alderman Foundation (PCAF) trauma clinics and their rural outreach centers - Mucwini health center III and Namukora health center IV. The two trauma clinics are situated in the Gulu and Kitgum districts, have the same ethnic population and form part of the post-conflict northern region of Uganda that endured more than two decades of brutal civil wars. The PCAF trauma clinics have a functioning infrastructure, culturally adapted monitoring and evaluation tools, and an established relationship with the community, thus providing a logistically sound and cost-effective platform for this pilot study (Nakimuli-Mpungu et al., 2013a)

Participant recruitment

During the month of June 2013, psychiatric Clinical Officers (COs) and psychiatric nurses working with the two PCAF trauma clinics identified patients with major depression through their day to day clinical activities at the outreach centers. Patients were eligible to participate if they were 18 years of age or older, receiving mental health care at PCAF trauma clinics and outreach centers. They were excluded from the study if they were acutely intoxicated and psychotic to the extent that they were unable to provide informed consent to participate.

Patients were initially screened for depression symptoms with the self-reporting questionnaire. Those who attained a score of 6 or more symptoms were assessed with the Mini-International Neuropsychiatric Interview (MINI) major depression module to diagnose major depression. Individuals diagnosed with major depression were informed about an eight-session group support psychotherapeutic intervention that had been developed within their culture and local preferences of their community (Nakimuli-Mpungu et al., 2014 In Press). They were informed that they could participate in intervention sessions weekly and learn coping skills to reduce and prevent depression symptoms as well as skills to enhance social support and their self-image.

Those interested in participating in the intervention were invited to return for a meeting with study investigators in two weeks' time. At the meeting, the purpose, design, and procedures of the pilot study were explained and written informed consent was obtained prior to administering study questionnaires for the baseline assessment. All individuals who attended the meeting wanted to participate in the intervention. Consequently, they were assigned to the intervention and a wait-list control group. HIV positive individuals with high depression scores (SRQ scores > 10) were given first priority to participate in the intervention. Other participants were selected on a "first come, first serve basis). Anti-depressant use was not restricted among study participants. Study assessments were conducted before, during and at the end of the intervention; the waiting –list group was assessed before, during and after a waiting period of 8 weeks. Figure 1 shows the flow of study participants in this pilot study. We placed no restrictions on the treatment options for patients assigned to the waiting –list. They could be referred for counseling, or to secondary care, when such treatment was clinically appropriate. The study was approved by both the Makerere University College of Health Sciences Research Ethics

Committee and the Uganda National Council of Science and Technology (UNSCT). All study participants provided written informed consent. Light refreshments were served to all participants during baseline and follow-up assessments. Each participant received an equivalent of $2-$5 US dollars to defray transport costs.

The Intervention

Developing this intervention involved the review of the pre-existing group counseling conducted in the PCAF trauma clinics (Nakimuli-Mpungu et al., 2013a) and conducting focus group discussions with community members to identify community perceptions of depression, local strategies used to deal with depression, community experiences with group interventions and opinions on what would be the most culturally acceptable components of a group support psychotherapy intervention to alleviate depression symptoms among HIV affected adults. Based on the findings from these two activities, a manual for implementing the 8-week group support psychotherapeutic intervention was developed by the investigating team. Details of the development process and structure of the intervention are available elsewhere (Nakimuli-Mpungu et al., 2014) .

Briefly, the first session addressed issues relevant for rapport and psychological education on the group process, techniques, ground rules and expectations. In the second session, participants were educated about triggers, symptoms, complications, and treatment options for depression. The relationship between depression and HIV/AIDS was also discussed. Participants were given the opportunity to share and externalize any problem that they may have in sessions 3 and 4. Given the high burden of war related trauma among participants, sharing trauma stories was encouraged. In session 5, participants were taught positive coping skills, in particular skills to manage depressive thinking and excessive worries. Problem solving skills and skills for

coping with stigma and discrimination were taught in session 6. Given that poverty is a known risk factor for depression (Patel et al., 2003; Lopez et al., 2006 Lund et al., 2010) the last two sessions were dedicated to training participants in basic livelihood skills.

The intervention was delivered in a group format over 8 weeks with intervention sessions lasting 2-3 hours each. The groups were gender specific and problem specific. Intervention facilitators were mental health workers with diploma level and degree training in psychiatric nursing, social work, counseling and clinical psychiatry. They were of the same gender as the participants and delivered the intervention materials following a scripted intervention manual. Apart from sessions 3 and 4, all other sessions were followed by homework activities designed to get participants to practice new skills between sessions, with feedback and discussions at the next session.

Facilitator training and quality assurance

Intervention facilitators at both sites received a manual containing the intervention content and guidelines for conducting the intervention sessions. To ensure consistent interpretation of the manual, all facilitators participated in a seven-day training workshop at the Kitgum PCAF trauma clinic. Training included pre-tests and post-tests, classroom work utilizing frequent role plays and feedback. Video recordings of each training session were provided to facilitators which they reviewed prior to onset of each intervention session. The third author (J.O) had monthly supervision with facilitators to address issues arising from the on-going intervention sessions.

Participant evaluation of the interventions

At the end of the 8 sessions, participants were asked to rate the intervention on 5 items that assessed perceived effects of the intervention, how they liked the group leaders, and their overall impression of the intervention. These items were adapted from items used to evaluate previous interventions (Purcell et al., 2007). Items were rated on a five-point Likert-type scale (from strongly agree = 1 to strongly disagree = 4).

Study measures

Exposure variable

The main exposure variable was participation in the intervention. The variable was dichotomized as "participation in the intervention versus non-participation".

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.

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 treated as a continuous variable in all analyses. 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).

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".

HIV Serostatus

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

Clinical variables

Clinical diagnoses and pharmacological interventions were obtained from the medical records for each participant. Variables indicating presence or absence of a given clinical diagnosis and psychotropic medication were created.

Outcome variables:

Depression symptoms

Depression symptoms were assessed using the self-reporting Questionnaire (SRQ-20). The SRQ-20 is recommended by the World Health Organization for screening common mental disorders such as depression and anxiety in developing countries like Uganda. Further, it has been successfully translated into at least 20 languages in several developing countries, with acceptable measures of reliability and validity (WHO, 1994). Cross-cultural adaptation and validation of the self-reporting questionnaire (SRQ-20) among HIV+ individuals in a rural ART

program in southern Uganda revealed that an optimal cutoff point of ≥6 scores had a sensitivity of 84% and a specificity of 93% for current depression. 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 α) of 0.97

Functioning level

Function levels of study participants 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. This five-item instrument has been previously validated among individuals attending PCAF clinics. 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 were 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). The Cronbach's alpha in this study population was 0.71.

Perceived social support

Perceived social support was assessed using the 12-item Multi-dimensional social support scale (Zimet et al., 1988), which provides assessment of three sources of support: family (FA), friends (FR), and significant other (SO). The scale has been validated in Uganda and the three-subscale structure (Family, Friends, and Significant Other) of the MSPSS was confirmed (Nakigudde et al., 2009). The Cronbach α for this sample was 0.94. Responses were based on a 7-point likert scale where 1–4 referred to those who very strongly, strongly, mildly disagreed and those who were neutral about having enough support from friends, family and significant others

respectively. Scores of 5–7 referred to those who mildly, strongly or very strongly agreed to have enough support respectively. Perceived social support was treated as a continuous variable in all analyses.

Self-Esteem

Self-esteem was assessed using the Rosenberg Self-Esteem Scale (Rosenberg, 1965) which provides assessment of one's general feelings about oneself. This is a ten item Likert scale with items such as, "On the whole, I am satisfied with myself"; "I feel that I have a number of good qualities". Responses were based on a 4-point scale where 1–4 referred to those who responded with " I strongly agree", "I agree", "I disagree" and "I strongly disagree" respectively. This scale has been used in HIV positive women in South Africa (Mundell et al., 2011).In this study population, the measure attained a reliability coefficient (Cronbach α) of 0.97

Statistical analyses

We analyzed data in three steps. First, we conducted bivariate analyses using simple logistic regression models to compare baseline demographic, clinical and treatment variables between intervention participants and those on the waiting-list. Second, we used multivariate longitudinal regression models to examine the effects of the intervention on depression, function, social support and self-esteem measured across three time periods (baseline, during and after treatment). 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 scores of the outcome variables.

Four separate models were analyzed in which the dependent variables were change in depression symptom scores, change in function scores, change in social support scores and

change in self-esteem scores. In each model, the independent variables included intervention 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., 4weeks] over the three periods and the interaction of intervention status by time (represents the additional change in the dependent variable with each additional unit of time among intervention participants relative to non-participants). Potential confounders including baseline mean depression scores, anti-depressant use and HIV status were added to each model. We used STATA statistical software (v 12; Stata Corp, College Station, TX) for all analyses.

RESULTS

Study group (assignment)

One hundred twenty individuals seeking care at the PCAF clinics were screened for depression. Of these, 77 were diagnosed with major depression and were invited to the study orientation meeting. All accepted to participate in the study and were assigned to one of two groups: the intervention (N= 48 or the waiting-list (N= 29) control group. The degree of homogeneity at baseline of study participants in the two study groups was determined by comparing them on socio-demographics, clinical and treatment characteristics. No significant differences by study group were found in the subjects' baseline characteristics except for HIV status, baseline depression scores and anti-depressant use (Table 1).

Tri-cyclic antidepressants were the only type of antidepressants available at the health centers where the study was conducted. Nine participants in the intervention arm were using

amitriptylline and one participant was using imipramine. In the control arm, eleven participants were using amitriptylline and one participant was using imipramine.

Loss to follow-up and attendance

Attrition was minimal and similar across the two groups, with 84% and 79% of the intervention participants and non-participants, respectively, completing post-intervention assessments. The completers did not differ significantly from the study dropouts in terms of baseline socio-demographics, clinical and treatment characteristics. The majority of intervention participants (90%) attended all the eight sessions.

Impact of intervention on depression symptoms and functioning levels

Intervention participants had higher depression symptom scores at baseline than non-participants [OR= 1.75, 95%CI 0.73 to 4.20]. Although there was a decrease in depression symptom scores in both groups both at four weeks [OR= 0.05, 95%CI 0.01 to 0.22] and after the intervention[OR= 0.22, 95% CI 0.04 to 1.35], the rate of reduction in depression symptom scores was greater among the intervention participants than non-participants both at four weeks [OR= 0.01, 95%CI 0.00 to 0.07] and after the intervention [OR= 0.00, 95%CI 0.00 to 0.003] as shown in Figure 2a.

Baseline functioning scores were comparable between the two groups [OR= 0.66, 95%CI 0.28 to 1.50]. The study sample as a whole had a significant increase in function scores both at four weeks [OR= 2.87, 95%CI 1.75 to 4.69] and after the intervention [OR= 2.41, 95%CI 1.38 to 4.21] . Figure 2b illustrates that the rate of increase in function scores was greater among the intervention participants than non-participants both at four weeks [OR= 2.88, 95%CI 1.47 to 5.64] and after the intervention [OR= 4.82, 95%CI 2.39 to 9.75]

Impact of intervention on social support and self-esteem

Baseline perceived social support scores were comparable between the two groups [OR= 0.97, 95%CI 0.52 to 1.81] . Perceived social support scores increased in both groups at four weeks [OR= 1.56, 95%CI 1.05 to 2.32] and after the intervention [OR= 1.47, 95%CI 0.88 to 2.43]. However, the rate of increase in perceived social support scores was greater among the intervention participants than non-participants by the end of the intervention [OR= 2.68, 95%CI 1.50 to 4.78] as shown in Figure 2c.

Baseline self-esteem scores were comparable between the two groups [OR= 1.02, 95%CI 0.80 to 1.30]. Self-esteem scores increased in both groups at four weeks [OR= 1.13, 95%CI 0.97 to 1.31] and after the intervention [OR=1.17, 95%CI 0.96 to 1.44]. However, the rate of increase in self-esteem scores was greater among the intervention participants than non-participants both at four weeks [OR= 1.39, 95%CI 1.14 to 1.69] and after the intervention [OR= 1.90, 95%CI 1.48 to 2.44] as shown in Figure 2d.

Discussion

This study targeted HIV affected rural, depressed, individuals residing in remote villages that had initiated care in the PCAF trauma clinics and outreach centers. Our primary focus was to assess the effects of a locally developed group support psychotherapeutic intervention on depression, function, social support and self-esteem. In keeping with our hypothesis, individuals assigned to the intervention, compared with those assigned to the waiting-list, had a faster reduction in depression symptoms and faster increase in function levels. These differences were observable within 4 weeks of participating in the intervention and increased as participation in the intervention progressed. These findings are consistent with previous studies that have

assessed the impact of adapted "western" psychological interventions (Bass et al., 2013b;Bolton et al., 2003) and locally developed psychological interventions (Futterman et al., 2010;Kaaya et al., 2013) on depression and functioning in sub-Saharan Africa.

Our findings regarding the impact of the intervention on social support and self-esteem support our hypothesis as well and are consistent with findings from a study by (Kaaya et al., 2013) among HIV positive pregnant women. They conducted a randomized clinical trial comparing a six-week structured nurse led group psychosocial intervention with standard care. Narratives from participants after each therapy session indicated that they may have benefited from receiving emotional and informational support during sessions that helped them adjust to a positive diagnosis. In contrast, a quasi-experimental study among South African HIV positive women to evaluate the impact of a structured 10-session psychosocial support group intervention did not find any differences between the intervention and the control groups in terms of depressive symptoms and social support and self-esteem (Mundell et al., 2011). Among intervention participants, improved self-esteem was reported by only those who attended at least half of the intervention sessions. The positive outcomes of our intervention could be explained by the high attendance rates and well-established therapeutic alliance with intervention facilitators as indicated by the participants' evaluations.

Several limitations of this pilot study must be acknowledged. First, most of our participants were of Luo ethnicity, which limits generalization of our results to other ethnic populations in the northern region of Uganda or those living in other regions. Second, our analyses could be affected by selection bias given the use of non-random samples. However, variables that were not equally distributed between the intervention and control arms were considered as confounders which were adjusted for in all multivariate longitudinal regression

models. Third, the absence of long-term follow-up may not have allowed us to truly capture the effect of the intervention on the study over time (i.e., longitudinally). Lastly, we did not carry out any formal power calculations for this study. Small study samples may not have adequate power to detect differences between intervention and control arms. Further, even when there are significant differences, confidence intervals are likely to be imprecise (Lancaster et al., 2010). Therefore, findings from this pilot study should be treated as preliminary and interpreted with caution.

Within the context of these limitations, our study has important implications. The results show that it is feasible to establish and maintain this low intensity psychological intervention in rural remote villages. The group intervention model capitalizes on peer group processes and may be more efficient than approaches restricted to individual interventions. In addition to providing peer support and modeling, groups provide a more efficient utilization of counseling resources. In order to substantiate the present results and related explanations, there is a need to conduct a more adequately powered randomized controlled trial with longer periods of follow-up. This would require more funds; a challenging resource to acquire in resource limited settings.

While this intervention is promising in reducing depression and enhancing social support and self-esteem, it was delivered by diploma and degree level mental health professionals, limiting its long-term accessibility and sustainability, due to the limited availability of these professionals and the high transport costs incurred when they travel to these rural remote villages where most of our study participants reside. Clearly, if this intervention is proven to be effective in a randomized controlled trial, it needs to be rolled out to rural communities using the task-shift model. Trained mental health workers will train and supervise community lay workers identified by the target community using simplified intervention and training manuals translated into the

local language of the target community (Chowdhary et al., 2013). These trained community lay workers will then be able to facilitate group sessions in their communities thereby delivering the intervention to hundreds of individuals who need it.

In conclusion, our findings suggest that this group support psychotherapeutic intervention is feasible, acceptable and promising in not only reducing depression symptoms and restoring functioning but also enhancing social support and self-esteem among HIV affected individuals residing in rural remote villages in northern Uganda.

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Table 1: Socio-demographic and clinical profile at baseline of participants in the intervention and wait- list control groups

Characteristic	Total N=77 n (%)	Intervention N=48 n (%)	Wait List N=29 n (%)	OR (95% CI)
Males	34(44.16)	22(45.83)	12(41.38)	1.20(0.47-3.04)
Age, Mean (SD)	40.72(11.3)	39(11.13)	42(11.6)	2.23 (-3.10-7.56) †
Previously married	28(36.36)	11(22.92)	17(37.93)	0.85(0.21-3.38)
Peasant farmer	61(79.22)	35(72.92)	26(89.66)	0.38(0.07-2.01)
Secondary level education	13(16.88)	11(23.4)	2(6.90)	4.12(0.84-20.20)
HIV positive	45(58.44)	35(74.50)	10(34.48)	5.54(2.02-15.20)
History ≥ 6 trauma events	35(45.45)	22(45.83)	13(44.83)	0.75(0.69-7.31)
Diagnosed with PTSD	42(54)	27(56.25)	15(51.72)	1.20(0.47-3.02)
Antidepressant use	22(28.57)	10(20.83)	12(41.38)	0.37 (0.13-1.02)
Baseline depression scores(Mean, SD)	12(4.32)	12.89(3.86)	10.55(4.71)	-2.34(-4.31-0.36) †
Baseline social support score (Mean, SD)	54.04(14.39)	52.48(13.12)	56.73(16.30)	4.24(-2.81-11.29) †
Baseline function scores (Mean, SD)	7(1.57)	6.77(1.46)	7.38(1.69)	0.61(-0.12-1.34) †
Baseline self-esteem scores (Mean, SD)	19.51(5.57)	47(19.11)	27(20.22)	1.12(-1.57-3.8) †

† Mean difference between wait list and GSP groups, OR=Odds ratio

Table 2. Longitudinal analysis of depression, function, social support and self-esteem scores over time (N = 77)

Characteristics	**Depression Scores**		**Social support scores**		**Function Scores**		**Self-esteem scores**	
	Odds ratios	**95%CI**	**Odds ratios**	**95%CI**	**Odds ratio**	**95%CI**	**Odds ratio**	**95%CI**
Group support psychotherapy(GSP)	1.75	0.73 - 4.20	0.97	0.52 - 1.81	0.66	0.28-1.50	1.02	0.80-1.30
Anti-depressant use	0.53	0.11-2.49	1.62	0.97-2.73	1.27	0.59 - 2.72	0.99	0.75-1.29
HIV positive	1.25	0.75-2.06	0.89	0.73-1.07	0.85	0.71-1.01	0.97	0.88-1.06
Baseline depression total scores	2.07	1.81-2.36	0.93	0.88-0.98	0.96	0.89-1.05	0.95	0.92-0.97
Slope terms								
Overall change in outcome in 4 weeks	0.05	0.01-0.22	1.56	1.05-2.32	2.87	1.75-4.69	1.13	0.97-1.31
Overall change in outcome in 10 weeks	0.22	0.04-1.35	1.47	0.88-2.43	2.41	1.38-4.21	1.17	0.96-1.44
Difference in slope for GSP in 4 weeks	0.01	0.00 - 0.07	1.46	0.92-2.32	2.88	1.47-5.64	1.39	1.14-1.69
Difference in slope for GSP in 10 weeks	0.00	0.00-0.003	2.68	1.50-4.78	4.82	2.39 - 9.75	1.90	1.48-2.44

Acknowledgments

This article was in part presented as an oral presentation at the 8th European Congress on Tropical Medicine and International Health, 10-13 September 2013, Copenhagen, Denmark.

E N-M was supported by the Grand Challenges Canada: Rising Stars in Global Health Award, Grant Number 0124-01.

The authors would like to acknowledge the support of the management of the Gulu and Kitgum local government administration and regional referral hospitals where the two PCAF trauma clinics are situated, as well as the mental health section of the Ministry of Health, Uganda. We appreciate the support from the Peter C. Alderman Foundation. We are extremely grateful for the hard work of all research assistants especially Jean Laker, Milton Ojede and Elizabeth Nakanjako who collected data for this project. Lastly, we thank the study participants for their time and trust.

Author Contributions

Authors: ENM, KW, JO, SA, SM. Conceptualized and designed the study protocol. Authors: ENM, RO managed the literature searches. Author ENM undertook the statistical analysis, and wrote the first draft of the manuscript. Authors RM, EJM revised the manuscript critically for important intellectual content. All authors: ENM, KW, JO, SA, SM, RO, RM, EJM contributed to and have approved the final manuscript.

Conflicts of Interest

All authors have declared that no competing interests exist.

Source of Funding:

The study was funded by the Grand Challenges Canada: Rising Stars in Global Health Award, Grant Number 0124-01.The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Figure 1: Flow diagram of study participants.

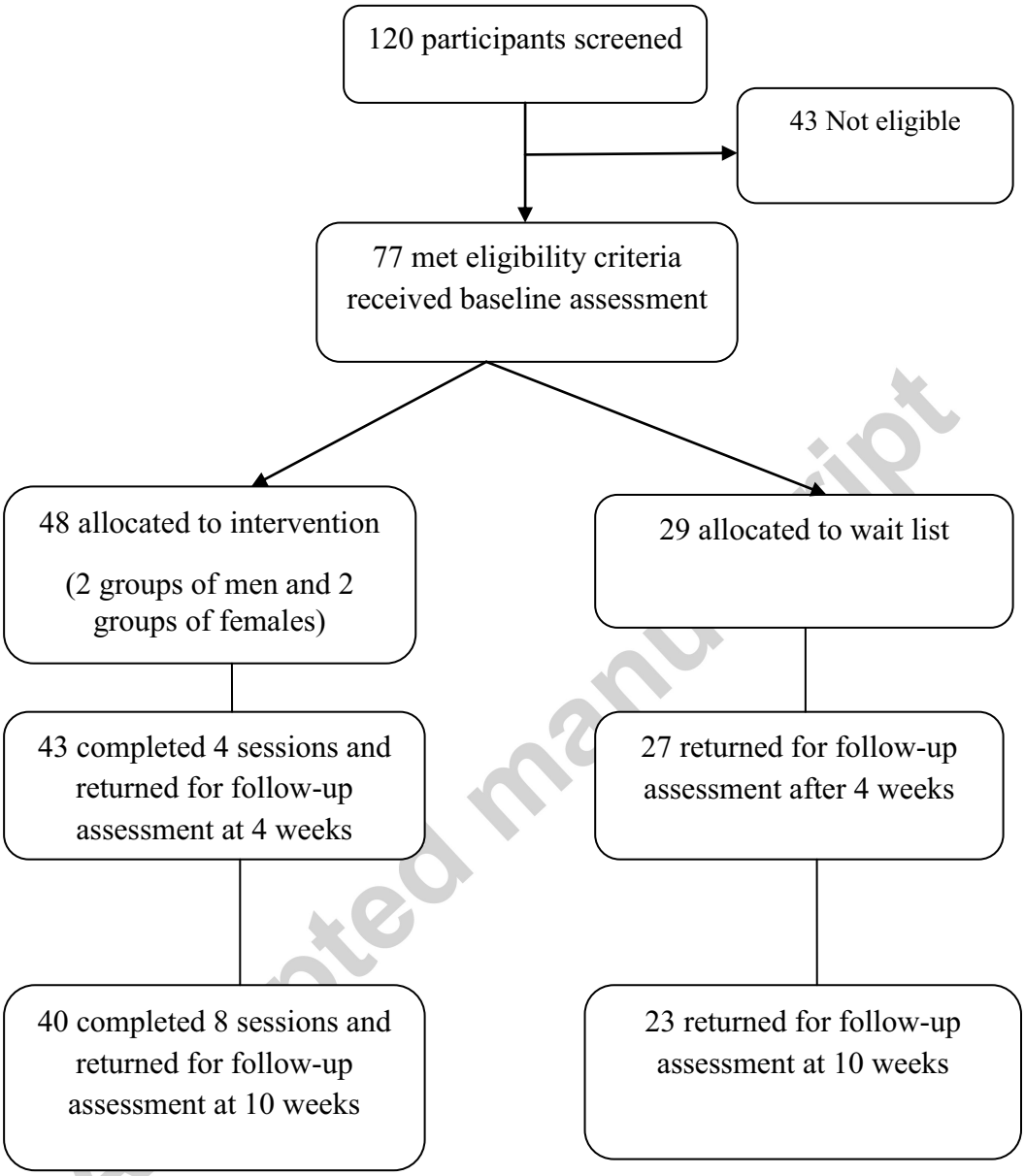

Figure 2a: Impact of the Intervention on depression symptom scores

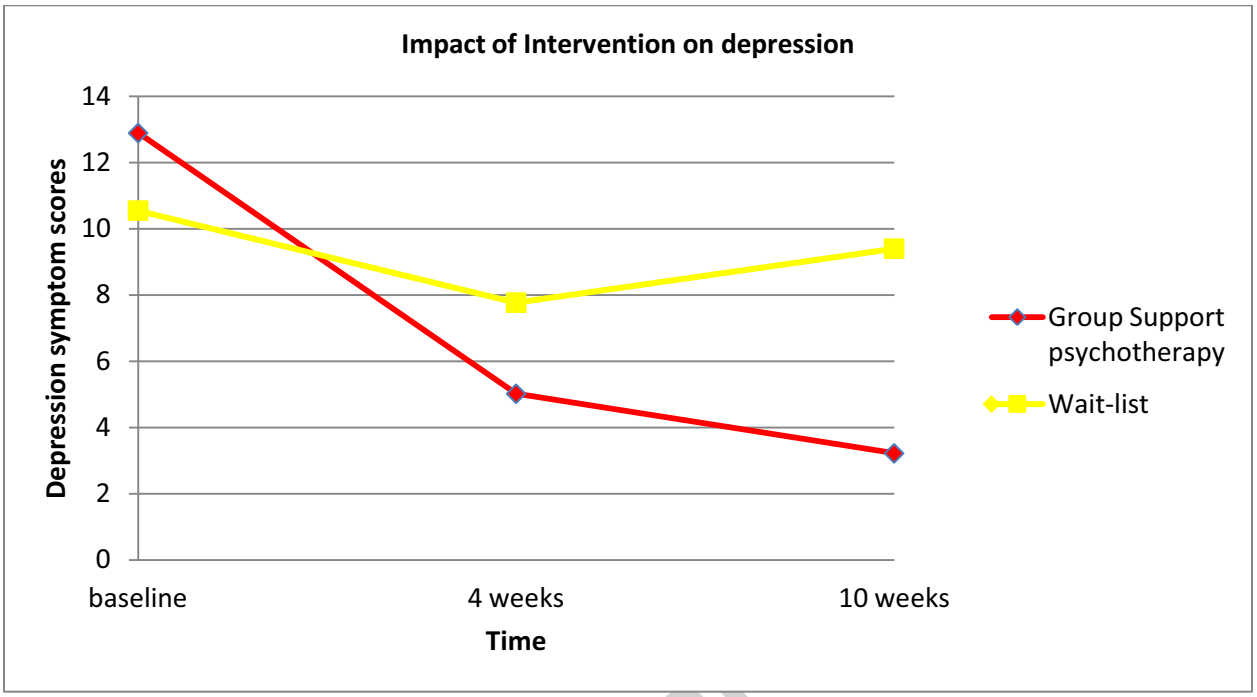

Figure 2b: Impact of the Intervention on function scores

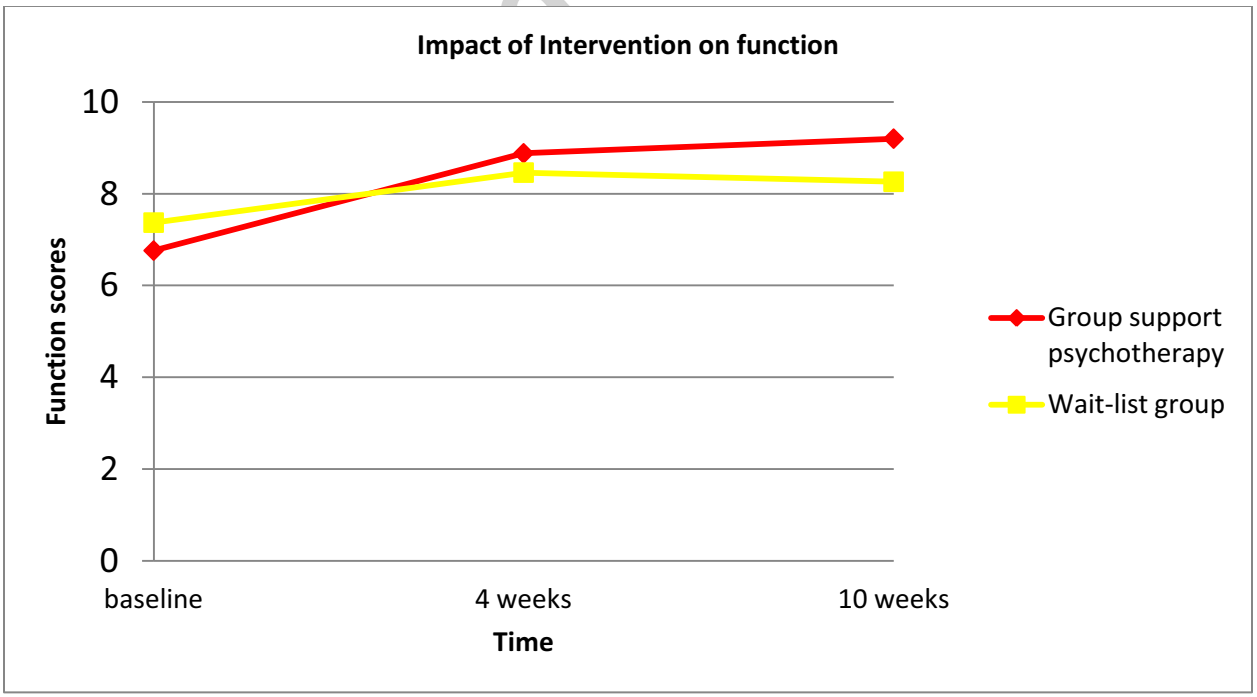

Figure 2c: Impact of the Intervention on perceived social support scores

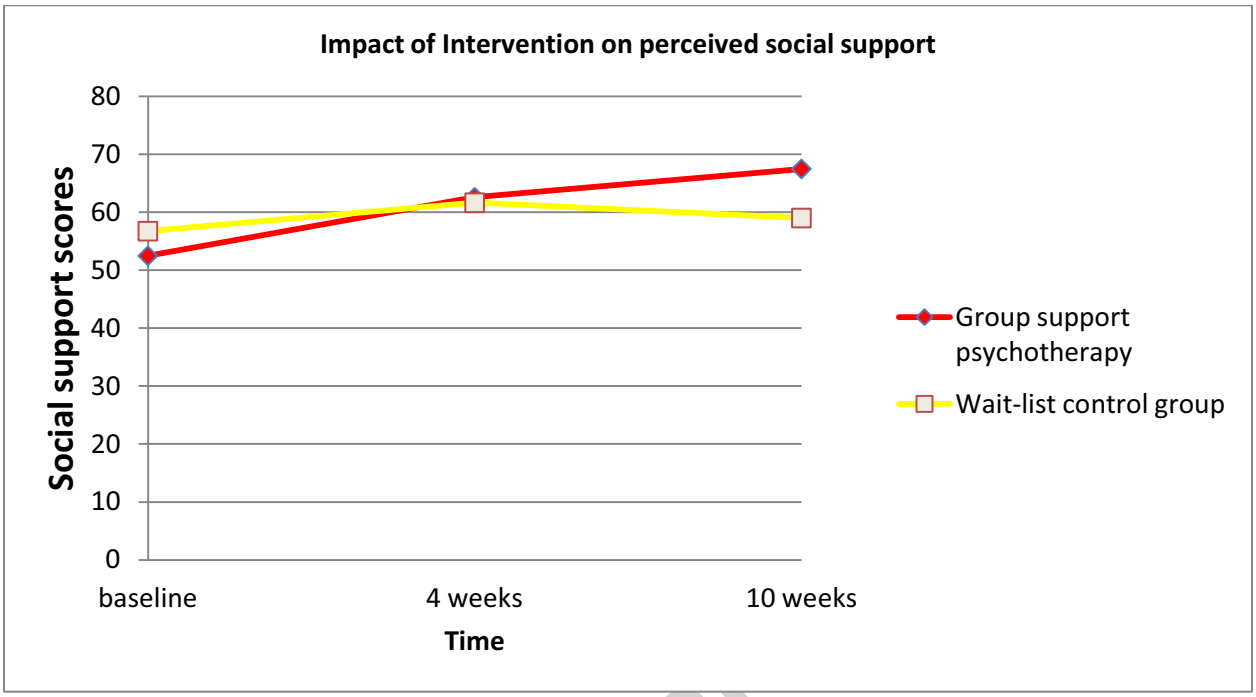

Figure 2d: Impact of the Intervention on self esteem scores

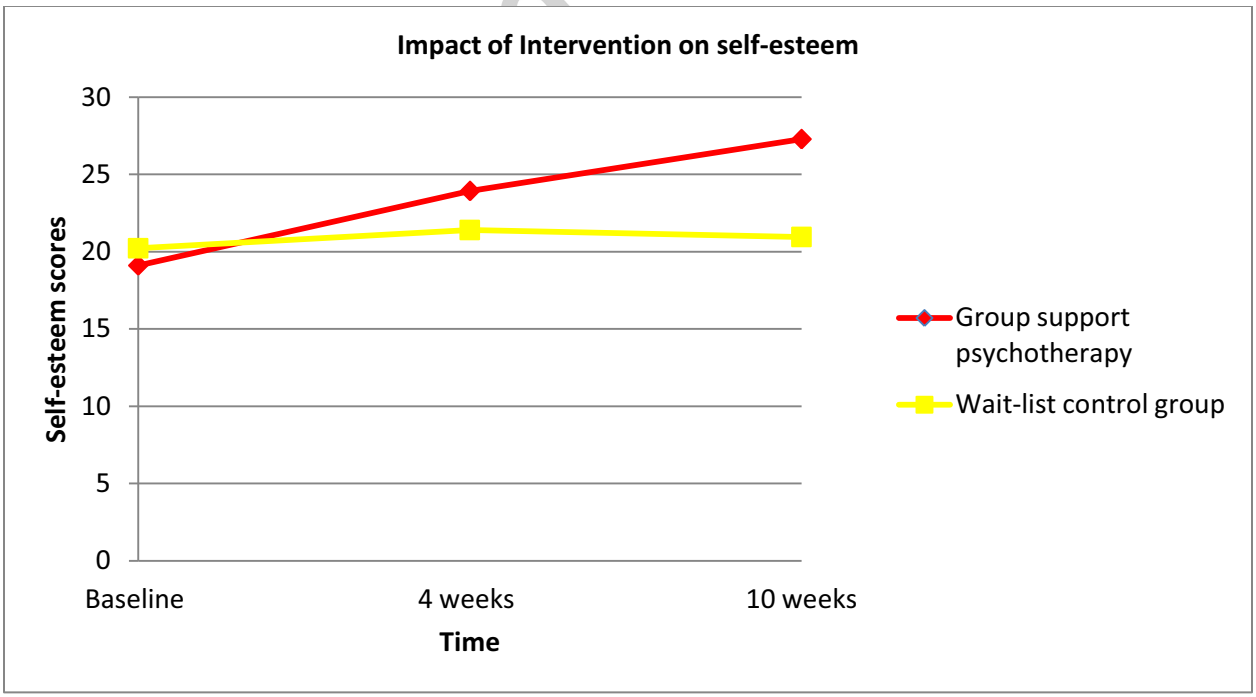

Figure 3: Participant evaluations of the Intervention