Supplementary Appendix

This appendix has been provided by the authors to give readers additional information about their work.

Supplement to: Bass JK, Annan J, Murray SM, et al. Controlled trial of psychotherapy for Congolese survivors of sexual violence. N Engl J Med 2013;368:2182-91. DOI: 10.1056/NEJMoa1211853

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Table S1: Cronbach alpha scores for the adapted HSCL-25, PCL and functional impairment measures* for the total sample and separately by language

	HSCL-25	PCL	Function
Total Sample (N=405)	0.89	0.88	0.93
Kibembe (N=54)	0.84	0.80	0.89
Kifuliro (N=118)	0.85	0.83	0.94
Kihavu (N=173)	0.93	0.93	0.91
Mashi (N=47)	0.89	0.85	0.80
Swahili (N=102)	0.91	0.90	0.94

* The adapted Hopkins Symptom Checklist (HSCL-25) assessment of combined depression/anxiety included 25 items; the PTSD Checklist civilian version (PCL) included 17 items; The measure of functional impairment (function) included 20 items.
** Cronbach alpha scores $\geq$ 0.80 are generally considered good to excellent.

Table S2: Correlation matrices of scores for the adapted HSCL-25, PCL and functional impairment measures for total sample and separately by language

Total (N=405)	HSCL-25	PCL	Function
HSCL-25	1.00		
PCL	0.87	1.00	
Function	0.56	0.62	1.00

Kihavu (N=173)	HSCL-25	PCL	Function
HSCL-25	1.00		
PCL	0.89	1.00	
Function	0.64	0.69	1.00

Kibembe (N=54)	HSCL-25	PCL	Function
HSCL-25	1.00		
PCL	0.89	1.00	
Function	0.32	0.44	1.00

Mashi (N=47)	HSCL-25	PCL	Function
HSCL-25	1.00		
PCL	0.80	1.00	
Function	0.41	0.34	1.00

Kifuliro (N=118)	HSCL-25	PCL	Function
HSCL-25	1.00		
PCL	0.86	1.00	
Function	0.59	0.66	1.00

Swahili (N=102)	HSCL-25	PCL	Function
HSCL-25	1.00		
PCL	0.88	1.00	
Function	0.67	0.81	1.00

Table S3: Mental health symptoms and tasks of daily leaving for study scales

Hopkins Symptom Checklist 25 (HSCL-25)* Depression/Anxiety items		PTSD Checklist* Posttraumatic Stress items	Local Functioning Index**	Local symptoms included for eligibility screening***
Feeling low in energy, slowed down	Suddenly scared for no reason	Recurrent thoughts or memories of the most hurtful or terrifying events	Cultivation/farming	Feeling guilty
Blaming self for things	Feeling fearful	Feeling as though the hurtful or terrifying event is happening again	Trading or other ways of making money	Being afraid to be infected by disease
Crying easily	Faintness, dizziness or weakness	Recurrent nightmares (about the event)	Cooking	Feeling badly treated by family members
Loss of sexual interest or pleasure	Nervousness or shakiness inside	Feeling detached or withdrawn from others	Looking after children	Feeling badly treated by community members
Poor appetite	Heart pounding or racing	Unable to feel emotions	Giving advice to family members	Feeling shame
Difficulty falling asleep, staying asleep	Trembling	Feeling jumpy, easily startled	Giving advice to other community members	Feeling rejected by everyone
Feeling hopeless about the future	Feeling tense or keyed up	Difficulty concentrating	Exchanging ideas with others	Feeling stigma
Feeling sad	Headaches	Feeling on guard	Raising /breeding animals	Thinking too much about what happened to you
Feeling lonely	Spells of terror or panic	Feeling irritable or having outbursts of anger	Any other types of manual labor	Thinking too much about other things that upset you
Thoughts of ending your life	Feeling restless, can't sit still	Avoiding activities that remind of the traumatic or hurtful events	Uniting with other community member to do tasks for the community	Thinking of hurting yourself
Feelings of being trapped or caught		Feeling as if you don't have a future	Uniting with other family members to do tasks for the family	Wanting to avoid other people or hide
Worrying too much about things		Avoiding thoughts or feelings associated with the traumatic or hurtful events	Socializing with others in the community	Too many thoughts
Feeling no interest in things/less			Asking/getting help from people or organizations when you need it	Being cold/shy
			Making important decisions about daily life	Lacking peace
				Anger in your heart
				Inward wounds

interest in daily activities Feeling everything is effort Feelings of worthlessness- no value		Sudden emotional or physical reaction when reminded of the most hurtful/traumatic events Inability to remember parts of the most traumatic or hurtful events Feeling no interest in things/less interest in daily activities Having trouble falling asleep/staying asleep	Taking part in family activities or events Taking part in community activities or events Learning new skills or knowledge Concentrating on your tasks /responsibilities Interacting or dealing with people you do not know Attending church or mosque as usual	

* Participants rated how often they experienced each symptom in the prior four weeks using a 4-point Likert scale (0=not at all, 1=little bit, 2=moderate amount, 3= a lot). Average per-item scores were generated for the HSCL-25 and PTSD Checklist; possible range 0-3 with higher scores indicating greater severity.

** For each tasks, responses were measured using a 5-point Likert scale for amount of difficulty doing the task (0=none, 1=little, 2=moderate amount, 3= a lot, 4=often cannot do). An average per-item score was generated for each participant; possible range 0-4 with higher scores indicating greater impairment.

*** Items identified from local qualitative study as relevant to the sexual violence survivors but not part of either the study mental health outcome assessments. Included in the total score used to define score cut-offs for study eligibility: total symptom score of at least 55 (i.e. average score of 1 for each of 55 symptoms including the 25 items in the HSCL-25, 16 items from the PTSD Checklist plus 16 additional locally relevant symptoms); and a functional impairment score of at least 10 (i.e. some dysfunction on at least half the tasks).

S4: Description of the Cognitive Processing Therapy Adaptation Process

We adapted the existing Cognitive Processing Therapy group manual and training materials (Resick, Monson, & Chard, 2008; Chard, Resick, Monson, & Kattar, 2008) to be both culturally appropriate and useable by local psychosocial assistants. The adaptation process was guided by the local context, which included: therapists with little to no training in cognitive behavioral treatments or group interventions; a client population with low levels of literacy; and specific beliefs and structures of cultural groups within the Democratic Republic of Congo. The adaptation process was iterative, allowing us to benefit from feedback from multiple constituencies including the project research team from Johns Hopkins (LM, JB, & PB), the hosting non-governmental organization (International Rescue Committee), NGO-based psychosocial staff, and the psychosocial assistants.

The first phase of the adaption process consisted of the US trainers (DK and SG), along with assistance from Cognitive Processing Therapy group trainer Carie Rogers, editing existing Cognitive Processing Therapy training materials and the treatment manual to replace technical terms and American idioms with standard, simple English terms and phrases. In addition, more information regarding providing group psychotherapy and managing group process was added to the manual. Review of the simplified materials was done in the US by members of the research team experienced in training persons with limited previous training and experience in mental health care (PB, JB, & LM). The resulting materials were translated into French by professional translators based in Democratic Republic of Congo. Materials were reviewed by a bilingual US-trained clinical social worker dedicated to the project for clarity and cultural appropriateness.

Adaptation continued in the Democratic Republic of Congo during the two-week training of the psychosocial assistants, NGO-based psychosocial staff, and the bilingual US-trained clinical social worker. Feedback from the trainees was solicited on a daily basis throughout the training and used to further adapt the manual and training materials for subsequent training days. The field-based adaptation process focused on continuing to (1) improve clarity of all written materials; (2) increase the cultural fit of materials; (3) adjust client materials to be accessible for those who are illiterate; and (4) reduce barriers to implementation inherent in a low resource environment.

Prior to initiating the trial, the adapted Cognitive Processing Therapy treatment was piloted by the psychosocial assistants and the clinical supervisor, allowing for additional feedback as they implemented the therapy for the first time. Minor changes were made to materials during this period. At the end of the study, a debriefing meeting was held with the psychosocial assistants and clinical supervisors to solicit any additional feedback regarding the training, materials, supervision and implementation of the therapy. Based on this feedback, a final set of materials was prepared for the psychosocial assistants and supervisors to use as reference material as they continue to provide the therapy as part of an ongoing mental health service program.

Therapy Adaptation

The structure of Cognitive Processing Therapy and essential elements were retained in the modified treatment, however some aspects were simplified. The main changes to the manual involved reducing technical jargon, decreasing the emphasis on underlying theories of PTSD, including more information on specifics of group therapy and managing group interactions, including more scripts of therapy content in lay language, adding more group specific clinical case examples relevant to the experiences of sexual violence survivors in the Democratic Republic of Congo, and modifying homework assignments for non-literate clients.

Structural considerations

Literacy. Cognitive Processing Therapy relies on homework as a way to facilitate emotional processing and to teach how to recognize and change maladaptive beliefs that maintain symptoms of PTSD and depression. It was not possible in the Democratic Republic of Congo to use written homework, therefore materials were simplified to be easier to understand and to memorize. We monitored the success of these modifications throughout the implementation process and also debriefed the psychosocial assistants about the modifications during the final project meeting.

In order to make Cognitive Processing Therapy accessible for low literacy and illiterate clients, the US trainers reduced the complexity of written materials and incorporated changes to help with retention of information. Skills taught to clients were simplified, both in terms of the language used and in terms of the number of items used for the skill. For example, one of the homework sheets

is called ‘Challenging Questions.’ The standard skill has 10 questions, but for simplicity, the number was reduced to four. We retained questions that were the least abstract and were easiest to memorize, while still retaining enough breadth across the questions. Clients Worksheets were also modified to use pictures as cues to help illiterate clients remember the worksheet instructions and/or skill. Thus the psychosocial assistants would teach the skill related to the worksheet during the group, and patients could refer back to the pictures on the worksheet as reminders of each step of the skill while doing the homework. Through brainstorming discussions with the psychosocial assistants we also developed a plan to help clients use exercises to memorize skills. For example, one of the sheets is called the ‘ABC sheet,’ which used a picture of a person standing as a cue for the “Activating event”, a picture of a person thinking as a cue for the “Belief”, and pictures of people with various facial expressions as a cue for the “Consequence” or emotion column. Clients were also encouraged to tap their heads as a reminder to notice the belief and touch their hearts as a reminder to notice the related emotion. Lastly, we removed one cognitive skill, to identify overarching patterns of cognitive distortions (called patterns of problematic thinking). Due to the need for skills to be memorized rather than written down this skill was deemed too abstract for clients to memorize and practice.

Efforts were also made to increase the chances that patients would practice the skills daily, regardless of their literacy level. The psychosocial assistants suggested that clients practice the therapy skills as part of their daily routine. Group members would also meet with each other between group sessions to help each other with practicing their homework.

An additional adaptation was the removal of two behavioral assignments in session 10 of the treatment. The first skill encourages patients to complete one nice thing for oneself daily, and the second is to practice giving and receiving compliments. The removal of these activities was simplified the protocol for both patients and therapists. The modified Cognitive Processing Therapy protocol thus focused on the clients mastering skills related to identifying thoughts and feelings, challenging their own thoughts, and generating alternative ways of viewing the situation, all core skills of Cognitive Processing Therapy. Each session therapists would teach the new skill and review several examples within the group to help with memorization and consolidation of skills.

Novelty of talk therapy. In addition to considerations regarding literacy, there were also important considerations related to the fact that there was not strong tradition of talk therapy or mental health treatment in the Democratic Republic of Congo. Based on suggestions from the local supervisors we added an additional individual therapy session to describe mental health symptoms, describe the rationale for talk therapy, discuss what group treatment will be like, and to answer client questions and concerns.

Cultural considerations

Consideration of cultural factors was vital to adapting Cognitive Processing Therapy for use in the Democratic Republic of Congo. The identification of these factors was a collaborative process, involving the US-based trainers, the study investigators, local and international staff at International Rescue Committee, and the Congolese supervisors, psychosocial assistants, and interpreter, all of whom were born, raised, and currently live in the region. Some factors were identified before the training began (by means of a preliminary qualitative study), whereas others emerged during the training and/or implementation of Cognitive Processing Therapy. Cultural factors that needed to be addressed included factors related to specific beliefs about social status, rape, and language differences.

With respect to beliefs about social status, psychosocial assistants and supervisors noted that many patients beliefs that rape would mean that women's social status was permanently changed. These beliefs can make cognitive restructuring challenging. Consistent with traditional Cognitive Processing Therapy treatment, the psychosocial assistants were trained to use Socratic dialogue to identify, within the client's own cultural and religious beliefs, those places where there is room for cognitive flexibility. For example, several female clients reported concerns about reduced social status due to being raped – e.g., "I have no voice in my home because I was raped." "My family is ashamed of me because I was raped."). To work with those beliefs, a strategy of using Socratic questions to identify possible exceptions was used. In the former example, therapist explored in what ways the client could have a say in her household and whether this was true of *all* people or *all* the time. In the

latter case, exploration centered on whether all of the family felt ashamed and how the client came to that conclusion.

Language differences also necessitated some adaptations to Cognitive Processing Therapy. Some key concepts such as the distinction between thoughts and feelings did not readily translate into Swahili. We worked closely with the psychosocial assistants to identify ways to explain these concepts within the local languages. The concept of homework did not translate directly and was instead translated as “small works you do at home.” The concept of extreme words was translated as “heavy words.” Lastly, the name of the therapy “cognitive processing therapy” did not translate to Swahili and was instead named “mind and heart” therapy.

The final session order is listed below:

Session 1: Introduction to therapy (individual)

Session 2:Introduction to Cognitive Processing Therapy

Session 3: Meaning of the Event

Session 4: Identification of Thoughts and Feelings

Session 5: Identification of Stuck Points (maladaptive beliefs)

Session 6: Challenging Questions

Session 7: Challenging Beliefs

Session 8-12: Cognitive Modules: Safety, Trust, Power/Control, Esteem, Intimacy

S5: Author contributions and acknowledgements

Author contributions

JB, PB, JA, and KW conceived of the study with TC involved with study design; JB, JA and TC oversaw the data collection; JB and SM were responsible for overseeing data management and conducting analyses. DK, SG, and LM were responsible for clinical oversight. All authors vouch for the data and analysis, and all were involved in the writing of the paper, and decided to publish. JB wrote the first draft of the manuscript.

Acknowledgements

- Amani Matabaro – translation of written materials and live translation during CPT and research trainings.
- All cognitive processing therapy and usual care psychosocial assistants and IRC supervisors, as well as Claudine Rusasura the psychosocial coordinator for IRC
- Carie Rogers for her assistance with preparation of the initial CPT treatment manual.
- Janny Jinor for providing in-country clinical supervision during the CPT intervention implementation.
- Maria Scicchitano, Gabrielle Cole, Daniela Greco, and Katie Robinette for their monitoring and evaluation leadership through the data collection periods.
- Georges Mugaruka for overseeing the data management and data cleaning at the Bukavu office.
- Catherine Poulton for feedback on the manuscript.
- Lionel LaForgue for management oversight of the CPT implementation and data collection
- Alden Gross for providing rapid and comprehensive statistical advice and assistance.