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Treating Posttraumatic Stress Symptoms Among People Living with HIV: a Critical Review of Intervention Trials

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Abstract

The prevalence rate of posttraumatic stress disorder (PTSD) among people living with HIV (PLWH) is significantly higher than the rate among the general population. Moreover, PTS symptoms have been linked with numerous negative health-related outcomes in PLWH. While these findings suggest that studies evaluating the efficacy of treatments for PTS symptoms among PLWH are sorely needed, according to prior reviews, such studies are lacking. The purpose of the present systematic review was to provide an updated critical evaluation of treatment studies that targeted PTS among PLWH. Following PRIMSA guidelines, we searched PubMed and PsycINFO and identified eight articles (representing seven studies) evaluating the impact of various individual and group treatments on PTS symptoms. The limited evidence base to date precludes clinical recommendations for this population. Future studies should examine the efficacy of existing evidence-based treatments for PTSD among PLWH and then, if necessary, evaluate the impact of any treatment modifications for this population.

Keywords

HIV; Posttraumatic stress disorder; Evidence-based treatments; Trauma; Systematic review

Introduction

The lifetime prevalence of posttraumatic stress disorder (PTSD) is much higher among people living with HIV (PLWH) than those without HIV. In the general US population, PTSD affects approximately 4.3 % of women and 1.7 % of men [1], while the estimated prevalence of PTSD among PLWH ranges from 35 % [2] to as high as 64 % [3]. Several PTSD risk factors may explain the elevated PTSD rate among PLWH: higher likelihood of trauma exposure at an early age [4, 5], repeated traumatization [2, 6], and exposure to traumatic events that are strong predictors of PTSD such as childhood physical and sexual abuse, physical and sexual assault, and crime-related violence. For example, the estimated

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Compliance with Ethical Standards

Conflict of Interest

The authors declare that they have no conflict of interest.

Human and Animal Rights and Informed Consent

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rate of sexual assault among HIV-positive women is 30.3 % [2] to 68 % [6], which is several times higher than the rate among women in the general population (e.g., 9.2 % [7]). Indeed, many PLWH live in environments characterized by poverty, violence, and a lack of social support [8], all of which are factors that have been associated with increased risk for developing PTSD [9–11]. Higher rates of PTSD may also be explained by the diagnosis of HIV, which can itself constitute a traumatic event, leading to the development of PTSD. In fact, Olley et al. [12] found that 36.4 % of PLWH with PTSD indicated that their “index trauma” (the worst event experienced) was being diagnosed with HIV.

Untreated PTSD is associated with a host of negative consequences. These include comorbid major depression and substance use disorders [13], poor physical health [14, 15], and low quality of life [16]. For PLWH, the consequences of untreated PTSD may be especially pernicious. PTSD negatively impacts adherence to antiretroviral medication [17], immune functioning [18], and risky sexual and drug behavior [19], all of which are critical determinants of HIV disease progression. Because the efficiency of HIV transmission increases at later stages of the disease [20], interventions that limit disease progression can prevent HIV transmission to uninfected persons. Given that PTSD is associated with disease progression, PTSD treatment among PLWH can be considered “treatment as prevention” [21, 22] and has enormous potential clinical and public health benefits.

The purpose of this review is to provide an updated summary of the evidence supporting interventions for PTSD or PTS symptoms among PLWH. There have been several prior reviews related to PTSD and HIV [23••, 24–26] which highlight the overall paucity of treatment research for PTSD in PLWH. At the same time, there are a small, but growing number of studies that have recognized the importance of reducing PTS symptoms among PLWH. The most recent review by Applebaum et al. [23••] included only randomized controlled trials (RCTs) for PTSD in PLWH until 2013, which yielded only two studies [23••]. The current review extends this prior work by including more recently published RCTs on PTSD and HIV as well as by including all intervention studies, rather than RCTs exclusively, in order to obtain a more comprehensive picture of the current evidence base supporting treatments for PTS symptoms among PLWH. Although our main interest is examining treatments for PTSD among PLWH, we did not restrict our search to studies for which PTSD was an inclusion criterion for study enrollment. Instead, the goal of this review was to critically evaluate all intervention studies which included measures of PTS or trauma-related symptoms among PLWH.

Methods

The literature search and identification of articles to be included in this systematic review were performed in accordance with PRISMA Statement guidelines [27, 28]. The criteria for included studies were as follows: (1) participants were HIV-positive; (2) the study was designed to empirically evaluate treatment outcomes; and (3) trauma-related or posttraumatic stress (PTS) symptoms were among the treatment targets. It was not required that participants had PTSD or that the primary focus of the intervention was trauma-related or PTS symptoms. First, studies were identified by searching two electronic databases: PsycINFO and PubMed. Then, additional potentially eligible articles were identified by

reviewing the reference lists of the included articles. The following search terms were entered into both databases, *HIV* (Abstract) OR *AIDS* (Abstract) AND *Posttraumatic* (Abstract) OR *PTSD* (Abstract) OR *Trauma** (Abstract) OR *Childhood* (Abstract) OR *Intimate Partner* (Abstract) AND *Efficacy* (Title) OR *Effectiveness* (Title) OR *Clinical trial* (Title) OR *Treatment outcome* (Title) OR *Random** (Title) OR *Intervention* (Title), and the search was restricted to only include articles that had been peer-reviewed. The search was not restricted for any particular range of dates, and the last search was run on May 10, 2016. An initial review of the titles and abstracts of the articles returned in the search was conducted to exclude those studies which clearly did not meet the specified inclusion criteria. Remaining studies were read in full to determine if they met the inclusion criteria and to extract relevant information.

Results

A total of 311 articles were returned in the search (Fig. 1). Of the 311 articles, 63 were excluded because they were duplicates, 33 were ruled out because the sample was not HIV-positive, 22 were ruled out because the study was not designed to evaluate treatment outcomes, and 186 were ruled out because the study did not measure PTS or trauma-related symptoms. Seven of the original 311 articles met all inclusion criteria. One additional article that met all inclusion criteria was identified by reviewing the reference sections of the included articles (Table 1).

Prolonged Exposure Therapy for PLWH and PTSD

There is only one study to date that has examined the efficacy of PTSD treatment among PLWH diagnosed with PTSD. Using an RCT design, Pacella and colleagues [31] examined the efficacy of prolonged exposure (PE) therapy compared to a monitored waitlist condition PE which is a manualized, evidence-based individual treatment for PTSD that typically consists of 8–15 individual 90-min sessions implemented once or twice weekly [37]. The two main components of PE are (1) in vivo exposure to trauma reminders, which involves approaching safe but avoided situations and objects, and (2) imaginal exposure and processing, which involves revisiting the traumatic memory in imagination and recounting it aloud, followed by discussing the patient's thoughts and feelings about the imaginal exposure experience. PE has been found to be efficacious and effective in a range of populations [38] but had not previously been examined in an HIV+ sample.

Participants were 65 HIV+ men and women who met diagnostic criteria for PTSD. Standard, unmodified PE was delivered in 10 twice-weekly 90-min sessions. The main outcome was PTSD severity as assessed by the Posttraumatic Stress Scale—Interview (PSS-I) [39], which is a well-validated clinician-administered interview of PTSD symptoms, at pretreatment, posttreatment, 3-month follow-up, and 6-month follow-up. Mixed model repeated measures ANOVAs were conducted up to the 3-month follow-up, and within-group analyses were conducted up to the 6-month follow-up (waitlist participants were offered PE after the 3-month follow-up). As hypothesized, PE was associated with a significantly greater decrease in PTSD severity compared to waitlist, with medium to large between-group effect sizes from pretreatment to posttreatment (partial $\eta^2 = 0.14$). The researchers assessed PTSD

symptoms related to both HIV-and non-HIV-related traumas and found that PE was superior to waitlist for both. PE was also associated with better end-state functioning (i.e., minimal PTSD and depression symptoms) and greater reductions in negative trauma-related cognitions at posttreatment, which are theorized to maintain PTSD symptoms [40, 41] and have been found to mediate changes in PTSD in several studies [42–45].

However, group differences in the reduction of PTSD symptoms and posttraumatic cognitions were not significant between baseline and the 3-month follow-up. This may have been due to inadequate power, particularly in light of the within-subject results, including those randomized to PE ($n = 40$) and those who completed the waitlist and then opted to receive PE ($n = 19$). There were no significant group differences in reductions in depression or substance use. Dropout from PE was 32 %, which is within range but on the high end of what previous studies have found [46].

Pacella et al. is the first study of PE in PLWH, as well as the first study of any evidence-based treatment (EBT) for PTSD among PLWH and PTSD [31]. Key strengths include the selection of PE as the experimental intervention, given the extensive evidence base supporting PE, and the use of interviewer-assessed PTSD as the main outcome. In terms of limitations, the monitored waitlist condition represents a weak comparator for PE. Studies have already established that PE is more effective than active supportive counseling and present-centered therapy [47–49], and there is no compelling reason to suspect that PE would not also be effective with PLWH. In addition, the sample size was modest, dropout was higher in PE than the waitlist, and the use of ANOVA may not have optimally handled the missing data. Future studies should examine the efficacy of PE among PLWH using a more active comparator.

Group Treatments for PLWH with Histories of Sexual Abuse

Four studies have examined the efficacy of group treatments and examined trauma-related symptoms as a treatment outcome among PLWH who were trauma-exposed.

Living in the Face of Trauma—Two studies by Sikkema and colleagues have examined the efficacy of a stress-coping group therapy among PLWH who have experienced sexual abuse on trauma-related symptoms [32, 33]. These studies were not focused on treating PTSD per se (i.e., PTSD was not an inclusion criteria), but rather on the negative psychological sequela of sexual abuse more broadly. The intervention examined in these studies, referred to as Living in the Face of Trauma (LIFT) in later work, is a group intervention designed to improve coping with HIV and childhood sexual abuse (CSA) (see Puffer et al. [50] for a description and discussion of clinical processes), with coping being the purported mediator linking current stressors and PTS symptoms. The treatment integrates cognitive appraisal and coping skills training with cognitive behavioral treatment strategies to reduce trauma-related distress.

The first study [32] was a small ($N = 28$), uncontrolled pilot study with HIV+ women and men who reported having experienced sexual abuse. Thirty-two percent of the sample had probable PTSD according to an elevated clinical scale on the self-report Personality Assessment Inventory [51]. The group intervention was delivered in 16 90-min weekly

sessions for three groups of women and eight weekly sessions for two groups of men in order to examine the impact of treatment length. PTSD symptoms were measured using the Trauma Symptom Inventory (TSI) [52] which is composed of 10 clinical scales which can be grouped into three clusters: trauma-related symptoms, mood and anxiety symptoms, and behavioral difficulties. The intervention was not designed to target PTSD specifically, and correspondingly, the outcome measures assessed the frequency of various difficulties that may arise posttrauma. The primary outcome was clinically significant change [53] on the TSI scales. From pretreatment to posttreatment, the majority (76.9 %) of participants demonstrated clinically significant change on one or more subscales of TSI (the median number of scales on which participants improved was 1). Only two participants dropped out of the study. Although the effect sizes for within-group change on the TSI scales were large (d 's ranged from 0.78 to 1.42), treatment gains were generally quite modest. This study was small, uncontrolled, and relied on a self-report outcome measure, and there was no follow-up assessment. However, this was the first preliminary study, to our knowledge, that examined the impact of treatment on trauma-related symptoms among PLWH, and the focus on clinical significance over statistical significance is laudable.

In the second study, Sikkema et al. reported the preliminary results of an RCT examining a 15-session version of the same group coping intervention compared to an HIV support group and a waitlist condition [33]. Participants ($N = 202$) were HIV+ men and women who reported experiencing CSA. The main outcome was change on the Impact of Events Scale (IES) [54], a well-validated self-report measure of post-traumatic intrusion and avoidance symptoms, from pretreatment to posttreatment. As hypothesized, repeated measures ANOVAs found that the coping group led to significantly greater reductions on the IES intrusion and avoidance subscales compared to the HIV support group and the waitlist condition. Effect sizes for the between-group comparisons were small ($d = 0.21$ for the Intrusion subscale and $d = 0.34$ for the Avoidance subscale). As in the 2004 pilot study [32], the researchers examined clinical significance using the Jacobson and Truax criteria [53] and found that those in the coping group were more likely to have made clinically significant change. Dropout was 29 % in the coping intervention and 27 % in the support group.

Major strengths of this study include the RCT design and the inclusion of an active comparator, the HIV support group. Unlike the outcome measure used in the pilot study, which covers a range of psychological and behavioral symptoms, the IES is focused on PTS symptoms (although it is also a self-report questionnaire). The variable rate of intervention exposure is a limitation, as is the lack of follow-up data reported.

In the results of the full trial ($N = 247$), which included follow-up data, Sikkema et al. refers to the group therapy as LIFT [34••]. In the full study, the authors used latent growth curve modeling (LGM) to examine changes over five time points: pretreatment, posttreatment, 4-month, 8-month, and 12-month follow-up. Forty percent of the sample had probable DSM-IV PTSD based on clinical interview. In addition to examining PTS symptoms using the IES, this study also examined whether avoidant coping, as measured by the Coping with AIDS scale [55], mediated changes in PTS. Consistent with the preliminary results [33], LIFT was associated with significantly greater reductions in PTS and avoidant coping over time than the support intervention (between-group effect sizes were not reported). Moreover,

avoidant coping was found to completely mediate the effect of treatment on reductions in PTSD symptoms, which suggests that the superior effect of LIFT was accounted for by its effect on avoidant coping.

In addition to the use of LGM, which is better able to model individual change over time than traditional ANOVA approaches, the extended follow-up period in this study is a major strength that makes this the first study to provide data on the maintenance of gains in PTS symptoms following LIFT. The analysis examining avoidant coping provides support for the hypothesis that increasing adaptive approach behaviors, or exposure, may be a mechanism of change in LIFT. The reliance on the self-report IES as a key outcome is a relative weakness. Also, given that LIFT aims to help PLWH who have experienced sexual abuse, it may not be appropriate for PLWH who are most bothered by other types of traumatic experiences.

Enhanced Sexual Health Intervention—Two studies have examined the efficacy of Enhanced Sexual Health Intervention (ESHI) [35, 36]. ESHI is a brief CBT-informed group intervention that focuses on reducing sexual risk behavior and stress using an ecological framework that addresses individual, interpersonal, social, and cultural factors. Compared to PE and LIFT which explicitly target trauma/PTS symptoms, ESHI has a broader focus that acknowledges the interrelationship between sexual risk behaviors and trauma symptoms. In the first study, Wyatt et al. used a quasi-experimental waitlist design to examine the efficacy of ESHI in 147 HIV+ African-American and Latina women [36]. Participants reported a history of sexual abuse or violence but did not necessarily have PTSD. Participants were randomized to either ESHI or to waitlist/case management followed by the option of ESHI or continued case management. PTSD symptoms were measured at pretreatment and posttreatment using the PTSD diagnostic module of the Composite International Diagnostic Interview (CIDI) [56], which is a well-validated clinician-administered diagnostic scale. As hypothesized, ESHI was associated with significantly greater reductions in PTSD symptoms than the waitlist condition (between-group effect sizes were not reported). There were no group differences in reduction of sexual trauma symptoms, as measured by the TSI sexual concern subscale [57]. A major strength of this study is the use of a clinician-administered PTSD scale. On the other hand, the lack of follow-up data and the weak comparator (waitlist) are study weaknesses.

The second study tested a modified version of ESHI for men (ES-HIM). Williams et al. conducted an RCT with 117 African-American men who have sex with men and women (MSMW) who did not self-identify as gay and who had histories of CSA [35]. ES-HIM was compared to a psychoeducational health promotion group. Both conditions consisted of six small-group sessions 2 h each in duration, administered over 3 weeks. PTS symptoms were measured using the Posttraumatic Diagnostic Scale (PDS) [58], a well-validated self-report measure of PTSD, at pretreatment and posttreatment as well as at the 3- and 6-month follow-up. Forty-five percent of the sample met criteria for probable PTSD based on the PDS. Results indicated that there were no group differences in the reduction of PTS symptoms (between-group effect sizes were not reported). Strengths of the study include the RCT design, the use of a PTSD measure (albeit self-report), and the inclusion of follow-up assessments. Although ES-HIM was not superior to the health promotion group on PTSD

outcomes, it is notable that both groups improved significantly following the brief interventions.

Expressive Writing Treatments for PLWH with HIV-Related Trauma

Two studies have examined the efficacy of expressive writing, either as a stand-alone treatment or as a key component in a treatment program, among PLWH [29, 30]. Unlike the studies reviewed above, neither PTSD nor trauma exposure was an inclusion criterion. Instead, participants were assumed to be trauma-exposed based on their HIV status.

In a large RCT with 244 HIV+ women and men, Ironson et al. tested four sessions of 30-min trauma/stress-focused expressive writing versus writing about daily events [30]. At pretreatment and posttreatment and at the 6- and 12-month follow-up, PTSD symptoms were measured using the Davidson Trauma Scale [59, 60], which is designed as a self-report measure of DSM-IV criteria for PTSD. The proportion of the sample with probable PTSD based on the Davidson PTSD Scale cutoff was not reported. To promote emotional-cognitive processing and emotional disclosure, participants in the trauma/stress-focused expressive writing group were encouraged to write about their understanding of a traumatic experience, feelings of self-worth and self-esteem, and coping or problem-solving efforts in response to trauma. Participants in the control condition were asked to write about what they did throughout the day yesterday. Using hierarchical linear models (HLMs), the results showed no significant differences in PTSD reduction between conditions. The effect size for within-group change in the trauma/stress expressive writing condition was in the medium range ($d = .043$ at the 6-month follow-up). Exploratory analyses showed that women, but not men, showed significant improvement in PTSD (with a small between-group effect size). The RCT design, the clinician-administered scale, and the long follow-up period are major strengths of this study. The fact that participants were not included based on PTSD or trauma exposure beyond their HIV status likely limited the impact of the brief intervention relative to an active control condition.

In a small pilot RCT, Carrico et al. examined the efficacy of seven sessions of multicomponent resilient affective processing (RAP) versus neutral writing in 23 HIV+ men who have sex with men (MSM) who use methamphetamine [29]. RAP focuses on decreasing HIV-related traumatic stress and includes psychoeducation, expressive writing with prompts designed to cultivate positive psychological states (e.g., “what makes you feel hopeful or optimistic about the future?”), and relaxation exercises. PTS symptoms were measured at pre-treatment and posttreatment and at the 1- and 3-month follow-up using a revised version of the IES (IES-R) [61]. Similar to the findings of Ironson et al. among men [30], these results showed no significant reductions in PTS symptoms among those who received the RAP intervention (RAP was associated with decreases in methamphetamine use). In contrast, there were significant reductions in PTS symptoms in control condition (between-group effect sizes were not reported). The RCT design, the follow-up period, and the active comparator are strengths, but the sample size is too small to draw firm conclusions. Moreover, as with the Ironson et al. study [30], including participants with no documented PTSD or trauma-related symptoms limits the likelihood of observing treatment effects on PTS symptoms.

Conclusions

This review sought to identify and critically evaluate studies of PTSD and PTS symptoms among PLWH. In terms of treatment studies of PTSD among PLWH, there is currently only one study [31]. Given the elevated rate of PTSD among PLWH [62•] and the evidence that PTSD is linked with worse HIV-related health outcomes [17, 18], it is disheartening that the evidence base remains so small. Of course, PTS symptoms exist on a continuum, and fortunately there are several treatment studies of trauma-exposed PLWH who are experiencing some PTS or trauma-related symptoms. However, there is a need for research focusing on PTSD specifically. PTS symptoms that meet the threshold for diagnosis are associated, by definition, with clinically significant levels of distress and interference and may not respond to interventions that are efficacious for those who are trauma-exposed but not suffering from PTSD. The one PTSD study by Pacella et al. showed that PE is more effective than waitlist at posttreatment [31], but questions of the durability of these gains and the efficacy of PE relative to alternate interventions remain.

Treatment studies for trauma-exposed PLWH all examined group therapies that either focus on coping with HIV and trauma (i.e., LIFT) or sexual risk reduction and stress (i.e., ESHI and ES-HIM). LIFT was found to be slightly (but significantly) more effective than an HIV support group, and the most recent study [34••] showed that gains are maintained up to a year after treatment. The 11-session ESHI program was more effective than waitlist on interviewer-assessed PTSD at posttreatment (there was no follow-up period), whereas the six-session ES-HIM program was equivalent to waitlist on self-reported PTSD at posttreatment or follow-up. Overall, the evidence supporting group interventions is mixed, with shorter interventions showing less robust results.

It is interesting to note that Sikkema et al. found that reductions in avoidance coping fully mediated the effect of treatment on PTS symptoms [34••]. Together with Pacella et al.'s positive results for PE [31], which is an exposure therapy for PTSD, this finding suggests that interventions targeting avoidance and promoting approach behaviors may be effective for PLWH with PTS symptoms, as is already known to be the case in the general population [63]. In contrast, a study by Classen et al., excluded from our review because participants were not HIV+ although they were identified as at risk for HIV, found that a 24-week trauma-focused group treatment was superior to waitlist, but equivalent to a present-focused group treatment in reducing PTSD symptoms [64]. In the general population, present-focused individual treatments such as present-centered therapy have also been found efficacious for PTSD, albeit less effective than exposure treatments in head-to-head trials [48, 65].

It also bears mentioning that three of the four group treatment studies reviewed relied on self-report measures to assess PTS symptoms. Structured clinical interviews are recommended whenever possible in order to guard against the biases inherent to self-reports, to help patients assess the complex cognitive, emotional, and behavioral phenomena that comprise PTSD and (for measures of PTSD) to ensure that the reported symptoms are being correctly linked to an identified traumatic event.

Both studies that examined expressive writing treatment, either alone [30] or as part of a multicomponent intervention [29], found null results relative to daily event writing. Expressive writing, also referred to as narrative writing, is a type of exposure therapy that has shown promise for treating PTSD in the general population [66] and is a feature of a number of PTSD treatment protocols. Participants in these studies did not necessarily have PTSD or PTS symptoms (i.e., neither was an inclusion criterion) but were assumed to be trauma-exposed based on the HIV+ status. As already noted, it may be that low initial PTS symptom severity limited room for improvement. Alternately, the intervention used by Ironson et al. [30] may have been too brief [66] and the intervention used by Carrico et al. [29] may have been too diluted with additional treatment components.

In summary, there is no strong evidence supporting the use of any specific interventions to treat PTS symptoms among PLWH, although PE for PTSD and LIFT for sexual assault-related PTS symptoms appear most promising. Considerable additional research is needed before these protocols could be recommended for clinical practice. Studies using active comparison conditions and interviewer-assessed PTS measures are particularly needed. Given that there are a number of EBTs for PTSD that have been supported in the general population, future studies should consider evaluating the efficacy of these treatments with PLWH as a first step, rather than assuming that new interventions need be developed. This approach allows for an evaluation of outcomes relative to the broader EBT research literature. The necessity of modifications to existing EBT to optimally address the needs of PLWH and PTSD/PTS is an empirical question that should be evaluated.

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Fig. 1.
Flow of article selection

Table 1

Summary of included articles in the systematic review

Study	Treatment(s)/control	Treatment length	Sample	PTS measure used	Major finding
Carrico et al. 2015 [29]	(1) RAP; (2) neutral writing	7 sessions of 30+ minutes ^a over 1 month	23 HIV+ MSM who use methamphetamine	The Impact of Events Scale-Revised (IES-R)	Neutral writing, but not RAP, was associated with significant reductions in PTS symptoms.
Ironson et al. 2013 [30]	(1) Augmented trauma-writing; (2) daily-event-writing	4 30-min sessions over 2–4 weeks	244 HIV+ men and women	Davidson PTSD Scale	No group differences were found in PTS symptom reduction.
Pacella et al. 2012 [31]	(1) PE; (2) weekly monitoring control	10 twice-weekly 90–120-min sessions	65 HIV+ men and women with PTSD	PTSD Symptom Scale-Interview (PSS-I)	PE was associated with significantly greater decreases in PTSD severity.
Sikkema et al. 2004 [32]	(1) Coping group intervention (later referred to as LIFT)	8 or 16 weekly 90-min sessions	28 HIV+ men and women with history of sexual abuse	Trauma Symptom Inventory (TSI)	Participants showed significant reductions in PTS severity.
Sikkema et al. 2007 [33]	(1) LIFT; (2) HIV support group; (3) waitlist control	15 weekly 90-min sessions	202 HIV+ men and women with history of CSA	The Impact of Events Scale (IES)	LIFT was associated with significantly greater reductions in PTS severity.
Sikkema et al. 2013 [34••]	(1) LIFT; (2) HIV support group	15 weekly 90-min sessions	247 HIV+ men and women with history of CSA	The Impact of Events Scale (IES)	LIFT was associated with significantly greater reductions in PTS severity; effect was mediated by avoidant coping.
Williams et al. 2013 [35]	(1) ES-HIM; (2) HP control	6 twice-weekly 2-h sessions	117 HIV+ African-American MSMW	Posttraumatic Diagnostic Scale (PDS)	No group differences were found in the reduction of PTSD symptoms.
Wyatt et al. 2011 [36]	(1) ESHI; (2) waitlist/case management	11 weekly 2.5-h sessions	147 HIV+ African-American and Latina women	PTSD diagnostic module of the Composite International Diagnostic Interview	ESHI was associated with significantly greater reductions in PTSD symptoms.

RAP resilient affective processing, *MSM* men who have sex with men, *PE* prolonged exposure, *LIFT* Living in the Face of Trauma, *CSA* childhood sexual abuse, *ES-HIM* enhanced sexual health intervention for men, *HP* health promotion, *MSMW* men who have sex with men and women, *EHSH* enhanced sexual health intervention

^a RAP included 30 min of expressive writing followed by meditation and relaxation exercises for an unspecified amount of time