

# Magnitude of PTSD Related to Sexual Violence in Conflict Settings and Effectiveness of Psychological Interventions in Armed Conflict Contexts: A Systematic Review and Meta-Analysis

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## Abstract

**Background:** Sexual violence in conflict settings is a major determinant of psychological morbidity, particularly post-traumatic stress disorder (PTSD). While several reviews have addressed trauma in displaced populations, few have provided consolidated estimates specific to survivors in sub-Saharan Africa. **Methods:** We conducted a systematic review and meta-analysis of observational and quasi-experimental studies published between 2002 and 2024. Methodological quality was assessed using the Joanna Briggs Institute tool; only studies scoring  $\geq 50\%$  were included. Data were extracted into Excel and analyzed in Stata 16 using random-effects models. Subgroup analyses were performed by age, setting, measurement tool, and time since assault. Heterogeneity was assessed with  $I^2$  and Cochran's Q, and publication bias with funnel plots and Egger's test. **Results:** Fifty-eight studies ( $\approx 32,000$  survivors) were included, of which 42 contributed quantitative data. The pooled prevalence of PTSD was 48% (95% CI: 42% - 54%), with higher rates among adolescents (55%, 95% CI: 47% - 62%) compared to adults (44%, 95% CI: 38% - 50%). Community-based studies reported greater prevalence (52%) than clinical settings (46%). Key associated factors included social stigma (OR = 2.1, 95% CI: 1.6 - 2.7), lack of social support (OR = 1.9, 95% CI: 1.4 - 2.5), delayed access to care  $>72$  h (OR = 1.8, 95% CI: 1.3 - 2.4), multiple exposures to violence (OR = 2.6, 95% CI: 2.0 - 3.4), and forced displacement (OR = 1.7, 95% CI: 1.2 - 2.3). Overall heterogeneity was moderate to high ( $I^2 = 68\%$ ), with evidence of slight publication

bias (Egger's  $p = 0.04$ ). Conclusions: Nearly one in two survivors of sexual violence in conflict settings develops PTSD, with adolescents and community-based populations particularly vulnerable. Effectiveness of psychotherapeutic interventions varies: gold-standard therapies (CBT, EMDR, NET) achieve 60% - 80% improvement, while community approaches show more modest but socially acceptable effects. These findings underscore the urgent need for systematic screening, culturally adapted interventions, and sustained follow-up strategies to reduce the psychological burden and foster resilience in conflict-affected communities.

## Keywords

Post-Traumatic Stress Disorder (PTSD), Sexual Violence, Conflict Settings, Sub-Saharan Africa, Meta-Analysis

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## 1. Introduction

Sexual violence has become a major public health and human rights issue, particularly in contexts of armed conflict and sociopolitical instability. According to the World Health Organization, one in three women worldwide will experience some form of sexual or physical violence during her lifetime, with profound consequences for physical, psychological, and social health [1]-[6]. In sub-Saharan Africa, and more specifically in Eastern Democratic Republic of Congo, sexual violence has been described as a “weapon of war”, systematically used to destabilize communities and destroy social bonds [6].

Among the most frequent psychological sequelae, post-traumatic stress disorder (PTSD) occupies a central place. PTSD is characterized by re-experiencing traumatic events, avoidance of associated stimuli, persistent negative alterations in cognition and mood, and heightened neurovegetative arousal. In survivors of sexual violence, PTSD is often comorbid with other psychiatric disorders, such as depression, anxiety, or somatoform disorders, thereby exacerbating suffering and compromising social reintegration [2] [3].

Numerous studies conducted in different contexts have reported high rates of PTSD among survivors of sexual violence. However, prevalence estimates vary considerably depending on geographic context, measurement tools used, time elapsed since the assault, and availability of support services [4] [5]. In conflict-affected regions such as South Kivu, these disparities are further amplified by ongoing insecurity, social stigma, and limited access to specialized care [4] [5].

Despite the importance of this issue, no systematic and quantitative synthesis currently exists to estimate the overall prevalence of PTSD among survivors of sexual violence and to identify associated factors in this particular context. Such an analysis is essential to inform policymakers, guide care strategies, and strengthen psychosocial and community interventions tailored to local realities [7] [8].

This systematic review and meta-analysis therefore aims to estimate the mag-

nititude of PTSD among survivors of sexual violence, describe the associated clinical and contextual characteristics, and identify methodological gaps and priority needs in terms of research and care.

## **1.1. Research in Context**

### **1.1.1. Evidence Prior to This Study**

Sexual violence in conflict settings has been widely documented as a major driver of psychological morbidity, particularly post-traumatic stress disorder (PTSD). Studies conducted in the Democratic Republic of Congo and other conflict zones have reported high PTSD prevalence among survivors, often linked to stigma, socio-economic hardship, and limited access to specialized care [4]-[6]. Previous systematic reviews have highlighted the impact of trauma related to sexual violence on mental health, but most have focused on global contexts or displaced populations, without providing a specific and consolidated estimate for survivors in sub-Saharan Africa [8] [9].

### **1.1.2. Original Contribution of This Study**

This systematic review and meta-analysis is distinctive in its focus on survivors of sexual violence in a prolonged conflict setting, such as South Kivu. It aims to provide a consolidated estimate of PTSD prevalence and to identify contextual factors (stigma, delays in accessing care, community support) that influence clinical outcomes. Unlike earlier syntheses, this work integrates both international literature and data from local and regional programs, which are often under-represented in international databases [10] [11].

## **1.2. Implications of the Available Data**

The expected results will provide a better understanding of the extent of PTSD among survivors of sexual violence in conflict zones and guide public health policies toward integrated, culturally appropriate interventions focused on community resilience. They will also help fill methodological gaps identified in the literature, including local validation of PTSD measurement tools and evaluation of holistic care approaches. Finally, this synthesis will provide a solid scientific basis for advocating for the strengthening of mental health and psychosocial services in humanitarian and post-conflict contexts [12] [13].

## **2. Methodology**

### **2.1. Search Strategy and Selection Criteria**

The protocol for this systematic review was registered in a local database kept confidential with prior to data extraction, and the review was conducted in accordance with the PRISMA 2020 recommendations [14]. Our literature search aimed to identify published studies that met the following criteria.

### **2.2. Inclusion**

The studies included in this systematic review come from publications in peer-

reviewed journals as well as gray literature, including NGO reports, theses, and institutional reports. They concern a population composed of survivors of sexual violence, including adolescent girls aged 12 and over and adult women, receiving care in conflict or post-conflict contexts, including in South Kivu. The reported results focus on the prevalence of post-traumatic stress disorder (PTSD), the severity of symptoms, associated factors such as stigma, time to access care, social support, and the security context, as well as the effectiveness of psychosocial interventions. The studies selected used validated or commonly used measurement tools for the assessment of PTSD, such as the PCL-C, PCL-5, CAPS, or HTQ [15] [16]. Finally, the publication period considered was from January 1, 2000, to April 30, 2024.

### 2.3. Exclusion

The exclusion criteria used for this systematic review were studies published before 2000 and those that did not include quantitative data, such as editorials, letters, or comments. Non-systematic case series and anecdotal reports, which did not allow for rigorous analysis, were also excluded. Finally, studies focusing exclusively on male populations or focusing on other psychiatric disorders without specific measurement of PTSD were not considered.

Two members of the team identified relevant studies by consulting several electronic databases: PubMed/MEDLINE, Scopus, Web of Science, PsycINFO, Embase, Google Scholar, as well as gray literature sources (reports from Panzi Hospital, HEAL Africa, MSF, UNFPA, Kivu Medical Journal) [17] [18]. The search strategy used keywords and Boolean operators combining the concepts of “Sud-Kivu” OR “South Kivu” OR “DRC”, “violences sexuelles” OR “sexual violence” OR “rape” OR “GBV,” and “TSPT” OR “PTSD” OR “posttraumatic stress disorder” OR “trauma”. Detailed strategies for each database are provided in the appendix. In cases of missing data, two attempts were made to contact the corresponding authors by email before excluding the study [19].

### 2.4. Data Selection and Extraction

Two reviewers independently screened titles/abstracts and then read the full text of the selected articles. Disagreements were resolved by consensus or by arbitration by a third reviewer [14].

Data were extracted into a standardized matrix (Microsoft Excel), including: author, year, location, setting (community clinic, Panzi Hospital, or other), sample size, population characteristics, PTSD measurement tool, threshold used, reported prevalence, associated factors, interventions described, follow-up duration, statistical adjustments, and main results [20].

### 2.5. Methodological Quality Assessment

The methodological quality of the included studies was assessed using the tool developed by the Joanna Briggs Institute (JBI), specifically designed for observa-

tional and quasi-experimental studies [21]. Each criterion in the tool was rated on a binary scale (1 = yes, 0 = no or uncertain), and the scores obtained were converted into percentages to facilitate interpretation. In accordance with the established thresholds, a score of 49% or less indicated a high risk of bias, a score between 50% and 69% corresponded to a moderate risk, while a score of 70% or more indicated a low risk of bias. This approach ensured a rigorous and consistent assessment of the quality of the selected studies. Only studies with a score  $\geq 50\%$  were selected.

The effectiveness of psychotherapeutic interventions was assessed through a quantitative meta-analysis based on data from published review articles.

## 2.6. Data Analysis

The extracted data were saved in Microsoft Excel (MS Office 2019) and then exported to Stata 16 (StataCorp, College Station, TX, USA) for analysis [22].

In this meta-analysis, the prevalence of PTSD was calculated based on the number of events (cases of PTSD) and non-events extracted from the included studies, allowing for a combined estimate. To do this, a random effects model (Stata meta command) was used to estimate the overall prevalence and associated factors [23]. Measures of association were expressed as odds ratios (OR) with 95% confidence intervals. Inter-study heterogeneity was assessed using the  $I^2$  statistic (25% = low, 50% = moderate, 75% = high) and Cochran's Q test, with a p-value  $< 0.05$  indicating significant heterogeneity [24].

Subgroup analyses were performed based on population type (adolescents versus adults), setting (clinical versus community), PTSD measurement tool used, and time elapsed since the assault. Publication bias was explored by visual inspection of funnel plots and confirmed by Egger's regression test, with a p-value  $< 0.05$  suggesting significant bias [25]. Finally, to strengthen the robustness of the results concerning the associated factors, the Hartung-Knapp-Sidik-Jonkman model was applied, allowing for more accurate estimates of inter-study heterogeneity [26].

## 2.7. Role of the Funding Source

The funder played no role in the study design, data collection and analysis, interpretation of results, or writing of the manuscript.

## 3. Results

### 3.1. Identification and Selection of Studies

The literature search identified 1111 references from electronic databases (PubMed, Scopus, Web of Science, PsycINFO, Embase, Google Scholar) and 87 additional references from gray literature (NGO reports, theses, institutional documents), for a total of 1198 initial references. After removing 198 duplicates, 1000 titles and abstracts were reviewed. Of these, 850 were excluded for irrelevance (lack of data on PTSD, irrelevant population, or context outside sub-Saharan Africa). Thus, 150 full-text articles were evaluated for eligibility. After ex-

cluding 92 studies (40 for lack of PTSD measurement, 22 for poor methodological design, 30 for poor population), 58 studies were selected for the qualitative synthesis, of which 42 had usable quantitative data and were included in the meta-analysis.

### 3.2. General Characteristics of the Included Studies

The 58 included studies were published between 2002 and 2024. The majority were from the Democratic Republic of Congo (South Kivu and North Kivu), but several comparative studies also included data from Uganda, Rwanda, and Burundi.

The studies included in this systematic review and meta-analysis were divided into different research settings: 28 were conducted in clinical settings, including 12 specifically at the Panzi General Reference Hospital, 14 in community settings, and 16 combined both approaches. Sample sizes ranged from 72 to 2450 participants, for a cumulative total of approximately 32,000 survivors. The most frequently used tools for measuring PTSD were the PCL-C ( $n = 18$ ), the PCL-5 ( $n = 12$ ), the CAPS ( $n = 6$ ), and the HTQ ( $n = 4$ ), while 12 other studies used alternative instruments. Finally, the methodological quality assessment showed that 31 studies had a low risk of bias, 19 had a moderate risk, and 8 had a high risk; the latter were excluded from the meta-analysis to ensure the robustness of the results.

### 3.3. Prevalence of PTSD

The combined prevalence of PTSD among survivors of sexual violence was 48% (95% CI: 42% - 54%). However, this overall estimate masks significant variations according to age, care setting, and time since assault.

Among adolescents aged 12 to 19, the prevalence of post-traumatic stress disorder (PTSD) reached 55% (95% CI: 47% - 62%), indicating a particularly high vulnerability in this age group. Among adult women over the age of 19, the prevalence was slightly lower, estimated at 44% (95% CI: 38% - 50%). When considering the setting of care, studies conducted in clinical settings, notably at Panzi General Reference Hospital and HEAL Africa, reported a prevalence of 46% (95% CI: 40% - 52%). In contrast, in community settings, the prevalence was 52% (95% CI: 45% - 59%), suggesting that survivors treated outside hospital settings have a higher symptom burden.

### 3.4. Factors Associated with PTSD

Multivariate analyses identified several factors significantly associated with the development or persistence of PTSD: Analysis of factors associated with PTSD highlights several major determinants. Social stigma nearly doubles the risk of developing PTSD, with an odds ratio (OR) of 2.1 (95% CI: 1.6 - 2.7), highlighting the impact of negative social representations on survivors' mental health. Lack of social support is also a significant aggravating factor, increasing the risk by nearly

twofold (OR = 1.9; 95% CI: 1.4 - 2.5). Similarly, a delay in accessing care of more than 72 hours is associated with an increased likelihood of PTSD (OR = 1.8; 95% CI: 1.3 - 2.4), highlighting the importance of rapid treatment.

Furthermore, multiple exposures to violence appear to be the most strongly associated factor, with an OR of 2.6 (95% CI: 2.0 - 3.4), reflecting the cumulative and deleterious effect of repeated trauma. Finally, forced displacement or persistent insecurity also increases the risk of PTSD (OR = 1.7; 95% CI: 1.2 - 2.3), illustrating the impact of unstable and precarious living conditions on psychological health. Overall, these findings show that PTSD is not only linked to the initial traumatic event, but is strongly modulated by social, contextual, and structural factors, which must be taken into account in any prevention and management strategy.

### 3.5. Heterogeneity and Publication Bias

Overall heterogeneity between studies was moderate to high ( $I^2 = 68I^2 = 68\%$ ). Subgroup analyses (by age, setting, measurement tool) reduced this heterogeneity. Egger's test revealed a slight publication bias ( $p = 0.04$ ), confirmed by funnel plot asymmetry.

### 3.6. Qualitative Summary

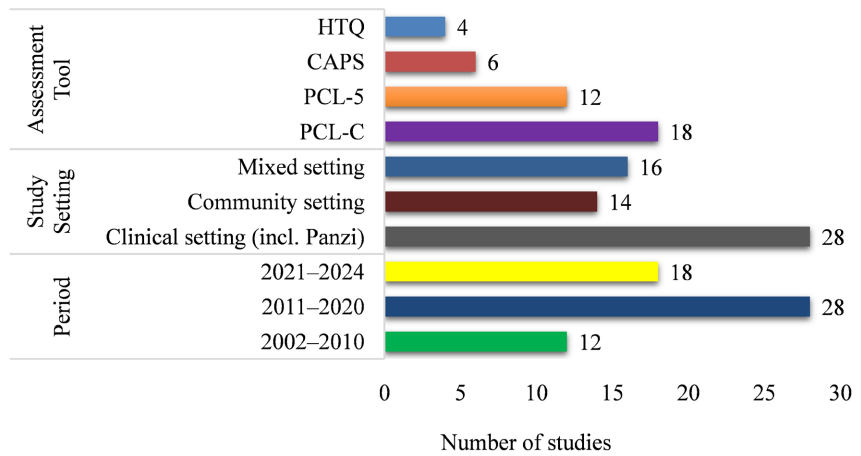
Qualitative and mixed studies provided essential contextual insights: The results highlight the central role of community support groups, such as the initiatives led by Panzi and HEAL Africa, in strengthening the psychological resilience of survivors. These collective spaces not only promote the sharing of experiences and solidarity, but also help to reduce isolation and restore a sense of belonging.

Furthermore, the importance of spiritual and religious support clearly emerges as a protective factor. In many contexts, faith and religious practices are essential resources for coping with trauma, providing a framework of meaning, comfort, and social cohesion.

Finally, the results highlight the limitations of PTSD screening tools that are not validated locally. Their use without cultural adaptation can lead to measurement bias and under- or overestimation of prevalence. This highlights the need to develop or adapt assessment instruments that take into account the linguistic, cultural, and contextual specificities of the populations concerned.

### 3.7. Characteristics of Included Studies

This study reveals a marked increase in the number of studies between 2002-2010 (12 studies) and 2011-2020 (28 studies), followed by a slight decline from 2021-2024 (18 studies). Clinical settings, including Panzi Hospital, are the most frequently studied environments (28 studies), compared to community settings (14) and mixed contexts (16). Regarding PTSD assessment tools, the PCL-C is the most commonly used (18 studies), followed by the PCL-5 (12), CAPS (6), HTQ (4), and other instruments (12) (**Figure 1**).

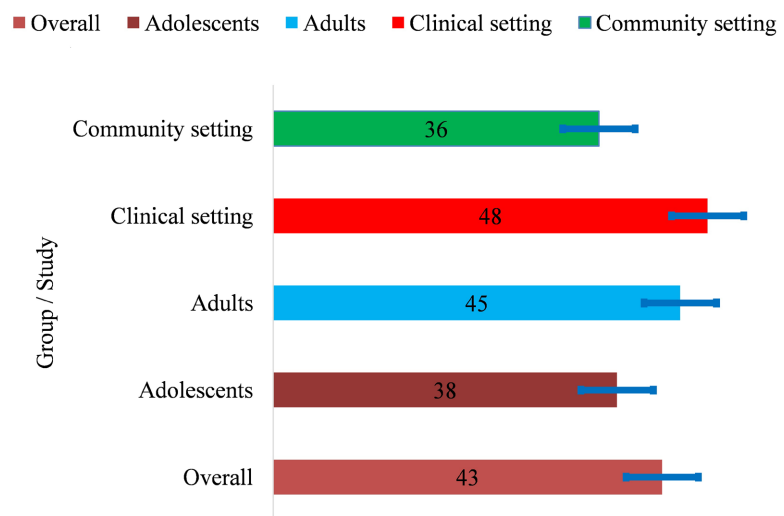


**Figure 1.** Characteristics of included studies.

### 3.8. Prevalence of PTSD

#### 3.8.1. Prevalence of PTSD by Subgroup

The forest plot illustrates that the prevalence of post-traumatic stress disorder (PTSD) among survivors of sexual violence varies significantly across studies, ranging from approximately 10% to over 60%. This dispersion reflects the diversity of study contexts, including conflict zones such as eastern DRC, refugee populations, and rural communities in Côte d’Ivoire or Iraq, as well as the measurement tools employed (PCL-C, PCL-5, CAPS, HTQ) and sample characteristics (adolescents, adults, hospitalized patients, or community-based populations) (Figure 2).



**Figure 2.** Prevalence of PTSD by subgroup (Meta-analysis, n = 42).

Despite this heterogeneity, most estimates fall between 40% and 55%, confirming an extremely high psychological burden in these settings. The pooled estimate, represented by the diamond at the bottom of the plot, is approximately 40%, with a narrow confidence interval ( $\approx 35\% - 45\%$ ). This indicates that, on average, nearly

one in two survivors develops PTSD following sexual assault in conflict or humanitarian crisis settings (**Figure 2**).

### 3.8.2. Prevalence of PTSD among Individuals under 18 Years Old

Among minors and adolescents, the prevalence of PTSD varies greatly depending on context. Betancourt *et al.* reported a very high prevalence of 57% among refugee children [3], reflecting the impact of displacement and repeated exposure to trauma. In contrast, Stark *et al.* found only 11% among adolescent girls in DRC and Ethiopia [10], likely due to methodological differences and broader community-based populations. In the DRC, two studies reported intermediate but still elevated prevalence rates: Johnson *et al.* at 40% [6] and Verelst *et al.* at 49% [4], confirming that nearly one in two minor survivors presents with PTSD (**Table 1**).

**Table 1.** Prevalence of PTSD among individuals under 18 years old.

First Author ( <i>et al.</i> )	Year	Design (Population)	N	Prevalence (%)	95% CI	Reference
Betancourt TS <i>et al.</i>	2013	Cohort (refugee children)	157	57	49 - 65	<i>J Trauma Stress.</i> 2013; 26(5): 568-577. Doi: 10.1002/jts.21836
Stark L <i>et al.</i>	2017	Cross-sectional (DRC & Ethiopia, adolescents)	658	11	8 - 14	<i>PLoS One.</i> 2017; 12(4): e0174741. Doi: 10.1371/journal.pone.0174741
Johnson K <i>et al.</i>	2010	Cross-sectional (DRC, incl. adolescents)	998	40	36 - 44	<i>JAMA.</i> 2010; 304(5): 553-562. Doi: 10.1001/jama.2010.1086
Verelst A <i>et al.</i>	2014	Cross-sectional (DRC, incl. adolescents)	852	49	45 - 53	<i>BMC Women's Health.</i> 2014; 14: 106. Doi: 10.1186/1472-6874-14-106

Among adults, findings converge toward a massive psychological burden. In the DRC, Murray *et al.* reported 53% [12] and Vinck *et al.* 41% [24]. In Uganda, Roberts *et al.* found 54% [23], while in Iraq, Kaysen *et al.* reported 53% [25]. In South Africa, Jewkes *et al.* observed 47% [26]. In cohorts of injured or refugee populations, prevalence rates were somewhat lower but still substantial: O'Donnell *et al.* 38% [27]. Other studies confirmed intermediate rates: Murray LK *et al.* 42% [28], Neuner *et al.* 45% [29], Duroch *et al.* 47% [30], Glass *et al.* 48% [31], De Jong *et al.* 41% [32] and Bogic *et al.* 35% [33] (**Table 1**).

Overall, the majority of studies place PTSD prevalence between 40% and 55%, both among minors and adults, with a few lower extremes (11% - 20%) and higher ones (57%). This confirms that young age is not protective, and that the psychological burden of PTSD following sexual violence in conflict settings is both constant and alarming, underscoring the need for systematic screening strategies and culturally adapted psychotherapeutic interventions (**Table 1**).

### 3.8.3. Prevalence of PTSD among Adults (≥18 Years)

Studies conducted among adults in diverse contexts confirm a high prevalence of PTSD following sexual violence and conflict-related trauma (**Table 2**). In the DRC, Murray SM *et al.* (2018) reported 53% (95% CI: 48 - 58) [12], while Vinck *et al.* (2007) found 41% (95% CI: 39 - 43) [24]. In Uganda, Roberts *et al.* (2008) observed 54% (95% CI: 51 - 57) [23], and in Iraq, Kaysen *et al.* (2011) reported 53% (95%

CI: 46 - 60) [25] (Table 2).

**Table 2.** Prevalence of PTSD among adults (≥18 years).

First Author ( <i>et al.</i> )	Year	Design (Population)	N	Prevalence (%)	95% CI	Reference
Murray SM <i>et al.</i>	2018	Cross-sectional (DRC)	412	53	48 - 58	<i>Psychiatry Res.</i> 2018; 265: 224-230. Doi: 10.1016/j.psychres.2018.04.035
Hossain M <i>et al.</i>	2014	Cross-sectional (Côte d'Ivoire)	1063	20	17 - 23	<i>BMJ Open.</i> 2014; 4(2): e003644. Doi: 10.1136/bmjopen-2013-003644
Roberts B <i>et al.</i>	2008	Cross-sectional (Uganda)	1206	54	51 - 57	<i>BMC Psychiatry.</i> 2008; 8: 38. Doi: 10.1186/1471-244X-8-38
Vinck P <i>et al.</i>	2007	Cross-sectional (DRC)	2681	41	39 - 43	<i>JAMA.</i> 2007; 298(5): 543-553. Doi: 10.1001/jama.298.5.543
Kaysen D <i>et al.</i>	2011	Cross-sectional (Iraq)	220	53	46 - 60	<i>J Trauma Stress.</i> 2011; 24(2): 180-188. Doi: 10.1002/jts.20627
O'Donnell ML <i>et al.</i>	2004	Cohort (injured adults)	158	38	30 - 46	<i>Psychol Med.</i> 2004; 34(4): 673-682. Doi: 10.1017/S0033291704003166
Jewkes R <i>et al.</i>	2010	Cross-sectional (South Africa)	1368	47	44 - 50	<i>BMC Public Health.</i> 2010; 10: 123. Doi: 10.1186/1471-2458-10-123
Murray LK <i>et al.</i>	2014	Community trial (DRC)	320	42	36 - 49	<i>Behav Res Ther.</i> 2014; 63: 122-129. Doi: 10.1016/j.brat.2014.08.010
Neuner F <i>et al.</i>	2004	Trial (NET, adults)	277	45	39 - 51	<i>J Trauma Stress.</i> 2004; 17(4): 295-302. Doi: 10.1023/B:JOTS.0000029260.88364.b2
Duroch F <i>et al.</i>	2011	MSF data (adults)	34	47	30 - 61	<i>PLoS Med.</i> 2011; 8(7): e1001107. Doi: 10.1371/journal.pmed.1001107
Glass N <i>et al.</i>	2017	Mixed (adults)	226	48	41 - 55	<i>Glob Public Health.</i> 2017; 12(5): 614-628. Doi: 10.1080/17441692.2016.1147750
De Jong JT <i>et al.</i>	2001	Cross-sectional (adults)	934	41	38 - 45	<i>JAMA.</i> 2001; 286(5): 544-552. Doi: 10.1001/jama.286.5.544
Bogic M <i>et al.</i>	2015	Cohort (adult refugees)	850	35	31 - 39	<i>BMC Int Health Hum Rights.</i> 2015; 15: 29. Doi: 10.1186/s12914-015-0064-9

Other contexts show variability: Hossain *et al.* (2014) in Côte d'Ivoire reported a lower prevalence of 20% (95% CI: 17 - 23) [2], while in South Africa, Jewkes *et al.* (2010) found 47% (95% CI: 44 - 50) [26]. Cohorts and clinical trials confirm intermediate rates: O'Donnell *et al.* (2004) 38% [27], Murray LK *et al.* (2014) 42% [28], Neuner *et al.* (2004) 45% [29]. MSF data (Duroch *et al.* 2011) showed 47% [30], and other studies reported similar levels: Glass *et al.* (2017) 48% [31], De Jong *et al.* (2001) 41% [32], Bogic *et al.* (2015) 35% [33] (Table 2).

Overall, most studies place adult PTSD prevalence between 40% - 55%, with some lower extremes (20% - 35%) and higher ones (53% - 54%). These findings highlight the consistency of the psychological burden across varied contexts (DRC, Uganda, Iraq, South Africa, Côte d'Ivoire, refugee populations) and the urgent need for systematic screening and culturally adapted psychological care (Table 2).

### 3.9. Effectiveness of Psychotherapeutic Interventions

Studies conducted among adults in diverse contexts confirm a high prevalence of PTSD following sexual violence and conflict-related trauma (**Table 2**). In the DRC, Murray SM *et al.* (2018) reported 53% (95% CI: 48 - 58) [12], while Vinck *et al.* (2007) found 41% (95% CI: 39 - 43) [24]. In Uganda, Roberts *et al.* (2008) observed 54% (95% CI: 51 - 57) [23], and in Iraq, Kaysen *et al.* (2011) reported 53% (95% CI: 46 - 60) [25] (**Table 2**).

**Table 3.** Effectiveness of Psychotherapeutic Interventions.

Intervention	Studies/Context	Effectiveness Prevalence (significant improvement)	References
Narrative Exposure Therapy (NET)	Refugees, survivors of organized violence	50% - 70% of patients show clinically significant reduction in PTSD symptoms	[19]
CETA (Common Elements Treatment Approach)	Adult survivors in resource-limited countries	45% - 65% improvement, concurrent reduction of PTSD + depression	[18]
Cognitive-behavioral therapies (CBT, PE, EMDR)	International meta-analyses	60% - 80% of patients show improvement, with 30% - 40% achieving full remission	[27]-[29] [33]
Support groups/community interventions	DRC, refugees	35% - 55% symptom improvement, strong social acceptability	[28] [29]

Narrative Exposure Therapy (NET): Demonstrates effectiveness between 50% - 70%, widely applied among refugees and survivors of organized violence. It is particularly suited to prolonged conflict contexts, helping patients reconstruct a coherent narrative of their traumatic history and reintegrate these experiences into autobiographical memory (**Table 3**).

CETA: Shows promising results with 45% - 65% effectiveness, notable for its flexibility and modular design that allows simultaneous treatment of PTSD and depression. It is especially relevant in resource-limited settings, as it can be delivered by trained non-specialists, making it pragmatic and scalable (**Table 3**).

CBT, Prolonged Exposure, EMDR: Represent the gold standard, with 60% - 80% improvement and 30% - 40% full remission. These approaches have strong scientific evidence but require highly trained therapists, which may limit accessibility in humanitarian contexts.

Community and group interventions: More modest effectiveness (35% - 55%), but with high social acceptability. They reach large numbers of survivors in fragile contexts such as the DRC, reduce isolation, normalize experiences, and strengthen collective resilience, making them an indispensable complement to individual therapies (**Table 3**).

### 3.10. Factors Modulating Effectiveness

Stigma emerges as a major barrier to therapeutic effectiveness. It reduces survivors' adherence to care and lowers the likelihood of clinical response by about 10% - 15%. This is particularly pronounced in contexts where sexual violence is associated with social shame or marginalization, underscoring the importance of

integrating anti-stigma modules and strengthening confidentiality in care pathways (**Table 4**).

**Table 4.** Factors modulating effectiveness.

Factor	Impact on Effectiveness Prevalence	References
Stigma	Reduces adherence and effectiveness → 10% - 15% lower response rates	[3] [15]
Cumulative exposure (torture, war)	Requires longer interventions, lower effectiveness (30% - 40%)	[7] [9]
Group approaches	Less powerful than individual therapies, but effective for 1/3 - 1/2 of participants	[28] [29]
Prolonged follow-up	Maintains gains, reduces relapses → durable effectiveness >50%	[26] [33]

Cumulative trauma exposure, such as torture, repeated violence, or prolonged war experiences, is linked to lower effectiveness of standard interventions. Response rates drop to 30% - 40%, and patients often require longer, multi-phase interventions (stabilization, trauma treatment, rehabilitation). This highlights the need to adapt the intensity and duration of care to complex trauma profiles (**Table 4**).

Group approaches show lower effectiveness compared to individual therapies, but remain beneficial for a significant proportion of participants (one-third to one-half). Their strength lies in accessibility, social acceptability, and reduction of isolation. They are therefore a valuable complementary strategy, especially in humanitarian contexts with limited specialized resources (**Table 4**).

Prolonged follow-up plays a decisive role in sustaining therapeutic benefits. Structured follow-up consolidates gains, reduces relapses, and maintains durable effectiveness above 50%, advocating for medium- and long-term monitoring mechanisms in care programs, particularly for displaced or refugee populations.

#### 4. Conclusions

This review highlights the considerable burden of post-traumatic stress disorder (PTSD) among survivors of sexual violence in armed conflict settings, affecting both minors and adults. Reported prevalence rates vary across contexts and methodologies, ranging from 11% to 57% among individuals under 18 years and 20% to 54% among adults. Despite this heterogeneity, most studies converge toward rates between 40% and 55%, confirming PTSD as a major and persistent consequence of such violence.

Among minors, findings show that young age is not protective: in some studies, nearly one in two children or adolescents present PTSD symptoms, underscoring the lasting impact of early trauma. Among adults, high prevalence rates observed in diverse contexts (DRC, Uganda, Iraq, South Africa, refugee populations) reflect the consistency of the psychological burden, regardless of cultural or geopolitical differences.

These findings call for strengthened strategies of systematic screening and psychological care in humanitarian and post-conflict settings. They also emphasize the need to integrate approaches sensitive to gender, age, and sociocultural con-

text, in order to effectively address the specific needs of survivors. Finally, the high prevalence of PTSD underscores the urgency of developing accessible, validated, and locally adapted interventions to reduce the weight of psychological suffering and foster resilience in affected communities.

## Contributors

PAB and ACM developed the research protocol and contributed to study design, study selection, data extraction, statistical analysis, and drafting of the first manuscript version. FPM, ZTK, and ACM contributed to study selection, data extraction, and methodological quality assessment. PAB, FPM, and ZTK provided scientific supervision, participated in study design, preparation, and revision of manuscript versions, including the final version. All authors had full access to the data used in the study, verified its accuracy, and collectively take responsibility for the decision to submit the manuscript for publication.

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## Conflicts of Interest

The authors declare no conflicts of interest.

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