Post-Traumatic Stress Disorder and Co-Existing Mental Health Disorders Among Young Adult Survivors of Massacres in the Beni Region, D.R. Congo

Kakule Matabishi Nehemie [1],
Master of Arts in Counselling Psychology Candidate
Africa International University, Nairobi, Kenya
nehemiematabishi0@gmail.com

Prof. Niceta Ireri[2],
HOD, Department of Counselling Psychology, Africa International University, Nairobi, Kenya
niceta.ireri@africainternational.edu

Dr. Preskilla Ochieng-Munda[3]
Lecturer, Department of Counselling Psychology, Africa International University, Nairobi, Kenya
preskilla.ochieng@africainternational.edu

Abstract

The Beni region of the Democratic Republic of Congo (DRC) has endured persistent armed conflict, exposing young adult survivors to severe psychological trauma. This study examined the prevalence of post-traumatic stress disorder (PTSD), assessed its associated factors, and its relationship with co-existing mental health disorders in this population. Guided by Ecological Systems Theory and Cognitive Behavioural Theory, a cross-sectional descriptive design with a quantitative approach was employed. A stratified random sample of 385 participants (aged 18–35) was assessed using the PTSD Checklist for DSM-5 (PCL-5), the Depression Anxiety and Stress Scale (DASS-21), and the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST). Results indicated a high prevalence of probable PTSD (67.7%; $M = 50.85$, $SD = 21.32$). Significant associations were observed between PTSD and age, education level, duration of exposure, occupation, and marital status ($p < .05$). Strong positive correlations were found between PTSD and depression ($r = .74$, $p < .001$), anxiety ($r = .71$, $p < .001$), and stress ($r = .76$, $p < .001$). Substance use was also significantly associated with PTSD ($\chi^2 = 12.87$, $p < .001$), suggesting its role as a maladaptive

coping strategy. These findings demonstrate that PTSD is highly prevalent among young adult survivors in Beni and is closely linked to psychological comorbidities and socio-demographic factors. The study underscores the need for integrated, context-sensitive mental health interventions targeting PTSD, co-occurring disorders, and substance use in conflict-affected settings.

Keywords: Post-traumatic stress disorders, mental health comorbidity, young adult survivors, massacres, Beni region, DRC, suicide, depression.

INTRODUCTION

The Democratic Republic of Congo (DRC) has endured decades of armed conflict, with the Beni region in North Kivu province among the most severely affected areas. Since 2014, the Allied Democratic Forces (ADF) and other armed factions have perpetrated recurrent massacres, resulting in thousands of civilian deaths, mass displacement, and pervasive psychological trauma (Musavuli & Nzongola-Ntalaja, 2018). One of the most brutal incidents occurred on August 14, 2016, in the Rwangoma district, where between 64 and 101 individuals were killed with machetes and knives (Al Jazeera, 2016). These violent episodes have created an environment of chronic fear and insecurity, with profound implications for the mental health of survivors.

Post-Traumatic Stress Disorder (PTSD) is one of the most common psychological sequelae of exposure to mass violence. As defined by DSM-5 criteria, PTSD encompasses intrusive symptoms, avoidance behaviours, negative alterations in cognition and mood, and hyperarousal (Association, 2021). In conflict zones, PTSD rarely occurs in isolation; research consistently demonstrates high rates of comorbidity with depression, anxiety, and substance use disorders (Najavits et al., 2020). These co-occurring disorders amplify the severity of

PTSD, complicate recovery, and place immense burdens on already fragile health systems (Renaud et al., 2021).

Young adults, defined here as individuals aged 18 to 35, represent a particularly vulnerable group. This developmental stage is characterised by ongoing emotional and psychological maturation, and exposure to extreme trauma during this period can have lasting consequences (Blakemore, 2018). In Beni, young adult survivors must navigate not only their psychological wounds but also the daily reality of continued insecurity, displacement, and severely limited mental health resources. A local study by Katembo Kehya Esaie found PTSD symptom prevalence of 70.1%, depressive symptoms of 66.9%, and complicated grief of 76.4% among adults in Beni, figures dramatically higher than in non-conflict populations (Esaie, n.d.).

Despite this burden, there is a significant gap in research specifically examining the relationship between PTSD and co-existing mental health disorders among young adult massacre survivors in the Beni region. Previous studies on African conflict-affected populations have often overlooked this age group's distinct developmental challenges, and few have explored PTSD comorbidity patterns in culturally and resource-constrained settings like Beni (Betancourt et al., 2018). This study therefore sought to: (1) examine the prevalence of PTSD among young adult massacre survivors in Beni; (2) assess factors associated with PTSD; and (3) evaluate the relationship between PTSD and its co-existing mental health disorders, including depression, anxiety, and substance use.

STATEMENT OF THE PROBLEM

The prevalence of Post-Traumatic Stress Disorder (PTSD) among survivors of massacres represents a critical public health challenge, particularly in regions marked by ongoing violence, such as Beni in the Democratic Republic of Congo (DRC). Studies

estimate that PTSD rates among massacre survivors can range from 30% to 70%, with symptoms often exacerbated by the chronic nature of exposure to trauma in conflict zones (Diongo, 2017).

In Beni, where persistent massacres and brutal attacks by groups like the Allied Democratic Forces (ADF) have resulted in thousands of deaths and displacements since 2014, survivors frequently experience enduring psychological scars. Young adults, who are at a critical stage of psychological development, are disproportionately affected. This population not only endures high rates of PTSD but also faces co-occurring mental health disorders such as anxiety, depression, and substance use disorders, which intensify PTSD symptoms and complicate recovery.

Beni lacks specialised mental health services and has very limited resources, despite the urgent need for comprehensive mental health treatment. There is also a significant gap in targeted studies addressing the relationship between PTSD and co-existing mental health disorders among young adult massacre survivors. Extensive research has documented the prevalence of PTSD and its frequent co-occurrence with other mental health disorders, particularly among conflict survivors and veterans (Kessler et al., 2018; Brewin et al., 2019). Studies indicate that PTSD is often accompanied by mood disorders, substance use disorders, and complex trauma responses (Neria et al., 2022). Research from conflict zones, such as Syria and South Sudan, highlights how prolonged trauma exacerbates mental health comorbidities (Jong et al., 2020; Hassan et al., 2021).

However, there is limited research on the specific experiences of young adult survivors of mass atrocities, particularly in the Beni region. While studies on African conflict-affected populations (e.g., Uganda and Rwanda) address PTSD, they often overlook the distinct developmental and social challenges faced by young adults (Betancourt et al.,

2018). Additionally, few studies explore how PTSD interacts with co-occurring disorders in survivors of mass violence within culturally and resource-constrained settings like Beni.

This study, therefore, seeks to fill these gaps by examining the relationship between PTSD and co-existing mental health disorders among young adults in Beni, D.R. Congo. It provides culturally relevant insights and contributes to the development of tailored trauma care models, while informing policies and advocacy efforts to improve mental health services in conflict-affected regions. Policymakers, humanitarian groups, and mental health professionals will benefit from this study's more detailed understanding of these complex mental health characteristics.

The results will help practitioners create trauma-informed, integrated treatment regimens that are specifically suited to the needs of survivors of massacres. In addition, policymakers will have useful information to guide plans for enhancing mental health services and access in places affected by war, such as Beni. Ultimately, this study holds the potential to foster a more resilient community by addressing the mental health challenges that impede individual recovery and societal stability in the Beni region.

OBJECTIVE OF THE STUDY

To examine the prevalence, associated factors, and relationship between Post-Traumatic Stress Disorder (PTSD) and co-existing mental health disorders among young adult survivors of massacres in the Beni region of the Democratic Republic of Congo (DRC).

RESEARCH QUESTION

What is the prevalence of post-traumatic stress disorder (PTSD), the associated risk factors, and its relationship with co-existing mental health disorders among young adult survivors of massacres in the Beni region of the Democratic Republic of Congo?

THEORETICAL FRAMEWORK

This study was guided by two complementary theoretical frameworks: Ecological Systems Theory (EST) and Cognitive Behavioural Theory (CBT). Together, these theories offer a comprehensive lens through which to understand the multidimensional nature of trauma and its psychological consequences.

Ecological Systems Theory

Developed by Bronfenbrenner (1979), EST conceptualises human development and psychological outcomes as products of nested environmental systems: the microsystem (family and peers), mesosystem (community interactions), exosystem (healthcare infrastructure), macrosystem (cultural and political context), and chronosystem (temporal dimensions). In Beni, these systems are severely compromised by ongoing violence. The absence of robust microsystem-level support, such as family cohesion and peer relationships, worsens PTSD symptoms and increases vulnerability to co-occurring disorders (Ozbay et al., 2007). At the macrosystem level, cultural stigma surrounding mental health and weak institutional support structures discourage survivors from seeking care (Wainberg et al., 2017). EST thus illuminates how systemic deficiencies at every ecological level compound trauma's psychological impact.

Cognitive Behavioural Theory

CBT, developed by Aaron Beck (1976), posits that distorted cognitive patterns such as catastrophic thinking, self-blame, and overgeneralisation contribute to the onset and persistence of PTSD. Negative appraisals of trauma fuel avoidance behaviours and hypervigilance, while rumination links PTSD to comorbid depression and anxiety (Gorbis et al., 2024). CBT interventions, including cognitive restructuring and gradual exposure

techniques, address these maladaptive cognitions and have demonstrated efficacy in reducing PTSD symptoms across diverse settings (Foa et al., 2007). The integration of EST and CBT enables this study to examine both the environmental determinants and the individual cognitive-behavioural mechanisms underlying PTSD and its comorbidities.

Empirical literature review

According to Bowen (2023), a literature review synthesises existing research to provide a foundation for academic inquiry, highlighting significant themes, methodologies, and research gaps (Liu & Mehta, 2024). A review of literature on the relationship between PTSD and co-existing mental health disorders among young adult massacre survivors in Beni, DRC, provides critical insight into the prevalence and interplay of these psychological conditions. WHO (2023) reported that individuals in conflict zones often experience compounded psychological distress, making PTSD and related disorders a significant concern (Charlson et al., 2019).

Prevalence of PTSD Among Massacre Survivors

Globally, PTSD prevalence is estimated at 5–10% in the general population but rises dramatically to 19–39% among survivors of conflict-related violence (Lim et al., 2022). In African conflict zones, meta-analyses report average PTSD rates of 42.3% among those directly exposed to massacres (Tesfaye et al., 2024). Among Congolese populations, prevalence rates are among the highest documented: 73% of women survivors in North Kivu met PTSD symptom criteria (Familiar et al., 2021), while 84–94% of Congolese refugees in Uganda displayed PTSD symptoms (Ainamani et al., 2020). In Beni specifically, Moreland et al., (2024) the estimated PTSD prevalence at 37.4% among young adult massacre survivors, while Veling et al., (2013) documented rates of 38.5% in young adults exposed to violence in

eastern DRC. These figures underscore the critical need for targeted mental health interventions in the region.

Factors Associated with PTSD

Research identifies multiple determinants of PTSD development among massacre survivors. Exposure intensity and duration are primary predictors: Rukundo-Zeller et al., (2022) found PTSD prevalence of 49% among survivors of repeated massacres in Burundi, compared to 28% following a single event. Social isolation significantly exacerbates symptoms; survivors separated from their families during violence were twice as likely to develop PTSD (Ntumba et al., 2023). Socio-demographic factors, including age, gender, education, marital status, and occupation, also shape vulnerability. Younger adults and those in economically precarious occupations demonstrate heightened susceptibility (Charlson et al., 2019). Access to psychological care, though limited in contexts like Beni where fewer than 20% of survivors receive mental health services, is associated with improved outcomes when available (Veling et al., 2013).

PTSD and Co-Existing Mental Health Disorders

The comorbidity between PTSD and other mental health disorders is well-established across global settings. In the United Kingdom, 78.5% of individuals with PTSD exhibited comorbidity with at least one other disorder, most commonly depression (54%) and anxiety (>30%) (Qassem et al., 2021). In Uganda's Nakivale refugee camp, Bapolisi et al., (2020) strong associations were found between PTSD and both substance use disorders (OR = 5.13) and major depressive disorder (OR = 4.04). A meta-analysis by James et al. (2022)(Kassa et al., 2024) revealed that African conflict survivors with PTSD are 2.5 times more likely to develop anxiety and depressive disorders. In Beni specifically, Cénat et al. (2023) reported a 34% comorbidity rate between PTSD, depression, and anxiety, while Kassa et al., (2024)

documenting high rates of PTSD co-morbid with substance use disorders. These findings collectively highlight the imperative of integrated mental health approaches in conflict-affected settings.

METHODOLOGY

This study employed a cross-sectional descriptive design with a quantitative approach. Data were collected in Beni City, North Kivu province, DRC, a region that has experienced recurrent massacres attributed primarily to the ADF since 2014. Beni City comprises four communes (Beu, Bungulu, Ruwenzori, and Mulekera) and was selected as the study site due to its concentration of young adult massacre survivors who had migrated from the surrounding conflict-affected territory.

Location of the study

The study was carried out in the Democratic Republic of the Congo's (DRC) Beni region. This region includes the city of Beni and the neighbouring regions. This region is located in the North Kivu province, which has been significantly affected by violent conflict, including frequent massacres that have left many survivors struggling with severe psychological trauma. The region is characterised by insecurity and ongoing displacement due to attacks by armed groups, creating an environment with restricted availability of support networks and mental health services.

Population and Sampling of the Study

The target population comprised young adults aged 18 to 35 who had survived massacres in the Beni region, estimated at approximately 10,000 individuals (Mwambusa et al., 2022). Using Yamane's (1967) formula with a 5% margin of error, a sample size of 385 participants was determined. Stratified random sampling was employed, with strata defined

by gender and type of trauma exposure. Collaboration with local health authorities and community leaders facilitated participant identification. A total of 388 questionnaires were completed via Kobo Toolbox, yielding a response rate of 100.78%, which is considered excellent per Mugenda and Mugenda (2008).

Instruments

Three validated instruments were administered in French. The PTSD Checklist for DSM-5 (PCL-5) is a 20-item self-report scale rated 0–4, with a score ≥ 33 indicating probable PTSD (Blevins et al., 2015). Its French version demonstrates excellent internal consistency (Cronbach's $\alpha = .94$) (Ashbaugh et al., 2016). The Depression Anxiety Stress Scale-21 (DASS-21) assesses three subscales across 21 items on a 4-point Likert scale; scores are multiplied by two and classified from normal to extremely severe (Lovibond & Lovibond, 1995). The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST), developed by the WHO, screens for substance use risk across eight categories, classifying participants as low, moderate, or high risk (Humeniuk et al., 2012). A socio-demographic questionnaire captured background characteristics including age, education, occupation, marital status, and exposure duration.

Data Analysis

Data were analysed using IBM SPSS version 23 (George & Mallery, 2016). Descriptive statistics (frequencies, percentages, means, and standard deviations) summarised demographic and PTSD prevalence data. Chi-square tests of independence assessed associations between PTSD and socio-demographic variables. Pearson's correlation coefficient examined the strength and direction of relationships between PTSD and comorbid disorders. The threshold for statistical significance was set at $p < .05$.

The study findings and Discussion

This section presents and critically interprets the study's findings in relation to the research objectives, the existing empirical literature, and the theoretical frameworks. The analysis focuses on three key domains: the demographic characteristics of respondents, the prevalence of Post-Traumatic Stress Disorder (PTSD), and the factors associated with PTSD, including its relationship with co-existing mental health disorders. By integrating descriptive and inferential statistical results, this section provides a comprehensive understanding of the psychological impact of massacre-related violence among young adult survivors in the Beni region of the Democratic Republic of Congo.

The presentation of findings begins with an overview of respondents' socio-demographic profiles, which provides essential contextual grounding for interpreting patterns of trauma exposure and psychological outcomes. This is followed by an examination of the prevalence and symptom severity of PTSD, highlighting the extent of psychological distress within the study population. Subsequently, the analysis explores statistically significant associations between PTSD and selected socio-demographic variables using chi-square tests, offering insight into risk and protective factors within this conflict-affected context.

Furthermore, the section examines the relationship between PTSD and co-existing mental health conditions (specifically depression, anxiety, and substance use) through correlation analysis. This allows for a deeper understanding of comorbidity patterns and the complexity of psychological distress experienced by survivors. Throughout the discussion, findings are compared with prior studies conducted in the Democratic Republic of Congo and other conflict-affected settings, thereby situating the results within the broader global mental health literature.

Demographic Characteristics of Respondents

The majority of respondents fell within the 24–29 age group (44.4%), followed by 30–35 years (33.6%) and 18–23 years (21.5%). Secondary education was the most common educational level (48.7%), with 26.7% having limited or no formal education. Farming (38.1%) and business (29.6%) were the predominant occupations, reflecting the region's informal economic base. Nearly half of respondents were single (49.4%), while 13.3% were widowed, a figure reflecting the direct toll of massacre-related violence on family structures. The majority (63.1%) had been exposed to massacre events for more than six months, indicating chronic trauma exposure. Table 1 presents the full demographic distribution.

Table 1: Demographic Characteristics of Respondents (N = 388)

Variable	Category	Frequency (n)	Percentage (%)
Age	18–23 years	84	21.6
	24–29 years	173	44.6
	30–35 years	131	33.8
Education	No education	48	12.4
	Primary	56	14.4
	Secondary	190	48.9
	Graduate	50	12.9

Variable	Category	Frequency (n)	Percentage (%)
	Degree (Licence)	44	11.3
Marital Status	Single	190	49.4
	Married	107	27.8
	Widowed	51	13.3
	Separated	37	9.6
Occupation	Farmer	148	38.1
	Business	115	29.6
	Student	53	13.7
	Teacher	42	10.8
	Health Worker	30	7.7
Exposure Duration	< 6 months	143	36.9
	> 6 months	245	63.1

Prevalence of PTSD

Results revealed a high prevalence of probable PTSD among respondents. Based on PCL-5 scores ≥ 33, 67.7% of participants met the threshold for probable PTSD (M = 50.85, SD = 21.32). Item-level analysis indicated that hypervigilance (M = 3.45, SD = 0.79), negative emotions (M = 3.34, SD = 1.53), irritability/anger (M = 3.22, SD = 1.53), and startle response (M = 3.28, SD = 1.65) were the most severely endorsed symptoms. These hyperarousal and emotional dysregulation symptoms are consistent with the DSM-5 characterisation of PTSD in populations subjected to prolonged trauma (APA, 2013; Weathers et al., 2018). The prevalence obtained in this study exceeds estimates reported by Moreland et al., (2024) Beni (37.4%) and Veling et al. (2013) for eastern DRC (38.5%), likely reflecting the study's focus on young adults who experienced the most severe and direct exposure to violence.

This figure aligns closely with Katembo Kehya Esaie's study (70.1%) conducted in the same region (Esaie, n.d.) and is consistent with broader African evidence indicating PTSD rates of 25–60% in conflict-affected populations (Tesfaye et al., 2024). The high prevalence underscores the profound psychological burden borne by Beni's young adult population and the urgent need for structured mental health intervention.

Factors Associated with PTSD

Chi-square analyses revealed statistically significant associations between PTSD and five socio-demographic variables (Table 2). Age was significantly associated with PTSD (χ^2 = 10.32, p = .006), with the 24–29 age group exhibiting the highest PTSD prevalence (76.3%). This finding corroborates evidence that young adults at transitional life stages bear heightened vulnerability to trauma-related disorders (Kessler et al., 2022). Education level showed the strongest chi-square value (χ^2 = 45.86, p < .001), with secondary-educated

respondents recording the highest PTSD rate (82.6%). This non-linear pattern suggests that moderate education may heighten awareness of trauma without providing sufficient cognitive or material resources for adaptive coping, consistent with Koenen et al. (2021).

Duration of exposure was significantly associated with PTSD ($\chi^2 = 4.89$, $p = .027$), with those exposed for more than six months showing higher rates (72.2%) compared to more recent survivors (60.8%), supporting the concept of cumulative trauma (Miller & Rasmussen, 2021). Occupation emerged as a significant factor ($\chi^2 = 31.04$, $p < .001$): business workers (80.9%) and farmers (68.2%) showed the highest PTSD rates, while health workers reported the lowest (30.0%), possibly due to professional training and structured support systems. Marital status was also significant ($\chi^2 = 37.36$, $p < .001$), with single respondents recording the highest PTSD prevalence (81.1%), highlighting the protective role of spousal and social support (Pietrzak et al., 2021). Conversely, access to counselling, prior mental health diagnosis, and community group participation were not statistically significant ($p > .05$), likely reflecting the extremely limited availability and uptake of mental health services in the study area (Patel et al., 2022).

Table 2: Chi-Square Results Factors Associated with PTSD

Variable	Chi-square (χ^2)	Df	p-value	Significance
Age	10.32	2	0.006	Significant
Education level	45.86	4	< 0.001	Significant
Exposure duration	4.89	1	0.027	Significant

Variable	Chi-square (χ^2)	Df	p-value	Significance
Occupation	31.04	4	< 0.001	Significant
Marital status	37.36	3	< 0.001	Significant
Counselling access	3.49	1	0.062	Not Significant
Community support	2.47	1	0.116	Not Significant

Relationship Between PTSD and Co-Existing Mental Health Disorders

Pearson correlation analysis revealed strong positive and statistically significant associations between PTSD and all three DASS-21 subscales (Table 3). PTSD was most strongly correlated with stress ($r = .76$, $p < .001$), followed by depression ($r = .74$, $p < .001$) and anxiety ($r = .71$, $p < .001$). These high correlation coefficients indicate substantial comorbidity: as PTSD symptom severity increases, so does the severity of depression, anxiety, and stress, a compounding effect consistent with shared cognitive-affective mechanisms, including rumination, emotional dysregulation, and negative appraisal (Brewin et al., 2021).

These findings corroborate the global literature on PTSD comorbidity. In the UK, 80% of chronic PTSD cases involved comorbid depression, anxiety, or substance use (Back & Brady, 2008). In the DRC, Cénat et al. (2023) documented a 34% comorbidity rate between PTSD and depressive or anxiety disorders. The correlation between PTSD and stress ($r = .76$) reflects the chronically hyperactivated stress-response system characteristic of individuals exposed to sustained violence (Bapolisi et al., 2020)(McFarlane, 2020). The close

link between PTSD and depression (r = .74) mirrors O'Donnell et al.'s (2021) finding that trauma survivors frequently develop hopelessness and emotional numbness as secondary psychological responses.

Substance use was significantly associated with PTSD ($\chi^2 = 12.87$, $p < .001$). Participants who reported substance use exhibited substantially higher PTSD prevalence (76.2%) than non-users (58.2%). Alcohol was the most commonly reported substance (51.0%), followed by tobacco (36.6%) and cannabis (31.2%). This pattern is consistent with the self-medication hypothesis, whereby survivors utilise psychoactive substances to manage PTSD-related distress, including intrusive memories and hyperarousal (Najavits et al., 2020; WHO, 2022). The bidirectional relationship between PTSD and substance use, where each condition exacerbates the other, creates a vicious cycle of psychological distress documented extensively in African conflict contexts (Bapolisi et al., 2020). These findings collectively confirm that PTSD among young adult survivors in Beni is not an isolated condition but the nucleus of a broader syndrome of co-occurring psychological distress, requiring integrated treatment approaches.

Table 3: Pearson Correlation Matrix PTSD, Depression, Anxiety, and Stress

Variable	PTSD r	Depression r	Anxiety r	Stress r
PTSD	1	.74**	.71**	.76**
Depression	.74**	1	.69**	.72**
Anxiety	.71**	.69**	1	.75**
Stress	.76**	.72**	.75**	1

*** Correlation significant at p < .001 (2-tailed)*

CONCLUSION AND RECOMMENDATIONS

This study provides compelling evidence that PTSD is highly prevalent (67.7%) among young adult survivors of massacres in the Beni region, DRC, and is strongly associated with a constellation of co-existing mental health disorders. Socio-demographic factors, particularly age, education level, exposure duration, occupation, and marital status, significantly differentiate PTSD risk, while access to mental health services remains critically inadequate. Strong correlations between PTSD and depression, anxiety, stress, and substance use confirm the multidimensional nature of psychological distress in this conflict-affected population.

These findings carry important practical and policy implications. First, mental health practitioners and humanitarian organisations should implement integrated, trauma-informed care programmes that simultaneously address PTSD, comorbid mood disorders, and

substance use rather than treating these as discrete conditions. Given the efficacy of both CBT-based approaches and community-led interventions in similar settings (Foa et al., 2007; Jansen et al., 2024), such programmes should be culturally adapted and delivered by trained community health workers where specialist personnel are unavailable.

Second, policymakers at the national and provincial levels should prioritise the integration of mental health services into primary healthcare systems in North Kivu. The study's finding that 96.4% of respondents had never received counselling and 92.0% reported no counselling available in their communities signals a systemic failure that demands urgent structural investment. Third, targeted interventions are needed for the highest-risk subgroups identified: young adults aged 24–29, those with secondary education, informal workers, single individuals, and those with prolonged trauma exposure. Finally, future research should explore longitudinal trajectories of PTSD and comorbid disorders in this population, assess the effectiveness of specific intervention models, and investigate the role of cultural and spiritual coping mechanisms in facilitating recovery.

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