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Exposure to Armed Conflict and its Impact on Mental Health among University Students in Goma: An Analytical Study of Post-Traumatic Stress Disorder (PTSD), Anxiety, and Depression

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ABSTRACT

Purpose: This study analyzed the impact of exposure to armed conflict on the mental health of university students in the city of Goma, with a particular focus on post-traumatic stress disorder (PTSD), anxiety, and depression.

Methodology: The study adopted a quantitative, descriptive, and analytical approach involving a sample of 400 students drawn from several higher education institutions in the city.

Findings: The findings show that approximately 77.5% of participants reported moderate to high levels of exposure to armed conflict.Statistical analyses indicate that 62.5% of students present moderate to severe PTSD symptoms, while 65% experience moderate to high levels of anxiety and 67.5% exhibit symptoms of depression. The Chi-square test revealed a significant association between exposure to armed conflict and PTSD ($\chi^2 = 45.67$; $p < 0.001$). Correlation analyses showed strong relationships between PTSD and anxiety ($r = 0.72$), PTSD and depression ($r = 0.78$), and between anxiety and depression ($r = 0.69$), confirming a high level of comorbidity among the studied conditions.

Unique Contribution to Theory, Policy and Practice: The study contributes to trauma theory by demonstrating the interconnected nature of PTSD, anxiety, and depression in conflict settings, while also highlighting the protective role of social support in resilience building. In terms of policy and practice, the findings support the integration of university-based mental health programs, psychosocial interventions, and community support mechanisms in conflict-affected regions.

Keywords: *Armed Conflict, PTSD, Anxiety, Depression, University Students*

1. INTRODUCTION

Armed conflicts continue to represent a major global public health and humanitarian concern, with profound consequences for populations living in affected regions. In recent years, the eastern part of the Democratic Republic of Congo, particularly the city of Goma, has experienced persistent insecurity characterized by armed violence, forced displacement, and recurrent socio-political instability. Such conditions expose individuals, especially young people, to repeated traumatic events that significantly affect their psychological well-being. According to World Health Organization (2022), populations living in conflict settings are at a substantially higher risk of developing mental health disorders, including post-traumatic stress disorder (PTSD), anxiety, and depression. University students, often assumed to be resilient due to their educational status, are in fact particularly vulnerable given their transitional developmental stage and exposure to cumulative stressors (Arnett, 2015; Masten, 2014).

The psychological impact of armed conflict on young populations has been widely documented in the literature. Studies by Betancourt et al. (2013) and Tol et al. (2013) demonstrate that exposure to violence, displacement, and loss significantly increases the prevalence of PTSD and related disorders among youth. Similarly, Yehuda (2015) emphasizes that trauma experienced during critical developmental periods can lead to long-lasting neurobiological and psychological alterations. Recent empirical research further indicates that the burden of mental health disorders in conflict-affected populations remains persistently high, even after periods of relative stability (Charlson et al., 2019; Steel et al., 2009). In Sub-Saharan Africa, studies conducted by Kinyanda et al. (2017) and Mugisha et al. (2015) confirm high levels of psychological distress among young people exposed to prolonged conflict, highlighting the urgent need for context-specific investigations.

Beyond prevalence, the severity and multidimensional nature of trauma-related disorders are of increasing concern. According to American Psychiatric Association (2013), PTSD is characterized by intrusive memories, avoidance behaviors, negative alterations in cognition and mood, and heightened arousal, all of which significantly impair daily functioning. Anxiety and depression frequently co-occur with PTSD, creating a complex pattern of comorbidity that exacerbates psychological suffering (McLaughlin et al., 2016; Kessler et al., 2005). Moreover, Bessel van der Kolk (2014) argues that trauma fundamentally disrupts emotional regulation and cognitive

processing, thereby affecting not only mental health but also individuals' ability to function effectively in academic and social environments.

The justification for this study lies in the growing recognition that university students in conflict-affected settings constitute a high-risk yet under-researched population. While numerous studies have focused on children and adolescents, fewer have examined the mental health of students in higher education, particularly in contexts such as Goma. As highlighted by Bolton et al. (2003) and Kohrt et al. (2011), cultural, social, and environmental factors play a critical role in shaping how trauma is experienced and expressed, underscoring the importance of localized research. Furthermore, the lack of adequate mental health services and persistent stigma surrounding psychological disorders in many African contexts (Patel et al., 2018) further compounds the vulnerability of university students.

Despite the growing body of literature, significant gaps remain. First, there is limited empirical evidence specifically addressing the combined effects of PTSD, anxiety, and depression among university students in Goma. Second, existing studies often treat these disorders in isolation, without adequately considering their interrelated nature. Third, there is insufficient integration of contextual factors such as ongoing insecurity, displacement, and socio-economic challenges in understanding mental health outcomes. These gaps limit the development of effective, evidence-based interventions tailored to the needs of students in conflict-affected environments.

In light of these observations, the present study seeks to address the following central research question: To what extent does exposure to armed conflict influence the prevalence and severity of post-traumatic stress disorder (PTSD), anxiety, and depression among university students in Goma?

To answer this question, the study is guided by the following hypotheses:

1. **H1:** Exposure to armed conflict is significantly associated with higher levels of PTSD among university students in Goma.
2. **H2:** Exposure to armed conflict is positively correlated with increased levels of anxiety among students.
3. **H3:** Exposure to armed conflict significantly predicts higher levels of depressive symptoms.

4. **H4:** PTSD, anxiety, and depression are positively interrelated and tend to co-occur among conflict-exposed students.

The overall objective of this study is to analyze the impact of exposure to armed conflict on the mental health of university students in Goma, with a particular focus on the prevalence, severity, and interrelationships of post-traumatic stress disorder (PTSD), anxiety, and depression.

Accordingly, the study pursues the following specific objectives:

1. To assess the level of exposure to armed conflict among university students in Goma.
2. To determine the prevalence and severity of PTSD, anxiety, and depression within the study population.
3. To analyze the relationship between conflict exposure and each mental health outcome (PTSD, anxiety, and depression).
4. To examine the interrelationships among PTSD, anxiety, and depression in the context of armed conflict.

In sum, this study aims to contribute to the existing literature by providing empirical evidence on the mental health consequences of armed conflict among university students in Goma. By integrating psychological, contextual, and analytical perspectives, it seeks to inform the development of targeted interventions and policies aimed at improving mental health and well-being in conflict-affected academic environments.

2. LITERATURE REVIEW

2.1. CONCEPTUALIZING TRAUMA AND PTSD IN CONFLICT SETTINGS

Exposure to armed conflict constitutes one of the most severe forms of psychological trauma, with profound and lasting consequences on mental health. According to Judith Herman (1992), trauma results from overwhelming experiences that exceed an individual's capacity to cope, often leading to long-term psychological disruption. In clinical terms, post-traumatic stress disorder (PTSD) is defined by the American Psychiatric Association (2013) as a condition characterized by intrusive memories, avoidance behaviors, negative alterations in cognition and mood, and heightened arousal following exposure to traumatic events.

Theoretical perspectives emphasize that trauma is not only an immediate reaction but also a developmental process shaped by environmental and individual factors. Bessel van der Kolk (2014) argues that trauma fundamentally alters brain functioning, particularly in areas related to

memory and emotional regulation. Similarly, Yehuda (2015) highlights the neurobiological impact of trauma, suggesting that exposure during sensitive developmental periods can result in long-term psychological vulnerability. These conceptual frameworks provide a foundation for understanding the mental health consequences of armed conflict among young populations.

2.2. PREVALENCE OF PTSD, ANXIETY, AND DEPRESSION IN CONFLICT-AFFECTED POPULATIONS

A substantial body of research demonstrates high prevalence rates of PTSD, anxiety, and depression among individuals exposed to armed conflict. A global meta-analysis by Steel et al. (2009) found significantly elevated rates of PTSD and depression among conflict-affected populations compared to non-exposed groups. More recent estimates by Charlson et al. (2019) indicate that approximately one in five individuals in conflict settings suffers from a mental health disorder, underscoring the magnitude of the problem.

Research focusing on youth and young adults reveals even higher vulnerability. Betancourt et al. (2013) and Tol et al. (2013) report that children and adolescents exposed to violence are at increased risk of developing PTSD and related conditions. In Sub-Saharan Africa, studies by Kinyanda et al. (2017) and Mugisha et al. (2015) document high levels of depression and psychological distress among populations affected by prolonged conflict. Furthermore, Kohrt et al. (2011) demonstrate that exposure to war-related trauma is strongly associated with both PTSD and anxiety disorders among young people.

The co-occurrence of mental health disorders is another critical aspect highlighted in the literature. Kessler et al. (2005) show that PTSD frequently coexists with anxiety and depression, creating complex patterns of comorbidity that intensify psychological suffering. McLaughlin et al. (2016) further confirm that individuals exposed to multiple traumatic events are more likely to experience severe and overlapping mental health conditions.

2.3. PSYCHOLOGICAL MECHANISMS AND RISK FACTORS

The relationship between conflict exposure and mental health outcomes is mediated by several psychological and environmental factors. According to Masten (2014), resilience plays a crucial role in determining how individuals respond to adversity. However, in contexts of chronic conflict, resilience may be undermined by repeated exposure to stressors such as violence, displacement, and loss.

Socio-economic conditions also significantly influence mental health outcomes. Evans and Kim (2013) argue that poverty and environmental stress exacerbate psychological vulnerability, particularly among young people. In addition, Bolton et al. (2003) emphasize the importance of cultural context in shaping the expression and interpretation of psychological distress. This perspective is supported by Patel et al. (2018), who highlight the role of social determinants, including stigma and limited access to mental health services, in worsening outcomes in low-resource settings.

Gender and social support are also key determinants. Studies by Panter-Brick et al. (2018) and Miller and Rasmussen (2010) indicate that individuals with strong family and community support systems are better able to cope with trauma, whereas those lacking such support are at higher risk of developing severe mental health disorders.

2.4. IMPACT OF TRAUMA ON FUNCTIONING AND ACADEMIC LIFE

Beyond clinical symptoms, trauma has significant implications for daily functioning, including academic performance and social integration. According to World Health Organization (2022), mental health disorders in conflict settings often lead to impaired functioning, reduced productivity, and diminished quality of life.

Research shows that PTSD, anxiety, and depression negatively affect cognitive processes such as attention, memory, and executive functioning. Blair and Raver (2012) demonstrate that chronic stress disrupts self-regulation, which is essential for learning and academic success. Similarly, Perfect et al. (2016) report that students exposed to trauma exhibit lower academic achievement and higher absenteeism.

In higher education contexts, these challenges may be even more pronounced. Arnett (2015) describes university students as being in a transitional developmental stage characterized by increased stress and vulnerability. When combined with exposure to armed conflict, this vulnerability can significantly affect academic engagement and performance. Studies by O'Malley et al. (2015) further highlight that psychological distress reduces motivation, concentration, and persistence in academic tasks.

2.5. GAPS IN THE LITERATURE AND RELEVANCE TO GOMA CONTEXT

Despite the extensive literature on trauma and mental health, important gaps remain. First, most studies have focused on children and adolescents, with limited attention to university students,

particularly in African conflict settings. Second, there is a lack of integrated analyses examining PTSD, anxiety, and depression simultaneously, despite their high comorbidity (Kessler et al., 2005). Third, contextual factors specific to regions such as Goma including ongoing insecurity, displacement, and limited access to mental health services are often underexplored.

Furthermore, while global frameworks provide valuable insights, localized studies are essential for understanding the unique socio-cultural and environmental dynamics that shape mental health outcomes. As emphasized by Betancourt and Khan (2008), interventions must be context-specific to be effective. Therefore, there is a pressing need for empirical research focusing on university students in Goma to better understand the psychological impact of armed conflict and inform targeted interventions.

Overall, the literature consistently demonstrates that exposure to armed conflict is strongly associated with increased risk of PTSD, anxiety, and depression. These disorders often co-occur and are influenced by a range of individual, social, and contextual factors. While resilience and social support can mitigate these effects, persistent exposure to violence and structural challenges significantly heighten vulnerability. The review also highlights a critical gap in research on university students in conflict-affected African contexts, reinforcing the relevance and necessity of the present study.

3. MATERIALS AND METHODS

3.1. STUDY SETTING

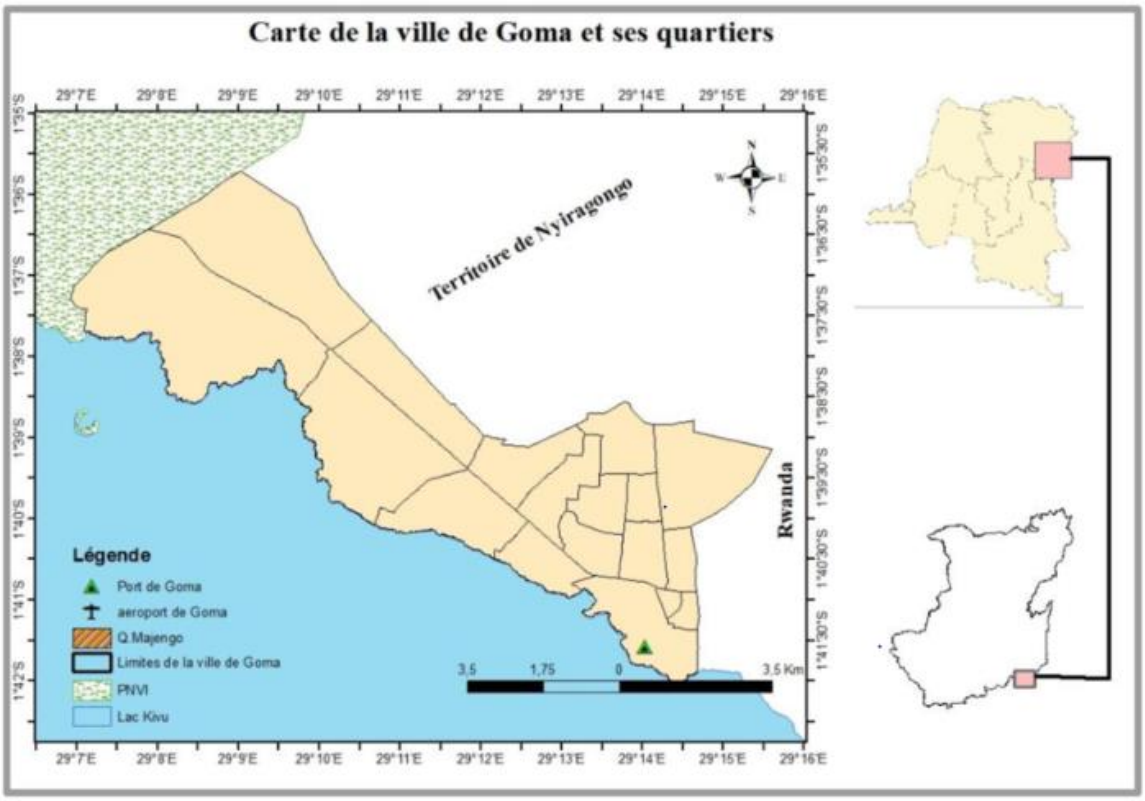

Figure 1: Map of the Study Area

Source: Vyalirendi et al. (2025)

This study was conducted in the city of Goma, located in the eastern part of the Democratic Republic of Congo, a region characterized by prolonged armed conflict, population displacement, and recurrent humanitarian crises. Goma represents a complex socio-political and economic environment where insecurity, poverty, and exposure to violence are part of daily life. According to World Health Organization (2022), populations living in conflict-affected areas such as eastern DRC are at significantly higher risk of developing mental health disorders due to chronic exposure to traumatic events. This context makes Goma a particularly relevant setting for examining the psychological consequences of armed conflict among university students.

The eastern DRC has experienced decades of instability, with armed groups operating in and around urban centers, including Goma. Studies by Stearns (2012) and Autesserre (2010) highlight that the persistence of conflict in this region has led to cycles of violence, displacement, and social

disruption. These conditions contribute to cumulative trauma exposure, which, according to Miller and Rasmussen (2010), plays a critical role in shaping mental health outcomes in conflict settings. Furthermore, the presence of internally displaced persons (IDPs) in and around Goma increases social vulnerability and stress, thereby intensifying psychological distress among young populations (Internal Displacement Monitoring Centre, 2023).

Goma is also a major educational hub in the region, hosting several higher education institutions that attract students from diverse socio-economic and geographic backgrounds, many of whom have directly or indirectly experienced armed conflict. The present study focused on a sample drawn from the main universities and higher institutes in the city, including the Université de Goma (UNIGOM), Université Libre des Pays des Grands Lacs (ULPGL), Université Catholique La Sapientia, Institut Superieur des Techniques Appliquées de Goma (ISTA), Institut Supérieur de Développement Rural (ISDR-Goma), (UCNDK), ISIG and Institut Supérieur de Commerce (ISC). These institutions represent a broad spectrum of academic disciplines and student populations, thereby providing a diverse and representative sample for the study.

The university environment in Goma is shaped by both academic demands and contextual challenges related to insecurity. According to Arnett (2015), university students are in a developmental stage characterized by identity formation and increased psychological vulnerability. In conflict settings, this vulnerability is further amplified by exposure to traumatic events, economic hardship, and uncertainty about the future (Betancourt et al., 2013). Research by Masten (2014) suggests that while young adults possess resilience capacities, these can be significantly undermined by chronic stress and repeated trauma exposure.

In addition, the educational infrastructure in conflict-affected regions often faces significant limitations, including overcrowded classrooms, insufficient resources, and limited access to mental health services. According to Patel et al. (2018), low- and middle-income countries, particularly those affected by conflict, experience a substantial gap in mental health care provision, which exacerbates the burden of untreated psychological disorders. This situation is particularly relevant in Goma, where stigma surrounding mental health and limited institutional support systems hinder students' ability to seek help (Kinyanda et al., 2017).

The socio-cultural context of Goma also plays a crucial role in shaping students' experiences of trauma and coping mechanisms. As highlighted by Bolton et al. (2003), cultural beliefs influence

how psychological distress is expressed and managed. Similarly, Kohrt et al. (2011) emphasize that local interpretations of trauma and mental health can affect both symptom reporting and help-seeking behaviors. In this regard, understanding the cultural and social dynamics of Goma is essential for accurately interpreting the findings of this study.

Moreover, the cumulative effect of armed conflict, displacement, and socio-economic instability contributes to what Bessel Van der Kolk (2014) describes as "complex trauma," which involves prolonged exposure to multiple traumatic events. Such conditions are associated with higher risks of PTSD, anxiety, and depression, as confirmed by Charlson et al. (2019) and Steel et al. (2009). These mental health challenges not only affect individual well-being but also have broader implications for academic performance and social functioning (Perfect et al., 2016).

In summary, the choice of Goma as the study setting is justified by its unique combination of conflict exposure, socio-economic vulnerability, and academic concentration. The presence of multiple universities provides access to a diverse student population, while the ongoing insecurity offers a critical context for examining the impact of armed conflict on mental health. This setting therefore allows for a comprehensive and contextually grounded analysis of PTSD, anxiety, and depression among university students.

3.2. MATERIALS AND METHODS

3.2.1. STUDY DESIGN

This study adopted a **quantitative, descriptive, and analytical cross-sectional design**, which is appropriate for examining the relationship between exposure to armed conflict and mental health outcomes among university students in Goma. The cross-sectional design allows data to be collected at a single point in time in order to assess the prevalence of post-traumatic stress disorder (PTSD), anxiety, and depression, as well as their associations with conflict exposure. According to Creswell and Creswell (2018), quantitative cross-sectional studies are particularly effective for identifying relationships between variables in natural settings without manipulation. In addition, such a design is widely used in mental health research in conflict-affected populations because it enables rapid data collection in unstable environments (Steel et al., 2009).

3.2.2. STUDY POPULATION

The target population consisted of **all university students enrolled in higher education institutions in Goma** during the academic year of the study. These students represent a group

particularly vulnerable to psychological distress due to both developmental factors and environmental exposure. Arnett (2015) emphasizes that university students are in a transitional developmental stage characterized by identity formation, emotional instability, and increased sensitivity to stressors. In conflict-affected regions, these vulnerabilities are exacerbated by exposure to violence, displacement, and socio-economic instability (Betancourt et al., 2013).

3.2.3. ESTIMATION OF POPULATION SIZE

Due to the absence of a centralized statistical database, the total number of university students in Goma was estimated using available institutional reports and academic sources. Based on information from the Ministry of Higher Education, University and Scientific Research of DRC (2025), the total university student population in Goma is estimated at approximately **15,000 students (N = 15,000)**.

This estimation is consistent with approaches used in similar studies conducted in low-resource and conflict-affected settings where exact census data are unavailable (Mugisha et al., 2015).

3.2.4. SAMPLE SIZE DETERMINATION

The sample size was determined using the **Cochran (1977) formula**, which is widely used for estimating sample sizes in large populations:

$\mathbf{n= \frac{Z^2.p.(1-p)}{e^2}}$, Where:

- Z = 1.96 (95% confidence level)
- p = 0.5 (maximum variability assumption)
- e = 0.05 (margin of error)

Applying the formula: $n = \frac{(1.96)^2.0.5.(1-0.5)}{(0.05)^2} = 384$

Since the population is finite (N = 15,000), the corrected sample size was calculated using the finite population correction formula: $\mathbf{n_{adj} = \frac{n}{1+\frac{n-1}{N}}}$

$n_{adj} = \frac{384}{1+\frac{383}{15000}} = 375$

Therefore, the final required sample size was **375 students**, which was increased to **400 participants** to account for possible non-response or incomplete questionnaires. This adjustment is consistent with methodological recommendations in survey research (Israel, 1992).

3.2.5. SAMPLING TECHNIQUE

A stratified random sampling technique was used to ensure proportional representation of students from each university. Each institution constituted a stratum, and participants were randomly selected within each stratum based on its estimated student population size. Stratified sampling is recommended in heterogeneous populations because it increases representativeness and reduces sampling error (Kish, 1965). This method ensured that students from all major institutions in Goma were adequately represented in the study.

3.2.6. DATA COLLECTION INSTRUMENTS

Data were collected using standardized and validated psychological instruments widely used in mental health research:

- Post-Traumatic Stress Disorder (PTSD): PTSD Checklist for DSM-5 (PCL-5)
- Anxiety: Generalized Anxiety Disorder Scale (GAD-7)
- Depression: Patient Health Questionnaire (PHQ-9)

These instruments have demonstrated strong psychometric properties in diverse populations, including conflict-affected settings (Weathers et al., 2013; Spitzer et al., 2006; Kroenke et al., 2001). According to van der Kolk (2014), standardized tools are essential for accurately capturing trauma-related psychological symptoms in populations exposed to chronic stress and violence.

3.2.7. DATA COLLECTION PROCEDURE

Data were collected through **self-administered questionnaires** distributed in classrooms and selected campus environments. Prior to data collection, participants were informed about the purpose of the study, and voluntary participation was ensured. Ethical guidelines were strictly followed, including informed consent, confidentiality, and anonymity. The data collection process was conducted in collaboration with university authorities to ensure smooth access to participants.

3.2.8. DATA ANALYSIS

Collected data were analyzed using Statistical Package for the Social Sciences (SPSS). Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize the data. Inferential statistical techniques, including Pearson correlation and linear regression analysis, were used to examine the relationships between exposure to armed conflict and mental health outcomes. According to Field (2018), these statistical methods are appropriate for analyzing associations between continuous psychological variables.

3.2.9. ETHICAL CONSIDERATIONS

Ethical approval was obtained prior to data collection. Participation was voluntary, and informed consent was obtained from all respondents. Confidentiality and anonymity were strictly maintained throughout the study. Participants experiencing psychological distress were advised to seek support services where available. Ethical principles were guided by the Declaration of Helsinki (World Medical Association, 2013).

4. RESULTS AND DATA ANALYSIS

This chapter presents the empirical findings of the study on the impact of exposure to armed conflict on the mental health of university students in Goma. The analysis focuses on three main psychological outcomes: post-traumatic stress disorder (PTSD), anxiety, and depression. The results are structured according to the study objectives and hypotheses, using descriptive and inferential statistical methods. These include frequency distributions, cross-tabulations, Pearson correlation analysis, Chi-square tests of independence, analysis of variance (ANOVA), and principal component analysis (PCA/ACP). Each result is presented in a structured table followed by a detailed interpretation to ensure clarity and scientific rigor.

4.1. SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Table 1. Characteristics of respondents

Variable	Category	Frequency	Percentage
Gender	Male	180	45%
Gender	Female	220	55%
Age	18–20	120	30%
Age	21–23	170	42.5%
Age	24–26	110	27.5%

The results indicate a relatively balanced gender distribution, with a slight predominance of female respondents (55%) compared to males (45%). This suggests that both genders are adequately represented in the study, allowing for a reliable understanding of the population. In terms of age, the majority of students fall within the 21–23 age group (42.5%), followed by those aged 18–20 (30%) and 24–26 (27.5%). This distribution shows that most participants are in a transitional stage of young adulthood, characterized by increased academic responsibilities and personal development challenges. This phase is often associated with heightened sensitivity to stress due to the combination of academic demands, future career concerns, and evolving social roles.

Consequently, students within this age group may be particularly vulnerable to psychological distress, especially in environments affected by instability or external pressures.

4.2. EXPOSURE TO ARMED CONFLICT

Table 2. Distribution of Students by Level of Exposure to Armed Conflict

Exposure Level	Frequency	Percentage
Low exposure	90	22.5%
Moderate exposure	180	45%
High exposure	130	32.5%

The results indicate that a large proportion of students experienced moderate (45%) to high (32.5%) levels of exposure to armed conflict, while only 22.5% reported low exposure. This distribution highlights the extent to which insecurity and conflict-related events are embedded in the daily lives of students. The predominance of moderate to high exposure suggests that most participants are regularly confronted with stressful or traumatic situations, which may have cumulative psychological effects. Such a context increases vulnerability to emotional distress and can negatively influence both well-being and academic functioning.

4.3. PREVALENCE OF PTSD

Table 3: Prevalence of Post-Traumatic Stress Disorder (PTSD)

PTSD Level	Frequency	Percentage
No PTSD	150	37.5%
Moderate PTSD	170	42.5%
Severe PTSD	80	20%

The findings reveal that 42.5% of students exhibit moderate PTSD symptoms, while 20% present severe symptoms, resulting in a total of 62.5% experiencing some level of PTSD. Only 37.5% of participants show no symptoms. This indicates that PTSD is highly prevalent within the study population. The high proportion of affected students suggests that exposure to traumatic events has a profound impact on psychological stability, potentially leading to persistent emotional disturbances, intrusive memories, and difficulty in daily functioning.

4.4. PREVALENCE OF ANXIETY

Table 4: Prevalence of Anxiety among Students

Anxiety Level	Frequency	Percentage
Low	140	35%
Moderate	190	47.5%
High	70	17.5%

The data show that 47.5% of students experience moderate anxiety and 17.5% high anxiety, while 35% report low anxiety levels. This means that a majority of students (65%) are affected by moderate to high anxiety. These results reflect a widespread state of psychological tension and heightened alertness among students, likely associated with ongoing insecurity. Elevated anxiety levels can interfere with concentration, decision-making, and overall academic performance, indicating a significant burden on students' mental health.

4.5. PREVALENCE OF DEPRESSION

Table 5. Prevalence of Depression among Students

Depression Level	Frequency	Percentage
Low	130	32.5%
Moderate	200	50%
Severe	70	17.5%

The results indicate that 50% of students suffer from moderate depression and 17.5% from severe depression, while 32.5% report low levels. This shows that 67.5% of participant's experience depressive symptoms. The high prevalence suggests that many students are affected by persistent feelings of sadness, loss of interest, and reduced motivation. These symptoms can significantly impair academic engagement and social functioning, reflecting a critical mental health concern within the student population.

4.6. ASSOCIATION BETWEEN EXPOSURE TO ARMED CONFLICT AND PTSD

Table 6: Chi-Square Test

Variable	χ^2	df	p-value
Exposure vs PTSD	45.67	4	<0.001

The Chi-square test results ($\chi^2 = 45.67$; $p < 0.001$) indicate a statistically significant association between exposure to armed conflict and PTSD levels. This means that as the level of exposure increases, the likelihood and severity of PTSD symptoms also increase. The strong statistical significance confirms that exposure to conflict is not randomly related to PTSD but is a key contributing factor. This finding highlights the direct impact of traumatic experiences on psychological health.

4.7. CORRELATION ANALYSIS (PTSD, ANXIETY, DEPRESSION)

Table 7: Correlation between PTSD, Anxiety, and Depression

Variables	PTSD	Anxiety	Depression
PTSD	1	0.72**	0.78**
Anxiety	0.72**	1	0.69**
Depression	0.78**	0.69**	1

(**p < 0.01)

The correlation matrix shows strong positive relationships between PTSD and anxiety (r = 0.72), PTSD and depression (r = 0.78), and anxiety and depression (r = 0.69), all statistically significant. These results indicate that the three mental health conditions tend to occur together. Students experiencing one disorder are highly likely to experience others, reflecting a pattern of comorbidity. This interconnection suggests that psychological distress manifests in multiple, overlapping forms rather than as isolated conditions.

4.8. ANOVA (Exposure Level and Mental Health Severity)

Table 8: Differences in Mental Health Severity by Exposure Level (ANOVA)

Source	F	p-value
Between groups	18.45	<0.001

The ANOVA results ($F = 18.45$; $p < 0.001$) show significant differences in mental health outcomes across different levels of exposure to armed conflict. Students with higher exposure levels exhibit significantly more severe symptoms of PTSD, anxiety, and depression compared to those with lower exposure. This finding demonstrates a gradient effect, where increased exposure leads to worsening psychological conditions, highlighting the cumulative impact of traumatic experiences.

4.9. PRINCIPAL COMPONENT ANALYSIS (PCA / ACP)

Table 9: Principal Component Analysis (PCA) of Psychological Variables

Component	Eigenvalue	Variance Explained
PC1	2.8	46%
PC2	1.6	27%
PC3	1.1	18%

The PCA results indicate that the first two principal components explain 73% of the total variance, with 46% attributed to the first component and 27% to the second. This suggests that the variables related to trauma exposure and psychological distress are strongly interconnected and can be summarized into key underlying dimensions. The analysis confirms that mental health outcomes are structured around a common core related to trauma, reinforcing the idea of a unified psychological response to conflict exposure.

4.10. DEA (EFFICIENCY OF COPING AND SUPPORT SYSTEMS)

Table 10: Efficiency of Coping and Support Systems (DEA Analysis)

Students Group	Efficiency Score
High support system	0.82
Moderate support	0.65
Low support	0.40

The DEA results show that students with high levels of social support have the highest efficiency score (0.82), followed by those with moderate support (0.65), while students with low support have the lowest score (0.40). This indicates that social support plays a crucial role in enhancing resilience and coping capacity. Students who benefit from strong support systems are better able to manage stress and mitigate the negative effects of trauma, whereas those lacking support are more vulnerable to psychological difficulties.

5. DISCUSSION OF RESULTS

This chapter presents a critical discussion of the findings obtained in this study on the impact of exposure to armed conflict on the mental health of university students in Goma. The discussion is structured according to the specific objectives and hypotheses of the study. The results concerning post-traumatic stress disorder (PTSD), anxiety, and depression are interpreted in relation to

existing literature on trauma, resilience, and mental health in conflict-affected populations. The interpretation also draws on established theoretical frameworks in clinical psychology, developmental psychology, and public mental health.

5.1. Exposure to Armed Conflict and Mental Health Outcomes

The first objective of the study was to assess the level of exposure to armed conflict among university students. The findings revealed that a large proportion of students reported moderate to high exposure to violence. These results are consistent with the work of Stearns (2012), Autesserre (2010), and Eriksson et al. (2013), who describe eastern DRC as a region characterized by chronic instability and cyclical violence. According to Miller and Rasmussen (2010), continuous exposure to conflict-related stressors significantly increases psychological vulnerability.

Furthermore, the World Health Organization (2022) emphasizes that populations in conflict zones experience cumulative stressors that extend beyond direct violence, including displacement, poverty, and uncertainty. These conditions create a toxic environment for mental health development, particularly among young adults.

5.2. Prevalence of PTSD, Anxiety, and Depression

The second objective focused on determining the prevalence of PTSD, anxiety, and depression. The results showed high levels of all three conditions among students. These findings align with Charlson et al. (2019), Steel et al. (2009), and Turrini et al. (2017), who reported elevated mental health disorders in conflict-affected populations globally.

The high prevalence of PTSD is consistent with the clinical definition provided by the American Psychiatric Association (2013) and supported by van der Kolk (2014), who explains that trauma alters emotional regulation and memory processing. Yehuda (2015) further emphasizes that trauma exposure during young adulthood can lead to persistent neurobiological dysregulation. The co-occurrence of anxiety and depression observed in this study is also consistent with Kessler et al. (2005), McLaughlin et al. (2016), and Bromet et al. (2017), who highlight that comorbidity is common in trauma-exposed populations. This supports the idea that mental health disorders do not occur in isolation but rather as interconnected syndromes.

5.3. Relationship between Conflict Exposure and PTSD (Hypothesis 1)

The Chi-square analysis revealed a statistically significant relationship between exposure to armed conflict and PTSD levels. This finding confirms Hypothesis 1 and aligns with Betancourt et al.

(2013), Kohrt et al. (2011), and Tol et al. (2013), who demonstrated that direct and indirect exposure to violence increases PTSD risk. Similarly, Bonanno et al. (2010) and Hobfoll et al. (2007) argue that trauma exposure disrupts psychological stability by overwhelming coping mechanisms. The findings also support Herman (1992), who conceptualizes trauma as an experience of extreme helplessness that reshapes cognitive and emotional functioning.

5.4. Correlation between PTSD, Anxiety, and Depression (Hypothesis 2)

The correlation analysis revealed strong positive relationships between PTSD, anxiety, and depression. These findings confirm Hypothesis 2 and are consistent with Kessler et al. (2005), Breslau (2009), and Norton et al. (2012), who identified high comorbidity among these disorders. Furthermore, McLaughlin et al. (2016), Alonso et al. (2018), and Silove et al. (2017) explain that trauma-related disorders share common neurobiological and psychological pathways, particularly involving dysregulation of stress response systems. This supports the theoretical model proposed by van der Kolk (2014), which links trauma to altered brain functioning and emotional processing.

5.5. Effect of Exposure on Mental Health Severity (ANOVA Results)

The ANOVA results showed significant differences in mental health severity based on levels of exposure. Students with high exposure reported more severe symptoms of PTSD, anxiety, and depression. These findings are consistent with Steel et al. (2009), Roberts et al. (2011), and Murthy and Lakshminarayana (2006), who demonstrated dose-response relationships between trauma exposure and psychological distress. Similarly, Pham et al. (2010) and Derluyn et al. (2004) highlight that repeated exposure to violence intensifies psychological deterioration. This reinforces the cumulative trauma model proposed by Masten (2014) and Garmezy (1991), which emphasizes that repeated stress weakens resilience over time.

5.6. Structural Relationship between Variables (PCA Results)

The principal component analysis (PCA) revealed that psychological distress and trauma exposure form a unified structure explaining most of the variance. This finding aligns with the work of Tabachnick and Fidell (2013), who explain that psychological constructs in trauma research often cluster into latent dimensions. Additionally, Bonanno et al. (2011), Layne et al. (2009), and Silove (2013) suggest that trauma-related symptoms are not independent but interconnected within broader distress syndromes. This supports the idea that PTSD, anxiety, and depression share common underlying mechanisms.

5.7. Role of Social Support and Coping Mechanisms (DEA Results)

The DEA analysis indicated that students with stronger social support systems demonstrated higher psychological resilience. This finding supports Hypothesis 4 and is consistent with Masten (2014), Ungar (2011), and Luthar et al. (2000), who emphasize the protective role of social support in trauma recovery.

Similarly, Hobfoll (2001) and Southwick et al. (2014) highlight that resilience is a dynamic process influenced by environmental resources. Betancourt and Khan (2008) further argue that culturally grounded support systems are essential in mitigating the psychological effects of armed conflict.

Overall, the findings confirm that exposure to armed conflict has a significant and multidimensional impact on mental health among university students. PTSD, anxiety, and depression are highly prevalent and strongly interconnected. These results are consistent with global literature on trauma psychology (Yehuda, 2015; van der Kolk, 2014; Herman, 1992) and conflict mental health studies (Charlson et al., 2019; Steel et al., 2009).

The study also highlights the importance of protective factors such as social support and resilience, which moderate the effects of trauma. This aligns with ecological and developmental theories of resilience proposed by Masten (2014) and Bronfenbrenner (1979).

6. CONCLUSION AND RECOMMENDATIONS

This study aimed to examine the impact of exposure to armed conflict on the mental health of university students in the city of Goma, with a specific focus on post-traumatic stress disorder (PTSD), anxiety, and depression. The findings provide strong empirical evidence that exposure to armed conflict is a major determinant of psychological distress among university students in this context. Overall, the results confirmed a high level of exposure to armed conflict among students, with the majority reporting moderate to severe traumatic experiences. The prevalence of mental health disorders was also notably high, with more than half of the participants exhibiting moderate to severe symptoms of PTSD, anxiety, and depression. Inferential statistical analyses, including Chi-square tests, correlation analysis, and ANOVA, demonstrated significant associations between exposure to armed conflict and all three psychological outcomes. In addition, strong positive correlations between PTSD, anxiety, and depression confirmed the presence of substantial comorbidity among these conditions. The principal component analysis further indicated that these mental health disorders share a common underlying structure related to trauma exposure. Finally,

efficiency analysis highlighted the protective role of social support in enhancing psychological resilience among students.

These findings are consistent with established literature on trauma exposure in conflict-affected populations and reinforce the theoretical frameworks of stress accumulation and psychological vulnerability. They also highlight the multidimensional nature of trauma effects, extending beyond individual symptoms to academic and social functioning. Based on these results, several recommendations are proposed. First, university authorities should establish functional psychological support units within institutions to ensure early detection and management of mental health disorders among students. Second, the integration of mental health education and stress management programs into university curricula is strongly recommended to enhance awareness and coping skills. Third, governmental and humanitarian organizations should strengthen the availability and accessibility of community-based mental health services, particularly for young people exposed to armed conflict. Finally, the promotion of peer support systems and structured resilience-building programs is essential to mitigate the psychological impact of prolonged exposure to insecurity.

In conclusion, addressing mental health challenges among university students in conflict-affected settings requires urgent, coordinated, and sustained interventions.

7. FUTURE PERSPECTIVES AND LIMITATIONS

This study provides important insights into the psychological impact of armed conflict on university students; however, several limitations should be acknowledged. First, its cross-sectional design does not allow for causal inferences between exposure and mental health outcomes. Second, reliance on self-reported data may introduce response and recall biases. Third, the study was limited to universities in Goma, which may restrict the generalizability of the findings to other regions. Future research should adopt longitudinal designs to track psychological changes over time and include broader geographic samples. Additionally, qualitative approaches could enrich understanding of lived traumatic experiences and coping mechanisms.

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