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Coping Mechanisms Among Aksum City Massacre Survivors in Tigray, Ethiopia

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Research Article

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Abstract

Background: Traumatic events arising from war and mass violence lead to severe psychological distress. While the epidemiological prevalence and clinical severity of Post-Traumatic Stress Disorder (PTSD) within this cohort have been documented separately, understanding how survivors manage distress remains critical. This study aimed to assess the coping mechanisms utilized by adult survivors of the November 2020 Aksum City massacre in Tigray, Ethiopia.

Methods: Utilizing a community-based cross-sectional study design, quantitative and qualitative data were collected from 439 participants using the Brief-COPE 28 scale and open-ended items. Data were analyzed using SPSS Version 26 via descriptive statistics, independent-samples t-tests, and one-way Analysis of Variance (ANOVA) with Tukey HSD post-hoc comparisons.

Results: The community exhibits a near-even split in coping mechanisms, with approximately 49.85% utilizing adaptive strategies and 50.15% resorting to maladaptive strategies. Maladaptive coping was slightly more prevalent overall (M = 2.3062) compared to adaptive coping (M = 2.2985), with a mean difference of 0.0077. The most frequently used adaptive strategies were Emotional Support (M = 2.5695, SD = 0.82017) and Positive Reframing (M = 2.3918, SD = 0.73963). The most reported maladaptive strategies were Venting (M = 2.4795, SD = 0.76274) and Behavioral Disengagement (M = 2.3428, SD = 0.70977). Significant demographic variations were identified: males reported significantly higher usage of instrumental support, behavioral disengagement, planning, humor, acceptance, and religious coping compared to females ($p < 0.05$). Older adults (>60 years) reported significantly lower active coping and emotional support, but higher self-distraction and self-blame compared to younger cohorts ($p < 0.05$).

Conclusion: The slightly higher reliance on maladaptive coping highlights an urgent need for targeted mental health interventions, collaborative psychosocial resource mobilization, and community-based support programs in post-conflict Tigray.

Impact statements

Mass atrocities and armed conflicts leave profound, long-term psychological impacts on affected communities, yet empirical research on post-conflict coping strategies in low-resource settings remains sparse. This study evaluates how survivors of the November 2020 Aksum City massacre in Tigray, Ethiopia, manage psychological distress following traumatic exposure. By examining responses from 439 adult survivors, the research demonstrates a critical community-wide vulnerability: survivors are nearly evenly divided between adaptive and maladaptive coping strategies, with a slight overall reliance on maladaptive responses such as behavioral disengagement, emotional venting, and substance use. Furthermore, the findings reveal significant demographic variations, showing that older adults and men face distinct psychological vulnerabilities and coping trade-offs.

The practical impact of this research is twofold. First, it offers local health authorities, non-governmental organizations, and international humanitarian agencies concrete, empirical evidence needed to move

beyond generic trauma interventions toward culturally grounded, targeted Mental Health and Psychosocial Support (MHPSS) programs. Second, by identifying specific demographic groups at higher risk for maladaptive coping, this study provides a framework for optimizing resource allocation, facilitating community-based resilience initiatives, and guiding post-conflict mental health rehabilitation in Tigray and comparable low-resource, conflict-affected settings across Sub-Saharan Africa.

1. Introduction

1.1 Background of the Study

Coping mechanisms among trauma survivors vary widely across individual, environmental, and situational contexts (Monzani et al., 2015). Coping literature distinguishes between situational coping responses—how an individual responds to a specific stressful occurrence—and dispositional coping styles, which represent enduring patterns of stress management (Carver & Scheier, 1994; Monzani et al., 2015). In conflict-affected settings, strategies such as emotion-focused coping, problem-solving, and reliance on community support structures are frequently activated (García, 2015). Furthermore, socio-demographic factors such as age, gender, and educational attainment consistently shape the selection and execution of coping strategies (Campos et al., 2004).

Globally, Post-Traumatic Stress Disorder (PTSD) represents a major component of the global disease burden, affecting roughly 4% of the world's population (Hoppen & Priebe, 2019; White et al., 2015). In post-war settings, particularly within low- and middle-income countries, approximately 23.8% of adult populations suffer from PTSD (Hoppen & Morina, 2019). In Sub-Saharan Africa, the prevalence of PTSD in conflict-exposed regions reaches up to 30% (Ng et al., 2020). In Nigeria, for example, reported PTSD rates range widely between 2.7% and 66.7%, driven by political violence, ethno-religious conflicts, and trauma exposure in vulnerable settings (Asuquo et al., 2017; Gapen et al., 2011; Nwoga et al., 2016; Sheikh et al., 2016).

In Ethiopia, historical and recent armed conflicts, including the Ethiopian Civil War (1974–1991) and subsequent regional hostilities, have generated high rates of PTSD, ranging between 12% and 57% depending on the intensity of exposure and population studied (Makango et al., 2023; Teshome et al., 2023). Between November 2020 and November 2022, severe armed conflict broke out in the Tigray region involving federal and allied military forces (Amnesty International, 2021; Eliza, 2021).

On November 28–29, 2020, in the historic city of Aksum, Eritrean forces systematically executed hundreds of unarmed civilians through street shootings and house-to-house raids (Amnesty International, 2021; Muchena, 2020). Occurring on the eve of the annual Aksum Tsion Mariam festival, the massacre left streets strewn with corpses, plunged residents into acute collective trauma, and triggered prolonged mass burials (Amnesty International, 2021; Muchena, 2020). Independent investigations by Human Rights Watch (2021), the United Nations Human Rights Council (2021), the

Ethiopian Human Rights Commission (2021), and the International Committee of the Red Cross (2021) documented severe atrocities, potential war crimes, and crimes against humanity throughout the region.

(Note: The epidemiological prevalence, clinical severity levels, and specific predictors of PTSD within this Aksum massacre survivor cohort have been evaluated and published independently in a complementary study. The current paper focuses specifically on assessing the coping mechanisms [Brief-COPE 28] utilized by these survivors and analyzing variations across key socio-demographic groups.)

1.2 Statement of the Problem

Despite the profound psychological toll of mass atrocities, mental health and psychosocial support (MHPSS) services in developing countries remain severely under-resourced (Gust et al., 2017; Marquez, 2016). Unaddressed traumatic stress and PTSD impair physical health, disrupt social cohesion, and diminish overall quality of life (Mesfin, 2007; Siriwardhana, 2015).

While international human rights organizations documented the physical scale of the Aksum massacre (Amnesty International, 2021; HRW, 2021), empirical research examining the psychological coping mechanisms deployed by resident survivors remains extremely scarce. Previous Ethiopian conflict studies have largely focused on internally displaced persons (IDPs) or general refugee cohorts (Fatuma et al., 2015; Mesfin, 2007), leaving a significant empirical gap regarding how resident survivors of localized massacres navigate distress. This study addresses this knowledge gap by analyzing the adaptive and maladaptive coping responses of Aksum massacre survivors.

1.3 Research Questions

- What are the predominant adaptive and maladaptive coping mechanisms employed by Aksum City massacre survivors?
- Are there statistically significant differences in coping strategy usage based on demographic variables (gender, age, and educational attainment)?

1.4 Objectives of the Study

General Objective

To investigate the coping mechanisms employed by adult survivors of the Aksum City massacre in Tigray, Ethiopia.

Specific Objectives:

- To identify the specific adaptive and maladaptive coping strategies utilized by Aksum massacre survivors to manage trauma-related stress.
- To evaluate variations in coping strategy selection across gender, age groups, and educational levels.

1.5 Significance of the Study

This study provides empirical evidence to inform evidence-based MHPSS intervention design, guide local health policy and resource allocation, diminish mental health stigma, and promote culturally grounded community resilience strategies in post-conflict settings.

1.6 Scope and Delimitations

Geographically, the study was delimited to resident adult survivors within Aksum City, Tigray, Ethiopia. Conceptually, the investigation focused on coping strategies as measured by the Brief-COPE 28 scale and qualitative participant responses following exposure to the November 2020 massacre. Clinical severity metrics of PTSD are delimited to references from our companion publication.

2. Literature Review

2.1 Theoretical Framework of Coping

Coping refers to cognitive and behavioral efforts aimed at managing specific external or internal demands that are appraised as taxing or exceeding an individual's resources (Lazarus & Folkman, 1984; Carver & Scheier, 1994). Folkman and Lazarus (1980) categorized coping into problem-focused coping (aimed at altering the stressor) and emotion-focused coping (aimed at regulating emotional distress).

Carver et al. (1989) expanded this framework into approach coping (active engagement with the stressor or emotions) versus avoidance coping (disengagement or denial). Adaptive coping mechanisms (e.g., active coping, positive reframing, planning, seeking emotional/instrumental support) foster long-term psychological resilience. Conversely, maladaptive coping mechanisms (e.g., behavioral disengagement, substance abuse, self-blame, denial) are frequently linked to chronic PTSD, depression, and functional impairment (Campos et al., 2004; Carver & Connor-Smith, 2010).

In disaster and mass atrocity literature, community resilience frameworks emphasize the role of local networks. Affected community members play a crucial role in facilitating social cohesion and integration, serving as the first line of psychosocial defense before formal humanitarian intervention arrives.

2.2 Demographic Determinants of Coping

- **Gender**: Studies indicate distinct gender variations in coping responses. Females often utilize higher emotion-focused strategies, such as seeking emotional support and venting (Matud, 2004; Tamres et al., 2002). However, structural and cultural contexts heavily influence these trends (Carver & Connor-Smith, 2010; Tamres et al., 2002).
- **Age**: Developmental perspectives show that older adults tend to favor emotion-regulation strategies such as positive reframing, acceptance, or religious coping, whereas younger cohorts frequently rely

on active problem-solving or active avoidance (Aldwin, 1994; Blanchard-Fields, 2007; Phillips, 2010).

- **Educational Attainment**: Education provides cognitive and instrumental resources that often facilitate problem-focused planning and active support-seeking while reducing reliance on avoidant strategies (Penley et al., 2002; Moos et al., 1990).

3. Methodology

3.1 Study Design and Setting

A community-based cross-sectional research design combining quantitative metrics and qualitative open-ended responses was conducted in Aksum City, Central Zone, Tigray, Ethiopia. Aksum is situated approximately 208 km north of Mekelle.

3.2 Target Population and Eligibility Criteria

The target population comprised adult residents of Aksum City who survived the November 2020 massacre.

- **Inclusion Criteria**: Adult residents (≥ 18 years) living in Aksum City during the November 2020 massacre.
- **Exclusion Criteria**: Internally Displaced Persons (IDPs) residing temporarily in Aksum, individuals under 18 years of age, and individuals with severe cognitive impairments preventing informed consent.

3.3 Sample Size and Sampling Strategy

Based on an estimated urban population of N = 120,250 (Aksum Administration Bureau, 2023), Yamane's (1967) formula was applied: n = N / [1 + N(e)^2]. For e = 0.05 at a 95% confidence interval, n = 399. Factoring in a 10% non-response buffer, the final sample size was n = 439 participants.

A stratified random sampling technique was applied across all five Kebeles of Aksum City (Kindeya, Hayelom, Haweliti, Abay Tsehaye, and Nigiste Saba). Proportionate allocation based on population size and gender was computed for each stratum, followed by simple random sampling (lottery method) at the household level.

Kebele	Total Pop.	Sample Size (n)	Male Pop.	Male n	Female Pop.	Female n
Kindeya	25,232	92	11,616	42	13,616	50
Hayelom	25,090	92	12,000	44	13,090	48
Haweliti	23,154	85	11,500	42	11,654	43
Abay Tsehaye	23,380	85	10,780	39	12,600	46
Nigiste Saba	23,394	85	11,254	41	12,140	44
Total	**120,250**	**439**	**57,150**	**208**	**63,100**	**231**

3.4 Data Collection Instruments

- **Socio-Demographics**: Structured items assessing sex, age, and educational status.
- **Brief-COPE 28 Scale**: A standardized 28-item self-report questionnaire measuring 14 distinct coping subscales (2 items per subscale) scored on a 4-point Likert scale (1 = I haven't been doing this at all; 4 = I've been doing this a lot) (Carver, 1997).
- • Adaptive Subscales: Active Coping (items 2, 7), Instrumental Support (items 10, 23), Planning (items 14, 25), Acceptance (items 20, 24), Emotional Support (items 5, 15), Humor (items 18, 28), Positive Reframing (items 12, 17), Religion (items 22, 27).
- • Maladaptive Subscales: Behavioral Disengagement (items 6, 16), Denial (items 3, 8), Self-Distraction (items 1, 19), Self-Blame (items 13, 26), Substance Use (items 4, 11), Venting (items 9, 21).
- **Qualitative Questionnaire**: Open-ended qualitative items probing community-specific coping strategies.

Instruments underwent forward-backward translation into Tigrigna by certified language and psychology specialists. A pilot study conducted with 35 non-sample residents demonstrated high internal consistency (Cronbach's alpha $\alpha = 0.880$ for the Brief-COPE).

3.5 Data Analysis

Data were analyzed using SPSS Version 26. Descriptive metrics (means, standard deviations, percentages) summarized coping patterns and demographics. Inferential statistics included:

- **Independent-Samples t-tests**: To evaluate differences in coping strategies by gender.
- **One-Way ANOVA with Tukey HSD Post-Hoc Tests**: To evaluate differences in coping subscales across age groups (18–39, 40–60, > 60) and educational levels (Illiterate, Primary, Secondary, College/Degree).

3.6 Ethical Considerations

Ethical approval

was granted by the Institutional Review Board (IRB) of Aksum University, Department of Psychology, adhering to the Declaration of Helsinki. Informed consent was obtained from all participants. Participants showing acute emotional distress or high trauma-related clinical risk were linked to established clinical MHPSS referral pathways at Aksum St. Mary Hospital.

4. Results

4.1 Socio-Demographic Characteristics

A total of 439 participants completed the study. The sample contained 231 females (52.6%) and 208 males (47.4%). The majority of respondents were aged 18–39 years (n = 266, 60.6%), followed by 40–60 years (n = 138, 31.4%) and 60 + years (n = 35, 8.0%). Educational background was distributed across college/degree (38.0%), secondary (30.1%), illiterate (18.5%), and primary (13.4%) levels.

Variable	Category	Frequency (n)	Percentage (%)
Sex	Male	208	47.4
	Female	231	52.6
Age Group	18–39 years	266	60.6
	40–60 years	138	31.4
	60 + years	35	8.0
Educational Status	Illiterate	81	18.5
	Primary School	59	13.4
	Secondary School	132	30.1
	College / Degree	167	38.0

4.2 Overall Usage of Coping Mechanisms

Participants utilized adaptive (M = 2.2985) and maladaptive (M = 2.3062) coping strategies in nearly equal proportions, with 49.85% relying on adaptive mechanisms and 50.15% relying on maladaptive mechanisms. Maladaptive coping exhibited a marginally higher mean overall score (mean difference = 0.0077).

Among adaptive coping subscales, Emotional Support (M = 2.5695, SD = 0.82017) and Positive Reframing (M = 2.3918, SD = 0.73963) were most frequently endorsed. Among maladaptive subscales, Venting (M = 2.4795, SD = 0.76274) and Behavioral Disengagement (M = 2.3428, SD = 0.70977) were highest.

Coping Category	Subscale	Mean (M)	Std. Deviation (SD)
Adaptive Coping	Emotional Support	2.5695	0.82017
	Positive Reframing	2.3918	0.73963
	Religion	2.3405	0.84783
	Instrumental Support	2.2825	0.80165
	Active Coping	2.2642	0.75602
	Humor	2.2574	0.75537
	Planning	2.2175	0.84599
	Acceptance	2.0649	0.53932
Maladaptive Coping	Venting	2.4795	0.76274
	Behavioral Disengagement	2.3428	0.70977
	Self-Distraction	2.3178	0.80795
	Denial	2.2449	0.66368
	Substance Use	2.2449	0.66368
	Self-Blame	2.2073	0.79688

Qualitative responses corroborated these quantitative findings. Participants reported turning to community gatherings, prayer, church attendance, and emotional expression (crying) as key adaptive activities. Conversely, widespread consumption of traditional alcoholic beverages (such as Siwa), intentional social isolation, and emotional withdrawal were frequently cited as maladaptive strategies.

4.3 Gender Differences in Coping Strategies

Independent-samples t-tests revealed significant gender differences across multiple coping subscales. Males reported significantly higher mean usage of Self-Distraction, Instrumental Support, Behavioral Disengagement, Planning, Humor, Acceptance, and Religion compared to females ($p < 0.05$). No significant gender differences were observed for Active Coping, Denial, Substance Use, Emotional Support, Venting, Positive Reframing, or Self-Blame.

Subscale	Male M (SD)	Female M (SD)	t-value	df	p-value
Self-Distraction	2.4038 (0.807)	2.2403 (0.801)	2.126	431.54	.034*
Instrumental Support	2.2524 (0.838)	1.9286 (0.874)	3.958	435.30	.000*
Behavioral Disengagement	2.2716 (0.802)	2.0996 (0.722)	2.350	418.74	.019*
Planning	2.3101 (0.875)	2.1342 (0.811)	2.176	423.11	.029*
Humor	2.1514 (0.708)	1.9459 (0.814)	2.827	436.50	.005*
Acceptance	2.1659 (0.818)	1.8463 (0.789)	4.155	428.50	.000*
Religion	2.3462 (1.038)	2.1429 (1.107)	1.985	436.30	.049*

4.4 Age Differences in Coping Strategies

One-way ANOVA with Tukey HSD post-hoc comparisons demonstrated significant differences across age cohorts:

- **Active Coping**: Participants aged 60 + reported significantly lower active coping (M = 2.00) compared to those aged 18–39 (M = 2.36, p = .021).
- **Emotional Support**: Younger adults (18–39) reported significantly lower reliance on emotional support compared to middle-aged adults (40–60, p = .014).
- **Self-Distraction & Self-Blame**: Older adults (60+) exhibited significantly higher self-distraction (p = .027) and self-blame (p = .041) compared to younger participants (18–39).
- **Denial & Venting**: Participants aged 18–39 reported significantly higher rates of denial (p = .031) and venting (p = .012) relative to older cohorts.

4.5 Educational Status Differences

Tukey HSD post-hoc analyses indicated that educational background did not yield statistically significant differences across most adaptive subscales (p > .05). However, secondary school graduates exhibited significantly higher self-distraction compared to illiterate participants (M_diff = 0.296, p = .041) and primary school graduates (M_diff = 0.322, p = .048).

5. Discussion

The findings reveal that survivors of the Aksum massacre rely almost equally on adaptive (49.85%) and maladaptive (50.15%) coping strategies. The elevated reliance on emotional support and religious coping aligns with post-conflict literature in Sub-Saharan Africa, where communal bonds and spiritual faith serve as primary psychological buffers against severe trauma (Ajibade et al., 2017; Osasumwen et al., 2018).

However, the widespread reliance on maladaptive mechanisms, specifically venting, behavioral disengagement, and local alcohol consumption (Siwa), highlights high levels of unresolved psychological distress and a severe absence of formal clinical services. When systemic trauma-informed care is unavailable, survivors frequently resort to avoidant coping, which paradoxically prolongs post-traumatic stress symptoms over time (Carver & Connor-Smith, 2010; Lazarus & Folkman, 1984).

Gender analysis demonstrated that male survivors engaged significantly more in instrumental support seeking, planning, behavioral disengagement, and religious coping. This suggests that men in this context simultaneously deploy active structural coping alongside avoidant disengagement. Age variations showed that older adults (> 60 years) utilized less active coping and experienced higher self-blame, pointing to elevated vulnerability among elderly mass atrocity survivors who may feel a loss of traditional protective roles within their households.

6. Conclusion and Recommendations

6.1 Conclusion

This study provides critical empirical insights into the coping mechanisms employed by adult survivors of the Aksum City massacre in Tigray, Ethiopia. While community members demonstrate resilience through religious practices and social support networks, over half of the population relies on maladaptive coping mechanisms such as behavioral disengagement, self-blame, and venting. Socio-demographic factors, particularly age and gender, significantly shape these coping dynamics.

1. **6.2 Recommendations**

- **1. Expand Community-Based MHPSS Infrastructure**: Regional health bureaus and international humanitarian agencies must establish accessible, trauma-informed psychological first aid and clinical counseling centers in Aksum City.
- **2. Design Targeted Interventions for Vulnerable Groups**: Tailor MHPSS interventions to address the unique vulnerabilities of older adults (> 60 years) who exhibit higher rates of self-blame, as well as men who demonstrate elevated behavioral disengagement.
- **3. Promote Adaptive Coping and Psychoeducation**: Implement community psychoeducation campaigns aimed at mitigating substance abuse (e.g., problematic alcohol use) and encouraging positive reframing and active coping strategies.
- **4. Future Longitudinal Research**: Conduct longitudinal mixed-methods research to evaluate the long-term trajectory of trauma symptoms and coping strategy evolution among massacre survivors across Tigray.

Declarations

Ethics approval and consent to participate:

Ethical approval was granted by the Institutional Review Board (IRB) of the Department of Psychology at Aksum University. Informed verbal consent was obtained from all individual participants prior to data collection, adhering to ethical standards for research involving human participants in humanitarian settings. All methods were carried out in accordance with relevant guidelines and regulations.

Consent for publication:

Not applicable.

Competing interests:

The author declares that he has no competing financial or non-financial interests as defined by BMC/Springer Nature.

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Author Contribution

H.A. conceptualized the study, designed the methodology, conducted data collection and analysis, and wrote the main manuscript text. H.A. reviewed and approved the final manuscript.

Data Availability

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request. Due to the sensitive nature of the topic and privacy considerations for massacre survivors, raw individual-level data are not publicly archived.

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