

# About Six in Ten Survivors of the November 2020 Maikadra Massacre Suffer from Posttraumatic Stress Disorder, Northwest Ethiopia

Dawed Ali<sup>1</sup>, Telake Azale<sup>2</sup>, Melese Wondie<sup>1</sup>, Jinenus Tadesse<sup>1</sup>

<sup>1</sup>University of Gondar, College of Medicine and Health Sciences, Department of Psychiatry, Gondar, Ethiopia; <sup>2</sup>University of Gondar, College of Medicine and Health Sciences, Department Health Education and Behavioral Sciences, Gondar, Ethiopia

Correspondence: Telake Azale, University of Gondar, College of Medicine and Health Sciences, Department of Health Education and Behavioral Sciences, PO Box 196, Gondar, Ethiopia, Tel +251 918771951, Email atelake07@gmail.com

**Background:** Post-traumatic stress disorder (PTSD) is characterized by recurrent, involuntary, and intrusive distressing memories of a traumatic event and dissociative reactions. Little is known about post-traumatic stress disorder in low and middle income countries such as Ethiopia where armed conflict, human rights violations, and ethnic-based violence are becoming everyday occurrences.

**Objective:** This study aimed to assess the prevalence of post-traumatic stress disorder and associated factors among residents of Maikadra, North West Ethiopia.

**Methods:** A community-based cross-sectional study was employed in April 2021. A multi-stage cluster sampling technique was employed to select the study participants. A post-traumatic stress disorder checklist (PCL-5) was used to assess post-traumatic stress disorder through a face-to-face interview. Bivariate and multi-variable binary logistic regression analyses were carried out to examine the association between posttraumatic stress disorder and several demographic and psychosocial variables. Statistical significance was declared at a *P*-value <0.05.

**Results:** A total of 610 participants were interviewed with a response rate of 98.8%. The prevalence of PTSD in this study was 59.8% with a 95% CI of 55.7–63.9. Female sex (AOR=1.93, 95% CI=1.64–3.24), having a close family member killed or seriously injured (AOR=1.96, 95% CI=1.1–3.48), having moderate (AOR=3.35, 95% CI=1.98–5.68) and high perceived threat to life (AOR=3.66, 95% CI=1.85–6.95), having depression (AOR=1.67, 95% CI=1.13–2.47) and anxiety disorder (AOR=1.85, 95% CI=1.21–2.83), and being directly exposed to the event (AOR=3.27, 95% CI=1.09–9.83) were significantly associated with post-traumatic stress disorder.

**Conclusion:** The majority of the residents of Maikadra town where the November 2020 massacre took place experienced posttraumatic stress disorder. Female sex, having a family member or a friend murdered or seriously injured, having depression and anxiety disorders and being directly exposed to the trauma were found to be significant predictors of post-traumatic stress disorder. People who have been exposed to such an intense traumatic event need psychosocial support to help them recover from the horrible experiences.

**Keywords:** PTSD, prevalence, Maikadra, survivors, Ethiopia

## Introduction

The number of people being forcibly displaced by conflicts, political instability, and economic crises has been growing in different parts of the world. A wide range of unpleasant and stressful experiences that people encounter before and after leaving their homes contribute to the development of mental illnesses.<sup>1</sup> Only 20 sub-Saharan African countries contribute to more than half of the global instability and conflict.<sup>2</sup>

Post-traumatic stress disorder is the most common mental disorder following exposure to a traumatic event.<sup>3</sup> Post-traumatic stress disorder is characterized by re-experiencing the traumatic event, avoidance, and hyper-arousal symptoms that can negatively impact mood and physiologic health.<sup>4,5</sup>

According to the result of a meta-analysis, about 242 million adult war survivors residing in post-war regions are estimated to suffer from PTSD and about 238 million adult survivors of war suffer from major depressive disorder.<sup>6</sup> The

contributions of post-traumatic stress disorder (PTSD) to the global burden of disease is estimated to be almost 4% of the world's population.<sup>7</sup> According to population-based studies, the prevalence of PTSD is estimated to be between 2 and 15%,<sup>8</sup> with a prevalence of 58% in high-risk groups.<sup>9</sup> In comparison to the developed world, there are few studies on the prevalence of post-traumatic stress disorder (PTSD) in low-income countries.<sup>10</sup> Available evidence indicates that war and political violence are associated with high rates of PTSD.<sup>11</sup> The major contributing factors for the development of PTSD have been divided into four categories. These are preexisting factors such as mental illness and drug use in the family, the traumatic event itself, level of exposure, and post-trauma factors such as social support.<sup>12</sup>

Individuals suffering from PTSD have the potential to influence public and mental health outcomes in several ways next to large number of immediate direct casualties in combatants and civilians.<sup>7,10,13</sup> It is also associated with substantial psychiatric comorbidity,<sup>14</sup> increased risk of suicide, and considerable economic burden.<sup>15,16</sup> In low- and middle-income nations, it is estimated that 77% of people with PTSD do not receive treatment.<sup>7</sup>

In African countries, particularly in sub-Saharan Africa (SSA), the majority of people with PTSD don't receive treatment and are at an increased risk of developing chronic symptoms.<sup>2</sup> Conflict has long-term mental health consequences after the events are over, and therefore mental health interventions are as urgent for post-conflict populations as physical health and other emergency interventions.<sup>17</sup> PTSD could result in long-term adverse consequences if left untreated, mainly it leads to social and functional impairments in survivors of conflict.<sup>18</sup>

According to meta-analysis conducted on a global population of adult war survivors that reviewed all countries that suffered at least one war within their own territory between 1989 and 2015 found that 23.81% of adult war survivors met diagnostic criteria for PTSD.<sup>6</sup> A community-based cross-sectional study done in Nepal reported the prevalence of post-traumatic disorder to be 9.6%.<sup>19</sup>

Meta-analysis conducted in Iranian population following disasters and wars showed that the pooled prevalence of PTSD was 47%.<sup>20</sup> A community based cross-sectional study done in Palestine on those who live in West Bank, Gaza, and East Jerusalem, reported 23.8%, 23.9%, and 17.9% prevalence estimates, respectively.<sup>21</sup> In a similar study done in Palestine following intifada-related injuries, the estimated prevalence of post-traumatic stress disorder was 76.5%.<sup>22</sup>

According to two studies done in Negoma community in Rwanda on heavily affected population by genocide at different periods, the prevalence of PTSD was 24.8%<sup>24</sup> and 21.6%,<sup>25</sup> respectively. Additionally, two regional studies done on eight districts in Uganda reported the prevalence of PTSD was 54%<sup>26</sup> and 74.3%, respectively.<sup>27</sup>

Another study conducted in Liberia after armed violence and conflict showed that the prevalence of PTSD assessed was 48.3%.<sup>28</sup> Another study done in Niger Delta region, Nigeria, on a population heavily exposed to conflict, the prevalence of PTSD was 60%.<sup>30</sup> Similarly, in research done among survivors of terrorist attacks in North-East Nigeria, the prevalence of post-traumatic disorder was 65.72%.<sup>31</sup>

In a study conducted in Kenya in 2015 after Election violence, the prevalence of PTSD was 10.6%.<sup>32</sup> Another home-to-home survey in Kenya among heads of households of ethnic clash survivors showed the prevalence of PTSD was 80.2%.<sup>33</sup>

Another community-based study conducted in South Sudan reported the prevalence of PTSD to be 28.1%.<sup>34</sup>

According to an institutional-based cross-sectional study done in southern Ethiopia the prevalence of probable PTSD was 15.4%. Research conducted in Ethiopia on an internally displaced community reported the prevalence of PTSD to be 58.4%.<sup>12</sup> Another community-based cross-sectional study conducted in Ethiopia among *Koshe* landslide survivors showed that the prevalence of PTSD was 37.3%.<sup>35</sup>

There are several factors associated with the occurrence of post-traumatic stress disorder following exposure to traumatic events.

These factors include female sex,<sup>36</sup> unemployment, and low educational status.<sup>40-42</sup> Moreover, younger age, being unmarried, lower socioeconomic status, and unemployment<sup>43</sup> have been frequently reported as predictors of post-traumatic stress disorder. Studies done among internally displaced people and those exposed to landslides in Ethiopia identified that females were more likely to develop PTSD than males.<sup>12</sup>

Apart from the demographic characteristics of individuals, a history of mental illnesses is a predictor of post-traumatic stress disorder.<sup>42</sup> Specifically, a history of depression was significantly associated with post-traumatic stress disorder.<sup>12,38</sup>

Poor social support, medical conditions, and the use of psychoactive substances are among the strong predictors of post-traumatic stress disorder.<sup>18,38,44</sup>

Despite the burgeoning evidence of high prevalence of post-traumatic stress disorder in conflict-affected countries around the world, only a few studies with highly variable estimates have been published in Ethiopia where armed conflict, ethnic-based violence, and terrorist attacks are becoming very rampant.

This study is therefore aimed at determining the prevalence of post-traumatic stress disorder and its predictors among the population of Maikadra town where a serious massacre occurred that resulted in the death of more than 1,650 innocent civilians of the Amhara ethnic group.

## Methods and Materials

A community-based cross-sectional study was conducted in April 2021 at Maikadra town, North West Ethiopia. The estimated total population was 27,840. About 4,500 individuals, mainly from Amhara region, had been there as seasonal migrant farm workers during the mass killings that took place in November 2020. This study was conducted among adult residents of the town. A total of 617 residents were randomly selected and recruited into the study. We used cluster sampling to select the lowest administrative units in the town called "kebeles". Two out of five "kebeles" were randomly selected. Each "kebele" has five sub-units called "ketena" which consist of 150 households. We selected five "ketenas" from the two randomly selected "kebeles". Then the data collectors interviewed each adult fulfilling the inclusion criteria in all of the five "ketenas".

## Measurement and Data Collection

Post-traumatic stress disorder was measured by using a 20-item post-traumatic checklist (PCL-5) with scores ranging from 0–80. A score of  $\geq 33$  was considered positive for PTSD.<sup>45</sup>

Social support was measured by the Oslo-3 social support scale which ranges from 3–14. Those respondents who scored between 3 and 8 were considered to have poor social support, a score of 9–11 was considered to have moderate social support, and a score of 12–14 was considered strong social support.<sup>46</sup>

Perceived life threat was measured using the perceived stress (PSS) scale which ranges from 0 to 40. Those respondents who scored 0–13 on PSS were considered to have low perceived stress, a score between 14 and 26 was considered moderate perceived stress, and those who scored 27–40 were considered to have high perceived stress.<sup>47</sup>

Depression was measured by Patient Health Questionnaire (PHQ-9) with a score of 10 or more suggesting depression.<sup>50</sup>

Data were collected by two psychiatric professionals who visited the selected households and interviewed randomly selected adults using the Amharic version of the questionnaire.

Data were coded and entered into the computer using Epi data version 4.2 and then exported to Statistical Package for Social Science (SPSS) version 25 for analysis. Binary logistic regression was used to identify factors associated with the outcome variable.

## Results

A total of 610 participants out of 617 were included in the study with a response rate of 98.8%. The mean age ( $\pm$ SD) of the respondents was 35 ( $\pm$ 13.03) years, with the age range of 18–65 years. Among the respondents, 348 (57%) were males, 539 (88.4%) were orthodox by religion and 371 (60.8%) were married. Regarding educational status, 213 (34.9%) of the participants were unable to read and write (Table 1).

Out of the respondents, 38 (6.2%) had a family history of mental illness and seven (1.1%) had been treated for mental illness. About a quarter, 153 (25.1%) of the respondents, had chronic medical conditions of different types. Close to half of the study participants were screened positive for depression, 322 (52.8%) and anxiety, 296 (48.5%).

At the time of interview, 274 (44.9%), 127 (20.8%), and 121 (19.9%) were using alcohol, Khat, and tobacco, respectively.

In this study, 382 (62.6%) of the total participants said they had poor social support and more than half (52.6%) had a moderate perceived life threat.

**Table 1** Socio-Demographic Characteristics of Study Participants of Mai Kadra, North West Ethiopia, 2021 (n=610)

Variables	Categories	Frequency	Percent
Sex	Male	348	57.0
	Female	262	43.0
Religion	Orthodox	539	88.4
	Muslim	66	10.8
	Other <sup>a</sup>	5	0.8
Marital status	Single	151	24.7
	Married	362	59.3
	Divorced	69	11.3
	Widowed	28	4.6
Educational level	Unable to read and write	213	34.9
	Primary school	182	29.02
	Secondary school	177	29.3
	Diploma	33	5.4
	Degree and above	5	0.82
Occupational status	Government employee	31	5.1
	Student	56	9.2
	Farmer	144	23.6
	Housewife	81	13.3
	Daily laborer	66	10.8
	Merchant	96	15.7
	Unemployed	136	22.3

Note: <sup>a</sup>Catholic, Protestant.

Concerning the level of exposure to the traumatic event, 439 (72%) witnessed others being brutally killed and 151 (25%) were themselves involved in the process but survived.

## Prevalence of Post-Traumatic Stress Disorder

In the current study, the estimated prevalence of post-traumatic stress disorder was 59.8% (95% CI=55.7–63.9) with an estimated prevalence of 46.6% and 71% among males and females, respectively.

## Factors Associated with PTSD

Female sex, being single, being unemployed, having destruction of personal property, having chronic medical illness, a family history of mental illness, being screened positive for depression and anxiety, using alcohol, Khat, and tobacco, poor social support, moderate and high levels of perceived life threat, having a family member or a close friend injured/killed, and direct exposure to the event were significantly associated with post-traumatic stress disorder at a  $P$ -value  $\leq 0.2$ . Then these variables were entered into the multivariable logistic regression model to control the confounding effects between the variables.

The multi-variable analysis identified that female sex, having a family member or close friend seriously injured or killed, having depression and anxiety, being directly exposed to the traumatic event, and having moderate and high perceived life threat were significantly associated with PTSD at a *P*-value less than 0.05.

Women were nearly twice as likely to experience PTSD compared to men (AOR=1.93, 95% CI=1.64–3.24). The odds of PTSD were 3-times more in those with high perceived threat to life (AOR=3.35, 95% CI=1.98–5.68). Having depression (AOR=1.67, 95% CI=1.13–2.47) and anxiety (AOR=1.85, 95% CI=1.21–2.83) were significantly associated with post-traumatic stress disorder. The odds of developing PTSD was 2-times higher among individuals whose family members or friends were seriously injured/killed (AOR=1.96, 95% CI=1.10–3.48). Participants who had been directly exposed to the traumatic event were 3.3-times more likely to have post-traumatic stress disorder (AOR=3.27, 95% CI=1.09–9.83) (Table 2).

**Table 2** Bi-Variable and Multi-Variable Regression Analysis Showing Associations Between Independent Variables and Post-Traumatic Stress Disorder Among Residents of Mai Kadra, North West Ethiopia, 2021 (n=610)

		PTSD		COR	AOR (95% CI)
		Yes	No		
Sex	Male	179	169	1	1
	Female	186	76	2.31 (1.64–3.24)	1.93 (1.27–2.92)**
Marital status	Single	105	46	1.75 (1.17–2.62)	1.35 (0.82–2.21)
	Married	205	157	1	1
	Divorced	38	31	0.94 (0.56–1.58)	0.73 (0.40–1.34)
	Widowed	17	11	1.18 (0.54–2.60)	1.06 (0.42–2.70)
Occupational status	Government employee	14	17	1	1
	Student	29	27	1.30 (0.54–3.15)	0.98 (0.35–2.76)
	Farmer	78	66	1.43 (0.66–3.13)	1.12 (0.45–2.76)
	Housewife	54	27	2.43 (1.04–5.65)	0.92 (0.33–2.56)
	Daily labor	33	33	1.21 (0.52–2.86)	0.88 (0.33–2.38)
	Merchant	63	33	2.32 (1.02–5.28)	1.51 (0.58–3.95)
	Unemployed	94	42	2.72 (1.23–6.02)	1.79 (0.71–4.56)
Worst events	Physical assault	138	102	1.10 (0.51–2.39)	1.34 (0.53–3.41)
	Being in a war fighting situation	146	72	1.65 (0.75–3.61)	2.01 (0.78–5.17)
	Destruction of personal property	65	58	0.91 (0.40–2.05)	1.11 (0.42–2.91)
	Did not access medical care during the event	16	13	1	1
A family member or friend was injured or killed	Yes	58	28	1.46 (0.90–2.37)	1.95 (1.10–3.48)*
	No	307	217	1	1
Family mental illness	Yes	18	20	0.58 (0.30–1.13)	0.69 (0.32–1.51)
	No	347	225	1	1

(Continued)

**Table 2** (Continued).

		PTSD		COR	AOR (95% CI)
		Yes	No		
Having chronic medical illness	Yes	81	72	0.69 (0.47–0.99)	0.89 (0.56–1.40)
	No	284	173		
Current use of khat	Yes	71	56	0.82 (0.55–1.21)	1.08 (0.64–1.83)
	No	294	189		
Current use of alcohol	Yes	146	128	0.61 (0.44–0.85)	0.70 (0.46–1.06)
	No	219	117		
Current cigarette smoking	Yes	55	54	0.63 (0.41–0.95)	1.07 (0.61–1.91)
	No	310	191		
Depression	Yes	216	106	1.90 (1.37–2.64)	1.67 (1.13–2.47)*
	No	149	139		
Social support	Poor social support	221	161	0.67 (0.40–1.12)	1.13 (0.60–2.11)
	Moderate social support	91	58	0.77 (0.43–1.37)	1.10 (0.56–2.16)
	Strong social support	53	26		
Perceived life threat	Low perceived threat	36	80		
	Moderate perceived threat	202	119	3.77 (2.40–5.94)	3.35 (1.98–5.68)***
	High perceived threat	127	46	6.14 (3.65–10.30)	3.66 (1.93, 6.96)***
Anxiety	Yes	208	88	2.36 (1.69–3.30)	1.85 (1.21–2.83)**
	No	157	157		
Level of exposure	Direct	124	27	4.59 (1.74–12.12)	3.27 (1.09–9.83)*
	Witnessed it	231	208	1.11 (0.45–2.72)	0.85 (0.29–2.25)
	Job related	10	10		

Notes: \*  $P < 0.05$  (variables significantly associated with PTSD), \*\* $p \leq 0.01$  and \*\*\* $p \leq 0.001$ ; chi-square=6.9; df=8; Hosmer-Lemeshow test=0.55.

## Discussion

Post-traumatic stress disorder is becoming a serious public health problem in low- and middle-income countries following exposure to man-made catastrophes such as ethnic-based conflicts, terrorist acts, and civil wars. Ethiopia is one of the conflict prone countries as a result of its ethnic based administrative structure. The November 2020 massacre of Maikadra town is one of the most serious events in the country that resulted in the death of more than 1,650 civilians of the Amhara ethnic group. Our study showed that six in 10 residents had post-traumatic stress disorder 6 months after the incident. Hence the prevalence of post-traumatic stress disorder was 59.8% (95% CI=55.7–63.9). This result is consistent with other findings of other African countries that reported a prevalence rate of PTSD of 60% in Nigeria<sup>33</sup> and 63% prevalence rate of PTSD in among internally displaced victims of boko haram terrorism in North-Eastern Nigeria<sup>51</sup> and 58.4% among internally displaced individuals in Ethiopia.<sup>12</sup> However, the prevalence of PTSD in the current study was lower than other previous studies, 82% in Kenya,<sup>36</sup> 65.7% in Nigeria,<sup>34</sup> 74% in Uganda,<sup>29</sup> and 76.5%<sup>23</sup> and 68.9%<sup>24</sup> in Palestine. The difference could be explained by the population composition participating. For example, the Palestinian study was limited to adolescents who were in refugee camps during the *Al-Aqsa* intifada who

were badly injured due to continuing conflict where the traumatic experience was severe and lasted for extended periods of time that increased their vulnerability. Hence, several studies have confirmed that as the level of exposure to traumatic events, such as the number or intensity of the experienced events increases, so does the rate of PTSD.<sup>52</sup> Conversely, the prevalence of PTSD in the current study was higher than the studies conducted in other parts of Ethiopia, 37.3% in *Koshe* landslide survivors (Addis Ababa),<sup>38</sup> 15.4%<sup>53</sup> after a road traffic accident in South West Ethiopia, and other African countries, 24.8% in Rwanda,<sup>25</sup> 46% in Nigeria,<sup>32</sup> 48.3% in Liberia,<sup>30</sup> as well as 29.3% in Southern Lebanon.<sup>54</sup>

In this study the odds of having PTSD were twice as high in women compared to men.<sup>12,39,56</sup> Females are more likely than males to experience PTSD as a result of a lower threshold for psycho-trauma exposure.<sup>57</sup> Women are more likely emotionally cope with stressful situations compared to men who employ problem-focused coping strategies.<sup>58</sup> Women have been reported to be more sensitive and responsive to threats.

The odds of PTSD were twice as high among respondents whose close friends and/or family members were murdered or seriously injured during the massacre. This is supported by previous studies of a Rwanda genocide and in a Peru earthquake. The odds of developing PTSD among individuals who had moderate and severe perceived threat to life were 3.3- and 3.7-times higher, which is consistent with another Ethiopian study.<sup>12</sup> Direct exposure to the traumatic event increased the odds of having PTSD. This is supported by studies conducted in an Ethiopian *Koshe* landslide (Addis Ababa)<sup>38</sup> and Palestine's Gaza.

Symptoms of depression and anxiety were also found to be independent predictors of PTSD.<sup>12</sup> This is similar to findings done on incarcerated veterans in the King County Jail system in Seattle and King County, Washington, and in Kenya.<sup>36</sup>

## Limitations

We were not able to verify whether the depressive and anxiety symptoms as well as substance use preceded or followed the PTSD due to the cross-sectional nature of the study.

## Conclusion

This study was conducted in an area where a serious massacre to an Amhara ethnic group was committed which left many terrified. Six out of ten of the residents suffered from PTSD following the killings of more than 1,560 innocent civilians where more than one-third of the respondents lost family members. Women, those who lost family members, individuals with high perceived threat to life and those with symptoms of mental illnesses were the most affected. This implies that the intense and persistent emotional disturbances need urgent psychosocial interventions.

## Abbreviations

AOR, Adjusted Odds Ratio; CI, Confidence Interval; CIDI, Composite International Diagnostic Interview; COR, Crude Odds Ratio; GAD, Generalized Anxiety Disorder; PCL-C, Posttraumatic stress disorder Checklist Civilian version; PCL-5, Posttraumatic stress disorder, fifth edition; PHQ-9, Patient Health Questionnaire 9 items; PSS, Perceived Stress Scale; PTSD, Post Traumatic Stress Disorder.

## Ethics Approval and Informed Consent

All procedures undertaken during data collection were in accordance with the ethical review board of the University of Gondar and the declaration of Helsinki. Ethical approval was obtained from the Ethical review committee of the college of medicine and health sciences, University of Gondar. A formal letter of permission was obtained from the department of Psychiatry. The participants were informed about the aim of the study and no name was recorded, instead codes were used to maintain confidentiality. They were given the information sheet to read and for those who were unable to read, the data collectors read for them and asked them if they understood. The study participants were also informed of their right to refuse, withdraw, or refrain from answering questions they are not comfortable with and this would not have any reprisal. They were assured that their decision wouldn't affect their future medical service. Finally, data were collected after obtaining written consent. Participants with serious suicidal ideation during the interview were advised to visit the nearby health center.

## Acknowledgments

The authors would like to thank the University of Gondar for funding the research. We are very grateful to the zonal administration of Setit Humera for granting us permission to conduct this research among Maikadra residents. We also extend our acknowledgments to the research participants, data collectors, and supervisors for their time and effort.

## Author Contributions

All authors conceptualized the research problem, drafted the proposal, developed the data collection tools, supervised the data collection process, contributed to data analysis, revised the manuscript, have agreed on the journal to which the article was submitted, gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

## Disclosure

All authors declared that they have no conflicts of interest for this work.

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