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Magnitude and factors associated with post-traumatic stress disorder among war-affected internally displaced people in northwest Ethiopia, 2022

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Abstract

Background: A large number of people are often directly involved in armed conflict and, therefore, are at greater risk of developing a wide range of mental disorders, including post-traumatic stress disorder. Despite this, few have been reported about it in low- and middle-income countries, including Ethiopia.

Objective: This study was carried out to assess the magnitude and factors associated with post-traumatic stress disorder among war-affected internally displaced people in northwest Ethiopia, 2022.

Methods: Cross-sectional study design was conducted from May 23 to June 22, 2022, and simple random sampling was used to select a sample of 412 participants. Data were collected by structured interviewer-administered questionnaires. The post-traumatic stress disorder checklist for Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition with extended criteria-A was used to assess post-traumatic stress disorder. Multivariable logistic regression analysis was done to identify factors associated with post-traumatic stress disorder.

Results: A total of 412 participants were interviewed with the response rate of 100%. The mean age of the respondents was 34.7 (±10.9) years. The prevalence of post-traumatic stress disorder was found to be 60.98% (95% CI: 56.1%, 65.5%) with an estimated prevalence of 23.5% and 76.5% among males and females, respectively. In multivariable analysis, female sex (AOR = 2.39; 95% CI: 1.48, 3.86), having depression (AOR = 2.86; 95% CI: 1.78, 4.60), family history of mental illness (AOR = 3.67; 95% CI: 1.43, 9.42), and poor social support (AOR = 3.61; 95% CI: 1.74, 7.47) were factors significantly associated with post-traumatic stress disorder at p-value < 0.05.

Conclusion and recommendation: Based on this study, at least 6 out of 10 war-affected populations have experienced post-traumatic stress disorder. Especially females, those who had depression, family history of mental illness, and poor social support, were more vulnerable to post-traumatic stress disorder. Therefore, it is recommended to do on-site screening and provide treatment for all displaced populations suffering from post-traumatic stress disorder by giving special concern for females, individuals having depression, poor social support, and family history of mental illness.

Keywords

Post-traumatic stress disorder, internally displaced people, Ethiopia

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Introduction

According to the United Nations (UN), internally displaced people (IDP) are "individuals or groups of individuals who have been compelled to flee or to leave their homes or places of habitual residence, particularly due to or in order to avoid the effects of armed conflict, situations of widespread violence, violations of human rights, or natural or man-made disasters, and who remain inside sovereign borders that are

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recognized internationally."[1,2] Now, there are more than 70.8 million IDP worldwide, of whom 87.2% have been displaced due to conflict and violence,[3] and disasters have displaced 12.8%.[4] The United Nations Human Rights Commission (UNHCR) reports that 42% of all IDP worldwide reside in Africa. Ethiopia has been dealing with the crisis of internal displacement for decades and is the host of the highest number of displaced people in the Horn of Africa with 2.2 million IDP in 2019, next to the Democratic Republic of the Congo, which had over 5 million IDP.[5,6] The confrontation between the Ethiopian National Defense Force and the Tigray People Liberation Front resulted in the displacement of millions of people, including children, women, and adolescents in the Tigray, Amhara, and Afar regions.[7]

As in many other countries, IDP in Ethiopia are neglected in many aspects, including health care, particularly mental health. They have been resulting in different health, environmental, physical, and social impacts.[8] IDP are perceived as unwelcome minorities, which exposes them to greater discrimination and social exclusion.[9] Displacement led to significant and varied consequences, initially related to the presence of multiple psychosocial stress factors and emotional well-being alterations. Overall, people with displacement were exposed to different kinds of trauma, violence, and injuries, making them more vulnerable to psychological disorders, particularly post-traumatic stress disorder (PTSD).[10,11] PTSD is one of the psychological disorders that can be experienced following exposure to traumatic or stressful events. It is characterized by symptoms of intrusion, avoidance, changes in mood and cognition, and hyperarousal, all of which can last for more than a month after the traumatic event.[12]

PTSD can occur due to witnessing and being exposed to terrible events, such as murder, threats, kidnapping, loss of relatives or friends, loss of house, and starvation.[10,13,14] Several systematic reviews indicated that IDP who stay within their own country experience worse mental health outcomes than refugees.[15] PTSD symptoms have been described as one of the most prevalent mental health conditions in IDP.[16] In post-conflict and conflict-ridden societies, the prevalence rates in the general population can be higher.[17]

The World Health Organization's (WHO) global disease burden survey estimates that mental illness, including stress-related disorders, will be the second leading cause of disability.[18] According to a WHO report, 0.4% of global diseases of the total years lived with disability (YLD) followed PTSD, and the estimated burden increased to 0.6% YLD globally. Statistical estimates showed that the magnitude of PTSD ranges from 1% to 5% in general population studies[19,20] and from 3% to 58% for high-risk groups such as displaced people.[21,22] According to a systematic review carried out in 40 nations, 30.6% of war-affected IDP have experienced PTSD,[23] whereas a systematic review conducted in Sub-Saharan African countries revealed that the prevalence of PTSD ranged from 42% to 54%.[24] Studies carried out in Nigeria,[25] Uganda,[26] and Ethiopia[27] revealed that the magnitude was 42.2%, 54%, and 58.4%, respectively.

There are several factors associated with PTSD following exposure to traumatic events. These factors include female sex, unemployment, and low educational status.[28] Moreover, younger age, lower socioeconomic status,[27,29] family history of mental illness, experience with depression,[26,27,30] and witnessing the murder of a family[27] have been frequently reported as predictors of PTSD. Even though they are the world's most vulnerable people who suffer from mental health problems,[31] they remain underrepresented in humanitarian policy and academia.[8]

Despite this, there is a scarcity of enough sound information that shows the magnitude, significant factors, and prevention mechanisms in low- and middle-income countries (LMICs), including Ethiopia. So, this study aims to investigate the prevalence and factors significantly associated with PTSD among the war-affected internally displaced population in Northwest Ethiopia. It would be used as a piece of evidence for the concerned stakeholders to address the problem, emphasizing prevention and treatment strategies as well as utilizing holistic approaches to address the potential predictors of PTSD.

Method and materials

Study design and period

This study was carried out through a cross-sectional study design from 23 May to 22 June 2022.

Study setting

This study was conducted in the Amhara regional state of the North Gondar administrative zone, which is located 761 km from Addis Ababa. There are three IDP sites (Dabat, Debark, and Zarima) that house people who have experienced large-scale displacement, loss of life, and property damage. The first site was found in Dabat, with a total of 2084 people. Those 18 years of age and older are 874. The second site was found in Debark, which holds 2430 people, 1320 of whom are 18 years and older. The third site was found in Zarima, with a total of 6470 people. Those 18 years of age and older are 3601. The total population in all three sites is 10,984, with 5795 (3913 females and 1882 males) people aged 18 and above.

Source and study population

Our source populations were all IDP aged 18 and above found in the temporary camps. IDP aged 18 and above who were found in temporary camps during the study period were the study population. IDP aged 18 and above who were available in the assigned camps during the data collection

period were included in this study, whereas individuals who were unable to communicate and acutely sick during the data collection period were excluded from this study.

The sample size was calculated using the single population proportion formula by considering the following assumptions: the prevalence of PTSD was 58.4% in a study conducted in southern Ethiopia among IDP from the Gedeo zone,[31] with a 95% confidence interval, a 5% margin of error, and a 10% non-response rate.

Applying the formula: $n = \frac{(za/2)^2 \times p(1-p)}{d^2} = \frac{(1.96)^2 \times 0.584(1-0.584)}{0.05^2} = 374$ with a 10% nonresponse rate the final sample size was 412.

In the recruitment of the study participants, simple random sampling was used to get a total sample of 412 participants. Since the sample was included from three sites, to assure representativeness of the sample, proportional allocation was done. The lists of persons were obtained from the leaders of each site, and participants were selected by using a computer-generated random method.

Measurement tools

PTSD was assessed using the Post-traumatic Stress Disorder Checklist for the DSM-5 (PCL-5 with extended criteria A). The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria are used to guide the development of the Post-traumatic Stress Disorder Checklist for DSM-5 (PCL-5), a self-report tool for evaluating symptoms of PTSD. It was developed as an updated PCL for the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, DSM-IV (PCL-IV) that took into account modifications to the DSM-5 PTSD criteria. In humanitarian settings in LMICs, the PCL-5 is a standardized tool that has been shown to be a reliable assessment of PTSD.

The PCL-5 reveals a high degree of internal consistency, meaning that all of the scale's components measure the same underlying PTSD construct. Additionally, PCL-5 scores have been demonstrated in test–retest reliability studies to be stable over time, indicating that the scale yields reliable results when used frequently. PCL-5 was used by several studies in African countries,[32] including Ethiopia.[27,33] The validity and reliability of the PCL-5 have been tested and proven among IDP of Kurdish[34] (Cronbach's alpha = 0.85), undergraduate university students of Rwanda,[35] and HIV patients of Zimbabwe[36] (Cronbach's alpha = 0.92). A total score was computed by adding the 20 items; scores range from 0 to 80 with a five-point Likert scale (0 = not at all, 1 = a little bit, 2 = moderately, 3 = quite a bit, and 4 = extremely) with a cut point of ⩾33.[37]

Depression screening, diagnosis, monitoring, and severity assessment are all done with the help of the Patient Health Questionnaire-9 (PHQ-9), a self-report instrument. Its foundation is in the Diagnostic and Statistical Manual of Mental Disorders' criteria for major depressive disorder. It is extensively employed in research investigations, community health evaluations, clinical settings, and primary care settings. PHQ-9 was validated in the Ethiopian population[38] and showed good internal consistency (Cronbach's alpha = 0.81) and test–retest reliability (intraclass correlation coefficient = 0.92). It was validated in the Kurdistan region of Iraq's displaced population with good internal consistency[39] (Cronbach's alpha = 0.89) and test–retest reliability, proven to have good psychometric qualities.

Therefore, for the assessment of depression, we have employed the Patient Health Questionnaire (PHQ-9) with nine items for the last 2 weeks, and each item has a four-point Likert scale ranging from 0 to 3 (0 = not at all, 1 = several days, 2 = more than half the days, and 3 = nearly every day). The total score is calculated by summing the scores of all items, resulting in a range of 0–27. It can be interpreted as 0–4 = minimal depression, 5–9 = mild depression, 10–14 = moderate depression, 15–19 = moderately severe depression, and 20–27 = severe depression. In this study, we have used a cut point of ⩾10 (moderate depression), and individuals who scored 10 and above were considered to have depression.[40] The items evaluate mood, interest or pleasure, energy, appetite, concentration, feelings of guilt or worthlessness, psychomotor changes, and suicidal thoughts.

Substance use was assessed by semistructured and modified form of the Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST). It is an adapted tool and validated by WHO. Using at least one of any specific substance for a nonmedical purpose within the last 3 months (alcohol, chat, tobacco) and using at least one of any specific substance for a nonmedical purpose at least once in a lifetime (alcohol, khat, tobacco) were suggested as current substance users and ever users of substances, respectively.[41]

Social support: Social support was assessed by the Oslo-3 scales: Oslo 1: How many people are so close to you that you can count on them if you have great personal problems? (1 = "none," 2 = "one to three," 3 = "three to five," and 4 = "above five"). Oslo 2: How much interest and concern do people show in what you do? (1 = "none," 2 = "little," 3 = "uncertain," 4 = "some," and 5 = "a lot"). Oslo 3: How easy is it to get practical help from neighbors if you should need it? (1 = "very difficult," 2 = "difficult," 3 = "possible," 4 = "easy," and 5 = "very easy").

OSLO-3 has a total of 14 scores and is classified into three broad categories: poor support = 3–8, moderate social support = "9–11," and strong support = "12–14."[42] Known chronic medical illnesses: chronic diseases were defined broadly as conditions that lasted 1 year or more and required ongoing medical attention, limited activities of daily living, or both, including HIV/AIDS, diabetes, epilepsy, and others. Family history of mental illness: to examine a family history of mental illness, respondents were asked, "Do you know a family member who had experienced a known mental illness?"

Data collection procedures

The selected participants were invited to a temporary hall (a wide tent at the center) made by the IOM and UNICEF within the temporary camp. Before data collection, all participants were given detailed information about the study. Informed consent was obtained from participants after explaining all the purposes, benefits, confidentiality of the information, and voluntary nature of the participation. Only individuals who gave their permission were interviewed. Separate structured interviews were conducted with each participant without any information contamination to establish their safety and privacy.

The data collection supervisors were mental health professionals, whereas the interviewers were BSc nursing professionals who work in the internally displaced community camps employed by the United Nations Children's Emergency Fund (UNICEF) and the International Organization for Migrants (IOM). They have received a 2-day training (both morning and afternoon) on handling the study instruments, mental health terms, and important principles of conducting the interviews. The interview was conducted in Amharic, which is a native and familiar language to participants and interviewers. Both supervisors and data collectors were familiar with the community, language, sociocultural, and environmental contexts.

Data quality control

The questionnaire was initially prepared in English, first translated into the local Amharic language for the participant, and then back-translated to English to maintain consistency by an independent person. A pretest was done on 5% of the samples ($n=21$) from the Kebero-Meda IDP site (found in the Central Gondar zone) for test, if the questions were understandable to the pretest sample and necessary amendments were made. (PCL-5 = 0.92, PHQ-9 = 0.79, and OSLO-3 = 0.86.) Throughout the course of the data collection, data collectors were supervised, and regular meetings were held between the data collectors, supervisors, and the principal investigator in which problematic issues arising during the data collection by the participants were discussed and corrected. The collected data were reviewed and checked for completeness before data entry.

Data management, processing, and analysis

The data were checked, coded, and entered into Epi-Data version 4.2.0 and exported to STATA version 14 for analysis. The descriptive examination of participants was employed in response to the assessment tool of PCL-5 to determine the prevalence of PTSD. A bivariable logistic regression analysis was performed to find the association of sociodemographic, clinical, substance-related, and psychosocial variables to predict participants PTSD risks. Variables with a p-value of less than 0.2 in the bivariable logistic regression analysis were entered into the multivariable logistic regression model to identify significant factors associated with PTSD. Then, multivariable logistic regression was computed, and variables with a p-value of $\leqslant 0.05$ were considered statistically significant factors associated with PTSD, and the adjusted odds ratio (AOR) with a 95% confidence interval (CI) was calculated. The goodness of the model's fitness was tested by the Hosmer and Lemeshow tests (0.2). The result shows the model was fitted to measure the processed data by the logistic regression analysis.

Declarations

Ethics approval

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. Ethical approval for this study was obtained from the University of Gondar Institutional Review Board with approval number UoGIRBSOM/1540/2022).

Informed consent

Before data collection, all participants were given detailed information about the study. After explaining all the purposes, risks, benefits, confidentiality of the information, and voluntary nature of the participation, both verbal and written informed consent was obtained from all subjects before the study.

Results

Sociodemographic characteristics of respondents

A total of 412 participants were interviewed, with a response rate of 100%. The mean age of the respondents was 34.7 ($\pm$10.9) years. The number of females in this study is two times higher than that of males. Most respondents (34.47%) were in the age range of 18–27 years old, and approximately half of the respondents were married. Regarding religion, almost 96% of them were Orthodox, and more than one-third of the total respondents have a primary educational level (Table 1).

Clinical, substance-related, and psychosocial characteristics of respondents

With regard to the clinical characteristics of respondents, more than half of the participants—243 (58.9%) and 232 (56.31%)—had depression and generalized anxiety disorder, respectively, whereas 83 (20.15%) had a chronic medical illness, and 59 (14.32%) had a family history of mental illness.

Table 1. Sociodemographic characteristics of war-affected internally displaced people in northwest Ethiopia, 2022 ($n = 412$).

Variables	Categories	Frequency	Percentage
Sex	Male	139	33.74
	Female	273	66.26
Age	18–27	142	34.47
	28–37	117	28.40
	38–47	72	17.48
	⩾48	81	19.66
Marital status	Single	126	30.58
	Married	185	44.90
	Divorced	40	9.71
	Widowed	61	14.81
Religion	Orthodox	395	95.87
	Muslim	13	3.16
	Protestant	4	0.97
Educational status	No formal education	128	31.07
	Primary	156	37.86
	Secondary	89	21.60
	College and above	39	9.47

Table 2. Clinical, psychosocial and substance related characteristics of war-affected internally displaced people in northwest Ethiopia, 2022 (n = 412).

Explanatory variables	Categories	Frequency	Percentage
Depression	No	169	41.02
	Yes	243	58.98
Lifetime alcohol use	No	232	56.31
	Yes	180	43.69
Current alcohol use	No	244	59.22
	Yes	168	40.78
Lifetime Chat use	No	384	93.2
	Yes	28	6.8
Current chat use	No	393	95.39
	Yes	19	4.61
Lifetime cigarette use	No	405	98.3
	Yes	7	1.7
Current cigarette use	No	409	99.27
	Yes	3	0.73
Chronic medical illness	No	329	79.85
	Yes	83	20.15
Family history of mental illness	No	353	85.68
	Yes	59	14.32
Social support	Strong	51	12.38
	Moderate	126	30.58
Poor		235	57.04
Witnessing murder of family member/friends	No	316	76.7
	Yes	96	23.3

With respect to substance use, 180 (43.69%) were lifetime alcohol users, and 168 (40.78%) were current alcohol users. About 28 (6.8%) of respondents had used khat throughout their lives, and 19 (4.61%) were using it currently. Seven (1.7%) respondents smoke cigarettes during their lifetime. Concerning with social support of participants, 235(57.04) had poor social support, whereas 51(12.38%) of participants had strong social support. On the other hand, 96(23.3%) of participants had witnessed murder of family member/friends (Table 2).

Table 3. Prevalence of post-traumatic stress disorder among war-affected internally displaced people in northwest Ethiopia, 2022 ($n = 412$).

No	In the past month, how much were you bothered by	Not at all (*n* (%))	A little bit (*n* (%))	Moderately (*n* (%))	Quite a bit (*n* (%))	Extremely (*n* (%))
501	Repeated, disturbing, and unwanted memories of the stressful experience?	5 (1.21)	95 (23.6)	110 (26.7)	185 (44.9)	17 (4.13)
502	Repeated, disturbing dreams of the stressful experience?	28 (6.8)	59 (14.32)	268 (65.05)	47 (11.41)	10 (2.43)
503	Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?	18 (4.37)	130 (31.55)	139 (33.74)	117 (28.40)	8 (1.94)
504	Feeling very upset when something reminded you of the stressful experience?	18 (4.37)	95 (23.06)	196 (47.57)	88 (21.36)	15 (3.64)
505	Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?	24 (5.83)	105 (25.49)	153 (37.14)	113 (27.43)	17 (4.13)
506	Avoiding memories, thoughts, or feelings related to the stressful experience?	23 (5.58)	114 (27.67)	152 (36.89)	99 (24.03)	24 (5.83)
507	Avoiding external reminders of the stressful experience (e.g., people, places, conversations, activities, objects, or situations)?	32 (7.77)	102 (24.76)	164 (39.81)	97 (23.54)	17 (4.13)
508	Trouble remembering important parts of the stressful experience?	24 (5.83)	112 (27.18)	130 (31.55)	126 (30.58)	20 (4.85)
509	Having strong negative beliefs about yourself, other people, or the world (e.g., having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)?	27 (6.55)	106 (25.73)	155 (37.62)	105 (25.49)	19 (4.61)
510	Blaming yourself or someone else for the stressful experience or what happened after it?	33 (8.01)	106 (25.73)	160 (38.83)	94 (22.82)	19 (4.61)
511	Having strong negative feelings such as fear, horror, anger, guilt, or shame?	32 (7.77)	80 (19.42)	160 (38.83)	123 (29.85)	17 (4.13)
512	Loss of interest in activities that you used to enjoy?	28 (6.80)	107 (25.97)	163 (39.56)	88 (21.36)	26 (6.31)
513	Feeling distant or cut off from other people?	33 (8.01)	99 (24.03)	153 (37.14)	114 (27.67)	13 (3.16)
514	Trouble experiencing positive feelings (e.g., being unable to feel happiness or have loving feelings for people close to you)?	30 (7.28)	95 (23.06)	155 (37.62)	106 (25.73)	26 (6.31)
515	Irritable behavior, angry outbursts, or acting aggressively?	30 (7.28)	93 (22.57)	169 (41.02)	104 (25.24)	16 (3.88)
516	Taking too many risks or doing things that could cause you harm?	33 (8.01)	106 (25.73)	142 (34.47)	120 (29.13)	11 (2.67)
517	Being "super-alert" or watchful or on guard?	32 (7.77)	82 (19.90)	178 (43.20)	100 (24.27)	20 (4.85)
518	Feeling jumpy or easily startled?	24 (5.83)	116 (28.16)	194 (47.09)	65 (15.78)	13 (3.16)
519	Having difficulty concentrating?	31 (7.52)	127 (30.83)	189 (45.87	59 (14.32)	6 (1.46)
520	Trouble falling or staying asleep?	8 (1.94)	241 (58.50)	141 (34.22)	18 (4.37)	4 (0.97)

No	Final PCL-5 dichotomous result for diagnosis of PTSD	Number	Percentage
1.	Yes (Score $\geq$ 33/80)	251	60.98
2.	No (Score $<$ 33/80)	161	39.02

Prevalence of PTSD

To confirm the presentation of PTSD, we have applied to dichotomize the total scores to "yes" or "no." Therefore, "yes = score $\geq$ 33/80," whereas "no $\leq$ 33/80." In this study, respondents who scored $\geq$ 33/80 were 458 out of 751 IDP. Therefore, the estimated prevalence of PTSD (Score $\geq$ 33/80) among war-affected IDP was found to be 60.98% (95% CI: 56.1%, 65.5%), with an estimated prevalence of 23.5% and 76.5% among males and females, respectively (Table 3).

Factors associated with post-traumatic stress disorder

In bivariable analysis, female sex, age, marital status, depression, chronic medical illness, a family history of mental illness, witnessing the murder of family members or friends, poor social support, and current alcohol use were associated with PTSD at a *p*-value of 0.2. Then, these variables were entered into the multivariable logistic regression model to control the confounding effects between variables.

Table 4. Bivariate and multivariate logistic regression analysis of variables and post-traumatic stress disorder among war-affected internally displaced people, northwest Ethiopia, 2022 ($n=412$).

Explanatory variables	Category	PTSD		COR (95% CI)	AOR (95%CI)
		Yes	No		
Sex	Male	192	81	1.00	1.00
	Female	59	80	3.21 (2.10, 4.91)	**2.39 (1.48, 3.86)*** **
Age	18–27	52	45	1.93 (1.07, 3.45)	1.87 (0.90, 3.89)
	28–37	38	53	1.08 (0.59, 1.94)	1.09 (0.55, 2.16)
	38–47	64	34	1.00	1.00
	⩾48	97	29	1.60 (0.84, 3.06)	1.17 (0. 53, 2.57)
Marital status	Single	40	21	2.41 (1.48, 3.91)	1.14 (0.62, 2.08)
	Married	24	16	1.00	1.00
	Divorced	96	89	1.39 (0.69, 2.79)	0.57 (0.24, 1.31)
	Widowed	91	35	1.76 (0.96, 3.22)	0.97 (0.44, 2.17)
Depression	No	70	99	1.00	1.00
	Yes	181	62	4.13 (2.71, 6.28)	**2.86 (1.78, 4.60)*** **
Current alcohol use	No	143	101	1.51 (0.96, 2.36)	1.00
	Yes	108	60	1.27 (0.84, 1.91)	0.85 (0.49, 1.45)
Chronic medical illness	No	186	143	1.00	1.00
	Yes	65	18	2.77 (1.57, 4.88)	1.26 (0.59, 2.69)
Family history of mental illness	No	198	155	1.00	1.00
	Yes	53	6	6.91 (2.89, 14.50)	**3.67 (1.43, 9.42)*** **
Social support	Strong	20	31	1.00	1.00
	Moderate	64	62	1.6 (0.82, 3.10)	1.65 (0.76, 3.56)
	Poor	167	68	3.81 (2.02, 7.14)	**3.61 (1.74, 7.47)*** **
Witnessing murder of family member/friends	No	138	178	1.00	1.00
	Yes	23	73	2.46 (1.46, 4.13)	1.76 (0.89, 3.52)

Hosmer–Lemeshow=0.2; PTSD: post-traumatic stress disorder; COR: crude odds ratio; AOR: adjusted odds ratio.
***$p < 0.001$
The bold text indicated that these factors are significantly associated with PTSD.

The multivariable analysis identified that female sex, having depression, a family history of mental illness, and poor social support were factors significantly associated with PTSD at a p-value of 0.05. Women were more than two times as likely to experience PTSD compared with men (AOR = 2.39; 95% CI: 1.48, 3.86). Those who had depression were nearly three times more likely to experience PTSD when compared with their counterparts (AOR = 2.86, 95% CI: 1.78, 4.60). The odds of developing PTSD were more than three times higher among those who had a family history of mental illness (AOR = 3.67, 95% CI: 1.43, 9.42) and poor social support (AOR = 3.61, 95% CI: 1.74, 7.47) than their counterparts (Table 4).

Discussion

The findings from the current study determine the prevalence and associated factors of PTSD among IDP in North Gondar, northwest Ethiopia.

In low- and middle-income nations, PTSD is becoming a significant public health issue as a result of exposure to man-made disasters such as civil wars, terrorist attacks, and ethnic conflicts. Ethiopia is one of the countries that have experienced large-scale displacement and crises during the war between the Ethiopian Defense Force and the Tigray People Liberation Front since 2020. Our study showed that 61% of displaced individuals experienced PTSD. This finding is consistent with other studies conducted in southern Ethiopia,[27] Nigeria,[43] and Sri Lanka.[44]

The current finding was lower than a study carried out in Nigeria,[45] Colombia,[46] and Northern Uganda.[47] The discrepancy might be due to exposure to different trauma types, in which being abducted was the more frequently reported type in the Colombian and Nigerian study,[45,48] and it might be more stressful than the destruction of personal property, which was more frequently reported in our study population than in the Colombian study.[47] The variation in sampling technique (convenience sampling in Colombia) might inflate the prevalence rate in those populations more than our study population because it might be more biased and subjective than the probability sampling technique used in the current study.[46]

On the other hand, the current finding was higher than the study carried out in Kaduna, northwest Nigeria,[25] and northern Uganda.[26] The discrepancy between the findings might be that in Nigeria and Uganda, the level and severity of

displacement were not harsh when compared with the displacement in Ethiopia.

Females have more than twofold higher odds of experiencing PTSD when compared to males. Apart from trauma type, culture and gender roles are also factors that contribute to the high prevalence of PTSD among women. Women might be more vulnerable to rape and sexual assault than men, which might expose them to the probability of having PTSD.[49] The incidence of PTSD is more evident in communities that stress traditional gender roles, where men have more social power than women and women in this type of culture feel more emotionally vulnerable. It is also hypothesized that women's coping mechanisms for stress may contribute to their increased vulnerability to PTSD. It is a known fact that men and women cope with stress.[50]

Respondents who had depression had approximately three times higher odds of experiencing PTSD, when compared with their counterparts. This is consistent with other studies undertaken in southern Ethiopia[27] and Nigeria.[51] This could be because participants with depression are more likely to have suffered traumatic experiences than respondents without depression, which in turn increases the likelihood of developing PTSD.[52] The presence of comorbid depression and other psychological problems can escalate the probability of experiencing PTSD.[25]

Respondents who had families with known mental illnesses had approximately four times higher odds of developing PTSD. The inheritance of genes associated with the hypothalamic–pituitary–adrenal axis, as well as the serotonin transporter gene, might constitute a possible cause. Psychological factors in the family members might also make participants more predisposed to PTSD.[53,54] This finding was consistent with a study carried out in South Korea.[55]

Moreover, having poor social support was found to be a stronger predictor of PTSD than those who had strong social support. This finding is consistent with other studies in Afghanistan.[56] Having poor social support may trigger PTSD by conveying a message that one is too taken care of and protected, which causes their cognition that the world is unsafe, decreases their ability to regulate emotions such as fear, anxiety, and mistrust, and enhances self-efficacy and control. In contrast, having strong social support decreases avoidant coping behaviors, such as passive isolation.[57]

Limitations of the study

It is important to take into account the limitations of this study. The cross-sectional nature of the study did not allow for inferences to be drawn as to the causal relationship among variables.[58] There might be social desirability bias associated with some sensitive questions.[59] The study relies on self-report measures for assessing PTSD, depression, substance use, and social support. This introduces the possibility of response bias, as participants may underreport or over-report their symptoms or behaviors. The study primarily focuses on demographic, clinical, and psychosocial factors associated with PTSD. Other potentially relevant variables, such as past trauma history,[60] food insecurity,[61] access to mental health services, and coping strategies,[62] are not adequately explored. The findings may have limited generalizability beyond the specific context of northwest Ethiopia, and similar settings experiencing internal displacement crises. Factors influencing PTSD prevalence and associated factors may vary across different regions and populations.

Conclusions and recommendations

The study revealed a significant burden of PTSD among IDP in northwest Ethiopia, with a prevalence rate of 60.98%. This underscores the urgent need for targeted mental health interventions within the displaced population. This study showed that PTSD disproportionately affected women compared to men. This highlights the importance of addressing gender-specific vulnerabilities and experiences in mental health interventions. Additionally, the presence of depression, a family history of mental illness, and poor social support were strongly associated with PTSD. Therefore, the results indicate the need for integrated approaches to addressing mental health conditions among IDP, including screening and treatment for comorbidities, strengthening social support networks, and addressing intergenerational mental health issues, which are crucial for mitigating the impact of PTSD. We recommend future researchers conduct longitudinal studies that would provide more robust evidence of the temporal relationships between variables and assess factors that might play an important role in PTSD, like past trauma history, food insecurity, food insecurity, and coping strategies.

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Author's contribution

GT developed the proposal, supervised the data collection, analyzed the data, and wrote the draft manuscript. TA, AA, and GK revised the proposal and checked the data analysis. SF, FG, and SY revised the proposal, checked data analysis, and revised and approved the manuscript.

Availability of data and materials

The dataset during and/or analyzed during the current study is available from the corresponding author on reasonable requests.

Declaration of conflicting interests

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Ethics approval

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. Ethical approval for this study was obtained from the University of Gondar Institutional Review Board with approval number UoG IRB SOM/1540/2022).

Informed consent

Before data collection, all participants were given detailed information about the study. After explaining all the purposes, risks, benefits, confidentiality of the information, and voluntary nature of the participation, both verbal and written informed consent was obtained from all subjects before the study.

Trial registration

Not applicable.

Consent for publications

Not applicable.

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Supplemental material

Supplemental material for this article is available online.

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