

Prevalence and correlates of post-traumatic stress disorder among internal displaced people in Qoloji Camps, Somali regional state, eastern Ethiopia

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Abstract

Objectives: This study assessed the prevalence and correlates of post-traumatic stress disorder (PTSD) among internally displaced people (IDP) in the Qoloji Camp, Somali Regional State, Eastern Ethiopia.

Methods: A community-based cross-sectional study was conducted from October 20 to November 5, 2021. The study utilized systematic random sampling to identify 410 IDP participants from the Qoloji Camp. PTSD was measured using the PTSD Check-list for DSM-5 (PCL-5). Bivariate analysis was performed to determine the crude odds ratio, and multivariate analysis was used to calculate adjusted odds ratios for associations between PTSD and independent variables.

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Data Availability Statement included at the end of the article.

Results: A total of 404 participants were interviewed (98.5% response rate). The estimated prevalence of PTSD symptoms was 41.1%. In the multivariate logistic regression analysis, several factors were significantly associated with PTSD: being female (AOR = 2.5, 95% CI = 1.39-4.44), lack of food and water (AOR = 2.2, 95% CI = 1.17, 4.23), destruction of personal property (AOR = 3.1, 95% CI = 1.62-6.09), and experiencing torture or beatings (AOR = 1.8, 95% CI = 1.01-3.28).

Conclusion: This study found a high prevalence of PTSD symptoms among IDPs, with factors such as female sex, property destruction, deprivation of essential goods and services, and experiences of torture or beatings significantly associated with those symptoms. To address these findings, prioritizing the well-being of IDPs with a specific focus on women, on-site screening, and the establishment of a referral system to facilitate access to specialized care are essential to enhance the overall mental health of such persons.

Keywords

stress disorders, post-traumatic, refugees

Introduction

Post-traumatic stress disorder (PTSD) is a mental health condition that develops after exposure to traumatic events, causing intense fear, helplessness, and horror.¹ Internally Displaced Persons (IDPs) are individuals forced to leave their homes within their own country due to conflicts or disasters.² The global number of displaced people in 2020 reached 50.8 million, with a significant portion attributed to conflict, particularly affecting low-income countries like Ethiopia.³ Ethiopia itself had over 2.2 million IDPs by early 2019, including those displaced by the Federal-TPLF conflict in various regions.⁴ The Somali Region of Ethiopia is also heavily affected by internal displacement due to factors such as drought, floods, ethnic tensions, and resource conflicts.⁵ However, there is a lack of comprehensive analysis and attention given to the mental health of IDPs in Ethiopia.

PTSD is a prevalent mental health disorder worldwide, commonly associated with traumatic events that have occurred. Populations affected by war and internal displacement bear a significant burden of psychiatric morbidity, including PTSD.⁶ Studies have shown that IDPs, who remain within their own country, experience poorer mental health outcomes compared to refugees.⁷ The untreated burden of PTSD has far-reaching consequences, impacting individuals' health, productivity, and social interactions.⁸ Additionally, stress-related mental illnesses are posing an increasing global economic burden.⁹ In Africa, PTSD continues to be a public health concern years after civil conflicts, with high prevalence rates among IDPs.⁸ Contributing factors to the development of PTSD include pre-existing conditions, the nature of the traumatic event itself, the level of exposure, and post-traumatic factors such as social support.¹⁰

However, availability of limited research in Ethiopia, particularly in the Somali Region hinders the development of targeted interventions and policies to improve the mental health outcomes and overall well-being of IDPs in this specific context. This study aims to address this gap by assessing the prevalence of PTSD and its correlates, such as: sociodemographic factors, trauma-related factors, and clinical, social support, and substance-related factors among internally displaced people in the Qoloji Camps of Eastern Ethiopia in 2021.

This study holds significant importance for stakeholders involved in supporting the well-being of IDPs in Qoloji Camps. The findings provide valuable insights into PTSD prevalence and associated factors, shedding light on specific challenges faced by this population. This information is crucial for developing tailored interventions and mental health services, enabling informed decision-making and resource allocation. It contributes to the global understanding of mental health challenges faced by displaced populations and serves as a foundation for future research in diverse regions.

Materials and Methods

Study design, period and setting

A community-based cross-sectional study was conducted from Oct 20 to Nov 5, 2021. The study was conducted in Qoloji IDP Camp located in the western part of the Somali Regional State. Qoloji Camp is an official IDP site in the Somali Region and administratively belongs to Babile woreda, situated approximately 60 km from Jigjiga.¹¹ The majority of IDPs in this camp have been displaced from West Hararge. According to the Displacement Tracking Matrix 14 (DTM14), the camp houses a total of 5493 households and 34,194 individuals.¹² Qoloji Camp was established in 2016 and chosen purposefully for this study due to its convenient location and accessibility for data collection.¹¹ The study focused on the target population of internally displaced people who had settled in the camp before 2018, originating from the Somali and Oromia regions' borders.¹²

Eligibility criteria

The study included all adults in the Qoloji IDP Camp who were aged 18 years and above and willing to participate in the study. Study participants not located at their assigned camp after revisiting the area during the data collection period, those who were severely ill or had difficulty of communication were excluded from the study.

Sample size determination and sampling technique

The sample size was determined using the single population proportion formula, considering an assumed prevalence of 58.4% ($P = .584$) based on studies conducted in Gedeos (Southern Nation Nationality Region),⁶ Z (the standard normal deviation at

95% confidence interval) = 1.96, d (margin of error) = 5% (.05), and after using 10% non-response rate, final sample size was **410**.

A systematic sampling technique, with a random start, was employed to select eligible study participants. The sampling interval was determined by dividing the total sampling frame ($N = 5493$ households) by the desired sample size ($n = 410$). The first participant was randomly selected from the sampling interval, and every **13th** household was included in the study until the required sample size was reached.

Data collection instruments

Data was collected using a structured, interviewer-administered questionnaire consisting of socio-demographic characteristics, clinical information, social support, substance histories, and trauma-related factors. The questionnaire utilized a "yes/no" response format and was operationalized according to different literature. Trained interviewers were responsible for delivering those questionnaires to eligible participants. The completion of the questionnaire was carried out in person during scheduled interview sessions conducted by trained interviewers. These interviewers were trained and equipped with the necessary skills to guide participants through the questionnaire, ensuring a standardized and consistent approach across all processes and measurements.

To measure Post-Traumatic Stress Disorder (PTSD), the study utilized the Post-traumatic Checklist-5 (PCL-5), a standardized instrument based on DSM-5 criteria. It is a self-report rating scale that consists of 20 items, measuring the severity of various PTSD symptoms. Each item is rated on a 5-point Likert scale (0 = Not at all, 1 = A little bit, 2 = moderately, 3 = Quite a bit, 4 = extremely).¹³ The calculated total symptom severity score (range of 0–80) which can be obtained by summing the scores for each of the 20 items. A total score of 33 or higher can be used for a temporary PTSD diagnosis.¹⁴ The PCL-5 has been widely validated and proven reliable in assessing PTSD symptoms in different populations, including internally displaced people and refugees in various countries such as, in Iraq (Cronbach's $\alpha = .85$) and Zimbabwe (Cronbach's $\alpha = .92$).^{15,16}

Social support was assessed according to the Oslo-3 social support scoring scale, which ranges from 3 to 14. The scale categorizes scores as follows: 3–8 = poor social support, 9–11 = intermediate social support, and 12–14 = strong social support.¹⁷

Data processing and analysis

The collected data underwent rigorous quality control, including checks for completeness, thorough editing for data accuracy, coding for analysis, and entry into EpiData version 3.1. Subsequently, it was exported to SPSS version 21.0 for analysis. Descriptive statistics (mean, median, frequency, percentage) summarized the data, presented through charts and tables. Bivariate analysis was performed to identify explanatory variables associated with PTSD, using a P -value of less than .25. These

identified variables were then included in the multivariate analysis. Independent predictors were determined using multivariable logistic regression analysis, and statistical significance was declared with a *P*-value less than .05 and the strength of associations was determined using adjusted odds ratio (AOR) at 95% CI.

Data quality control

To ensure data quality, a 2-day training session was conducted for the data collectors, consisting of 4 BSc nurses who were supervised by 2 psychiatry professionals. The training focused on familiarizing the collectors with the data collection tools, establishing the start and end dates of data collection, proper data collection techniques, efficient time management, appropriate data handling procedures, and timely submission of collected data. This training took place prior to the actual data collection period. Additionally, a pre-test was conducted, involving 5% of the participants in Biqo IDPs Camp, to assess questionnaire validity. Data completeness was rigorously monitored, involving daily cleaning to address outliers, resolve inconsistencies, and ensure data accuracy. To ensure cultural sensitivity, the structured questionnaire was translated into Somali, and then back-translated into English to verify accuracy and maintain cultural relevance.

Ethical consideration

Ethical clearance for this study was obtained through a comprehensive review by the Ethical Review Board of the College of Medicine and Health Science, School of Graduate Studies, following established ethical guidelines and principles. Each participant provided both written and verbal informed consent after a detailed explanation of the research's purpose and nature. Participation in the study was entirely voluntary, and participants were explicitly informed of their right to withdraw or decline involvement at any stage. To ensure confidentiality, questionnaires were coded using numbers instead of personal names.

Results

Socio-demographic characteristics of respondents

In this study, a total of 404 respondents participated, representing a response rate of 98.5%. Of the respondents, approximately half (210 or 52%) were female. The highest percentage of displaced individuals belonged to the age group of 25–34, accounting for 32.9% of the sample, with a mean age of 1.42 years and a standard deviation of 1.06 years. In terms of marital status, a substantial majority, 246 participants (60.9%), reported being married. In the realm of education, over half, precisely 218 respondents (54%), had completed primary school. Unemployment was prevalent among the majority, with 303 individuals (75%) reporting no current employment ([Table 1](#)).

Table 1. Distribution of sociodemographic factors (n = 404).

S/N	Variable	Category	Frequency
Sex	Male	194	48
	Female	210	52
Age	18-24	90	22.3
	25-34	133	32.9
	35-44	114	28.2
	45-54	56	13.9
	55+	11	2.7
Marital status	Married	246	60.9
	Unmarried	99	24.5
	Divorced/separate	26	6.4
	Windowed	33	8.2
Educational status	No formal education	104	25.7
	Primary school	218	54
	Secondary school	55	13.6
	Preparatory school	19	4.7
	College or above	8	2.0
Occupational status	Merchant	34	8.4
	Employed (gov't and private)	14	3.5
	Student	53	13.1
	Jobless	303	75

Trauma-related factors of respondent

Among the 404 study participants, various types of trauma experienced by internally displaced people (IDP) were identified. These included witnessing the physical murder of friends or family (78.2%), experiencing illness without access to basic medical care (73.3%), the destruction of personal property (66.8%), involvement in war-fighting situations (66.3%), scarcity of food or water in the camp (66.6%), and exposure to torture or beatings (65.3%). It is noteworthy that a small fraction of female participants disclosed occurrences of abduction or kidnapping and instances of rape or sexual abuse (1.2%) (Table 2).

Clinical, social support and substance-related factors of respondents

Among the 404 participants in the study, observations indicated that more than half of them (52%) reported inadequate social support. In terms of mental health history, a minority (3%) disclosed a personal history of mental illness, while 3.5% reported a family history of mental illness. Substance-related factors revealed that approximately 16.3% acknowledged using chat at some point in their lifetime or within the last three months, and 9.9% reported smoking cigarettes or tobacco (Table 3).

Table 2. Description of trauma-related factors (n = 404).

S/N	Variable	Respondent	Frequency	Percentages (%)
1	Destruction of personal property	Yes	270	66.8
		No	134	33.2
2	Lack of housing or shelter in camp	Yes	181	44.8
		No	223	55.2
3	Lack of food or water in camp	Yes	269	66.6
		No	135	33.4
4	Ill without access to medical care	Yes	296	73.3
		No	108	26.7
5	Witnessing murder of family or friend	Yes	316	78.2
		No	88	21.8
6	Witnessing murder of stranger	Yes	257	63.6
		No	147	36.4
7	Forced isolation from family	Yes	47	11.6
		No	357	88.4
8	Torture or beaten	Yes	264	65.3
		No	140	34.7
9	Being in war fighting situation	Yes	268	66.3
		No	136	33.7
10	Imprisonment against will	Yes	16	4
		No	388	96
11	Being abducted or rape or sexual abuse	Yes	5	1.2
		No	399	98.8

Table 3. Description of clinical, social support, and substance-related factors of respondents (n = 404).

S/N	Variable	Respondent	Frequency	Percentage (%)
1	Social support	Poor	210	52
		Moderate	110	27.2
		Strong	84	20.8
2	History (Hx) of mental illness	Yes	12	3
		No	392	97
3	Family history of mental illness	Yes	14	3.5
		No	390	96.5
4	Life time or in last 3 month use khat	Yes	66	16.3
		No	338	83.7
5	Use of cigarette or tobacco	Yes	40	9.9
		No	364	90.1

Prevalence of post-traumatic stress among internally displaced people

The study estimated the prevalence of post-traumatic stress disorder (PTSD) symptoms to be 41.1%, with a 95% confidence interval ranging from 36.4% to 45.5% (Figure 1).

Factor associated with post-traumatic stress disorder

Bivariate and multivariate binary logistic regression analyses were performed to assess the association between independent variables and PTSD. Variables with a P -value less than .25 in the bivariate regression analysis were incorporated into the multivariate logistic regression for further analysis. In the multivariate analysis, variables with a P -value less than .05 and a 95% confidence interval (CI) for the adjusted odds ratio (AOR) were deemed statistically significant. The results revealed that being female, experiencing a lack of food or water, the destruction of personal property, and being subjected to torture or beatings were statistically significant factors associated with PTSD (P -value $< .05$).

Specifically, females were 2.5 times more likely to develop PTSD compared to males (AOR = 2.5; 95% CI: 1.39 to 4.44; $P = .002$). Participants who had experienced a lack of food or water in the camp were 2.2 times more likely to develop PTSD compared to those who had not experienced this event (AOR = 2.2; 95% CI: 1.17 to 4.23; $P = .015$). The likelihood of developing PTSD was 3.1 times higher among individuals who had experienced the destruction of personal property compared to those who had not (AOR = 3.1; 95% CI: 1.62 to 6.09; $P = .01$). Additionally, the odds of developing PTSD were 1.8 times higher among participants who had faced torture compared to those who had not (AOR = 1.8; 95% CI 1.01 to 3.28; $P = .044$) (Table 4).

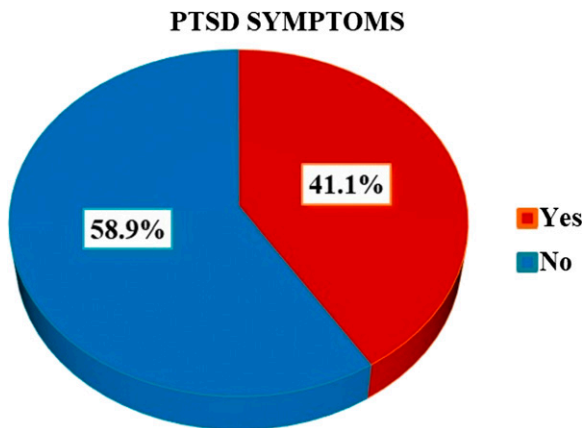


Figure 1. Prevalence of PTSD symptom of respondents ($n = 404$).

Table 4. Bi-variable and multivariate logistic regression analysis showing PTSD and its correlates (n = 404).

Variable		PTSD		COR (95%CI)	P value	AOR (95%CI)	P value
		Yes	No				
Sex	Female	106	104	2.28 (1.51, 3.42)	.00	2.5 (1.39, 4.44)	.002
	Male	60	134	1		1	
Destruction personal property	Yes	137	133	3.7 (2.31, 5.91)	.01	3.1 (1.62, 6.09)	.01
	No	29	105	1		1	
Lack of food or water	Yes	120	149	1.55 (1.01, 2.39)	.04	2.2 (1.17, 4.23)	.015
	No	46	89	1		1	
Ill without access to medical care	Yes	142	154	3.22 (1.94, 5.3)	.00		
	No	24	84	1			
Witnessing murder of family or friend	Yes	146	170	2.9 (1.69, 5.03)	.00		
	No	20	68	1			
Torture or beaten	Yes	123	141	1.96 (1.27, 3.03)	.02	1.8 (1.01, 3.28)	.044
	No	43	97	1		1	
Being in war fighting situation	Yes	118	150	1.44 (.94, 2.20)	.09		
	No	48	88	1			
History of mental illness	Yes	7	5	2 (.64, 6.57)	.22		
	No	159	233	1			
Family Hx of mental illness	Yes	8	6	1.9 (.66, 5.75)	.22		
	No	158	232	1			
Life time or last 3 ^o month use khat	Yes	35	31	1.7 (1.04, 3.03)	.03		
	No	131	207	1			

The bold values denote statistically significant variables.

Discussion

Prevalence of post-traumatic stress disorder

The present study found that the estimated prevalence of PTSD symptoms among internally displaced people (IDP) was 41.1%, with a 95% confidence interval (CI) of 36.1-45.6. This prevalence aligns with similar studies conducted in Nigeria (42.2%),¹⁸ Mexico (38.8%),¹⁹ West Nile region (40.1%),²⁰ and the Democratic Republic of Congo (44.42%).²¹ However, it was lower compared to studies in Turkey (51.4%),²² Syrian

refugees in Atlanta (84%),²³ Sri Lanka (56%), northern Uganda (54%),²⁴ southern Ethiopia (58.4%),⁶ and Debre-Berhan Ethiopia (67.5%).²⁵

The variations in prevalence rates may be attributed to differences in the types of trauma experienced, with abduction being a prominent trauma in Uganda, potentially more distressing than the types reported in the current study. Repeated exposure to traumatic events and a prior history of displacement could make individuals more vulnerable to acquiring PTSD.⁶ Earthquakes in Turkey, known for their severe impact, also contribute to differences in prevalence.²² Moreover, variations in measurement instruments, such as the use of the Harvard Trauma Questionnaire (HTQ) and structured interviews based on DSM-IV criteria in Uganda and Atlanta, compared to the use of the PCL-5 (DSM-V) in the current study, could contribute to discrepancies.^{23,24} Differences in sample size and sampling techniques may also play a role, with larger sample sizes and multi-stage sampling methods employed in northern Uganda, while the current study utilized systematic random sampling.⁶

Conversely, the estimated prevalence in the current study was higher than reported rates in Sri Lanka (7%),²⁶ Georgia (23.3%),²⁷ Iraq (20.8%),²⁸ Central Sudan (12.3%),²⁹ Mogadishu, Somalia (32%),³⁰ and Northeast Ethiopia (34.5%).³¹ These differences could be attributed to variations in measurement tools, with the Composite International Diagnostic Interview (CIDI) used in Sri Lanka²⁸ and the HTQ structured interview based on DSM-IV criteria used in Georgia,²⁷ whereas the current study utilized the PCL-5 (DSM-V), demonstrating better internal consistency in measuring PTSD. The duration of displacement is another factor influencing the disparities, as the study conducted in Georgia took place 20 years after displacement, while the current study was conducted within 3 years of forced displacement. Consequently, the increased duration of displacement in the Georgia study may have contributed to a reduced prevalence due to recall bias and gradual symptom remission.²⁷

Associated factors of post-traumatic stress disorder

According to the findings of the multivariate analysis, several factors were significantly associated with the development of PTSD. Being female was strongly correlated with an increased likelihood of developing PTSD, as females were 2.5 times more likely to develop PTSD compared to males. This finding aligns with systematic reviews conducted in Turkey,²² Sub-Saharan Africa,³² North-east Ethiopia,³¹ and a study conducted in Southern Ethiopia,⁶ suggesting that females may have a higher susceptibility to developing PTSD due to a lower threshold for exposure to psycho-trauma compared to males.⁶ Biological influences, such as hormonal effects and differences in brain structure, and sociocultural aspects, including the prevalence of certain types of trauma and societal expectations, might play crucial roles in the development of PTSD in females.³³⁻³⁵

The destruction of personal property was also significantly associated with the development of PTSD. Participants who had experienced the destruction of personal property were 3.1 times more likely to develop PTSD compared to those who had not

experienced such loss. This may be attributed to the perception that these losses are difficult to replace, leading to heightened psychological distress. Additionally, persistent psychological distress following traumatic events, such as property damage, can increase the risk of developing PTSD. This finding is consistent with studies conducted in Nigeria¹⁸ and Debre-Berhan Ethiopia.²⁵ The loss of property, traumatic reminders, distressing memories, financial consequences, feelings of victimization, and the association of property destruction might contribute to PTSD.^{36,37}

Deprivation of essential goods and services was another significant factor associated with PTSD. Among the respondents, 66.8% reported experiencing a lack of food or water. Participants who had experienced this deprivation were 2.2 times more likely to develop PTSD compared to those who had not experienced it. The lack of basic needs, such as food and water, can contribute to increased stress levels, potentially exacerbating the development of PTSD. This finding is in line with results from studies conducted in Turkey²² and Uganda.²⁴ Deprivation of essential goods and services induces chronic stress and triggers the body's stress response system. Prolonged exposure to stress hormones can result in neurobiological changes in the brain, impacting emotional regulation and memory, thus increasing the risk of developing PTSD.^{38,39}

Torture or beatings were also strongly associated with the development of PTSD. Participants who had faced torture or beatings were 1.8 times more likely to develop PTSD compared to those who had not experienced such trauma. The presence of scars and physical reminders of the traumatic event may contribute to reliving the experience, and unresolved issues may continue to affect the individual, leading to the development of PTSD. This finding is consistent with a study conducted in Syria.²³

Neurological sequelae of torture can be devastating physically and psychologically. Victims of torture can be left with painful and permanent disabilities, such as chronic pain syndromes and organic brain syndrome.⁴⁰ The neurobiological and physiological responses to torture or beatings disrupt the normal functioning of the brain and stress response systems, contributing to the development and persistence of PTSD symptoms.^{41,42}

Limitations of the study

The study's cross-sectional design provides only a snapshot of participants' experiences, precluding the exploration of causal relationships. Additionally, it is crucial to acknowledge that the study excluded internally displaced persons (IDPs) not officially registered, including those hosted by relatives.

Conclusion and recommendation

The study's findings underscore a notable prevalence of post-traumatic stress disorder (PTSD) symptoms among internally displaced persons (IDPs). Factors such as female gender, property destruction, deprivation of essential goods and services, and

encounters with torture or beatings were identified as substantial contributors to PTSD development. In light of these findings, the following recommendations are proposed:

Resettlement policies should prioritize the overall well-being of IDPs by integrating comprehensive mental health and psychosocial support programs. These initiatives should focus on enhancing coping mechanisms and resilience, with a particular emphasis on addressing the unique needs of IDPs, especially females, grappling with PTSD.

To effectively address the mental health needs of IDPs, the Somali Regional Health Bureau should play a proactive role. This entails on-site screening conducted by trained health professionals, enabling early identification of individuals manifesting PTSD symptoms for timely intervention.

It is strongly recommended to establish a well-structured referral system for mental health issues. This system would facilitate access to appropriate and specialized care for IDPs, ensuring that individuals in need receive timely and targeted interventions to address their mental health challenges.

Appendix

Abbreviations

IDMC	Internal displacement monitoring centre
IDP	Internally displaced people
PTSD	Post-traumatic stress disorder
DSM-5	Diagnostic and statistical manual of mental disorders, fifth edition
PCL	Posttraumatic checklist
IOM	International organization for migration.

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Author contributions

AMM is substantially contributed to the conception, design, acquisition, and interpretation of data. MKJ and AMA were actively involved in the analysis, interpretation of data and provided valuable comments. SYA were involved in the analysis, interpretation of data and prepared the manuscript for publication. AMM acting as the guarantor, took responsibility for the overall content. All authors read and approved the final manuscript.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Ethical statement

Informed consent

Ethical clearance for this study was obtained through a comprehensive review by the Ethical Review Board of the College of Medicine and Health Science, School of Graduate Studies, following established ethical guidelines and principles. Before participating, all individuals provided informed consent, both in written and verbal forms, following a comprehensive explanation of the research's objectives and procedures. Local NGO representatives played a crucial role in supervising the consent process for individuals who unable to read and write. Their presence guaranteed the fair and ethical execution of the procedure, as approved by the Research Ethics Board mentioned earlier. It was stressed that participation in the study was entirely voluntary, and participants were informed of their right to withdraw or decline participation at any stage without any external pressures. To protect confidentiality, numerical codes were utilized instead of names on the questionnaires, preserving the anonymity and privacy of the participants' responses. Participants identified with PTSD during the study were referred to Sheik Hassen Yabare Comprehensive Specialized Hospital, in collaboration with the Somali Regional Health Office, to ensure they received further assessment and appropriate care. The study strictly adhered to the ethical principles outlined in the Declaration of Helsinki.

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Data Availability Statement

All data generated or analyzed during this study are included in this published article.

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