

Association of Conflict-Affected Environment on Ethiopian Students' Mental Health and Its Correlates During COVID-19 Era

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Background: Ethiopia has seen the largest number of conflict-induced displacement. Mental disturbance has been identified as a major public health concern among conflict-affected people, including students. Due to the effect of continuous unfold of the COVID-19 epidemic in the conflicted affected setting, the mental health problem tends to be increased. This creates a double burden for students from conflict affected setting after school re-opening. As a result, the goal of this research was to evaluate the mental health impact and its correlates in students from conflict affected setting, Ethiopia.

Objective: To assess the association of conflict-affected environment on Ethiopian students' mental health and its correlates during COVID-19 era.

Methods: From April 1 to 30, 2021, an institutional-based cross-sectional survey was undertaken. A total sample of 795 students were participated through a systematic random sampling technique. The Kessler Psychological Distress Scale was used to assess mental distress (K10). The correlation between outcome and explanatory variables was investigated using bivariate and multivariate logistic regression analyses.

Results: A total of 795 people were examined, with a 100% response rate. Mental distress was reported about 59.4% with a 95% CI of 57% to 62.9%. Conflicted related sexual abuse (AOR = 4.1, 95% CI 2.37 to 6.94), witnessed shooting (AOR = 3.49, 95% CI 2.7 to 5.89), threat to security and safety (AOR = 2.23, 95% CI 1.29 to 3.87), being female (AOR = 3.01, 95% CI 1.61 to 5.44), and poor academic performance (AOR = 2.1, 95% CI 1.08 to 4.08) were found to be substantially correlated.

Conclusion: Students from conflict-affected areas are at high risk of mental distress. Therefore, the ministry of health, ministry of education of Ethiopia and humanitarian organizations should work collaboratively in providing consistent school-based psychosocial support and appropriate intervention for students.

Keywords: mental health, conflict affected setting, COVID 19, student, Ethiopia

Introduction

According to World Health Organization data dating from 2019, in conflict zones "one in five people live with some form of mental disorder, ranging from mild depression or anxiety to psychosis." In addition, "nearly one in ten people live with a moderate or severe mental disorder."¹

In 2021, nearly 50 million people were displaced worldwide because of conflict and violence but still living in their home country. Ethiopia has seen the highest number of internal displacements. According to the National Disaster and Risk

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Management of Ethiopia and IDMC, a reported more than 3 million people were internally displaced due to conflict in 2021.²

On March 13, 2020, the first case of COVID-19 in Ethiopia was verified. The Ethiopian Prime Minister's Office declared on March 16, 2020 that schools, sporting events, and public gatherings will be halted for 15 days until further notice. However, due to a heightened break-out of the virus, Ethiopia issued a state of emergency for the next five months on April 10, 2020. This has accelerated the closure of schools across the country. The Ethiopian Ministry of Health (MoH) reported 236,554 coronavirus (COVID-19) cases and 3285 deaths in Ethiopia as of April 15, 2021.³

The Ethiopian Ministry of Education has attempted to establish techniques to resume courses at home in order to avoid the disruption of learning.³ Despite this, a study in Ethiopia revealed a poorly prepared educational system, focusing on the effects of the new coronavirus on educational provision and government initiatives to alleviate difficulties, hurdles, challenges, and opportunities to adapt to contemporary reality.⁴

Despite the fact that there was limited research among students from conflict-affected areas during COVID-19 in Ethiopia, various studies on the influence of the pandemic on students' mental and psychological well-being were conducted, particularly at the college and university level. For example, the psychological impact of COVID-19 was 16.2% among college students,⁵ and the prevalence of depression, anxiety, and stress was 21.2%, 27.7%, and 32.5%, respectively, in Bench Sheko zone.⁶ Another study found that 22.2%, 39.6%, and 40.2% of graduating class students had stress, anxiety, or depression, respectively.⁷ In a similar study, depression was reported to be 46.3%, anxiety 52%, and stress 28.6% prevalent, respectively.⁸ The overall prevalence of depression, anxiety and stress was 51%, 51.6% and 11.1% recorded among Addis Ababa University students correspondingly.⁹

Circumstances that are or have been affected by significant disruptive conflict are referred to as conflict-affected situations (s). People in unstable and conflict-affected governments are more than three times as likely as those in other developing countries to be unable to send their children to school, according to the 2011 World Bank Development Report. Access to and completion of a primary education can be hampered in a variety of ways in unstable and conflict-affected contexts.¹⁰ 1.5 billion people live in places impacted by fragility,

conflict, or large-scale, organized criminal violence.¹¹ According to the Global Monitoring Report from that year, about 28 million primary school-aged children in conflict-affected countries were out of school. This accounts for around 42% of all out-of school children in the world.¹²

In armed conflict, primary school students face both direct and indirect impacts of violence, including as unlawful recruitment into armed forces, killings, gender-based violence, trafficking, and illegal detentions, as well as separation from families.¹³ Schoolchildren who have been exposed to conflict have higher rates of post-traumatic stress disorder, depression, and anxiety than those who have not been exposed to conflict.¹⁴ These effects are thought to be the result of both direct and indirect exposure to traumatic events, as well as elevated levels of daily stressors.¹⁵ However, mental health interventions for conflict-affected students are few, with treatment inequalities between primary school students and adults in low-resource contexts being considerably worse.¹⁶

People (including students) who have been displaced have been exposed to many types of trauma, violence, injuries, and economic crises, rendering them more susceptible to psychological problems.^{17–19} Due to the effect of continuous unfold of the COVID-19 epidemic; the above problem tends to be increased. Hence, lack of family's social and economic support appears to influence academic performance of the students.^{20–24} This in turn exerts negative impact on mental wellbeing of students after school re-opening and school drop out more likely increased. Despite this, there are no reports on the epidemic's and conflict setting impact on students' mental wellbeing after school re-opening.

Mental distress has been identified as a major public health concern for conflict-affected populations, particularly students, and has been linked to poverty, unemployment, communal violence, unsecured living conditions, and changes in social networks. As a result, emotional discomfort is strongly linked to a lower quality of life, even after the hostility has ended and the crisis has passed.^{25,26} Furthermore, mental trauma can affect anyone, even students, and can have a negative impact on job performance, sleep quality, daily activities, and productivity.⁸ The students' ability to deal with the pandemic and to effectively and appropriately regulate their emotions and behavior during the pandemic could have

a big impact on their long-term academic, social and mental health outcomes.²⁷

In post-conflict and conflict-ridden societies (including students), the prevalence rate appears to be substantially greater than the overall population.²⁸ In a variety of general population studies, statistical estimates showed that mental distress is between 1% and 5%,^{29,30} and between 3% and 58% for high-risk populations, such as displaced individuals.^{31,32} Even though Ethiopia is one of the most highly conflict affected countries, there are no reports regarding the mental health of students from conflict affected setting after school re-opening, for instance mental distress reported within a range of 11–74% according to studies from different countries.^{9,33–36} The result among students in conflicted affected setting during the era of COVID-19 expected to be raised. There is no specific published study in Ethiopia, according to the investigators' knowledge. As a result, the aim of this research was to close that gap by generating new knowledge regarding the mental health of students from conflict-affected settings in Ethiopia after school re-opening.

Methods

Study Design, Period, and Setting

From April 1 to April 30, 2021, an institutional-based cross-sectional survey was undertaken. During the re-opening of schools in south Ethiopia, the survey was done among students from conflict-affected areas. The study was done in two schools (2456 students were in Gedeo and 2035 students were in West Guji) located around conflict affected setting with a total of 5766 students.

Study Participants and Sampling Procedure

The respondents were chosen to use a systematic random selection procedure. Because the students were in different grade levels, proportional allocation to the number of students in each school was used to ensure that the sample was representative. The registrar provided a list of students, and participants were chosen via systematic random sampling. All level students in the conflict-affected region of south Ethiopia, located on the boundary of the Gedeo and West Guji zones, as well as those who were available during the data collection period, were included in the study. During the study period, students who were seriously unwell were excluded.

Sample Size Determination

The sample size was estimated using the single population proportion technique, with a 3% margin of error (d), a 95% confidence range of certainty ($\alpha = 0.05$), and a 10% non-response rate, assuming $p = 21.6\%$ from a study done among Adama students in Ethiopia.³⁶ A sample size of 795 was determined to be representative.

Study Variables

The dependent variable in this study was mental distress. Independent variables included socio-demographic factors (age, sex, field of study, score less than expected, residency, living with), conflicted and trauma-related factors, clinical-related factors (history of mental illness, family history of mental illness, pre-existing medical illness), and COVID-related factors (suspected/confirmed for COVID-19, knowledge about COVID-19), and social support.

Data Collection Procedure

The data was collected by six BSC nurses and routinely overseen by three psychiatry professionals by using pre-tested questionnaires. To ensure uniformity, the questionnaire was translated into Amharic and then returned to English. Data collectors were instructed on how to conduct interviews with respondents and explain any ambiguous questions as well as the study's purpose. They were also trained on ethical standards and how to obtain respondents' informed consent for participation.

Instruments

The Kessler Psychological Distress Scale (K10) was used to assess mental distress.³⁷ The K10 scale is a simple way to assess psychological distress; it consists of ten questions about emotional states, each with a five-level response scale. The K10 scale is a 10-item questionnaire that asks a person to rate their anxious and depression symptoms over the last 30 days on a 5-point Likert scale. Respondents with a score of 20 or lower were considered normal in this study, while those with a score of 20 or higher were regarded to be in emotional distress.³⁸ At a cut-off point of 6/7, it was verified with a consistency of 0.93, a sensitivity of 84.2%, and a specificity of 77.8%. As a result, it was reasonable.³⁹

Social support is measured using the Oslo-3 social support scale, which ranges from 3 to 14. Those who score 3 to 8 are considered to have poor social support, those who score 9–11 are considered to have moderate

social support, and those who score 12 to 14 are considered to have strong social support.⁴⁰ Low achievement in this study indicates for students those scores were less than the minimum requirements during this study. Yes/no response questionnaires were used to collect data on socio-demographics, substance use history, clinical factors, COVID-19 related factors, and conflict and trauma-related events, which were operationalized according to various literatures.

Statistical Analysis

Epidata version 4.2 was used to clean, code, and input data, which was then exported to SPSS V.24 for analysis using descriptive methods, and the data was summarized using tables and figures. Using logistic regression analysis, associations between mental distress and related covariates were discovered. In bivariable logistic regression, variables with a P value of less than two were included in the multivariable logistic regression model. A P value of less than 0.05 was considered statistically significant, and the strength of associations was determined using an adjusted odds ratio (AOR) with a 95% confidence interval (CI).

Results

Socio-Demographic Characteristics of the Respondents

A total of 795 participants took part in the study, with a 100% response rate. Males made up the majority of the 412 responders (51.8%). The respondents' average age was 21.98 (± 2.22) years. The majority of respondents (517% or 65.1%) were from urban areas, and 354 (44.5%) had low school achievement (Table 1).

COVID Related, Clinical, Psychosocial and Behavioral Factors of Respondents

Regarding the COVID-19-related factors, 93 (11.5%) of respondents had a history of suspected/confirmed for COVID-19. Out of the total respondents, 17 (2.1%) had experienced loss of family and most of the respondents 598 (75.2%) had adequate knowledge about COVID-19. With regard to clinical characteristics, 122 (15.3%) of the respondents had ever been treated for mental illness, and 168 (21.1%) had a history of pre-existing medical illness. Of the total study participants, 150 (18.9%) were current khat user. With respect to psychosocial characteristics of respondents, more than one third of respondents 306 (38.5%) had poor social support (Table 2).

Conflict and Trauma Related Factors

Out of the total participants, 461 (58%) of participants were reported fear of security and safety and 358 (45%) witnessed shooting of people around them. However, more than one third (68%) of participants family's house were destroyed during conflict (Figure 1).

Prevalence of Mental Health

The prevalence of mental distress among students from conflict affected setting was determined to be 59.4% in this study, with a 95% confidence interval of (57–62.9%).

Independent Variables Related to Mental Health

Conflicted linked sexual abuse, witnessed shooting, threat to security and safety, being female, and having low school performance were all substantially correlated with mental distress among respondents in multivariate logistic regression, with a P value of 0.05.

When compared to their counterparts, those who had suffered conflict-related sexual abuse were 4.1 times more likely to suffer from mental distress (AOR = 4.1, 95% CI 2.37 to 6.94). When compared to their counterparts, those who watched persons being shot during a conflict or war were 3.49 times more likely to acquire mental distress (AOR = 4.1, 95% CI 2.37 to 6.94). When compared to those who had no fear of security and safety in the school environment, those who had felt fear of security and safety were 2.23 times more likely to suffer mental distress (AOR = 2.23, 95% CI 1.29 to 3.87). The risk of developing mental distress was two times higher in participants with poor school achievement (AOR = 2.1, 95% CI 1.08 to 4.08). Females were 3.01 times more likely than males to experience mental distress (AOR = 3.01, 95% CI 1.61 to 5.44) (Table 3).

Discussion

The prevalence of mental distress was found to be 57.4% (95% CI 57 to 62.9) among Ethiopian students from conflict-affected areas, according to the findings of this study. This study's prevalence matches that of research conducted in Saudi Arabia (58.1%),⁸ Pakistan 57.6%.⁴¹ On the other hand, the current study's findings were lower than those of a Pakistani study, which came in at 68.4%.⁴² The gap could be due to a methodological variation in how an online cross-sectional survey was carried out in Pakistan; the results could be more skewed and subjective

Table 1 Distribution of Socio-Demographic Factors Among Students from Conflict Affected Setting in South Ethiopia, 2021 (n = 795)

| Variables | Frequency (n) | Percent (%) |
|-----------------------------------|---------------|-------------|
| Age | | |
| 15–19 years old | 403 | 50.6 |
| 20–24 years old | 238 | 29.9 |
| ≥25 years old | 154 | 19.3 |
| Sex | | |
| Male | 412 | 51.8 |
| Female | 383 | 48.2 |
| Religion | | |
| Orthodox | 117 | 14.7 |
| Protestant | 588 | 73.9 |
| Catholic | 74 | 9.3 |
| Muslim | 11 | 1.4 |
| Other* | 5 | 0.6 |
| Class level | | |
| 7th grade | 272 | 34.2 |
| 8th grade | 238 | 29.9 |
| 9th grade | 243 | 30.5 |
| 10th grade | 41 | 5.2 |
| Perform less than expected result | | |
| Yes | 354 | 44.5 |
| No | 441 | 55.4 |
| Residency | | |
| Urban | 517 | 65.1 |
| Rural | 278 | 34.9 |
| Living with | | |
| Alone | 55 | 6.9 |
| Parents | 534 | 67.1 |
| Relatives | 206 | 25.9 |
| Financial shortage | | |
| Yes | 496 | 62.4 |
| No | 299 | 37.6 |

Note: *Others: only Jesus, Jehovah witness.

than the face-to-face interview employed in this study. Another cause could be socioeconomic, cultural, or environmental differences.

However, the current study's prevalence was higher than previous research done in Canada 39.5%,^{33,43} Malaysia 30.7%,⁴² China 27%,⁴⁴ Croatia 19.4%,⁴⁵ Ethiopia 21.2%,⁶ Ethiopia among Addis Ababa students reported 51.3%,⁸ Gondar 46.3%,⁴⁶ European students 47%⁴⁷ and Pakistan 48%.⁴⁸ The difference could be a possible explanation for the observed differences in

Table 2 Characteristics of COVID Related, Psychosocial, Clinical and Behavioral Factors of Participants Among Students from Conflict Affected Setting in South Ethiopia, 2021 (n = 795)

| Variables | Frequency (n) | Percent (%) |
|---|---------------|-------------|
| Being suspected/confirmed for COVID 19 | | |
| Yes | 93 | 11.7 |
| No | 702 | 88.3 |
| Spent most of time reading about COVID-19 | | |
| Yes | 128 | 16.1 |
| No | 667 | 83.9 |
| Pre-existing mental problem | | |
| Yes | 122 | 15.3 |
| No | 673 | 84.7 |
| Family history of mental illness | | |
| Yes | 92 | 11.6 |
| No | 703 | 88.4 |
| Pre-existing medical condition | | |
| Yes | 168 | 21.1 |
| No | 627 | 78.9 |
| COVID death in the family/relatives | | |
| Yes | 17 | 2.1 |
| No | 778 | 97.9 |
| Knowledge of COVID-19 | | |
| Adequate | 598 | 75.2 |
| Inadequate | 197 | 24.8 |
| Had training about COVID-19 | | |
| Yes | 205 | 25.8 |
| No | 590 | 74.2 |
| Social support | | |
| Poor | 306 | 38.5 |
| Moderate | 352 | 44.3 |
| Strong | 137 | 17.2 |
| Current use of alcohol | | |
| Yes | 39 | 4.9 |
| No | 756 | 95.1 |
| Current use of chat | | |
| Yes | 150 | 18.9 |
| No | 645 | 81.1 |
| Current use of tobacco | | |
| Yes | 21 | 2.6 |
| No | 774 | 97.4 |

tool, socio-economic, environmental and study design (for instance, an 8 wave longitudinal study was used in

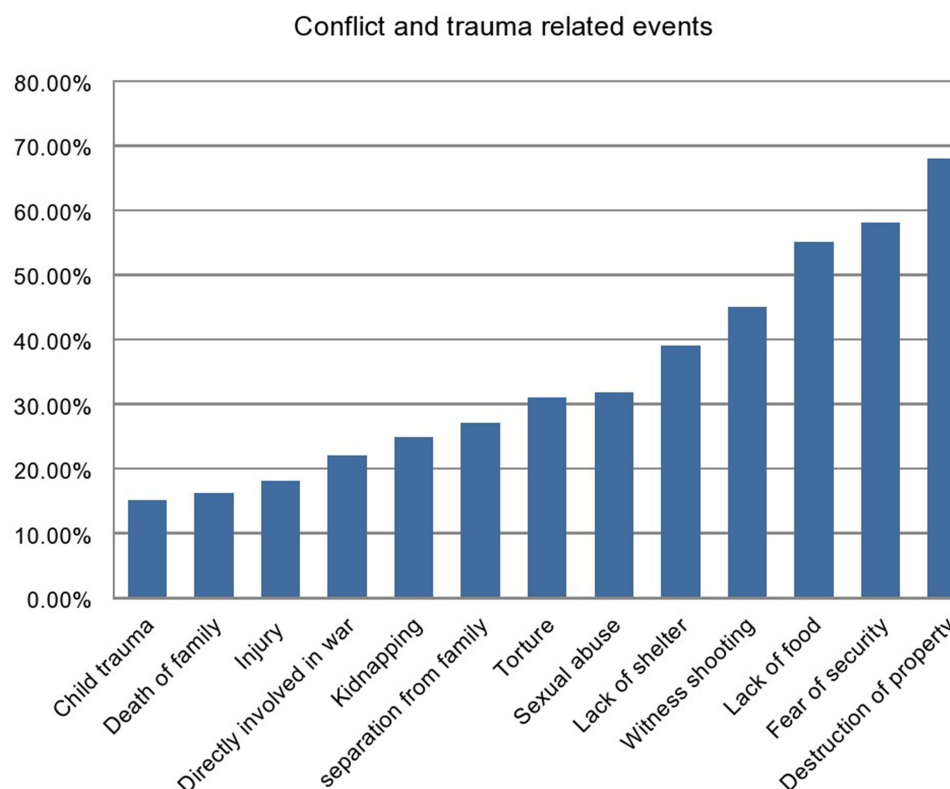


Figure 1 Conflict and trauma-related events among students from conflict affected setting in south Ethiopia, 2021 (n = 795).

Croatia, whereas in this study cross-sectional study was used). This study was conducted among students from conflict-affected settings during the era of COVID-19, but the above studies did not include specific students from conflict affected settings. The level of knowledge and perception about COVID-19, stress coping abilities of students, course load, educational delivery system and might be different among students from each country.

When compared to their counterparts, those who had conflict-related sexual abuse were 4.1 times more likely to experience mental distress. The explanation for this could be that sexual violence in conflict is not limited to rape, and conflict-related sexual violence does not end with the end of the conflict. In conflict settings, rates of intimate partner violence are considerably higher, in addition to the rate of wartime rape and sexual violence done by those outside the house.⁴⁹ Sexual and other forms of gender-based violence can have a variety of negative repercussions for survivors, including social implications and poor health.⁵⁰ In survivors of sexual and gender-based violence in areas of armed conflict, a study indicated a significant prevalence of psychological distress and other mental

problems. Anxiety disorders (including Posttraumatic Stress Disorder (PTSD), major depressive disorder, medically unexplained problems, substance use disorders, and suicidal ideation are among the mental disorders reported.⁵¹

Survivors who witnessed shootings of individuals around them were 3.49 times more likely to experience mental distress than those who did not witness shootings of people during the conflict/war. When exposed to or witnessing a terrifying situation, people, like other creatures, become apprehensive or afraid. The level of anxiety or distress varies. Survivors of the shooting may want to avoid the area where the incident occurred, as well as any surrounding contexts, such as grocery stores, if the shooting occurred in one. A survivor may develop post-traumatic stress disorder in a worst-case situation. The consequences can be terrible when students are involved in trauma, such as in a mass shooting. Survivors of mass shootings are at risk of developing PTSD at a rate of up to 36%. Depression, another devastating psychiatric disorder, affects up to 80% of patients with PTSD. Survivors of mass shootings may also develop survivor's guilt, which is

Table 3 Bi-Variable and Multivariable Logistic Regression Analysis Showing an Association Between Factors and Mental Distress Among Students from Conflict Affected Setting in South Ethiopia, 2021 (n = 795)

| Explanatory Variables | Mental Distress | | COR, (95% CI) | AOR (95% CI) |
|--------------------------------|-----------------|-----|-------------------|----------------------|
| | Yes | No | | |
| Sex | | | | |
| Male | 185 | 227 | 1 | 1 |
| Female | 275 | 108 | 3.12 [1.84, 4.37] | 3.01 [1.61, 5.44]*** |
| Age | | | | |
| 15–19 | 318 | 85 | 3.55 [1.32, 3.99] | 2.9 [0.17, 3.4] |
| 20–24 | 166 | 72 | 2.1 [2.18, 4.33] | 1.9 [0.89, 3.1] |
| ≥25 | 79 | 75 | 1 | 1 |
| Residency | | | | |
| Urban | 329 | 185 | 1.58 [1.18, 2.14] | 1.41 [0.56, 3.04] |
| Rural | 147 | 131 | 1 | 1 |
| Social support | | | | |
| Poor | 102 | 204 | 4.1 [2.49, 6.29] | 3.33 [0.95, 5.70] |
| Moderate | 56 | 296 | 1.54 [0.87, 2.50] | 1.34 [0.76, 2.38] |
| Strong | 15 | 122 | 1 | 1 |
| Pre-existing medical condition | | | | |
| Yes | 111 | 57 | 1.45 [0.95, 2.25] | 1.26 [0.76, 2.08] |
| No | 359 | 268 | 1 | 1 |
| School performance | | | | |
| Poor | 242 | 112 | 2.44 [1.92, 3.44] | 2.1 [1.65, 3.67]*** |
| Good | 207 | 234 | 1 | 1 |
| Conflict related sexual abuse | | | | |
| Yes | 74 | 99 | 3.26 [2.05, 5.04] | 4.06 [2.37, 6.94] ** |
| No | 116 | 506 | 1 | 1 |
| Knowledge of COVID-19 | | | | |
| Adequate | 122 | 476 | 0.68 [0.55, 2.64] | 1.1 [0.87, 2.19] |
| Inadequate | 54 | 143 | 1 | 1 |
| Threat to security and safety | | | | |
| Yes | 138 | 323 | 1.67 [1.04, 2.63] | 2.23 [1.29, 3.87] ** |
| No | 68 | 266 | 1 | 1 |
| Witnessed shooting | | | | |
| Yes | 292 | 66 | 3.69 [2.54, 5.39] | 3.49 [2.7, 5.89]*** |
| No | 238 | 199 | 1 | 1 |

Notes: **p<0.01, ***p<0.001.

the feeling that they failed others who died or who did not do enough to help them, or just guilt for surviving.^{52,53}

When it came to student achievement, those who did poorly in school were 2.1 times more likely to experience mental distress than those who did well. Early school dropout has been associated with substance addiction, depression, and externalizing challenges in studies on the impact of educational accomplishment and academic performance on mental health in the younger population,

which mostly comprises adolescents (such as students).⁵⁴ Furthermore, academic performance in students has been linked to male suicide.⁵⁵ In a recent Swedish study, poor academic performance was linked to depression in young adulthood.⁵⁶ This could put you at a high risk of developing mental illness.

Furthermore, having a danger to one's security and safety was linked to mental distress in this study. When compared to their counterparts, those who faced a danger

to their security and safety were 2.23 times more likely to experience mental distress. The explanation for this could be that military use of schools disrupts children's education and destroys school infrastructure. School attendance and educational quality may suffer as a result of fear and violence, and schools may even close. Effective teaching and learning require a safe and secure environment. A safe and secure environment is necessary for effective teaching and learning. In the context of violence and terror, school attendance and education quality may decline, and schools may even close due to the danger of attack. This has an impact on students' emotional health as well as their academic performance.^{57–59}

Being female was found to be one of the strongest predictors of mental distress. Females were three times more likely than males to experience mental distress. According to the study, girls are disproportionately harmed because they are more vulnerable to sexual violence on school grounds or are kept at home by their parents when the security situation worsens. Females' education outcomes in conflict-affected countries are often worse than boys', according to research, and girls frequently drop out after a school is occupied. Fear of sexual abuse in the school is one of the reasons.⁶⁰ Women are disproportionately disadvantaged in terms of personal safety, resource access, and human rights during times of war, and gender inequality is reinforced. If girls live in a conflict-affected country, they are nearly two and a half times more likely to be out of school, and adolescent girls are nearly 90% more likely to be out of secondary school.⁶¹ This all together worsens the mental health of students in the conflict setting.

The Study's Strengths and Limitations

This is the first research of its kind in Ethiopia, involving students from conflict-affected areas. Second, it added important variables that had previously been excluded from earlier studies. One of the study's merits was that it used an updated standardized and validated instrument to measure the outcome variable. One of the drawbacks was that only students from conflict-affected areas of south Ethiopia were included.

Conclusion

High rate of mental distress was found among students from conflict affected setting. Being female, treat for

security and safety, witnessed shooting, conflict-related sexual abuse, perform less than expected were all significant indicators of mental distress. Therefore, the ministry of health, ministry of education and humanitarian organizations should work collaboratively in providing consistent school-based psychosocial support and appropriate intervention for students.

Abbreviations

COVID, Corona Virus Disease; IDMC, Internal Displacement Monitoring Center; K10, Kessler Psychological Distress scale; PTSD, Post-Traumatic Stress Disorder.

Data Sharing Statement

Upon reasonable request, the corresponding author made the data for this study available.

Ethical Approval

The ethical review board of Dilla University's college of health science and medicine provided ethical approval number DU/225/7/111 for all data collection techniques, as well as the Helsinki Declaration. Each school director provided a formal letter of permission. Following an explanation of the study's goal, we gathered written informed consent from individuals aged 18 and up, as well as assent (parental informed consent) from those under the age of 18. All the information was kept private.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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