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Prevalence and associated factors of depression among refugees in East Africa: a systematic review and meta-analysis

Abdu Hailu Shibeshi^{1*}, Bizunesh Fantahun Kase², Abdulkерim Hassen Moloro³, Molla Getie Mehari⁴ and Abubeker Alebachew Seid³

Abstract

Introduction : Depression is a common and debilitating mental health issue among refugees in East Africa, who face numerous challenges. However, there is a lack of systematic reviews and meta-analyses that have explored the pooled prevalence and associated factors of depression among refugees in East Africa. This study aims to investigate the pooled prevalence of depression and its associated factors among refugees living in East Africa.

Methods A systematic search was conducted across several databases, including PubMed/MEDLINE, CINAHL, ScienceDirect, African Journals of Online (AJOL), and Google Scholar. The quality of the included studies was assessed using a Joanna Briggs Institute (JBI) quality appraisal tool. Statistical analysis was carried out using STATA-17 software packages, and a meta-analysis was conducted using a random-effects model. Heterogeneity among the studies was assessed using the I^2 statistic. Publication bias was evaluated using the DOI plot, Luis Furuya Kanamori (LFK) index, and Egger's test. For associated factors of depression, effect sizes (odds ratio) with 95% confidence intervals were analyzed.

Result A total of eight studies involving 6,388 participants were included in this systematic review and meta-analysis, all of which were assessed to have a low risk of bias. The pooled prevalence of depression was 50.60%, with a 95% CI (35.49%, 65.71). Regarding factors associated with depression; being female [(OR = 2.01; 95% CI (1.06, 3.82)], having poor social support [OR 5.88; 95% CI (2.53, 13.67)], and experienced eight or more traumatic events [OR = 3.31; 95% CI (1.74, 6.31)] were positively associated factors with depression.

Conclusion The pooled prevalence of depression among refugees in East Africa was found to be significantly high. Female participants, poor social support, and experienced eight or more traumatic events were factors affecting depression among refugees in East Africa. Therefore, policymakers and health personnel in East Africa should prioritize addressing the needs of female participants, individuals with poor social support, and those who have experienced eight or more traumatic events.

Keywords Depression, Refugees, East Africa

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Introduction

Depression is a common mental health disorder characterized by a persistent low mood or sadness, along with a loss of interest or pleasure in activities you once enjoyed [1]. It can also involve feelings of guilt, worthlessness, and difficulty concentrating [1]. Sleep, appetite, and energy levels are often disrupted, making it hard to complete daily tasks [2, 3]. Refugees are more susceptible to psychological distress, psychosomatic complaints, and clinical mental disorders, including depression and post-traumatic stress disorder, compared to other populations, such as individuals in stable housing, voluntary migrants, or the general population in host countries [4–7]. The global burden of depression increased from 172 million in 1990 to 25.8 million in 2017, with the highest rates in Lesotho (6.59 per 1000) and lowest in Myanmar (1.28 per 1000) [8]. Recent estimates indicate that refugees experience depression at two to four times the rate compared to the general population [9–11].

A global study estimated that 31.5% of such refugees experience depression [12]. Specifically in East Africa, research consistently shows a higher prevalence of depression among refugees compared to the general population [3, 13]. Studies report a range of 20–55%, with variations likely due to methodological differences and the specific refugee groups studied [14, 15]. Female refugees appear to be particularly vulnerable, with higher reported depression rates compared to males [16, 17], potentially due to gender-based violence and unequal access to resources. The consequences of depression among refugees are far-reaching, impacting individuals, families, and society as a whole. It can lead to a shortened lifespan, decreased quality of life, increased healthcare costs, and lower educational achievement and workplace productivity [18].

Refugees in East Africa, particularly from countries like South Sudan, the Democratic Republic of Congo (DRC), Rwanda, and others, face various stressors such as displacement, loss, violence, and uncertainty, leading to a significant mental health burden, including depression [19–21]. Depression among refugees can impede their integration into host communities, overall well-being, and productivity within society [22]. Factors contributing to depression in refugees include prolonged displacement, which increases rates due to chronic stress and uncertainty [23, 24]. Urban camps often show higher rates than rural ones, driven by limited support networks and isolation [25, 26]. Violence within camps is another major risk factor [26, 27]. Additionally, many refugee camps in East Africa face limited resources, poor sanitation, and food insecurity, exacerbating stress and psychological distress and increasing the risk of depression [28, 29].

Comprehensive data on depression among refugees in East Africa is urgently needed to address this critical public health concern. Despite its significant burden, summarizing data on the epidemiology of depression is scarce, leaving key challenges unexplored, including the interplay of pre- and post-displacement hardships, socioeconomic struggles, and cultural stigma [30]. Fear of discrimination and limited awareness further hinder help-seeking behaviors [31]. Uneven research distribution, especially in conflict-affected countries like South Sudan and Somalia, skews burden estimates and overlooks vulnerable groups such as lesbian, gay, bisexual, transgender, and intersex (LGBTQ+) individuals and female-headed households, who face unique stressors [12, 32, 33]. Additionally, inconsistencies in diagnostic tools and assessment methods complicate comparisons and meta-analyses, highlighting the need for standardized, inclusive, and region-specific research [12].

This systematic review and meta-analysis will provide robust estimates of depression prevalence among refugees, focusing on studies employing standardized research methods. It will examine the interplay of pre-displacement trauma, displacement experiences, host nation policies, and access to resources as key factors influencing mental health outcomes. In addition to identifying risk factors, the review will assess culturally relevant interventions for preventing and treating depression within this vulnerable population. Insights into refugees' coping mechanisms and resilience strategies will help design effective mental health programs. By comparing outcomes across countries with varying asylum and integration policies, the analysis aims to inform more effective resettlement strategies. Ethical considerations, such as informed consent and cultural sensitivity, will be prioritized to ensure the integrity and inclusivity of research involving vulnerable groups.

Review questions

The following review questions provide a framework for this systematic review and meta-analysis:

- i. What is the pooled prevalence of depression among refugees in East Africa?
- ii. What are the associated factors for depression among refugees in East Africa?

Materials and methods

Reporting

The results of this systematic review and meta-analysis were prepared and reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline [34]. The protocol has been

registered in the PROSPERO database with a registration number of CRD42024496728.

Study design, settings, and search strategies

We conducted a systematic review and meta-analysis to estimate the pooled prevalence of depression and identify associated factors among refugees in East Africa. A comprehensive search for relevant literature was conducted to identify published and unpublished studies. We searched electronic databases including PubMed/Medline, CINAHL, ScienceDirect, AJOL, and Google Scholar. Additionally, we searched online repository library centers for unpublished theses and dissertations. To capture potentially relevant gray literature, we reviewed the reference lists of included studies and consulted with content experts for their insights. The search strings or terms stemmed from the following keywords: depression, refugees, and East Africa. In the advanced search databases, the search strategy was built based on the above-mentioned terms using “Medical Subject Headings (MeSH)” and “Title/Abstract” by linking “AND” and “OR” Boolean operator terms, as appropriate. The details of the database search strategies are found in Supplementary File 1. The search was conducted between March 2 and April 29, 2024, and it included all papers published up to April 29, 2024.

Measurement outcome variables

This review had two outcomes: the primary outcome was to determine the pooled prevalence of depression among refugees in East Africa while the secondary outcome was to identify the factors associated with depression. Independent variables were sex (female vs. male), social support (poor social support vs. good social support), and cumulative traumatic events (≥ 8 vs. < 8).

Eligibility criteria

The study included all refugee populations without age restrictions, focusing on articles reported in English. Eligible studies comprised observational designs that reported the prevalence of depression and were conducted specifically in East Africa. Both published and unpublished studies were considered. However, studies on non-refugee populations, those not addressing the primary outcomes of interest, and articles in languages other than English were excluded. Additionally, conference proceedings, interventional studies, qualitative research, commentaries, editorial letters, case reports, case series, and monthly or annual police reports were not included in the analysis.

Search guide

The “CoCoPop search guide” framework was employed to design a systematic and comprehensive search

strategy, ensuring alignment with the study’s objectives. The framework focused on three core components: **Outcome/Condition**, which targeted depression; **Population**, encompassing all refugee populations; and **Context/Setting**, restricted to East Africa. By structuring the search strategy around these elements, the guide facilitated the identification of relevant studies, ensuring consistency and precision in capturing data specific to the epidemiology of depression among refugees in East Africa. This approach was integral to the conception and execution of the search strategies in the study.

Selection of studies

We used EndNote X9, a reference management software, to collect and organize the initial search results, manage citations, and efficiently remove duplicates. To ensure article relevance, we employed a rigorous three-step screening process. In the first two steps, both authors (AHS & AAS) independently reviewed titles and abstracts against the predefined eligibility criteria using EndNote. Titles deemed relevant then progressed to the third stage, where we reviewed the full text of the articles. Only studies approved by both authors were included for final data extraction. Any disagreements between the reviewers were resolved through discussion, and if necessary, by consulting a third reviewer (BFK). We documented the reasons for excluding studies to create a transparent and verifiable final list for data analysis.

Data extraction and management.

Two independent authors (AHS and AAS) extracted data from eligible articles using a standardized format based on the Joanna Briggs Institute (JBI) data extraction form for systematic reviews and research syntheses [35, 36]. To ensure consistency and accuracy, the authors first pilot-tested the data extraction process on a subset of articles in Microsoft Excel before proceeding with the full dataset.

Study characteristics (first author, publication year, country, study design, sample size), response rate, quality rating, depression assessment tool, and prevalence of depression were included in the data extraction form. Disagreements during extraction were actively resolved for consensus, with a third reviewer (BFK) consulted if needed, ensuring the highest accuracy and consistency in capturing all crucial information.

Quality assessment of the studies

Two independent reviewers (AHS and AAS) critically evaluated each study using the Joanna Briggs Institute (JBI) tool [37–39] checklists for analytical cross-sectional and cohort study studies. To ensure consistent quality assessment, any disagreements between the two initial reviewers were addressed by revisiting the study together.

If necessary, a third reviewer (BFK) was brought in to reach final appraisal scores.

Data processing and statistical analysis

We used Microsoft Excel to extract the necessary data from the studies. Then, we imported this data into the STATA version 17 statistical software program to analyze the combined results. Measuring heterogeneity based on statistical findings, outcome presentations, and methodologies was done using the I^2 statistic and a chi-squared test by Cochran's Q statistic with a 5% significance level [40]. I^2 values of 25%, 50%, and 75% are considered indicative of low, moderate, and high heterogeneity, respectively [41]. According to the results of the statistical test, there was significant heterogeneity among the included original studies ($I^2=99.4\%$, $p < 0.001$), hereafter, the random-effects meta-analysis model [42] was used to estimate the pooled prevalence of depression and its associated factors.

We performed subgroup analysis to address two key questions. First, we aimed to see if subgrouping the data could reduce the natural variability (random variation) seen in the original study's results (point estimates). Second, we wanted to explore how the rate of failure (fluctuates) differed between subgroups within the study population. Additionally, we employed sensitivity analysis by using the leave-one-out method to assess the influence of potential outliers on our findings. Furthermore, publication bias was assessed using the DOI plot [43], Luis Furuya Kanamori (LFK) index [44], and Egger's test. For the LFK index, a value falling outside the range of -1 to 1 was interpreted as indicating asymmetry, which suggests the presence of publication bias. For the associated factors, we reported odds ratios, their corresponding confidence intervals, and p-values to effectively demonstrate the strength and direction of the relationships between depression and its associated factors.

Results

Exploration of studies

A total of 1359 articles were identified using various electronic databases such as PubMed, Google Scholar, ScienceDirect, CINAHL, and African Journals of Online (AJOL). Of these initial articles, there were about 919 non-duplicated articles (records screened). From the remaining articles, 889 articles were excluded after a review of their titles and abstracts, and 3 additional articles were excluded after we were unable to retrieve the full reports. Then, 27 potentially full-text articles were assessed for eligibility based on the pre-set criteria and 19 articles were further excluded due to different reasons [45–63]. Ultimately, 8 articles met the eligibility criteria and were included in the final meta-analysis to determine

the prevalence and associated factors of depression (Fig. 1).

Quality of included studies

The methodological quality scores for the eight studies included in this review were assessed using the JBI quality assessment tool. Seven of these studies were cross-sectional, and one was a cohort study. Studies were considered high quality if they scored ≥ 6 for cross-sectional studies and ≥ 9 for the cohort study. The eight studies that met the specified criteria were included in the final systematic review and meta-analysis (Table 1).

Characteristics of the included studies

Seven cross-sectional studies and one cohort study were included in the final systematic review and meta-analysis and were published between 2008 and 2024. Among the included studies, four studies were conducted in Ethiopia [65–68], three in Uganda [61, 69, 70], and one in Somalia [64]. In this review and meta-analysis, a total of 6,388 participants were involved to determine the pooled prevalence of depression and associated factors with a minimum sample size of 374 [69] and a maximum of 1990 [68].

The response rates in the included primary studies ranged from 94.5% in northern Uganda [61] to 100% in Dabat town, northwest Ethiopia [67], and Kampala, Uganda [69, 70]. Regarding prevalence, the lowest prevalence (28.9%) of depression was reported in a study done in Kampala, Uganda [70], whereas the highest prevalence (81.2%) was reported in a study done in the Tigray region in Ethiopia [68] (Table 2).

Risk of bias assessment

Concerning the quality of the included studies, seven studies [61, 64–69] were assessed based on the JBI checklist for cross-sectional studies, and the remaining one study [70] was based on the JBI checklist for cohort studies. According to this quality assessment criterion, all studies included are classified as having a low risk of bias (Table 2).

Result of publication bias assessment

To assess potential publication bias, we utilized the DOI plot [43] and the Luis Furuya-Kanamori (LFK) index [44]. Egger's test results ($p=0.308$) were not statistically significant ($p > 0.05$), indicating no strong evidence of publication bias for the estimated pooled prevalence of depression. Additionally, the LFK index value (-0.25) fell within the acceptable range of -1 to 1, confirming symmetry in the DOI plot and supporting the absence of publication bias in the included studies (Fig. 2).

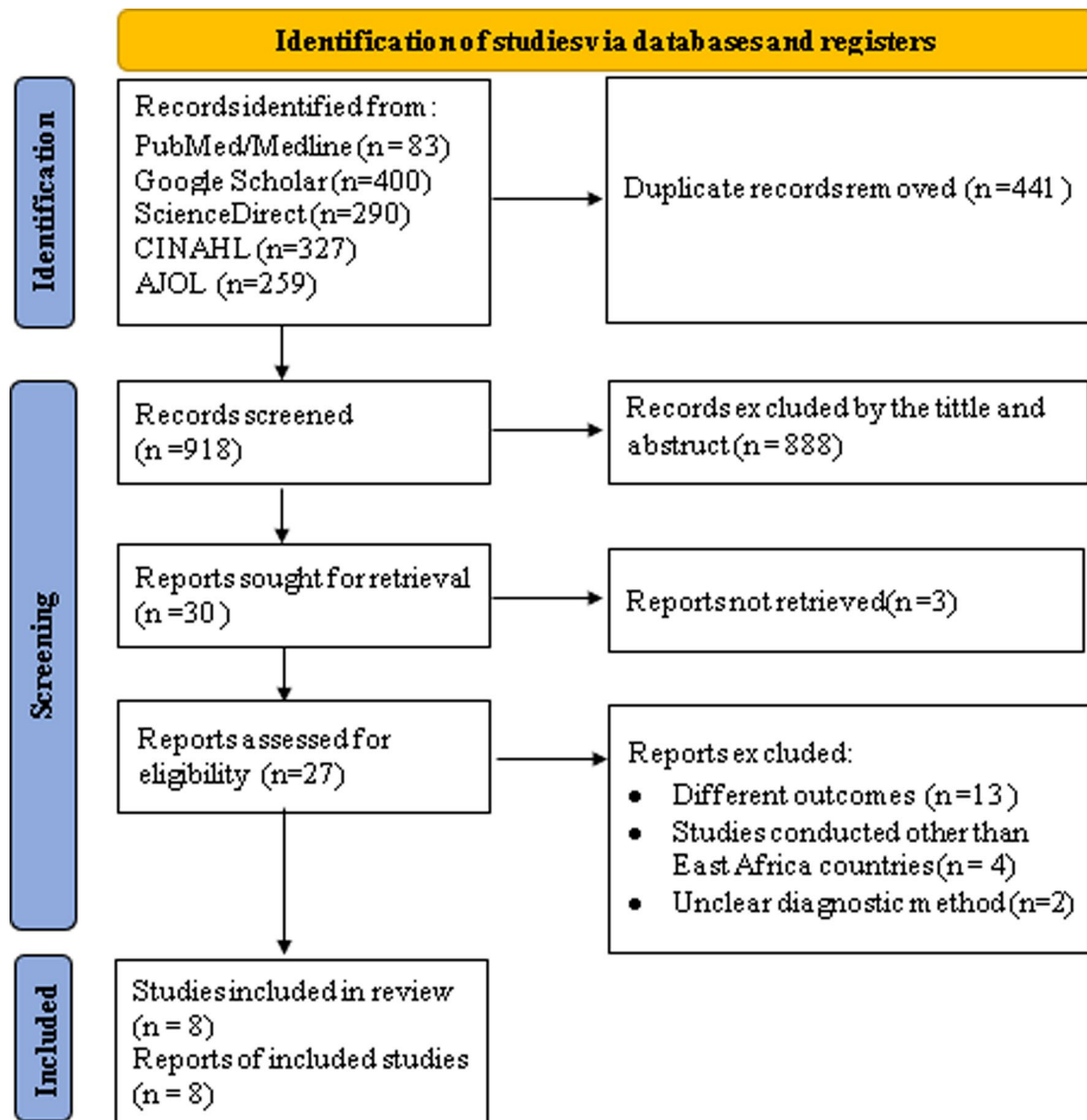


Fig. 1 PRISMA flow diagram of screened and the selection process of studies on the pooled prevalence of depression and associated factors among refugees in East Africa, 2024

Sensitivity analysis test

The result of the leave-one-out method for the evaluation of sensitivity analysis revealed that there is no significant influence of individual studies on the pooled prevalence of depression, demonstrating the robustness of the result (Fig. 3).

The result of the estimated pooled prevalence of depression among refugees in East Africa

The pooled prevalence of depression among refugees in East Africa was 50.60% (95% CI: 35.49, 65.71). Given the statistically significant heterogeneity observed between studies ($I^2 = 99.4\%$, $p < 0.001$), we applied a random-effects meta-analysis model to estimate the pooled

prevalence of depression among refugees in East Africa (Fig. 4).

Subgroup analysis

To explore potential variations, we conducted a subgroup analysis based on the countries and assessment tools used in the included studies. Regarding the pooled prevalence by country the lowest pooled prevalence of depression among refugees was reported in Uganda 47.64% (95% CI 23.46, 71.83; $I^2 = 99.1\%$, $p < 0.001$) and the highest was in Ethiopia 50.63% (95% CI 24.15, 77.11; $I^2 = 99.7\%$, $p < 0.001$). The results also indicated that there was a significant level of heterogeneity in the studies conducted in both countries. Since the study conducted in Somalia

Table 1 Joanna Briggs Institute (JBI) critical appraisal of the included studies, 2024

| Included Articles | Criterion No (items included to appraise analytical cross-sectional studies) | | | | | | | | | | | Overall quality | | |
|-------------------------|--|---|---|---|---|---|---|---|---|---|----|-----------------|------|-----------|
| | Year | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | 11 | Total (%) |
| Alli et al. [64] | 2023 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | 100 | High |
| Berhe et al. [65] | 2021 | ✓ | ✓ | ✓ | X | ✓ | ✓ | ✓ | ✓ | | | | 87.5 | High |
| Feyera et al. [66] | 2015 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | 100 | High |
| Roberts, B. et al.[61] | 2008 | X | ✓ | ✓ | ✓ | X | ✓ | ✓ | ✓ | | | | 75 | High |
| Melese et al. [67] | 2024 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | 100 | High |
| Gebreyesus et al. [68] | 2024 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | 100 | High |
| Misghinna et al. [69] | 2020 | ✓ | ✓ | ✓ | X | ✓ | ✓ | ✓ | ✓ | | | | 75 | High |
| Logie, C. H et al. [70] | 2022 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 100 | High |

✓= Yes, criterion fulfilled, X= No, criterion not fulfilled

For cross-sectional (Item 1: Were the criteria for inclusion in the sample clearly defined? Item 2: Were the study subjects and the setting described in detail? Item 3: Was the exposure measured validly and reliably? Item 4: Were objective, standard criteria used for measurement of the condition? Item 5: Were confounding factors identified? Item 6: Were strategies to deal with confounding factors stated? Item 7: Were the outcomes measured validly and reliably? Item 8: Was appropriate statistical analysis used?) and for the cohort -study we considered a JBI 11 items

County was a single study, there was no heterogeneity test (Fig. 5). Moreover, two articles were conducted with HSC-25, around four articles were conducted with PHQ-9, one article was conducted with DASS-21, and one study was conducted with a DSM-5. The pooled prevalence of depression by using HSC-25 and PHQ-9 was 63.62% with 95% CI (55.79, 71.44) and 46.58% with 95% CI (18.07, 75.08) respectively. The heterogeneity of each tool, HSC-25, and PHQ-9 was significant ($I^2=87.8$, $Q=8.18$, $df=1$, $P<0.004$), and ($I^2=99.7$, $Q=1063.43$, $df=3$, $p<0.001$) respectively. Since the study conducted by the DASS-21 and by the DSM-5 assessment tools was a single study, there was no heterogeneity test (Fig. 6).

Associated factors of depression among refugees in East Africa

In this systematic review and meta-analysis, five studies were used to identify factors associated with depression among refugees in East Africa [61, 64–67].

Association between depression and female participants

Four studies were included to reveal the association between depression and female participants [61, 65–67]. There was a significant association between female participants and depression. The finding showed that female participants were about 2 (OR=2.01, 95%, CI: 1.06, 3.82; $I^2=94.3\%$, $p=0.001$) times more likely to have depression when compared to male participants (Table 3).

Association between depression and social support

Two studies were carried out in this meta-analysis [65, 67]. The pooled odds ratio (OR) demonstrated that the odds of depression were significantly higher in participants who had poor social support than in participants who had good social support (OR=5.88, 95%, CI: 2.53, 13.67) ($I^2=82.7\%$, $p=0.016$) (Table 3).

Association between depression and cumulative traumatic events

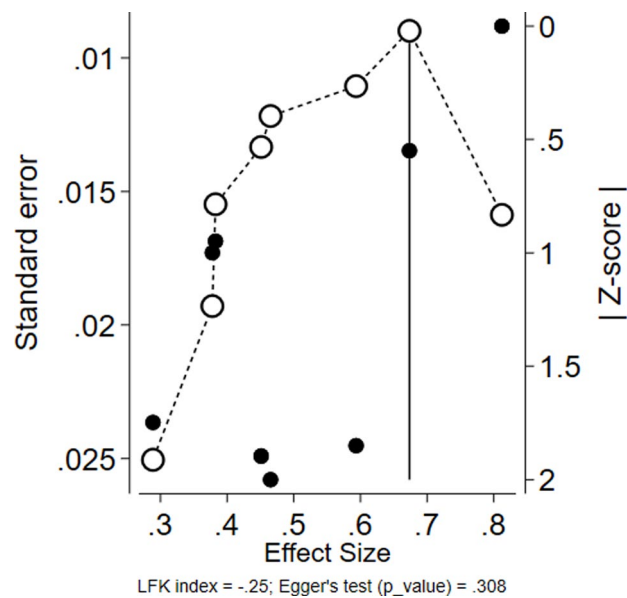
A total of three articles were included in this meta-analysis [64–66]. There was a significant association between cumulative traumatic events and depression. Participants who had experienced eight or more traumatic events were more likely to have depression (OR=3.31, 95%, CI: 1.74, 6.31; $I^2=88.6\%$, $p=0.001$) as compared to participants who had experienced less than eight traumatic events (Table 3).

The certainty of evidence for the pooled prevalence of depression is rated as low, while the certainty for associated factors is very low. This reflects the need for additional high-quality, geographically diverse studies using standardized diagnostic tools to address the observed heterogeneity and improve the precision of effect estimates. According to GRADE recommendations [71],

Table 2 Summary of the characteristics of eight studies included in the systemic review and meta-analysis on prevalence and associated factors of depression among refugees in East Africa, 2024

| Authors | Publica- tion year | Country | Refugees come from | Study design | Sample size | Response rate (%) | PoD(%) | Risk of bias | Tool |
|-------------------------|-----------------------|----------|-----------------------|--------------|----------------|----------------------|--------|-----------------|---------|
| Ali et al. [64] | 2023 | Somalia | IDPs | CS | 401 | 99.5 | 59.4 | Low | HSC-25 |
| Berhe et al. [65] | 2021 | Ethiopia | Eritrean | CS | 800 | 98.3 | 37.8 | Low | PHQ-9 |
| Feyera et al. [66] | 2015 | Ethiopia | IDPs | CS | 847 | 98.1 | 38.3 | Low | PHQ-9 |
| Roberts, B. et al.[61] | 2008 | Uganda | IDPs | CS | 1210 | 94.5 | 67 | Low | HSC-25 |
| Melese et al. [67] | 2024 | Ethiopia | Eritrean | CS | 399 | 100 | 45 | Low | DASS-21 |
| Gebreyesus et al. [68] | 2024 | Ethiopia | IDPs of Tigray | CS | 1990 | 98.7 | 81.2 | Low | PHQ-9 |
| Misghinna et al. [69] | 2020 | Uganda | IDPs | CS | 374 | 100 | 46.5 | Low | DSM-5 |
| Logie, C. H et al. [70] | 2022 | Uganda | IDPs | CoS | 367 | 100 | 28.9 | Low | PHQ-9 |

IDPs=internally displaced persons; CS=cross-sectional study; CoS=cohort study; PoD; prevalence of Depression

**Fig. 2** Assessment of publication bias of included studies using Doi plot and LFK index among refugees in East Africa, 2024

further research is very likely to improve confidence in the effect estimates and may result in substantial changes to these estimates (Supplementary File 2).

Discussion

This systematic review and meta-analysis were conducted in East African countries to estimate the pooled prevalence of depression and its associated factors among refugees. This study will contribute to the development of public health strategies aimed at preventing and treating depression in this vulnerable population by emphasizing early detection, culturally appropriate mental health interventions, and ongoing care to improve the overall well-being of refugees. The current study included eight studies with a total of 6,388 participants, to estimate the pooled prevalence of depression and associated factors among refugees in East Africa. This study only assessed articles performed in Ethiopia, Uganda, and Somalia due to limited study availability in other East African

countries. Most of the included studies were limited by cross-sectional designs, small sample sizes, and the use of the PHQ-9 tool. However, all studies were assessed as having a low risk of bias according to the JBI tool checklists, indicating high methodological quality.

In this meta-analysis, the pooled prevalence of depression among refugees in East Africa was 50.60% (95%CI:35.49, 65.71%). The current pooled prevalence of depression in East Africa was significantly higher than that reported in a systematic review and meta-analysis of adult Syrian refugees [72] (31%), in 15 countries [12] (31.5%), and in 5 countries [73] (13.81%). In addition, this finding was higher than that of a study conducted in 18 low-middle-income and high-income countries (32%) [74]. The discrepancy might be due to the severity of conflicts, East Africa has unfortunately experienced numerous protracted conflicts, some with ongoing violence. The nature and severity of these conflicts could be more impactful on mental health compared to conflicts in other regions included in the broader reviews [75]. The other possibility might be due to limited resources and support, refugees in East Africa might face greater challenges due to limited access to mental healthcare, social support systems, and basic necessities compared to refugees in other regions [76]. Furthermore, there is a possibility that the rising prevalence of depression and the predicted epidemic in developing countries may contribute to this.

Similarly, the current finding was significantly higher than the prevalence reported using fixed effect analysis in similar East African countries [3] (31%). The possible explanation for the observed variations might be due to differences in methodology. The fixed effect model assumes a single common effect size for all studies. This might underestimate the true variation in depression prevalence between countries. The random effects model acknowledges the potential for variation and provides a more conservative estimate that reflects the average effect across the included countries [77].

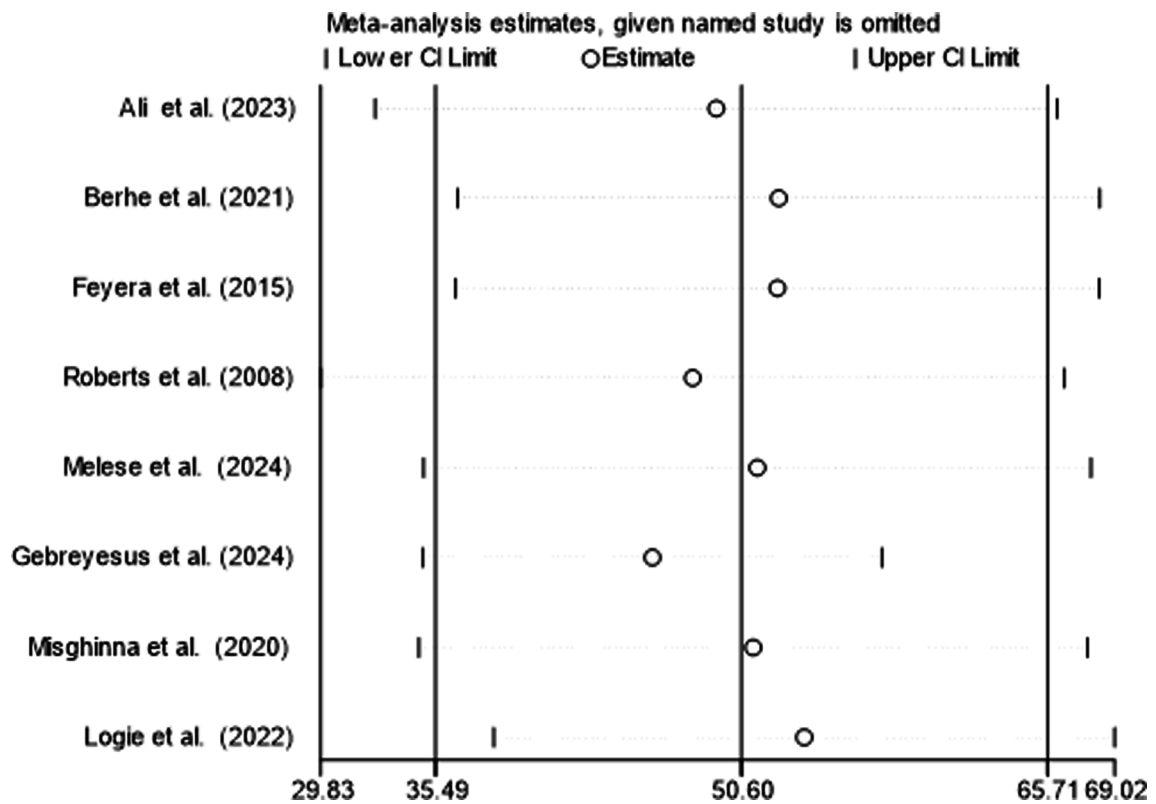


Fig. 3 Sensitivity analysis to determine a single study effect on the pooled prevalence of depression among refugees in East Africa, 2024

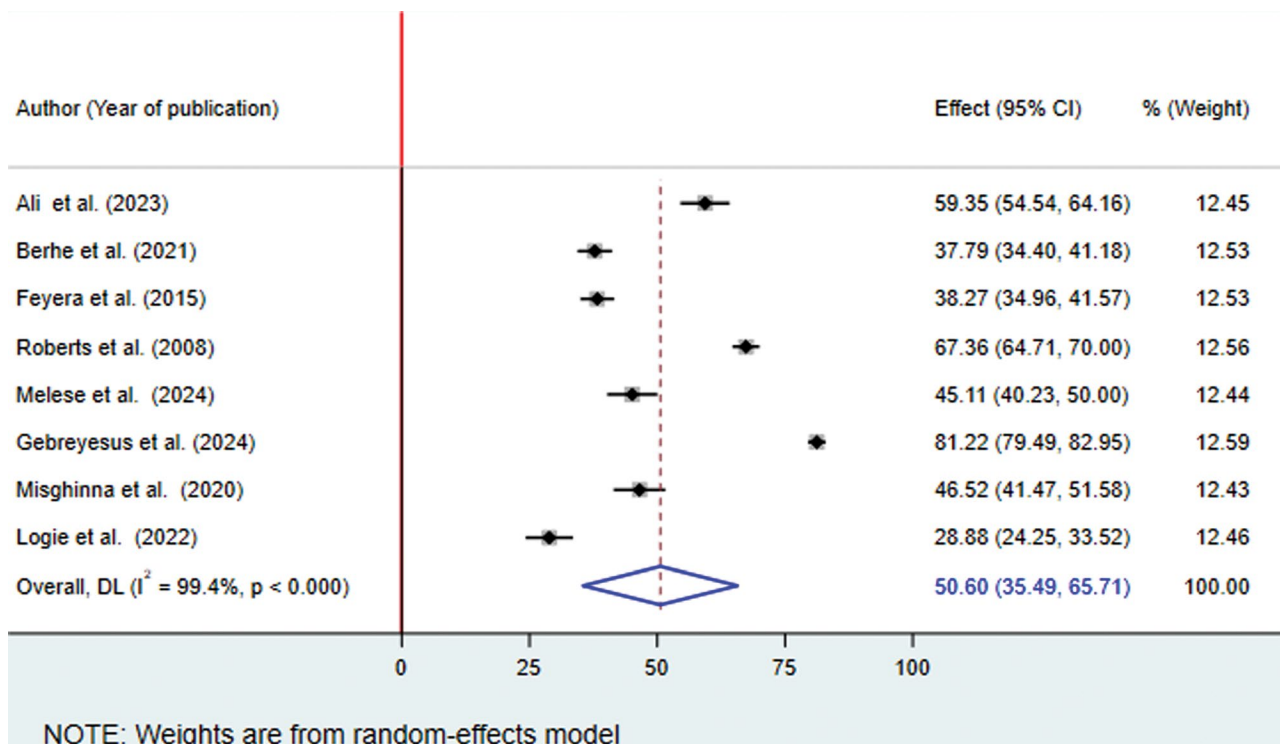


Fig. 4 Forest plot showing the pooled prevalence of depression among refugees in East Africa, 2024

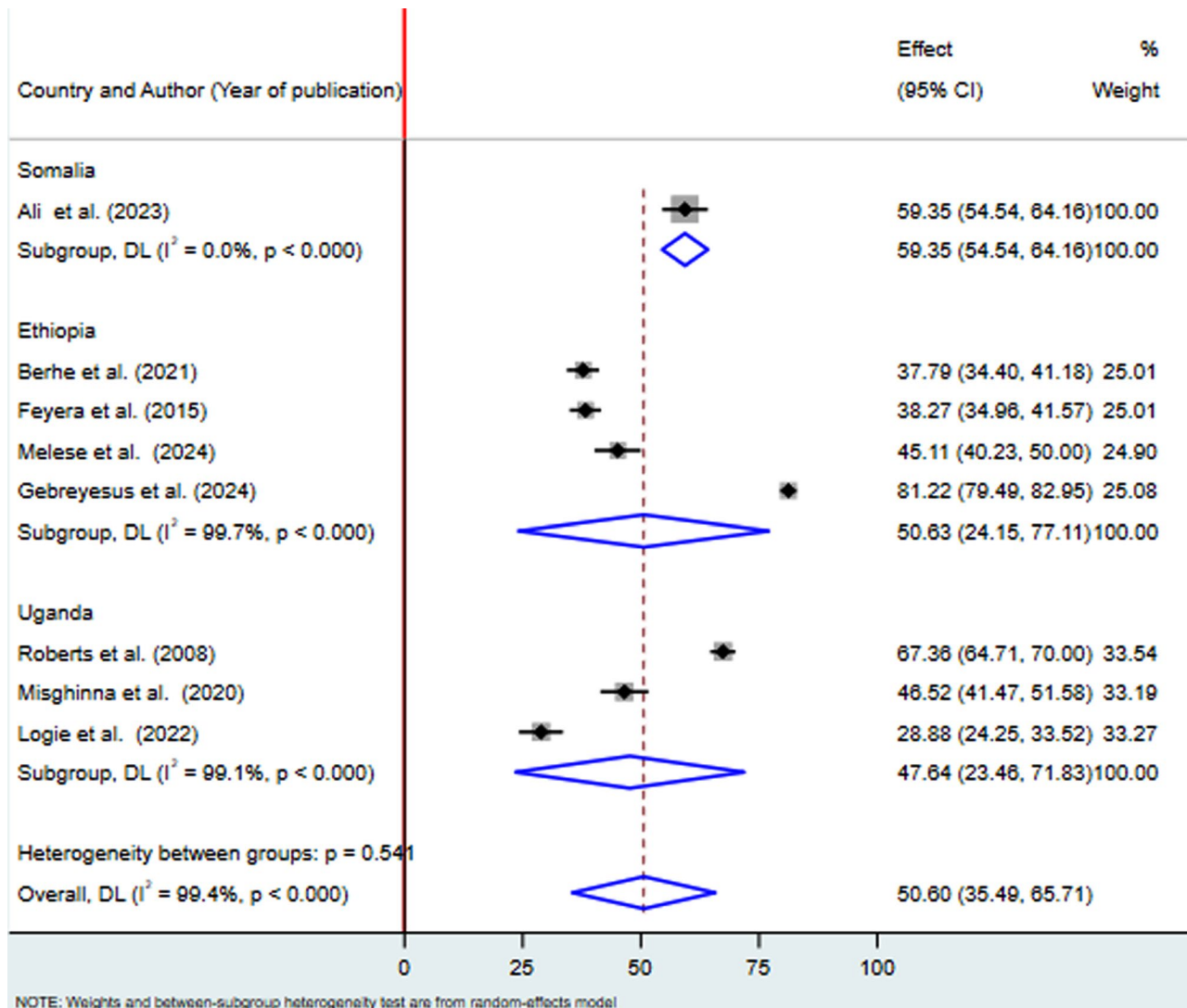


Fig. 5 Forest plot presenting subgroup analysis by country for the pooled prevalence of depression among refugees in East Africa, 2024

Significant variation (heterogeneity) in the prevalence of depression was found between the studies included in this review. To explore this variation and understand potential sources of differences, we conducted a subgroup analysis. Accordingly, the subgroup analysis of this study revealed that Uganda reported the lowest pooled prevalence of depression (47.64%) [61, 69, 70], while Ethiopia had the highest (50.63%) [65–68]. This difference might be explained by factors like the recent war in Ethiopia’s Tigray region, potentially causing greater displacement and hardship for refugees there. It is also important to consider the possibility that variations in sample sizes between studies from these countries might have influenced the observed prevalence differences.

In this review, we also investigated factors associated with depression among refugees in East Africa. Female participants, poor social support, and cumulative

traumatic events were identified as factors associated with depression among refugees in East Africa.

Female participants were two times more likely to have depression than male participants. This finding is supported by studies conducted in different nations [78], North Korea [79], Lebanon [80], Greece [81], and Kenya [82]. Potential reasons for this higher prevalence may include exposure to gender-based violence, as women in conflict zones are more vulnerable to sexual assault, domestic violence, and other forms of GBV, which are significant risk factors for depression [83]. In addition, societal expectations surrounding female behavior and emotional expression may also make it more difficult for women to seek help for mental health issues [84]. Furthermore, the limited resources and challenging living conditions in refugee camps may be more burdensome for women due to childcare and household responsibilities [85].

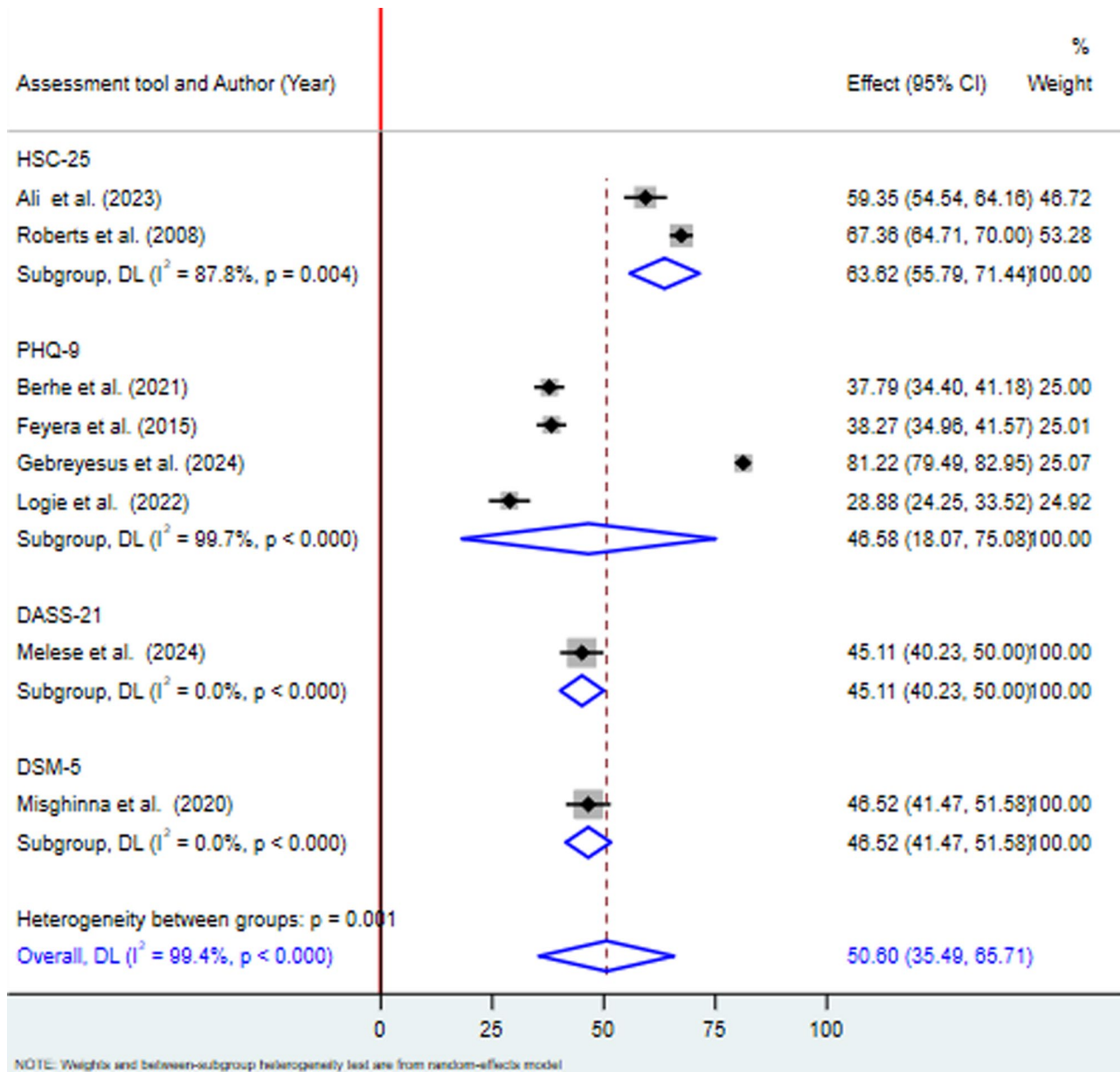


Fig. 6 Forest plot presenting subgroup analysis by assessment tool for the pooled prevalence of depression among refugees in East Africa, 2024

Participants who had poor social support were about six times more likely to have depression when compared to participants who had good social support. This finding was consistent with studies conducted in different nations [78], urban Somali refugees [86], and in Ethiopia [87]. This is the fact that poor social support can lead to feelings of isolation and loneliness, which are significant risk factors for depression [88] and refugees who lack strong social connections may have difficulty accessing emotional support and feel more alone in dealing with their struggles [76]. Cultural factors might influence how social support is expressed and perceived. For example, some cultures may have a stronger emphasis on family

support, while others may place more value on community connections [89].

Finally, participants who had experienced eight or more traumatic events were more likely to have depression as compared to participants who had experienced less than eight traumatic events. This finding is supported by studies conducted in different nations [90], South Korea [91], Germany [92], urban Somali refugees [86], Syrian refugee women [93], and in Somalia [64]. This might be because individuals experiencing eight or more traumas might have faced more severe or prolonged events, leading to a greater psychological impact and increased risk of depression [94] and repeated exposure to trauma can

Table 3 A result of factors associated with depression among refugees in East Africa, 2024

| Variables | Pooled OR (95%CI) | Number of studies included | I ² with p-values |
|------------------------------------|-------------------|----------------------------|------------------------------|
| Sex | | | |
| Male | 1.00 | | |
| Female | 2.01(1.06, 3.82) | 4 | 94.3%, p<0.001 |
| Social support | | | |
| Good | 1.00 | | |
| Poor | 5.88(2.53, 13.67) | 2 | 82.7%, p<0.016 |
| Cumulative traumatic events | | | |
| < 8 | 1.00 | | |
| ≥ 8 | 3.31(1.74, 6.31) | 3 | 88.6%, p<0.001 |

Certainty of evidence using GRADE approach

erode an individual's resilience - the ability to cope with adversity. This can leave them feeling overwhelmed and less able to bounce back from stressful events, making them more susceptible to depression [95].

Biological and neuropsychological hypotheses suggest that trauma and depression are linked through several mechanisms. Chronic trauma can dysregulate the HPA axis, leading to elevated cortisol levels, which are associated with depression. Inflammation in the brain, caused by trauma, can disrupt mood regulation and increase the risk of depressive symptoms. Additionally, trauma may result in structural changes in key brain areas, such as the hippocampus and amygdala, which affect emotional regulation. Neurotransmitter imbalances, particularly in serotonin, dopamine, and norepinephrine, also play a critical role in both trauma and depression [96].

The finding has implications for future researchers, clinicians, and policymakers; for future researchers, the high prevalence of depression highlights a need for further investigation. More research is crucial to understand the reasons behind this and develop better management strategies. These findings emphasize the importance of screening for depression among refugees, both in healthcare institutions and community settings. The study can inform policymakers in designing and implementing effective prevention and treatment programs for depression within refugee communities and healthcare systems across East Africa.

Strengths and limitations of this study

This systematic review adheres to the PRISMA guidelines and offers a comprehensive analysis of depression prevalence and associated factors among refugees in East African countries. To minimize bias and ensure quality, we searched multiple databases and employed dual reviewer screening. The review estimates pooled prevalence rates, identifies pooled associated factors, and conducts

subgroup analyses based on countries and assessment tools.

The limitations of this study include high heterogeneity among the included studies and restricted geographic coverage, with data available only from three countries (Ethiopia, Uganda, and Somalia), which may limit the generalizability of findings to other East African nations or global refugee populations. The study's focus on English-language articles may have excluded relevant research published in other languages, and the scarcity of eligible studies from other countries in the region further narrows the geographical scope. Additionally, while the exclusion of studies using alternative outcome measurement approaches ensured methodological consistency, it may have led to the omission of valuable insights. Variability in diagnostic tools, underrepresentation of key subpopulations (e.g., LGBTQ+ refugees), and imprecise estimates with wide confidence intervals due to small sample sizes further contribute to low certainty for prevalence and very low certainty for associated factors, emphasizing the need for more diverse, high-quality studies with standardized methodologies to strengthen the evidence base.

Conclusions

In this meta-analysis, the pooled prevalence of depression among refugees in East Africa was found to be significantly higher than that of host populations. The findings suggest that public health policymakers should focus on strengthening social support networks for refugees and implementing comprehensive mental health interventions, with particular attention to female refugees and those with a history of cumulative trauma. These strategies are essential for reducing depression prevalence and enhancing overall health outcomes among refugees. Therefore, regional policymakers and healthcare providers should prioritize interventions aimed at addressing the needs of female refugees, individuals with limited social support, and those who have experienced multiple traumatic events, as these factors are key contributors to mental health challenges within this population.

Abbreviations

| | |
|---------|--|
| AJOL | African Journals of Online |
| CINAHL | Cumulative Index to Nursing and Allied Health Literature |
| DASS-21 | Depression, Anxiety, and Stress Scale |
| DSM-5 | Diagnostic and Statistical Manual of Mental Disorder |
| GBV | Gender-Based Violence |
| GRADE | Grading of Recommendations, Assessment, Development, and Evaluations |
| HSC-25 | Hopkins Symptom Checklist |
| JBI | Joanna Briggs Institute |
| LGBTQ+ | Lesbian, Gay, Bisexual, Transgender and Intersex |
| LMIC | Low- and Middle-Income Countries |
| MeSH | Medical Subject Headings |
| PHQ-9 | patient health questionnaire |
| PRISMA | Preferred Reporting Items for Systematic Review and Meta-Analysis |

PTSD Post-Traumatic Stress Disorder

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12888-024-06371-1>.

Supplementary Material 1

Supplementary Material 2

Supplementary Material 3

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Author contributions

AHS, AAS and BFK were design, analysis and interpretation of data; and responsible for the drafting of the article. AHS, AAS, BFK, AHM and MGM were involved in acquisition of data, analysis and interpretation of data. All authors read and approved the final manuscript.

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Data availability

All data generated or analyzed during this study are available from the corresponding author with a reasonable request.

Declarations

Ethics approval and consent to participate

Not applicable.

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Not applicable.

Competing interests

The authors declare no competing interests.

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