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RESEARCH ARTICLE

Assessment of Substance use among adolescents residing in urban and rural areas of Gedeo *Zone*, Southern Ethiopia: A Comparative Cross-Sectional Study

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Abstract

Background: Evidence from various studies indicates that the initiation and early stages of substance use often begin in adolescence. However, less research has focused on the differences in substance use levels and determinants across distinct social contexts, particularly between urban and rural areas. This study aims to comparatively assess substance use and associated factors among adolescents in urban and rural areas of Gedeo Zone, Southern Ethiopia.

Method: A community-based comparative cross-sectional study was conducted among 2,446 adolescents. The characteristics of respondents, including substance use patterns, were compared between urban and rural adolescents. Data were collected using a structured questionnaire and analyzed with SPSS version 24. Multivariate binary logistic regression analysis was employed to identify factors associated with substance use, using a significance level of $p < 0.05$.

Results: The overall prevalence of substance use among adolescents in this study was 23.3%, with 20.1% among urban adolescents and 26.5% among rural adolescents, indicating a statistically significant difference between the two groups. Parental substance use and having peers who use substances increased the risk of substance use, while an unfavorable attitude toward substance use decreased this risk among both urban and rural adolescents. Additionally, urban adolescents with poor parental control were more likely to engage in substance use.

Conclusion: The level of substance use among adolescents in this study is moderately high. Factors such as peer and parental substance use, attitudes toward substance use, and adolescents' occupations were significantly associated with substance use.

Keywords: Adolescents, Comparative study; Gedeo Zone, Substance use

1 Introduction

Adolescence is one of life's most fascinating and complex life stages [1]. It is a period of transition from childhood to adulthood [2]. Adolescents constitute about one sixth of the world's population [3, 4].

According to WHO Expert Committee on Drug Dependence, drug use is defined as "persistent or sporadic excessive drug use inconsistent with or unrelated to acceptable medical practice" [5]. Harmful drug use among adolescents is a major concern in many countries of the world. The vast majority of people using tobacco today began doing so when they were adolescents [6].

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Adolescence is characterized by the onset of unhealthy behaviors and conditions including drinking, smoking and illicit drug use which represent major public health challenges among adolescents [7, 8]. Drug abuse has cumulative social, physical, and mental health on individuals, families, and communities at large [9].

There are factors contributing for substance abuse including socioeconomic status, quality of parenting, peer influence, and biological/inherent liability for drug addiction [10]. Substance use among adolescents is an important social and health problem in Africa and other countries in the world [11, 12]. Many factors and strategies that can help adolescents stay drug free were studied including strong positive connections with parents, other family members, school, and religion; having parents present in the home at key times of the day; and reduced access in the home to illegal substances [13].

Moreover, an adolescent's perception of the risks associated with substance use is an important determinant of whether he or she engages in substance use [16]. However, the difference in level of substance use and its determinants among distinct social contexts including urban and rural alteration were less studied. Thus the current study was planned to address this issue, particularly the difference in level and determinants of substance abuse among urban and rural residence of adolescents in Gedeo Zone, South Ethiopia.

2 Materials and methods

2.1 Study area and design

A community-based comparative cross-sectional study was conducted among adolescents residing in rural and urban areas of Gedeo Zone, Southern Ethiopia, located 362 km from the capital city, Addis Ababa. The Gedeo Zone comprises four towns: Dilla, Wenago, Yirgachafe, and Gedeb, along with nine districts: Dilla Zuria, Wenago, Bule, Yirgachafe Zuria, Gedeb, Kochere, Chelelektu, Chorso, and Raphe. The study was carried out from July 22 to August 28, 2021.

2.2 Population

In this study, the source population included all adolescents aged 12-19 years residing in rural and urban areas of Gedeo Zone. The study population was randomly selected from these adolescents in the chosen urban and rural districts.

2.3 Inclusion criteria

Those adolescent age 12-19 Years old and residing in rural and urban areas of Gedeo Zone.

2.4 Exclusion criteria

Those adolescents who were street children and exposed to very serious health problems during the data collection period were excluded from the study.

2.5 Sampling

2.6 Sample size determination

The sample size was calculated using Epi Info version 7.1, based on a prevalence of 47.5% (the prevalence of chat chewing among adolescents in Ethiopia, EDHS 2016), a power of 80%, a ratio of unexposed to exposed of 1, and an assumed odds ratio of 2. Consequently, the initial calculated sample size was 1,172. After accounting for a design effect of 2 and a 10% non-response rate, the final sample size was adjusted to 2,578.

2.7 Sampling technique and procedure

The study area was stratified into urban and rural regions of Gedeo Zone for comparison. Three rural districts - Chelelektu, Chorso, and Raphe were randomly selected, along with two urban administrative areas: Dilla Town and Yirgacheffe Town. From the rural districts, 26 kebeles (the smallest administrative unit) were selected through simple random sampling: nine kebeles from Chelelektu, eleven from Chorso, and six from Raphe. In the urban areas, six kebeles were selected using the same method: four kebeles from Dilla Town and two from Yirgacheffe Town.

After identifying the study kebeles, a census was conducted to determine the number of adolescents in each kebele, establishing the sampling frame. Households with eligible adolescents were labeled accordingly. Finally, one adolescent from each household was selected using systematic random sampling. If there was more than one eligible adolescent in a household, one respondent was chosen by lottery.

2.8 Data Collection Procedure and Measurement

For data collection, a structured questionnaire was adapted from the Ethiopian Demographic and Health Survey 2011 and other previously published studies. The questionnaire was initially prepared in English and then translated into the local language. To ensure consistency, it was back translated into English by an independent language expert.

The data collection instrument consisted of structured, close-ended questions, along with a few open-ended items. A set of questions addressing the study's objectives was compiled and adapted from previous research and the WHO sexual and reproductive health illustrative questionnaire.

2.9 Operational Definitions

The outcome variable of this study was self-reported. In the Ethiopian Demographic and Health Survey (EDHS), participants were asked about substance use through four questions regarding current smoking habits, including pipes, cigarettes, and other tobacco products, with responses of "no" or "yes". Adolescents were classified as "cigarette or tobacco smokers" if they answered "yes".

Additionally, two questions were posed regarding alcohol consumption and Khat chewing: "During the last 30 days prior to the survey, on how many days did you consume a drink containing alcohol"? and "On how many days did you chew Khat"? Adolescents were classified as "people who drink alcohol" or "people who chew Khat" if they responded, "one or more days" (including occasionally or daily). Those with no history of using these substances were considered "non-users".

Wealth Index: Household assets, including durable and semi-durable goods, were used to describe economic status. The household questionnaire from the Ethiopian Demographic and Health Survey was employed to assess the wealth index. This index was calculated using principal component analysis based on household assets, and respondents' families were classified into three categories according to wealth status: low, medium, and high.

Parental Communication: This was measured using a five-item parent-adolescent communication scale. Items were scored from 1 (never) to 4 (often). Those who scored below the median value were considered to have low parental communication, while those above the median were classified as having high parental communication over the past six months.

2.10 Data Quality Management

Before the actual data collection, the questionnaire was pretested, and a two-day training session was conducted for data collectors and supervisors to ensure a shared understanding of the tool. The final version of the questionnaire was translated into local languages and then back-translated into English to ensure consistency.

A pretest was conducted in the Sidama region, specifically in the Chuko district. Supervisors were responsible for checking the completeness and consistency of the complete questionnaires filled. The overall data collection process was closely monitored by the investigators to maintain data quality.

2.11 Data Analysis Plan

The data template was prepared using EpiData version 3.1, and the data was entered into the system. Completeness checks were conducted to ensure data integrity, and any inconsistencies were verified. The data was then exported to IBM SPSS version 23 for analysis.

Descriptive statistics were calculated to assess the status and patterns of substance use. Binary logistic regression was employed to identify

factors associated with substance use during bivariate analysis. Multivariable logistic regression models were used to evaluate the determinants of substance use. Both unadjusted (crude) and adjusted odds ratios, along with their corresponding 95% confidence intervals, were computed. A p-value of]leq 0.05 was considered statistically significant. The model's fit was assessed using the Hosmer-Lemeshow goodness-of-fit test.

2.12 Ethical consideration

Ethical approval was obtained from the Dilla University College of Health Sciences and Medicine. Written informed consent was obtained from the parents of each study participant prior to the interviews, and the purpose of the study was thoroughly explained in the consent form provided to the parents. Confidentiality of the information collected was assured, and the privacy of the respondents was maintained throughout the study.

3 Results

3.1 Socio-demographic and academic characteristics of the study participants

A total of 2,446 study participants were included in this research, yielding a response rate of 94.9% (1,235 urban and 1,211 rural adolescents). Among these participants, 555 (45.6%) of the urban adolescents and 557 (47.0%) of the rural adolescents were in the late adolescence period, with a mean age of 16 years. The sex distribution of respondents was comparable, with 1,261 (51.6%) males and 1,182 (48.4%) females. Occupationally, more than three-fourths of the respondents from the urban area (961 or 78.8%) were students, while just over half of the participants from the rural area (675 or 56.9%) were students (Table 1).

Table 1 Socio-demographic characteristics of the respondents, Gedeo Zone, South Ethiopia, 2021

Variables		Residence		Total n (%)
		Urban n (%)	Rural n (%)	
Age category	Early adolescence	219 (18.0)	214 (18.1)	433 (18.0)
	Middle adolescence	443 (36.4)	414 (35.0)	857 (35.7)
	Late adolescence	555 (45.6)	556 (47.0)	1111 (46.3)
Occupation	Student	961(78.8)	675(56.9)	1636(67.8)
	Unemployed	76(6.2)	191(16.1)	267(11.1)
	Student and work	46(3.8)	63(5.3)	109(4.5)
	Merchant	57(4.7)	170(14.3)	227(9.5)
	Others	80(6.60)	87(7.3)	167(6.9)
With whom do You live	with parents	961(77.8)	943(77.9)	1904(77.85)
	with relatives	96(7.8)	96(7.9)	192(7.85)
	with other	178(14.4)	172(14.2)	350(14.3)
Wealth index	Lowest	231(18.7)	48(4.0)	279(11.35)
	Second	255(20.6)	118(9.7)	373(15.15)
	Middle	255(20.6)	874(72.2)	1129(15.15)
	Fourth	255(20.6)	118(9.7)	373(15.15)
	Highest	239(19.4)	53(4.4)	292(11.9)
Family size	less than 6	343(32.1)	242(25.6)	5,85(28.85)
	greater than 6	724(67.7)	699(74.0)	1,423(70.85)

3.2 Factors associated with substance use among adolescents

Factors associated with substance use among urban and rural adolescents were assessed using multivariable logistic regression analysis for each group in this study. The analysis revealed that attitude towards substance use, parental substance use, peer substance use, and parental control over adolescents' activities were significantly associated with substance use among urban adolescents.

Urban adolescents with an unfavorable attitude towards substance use were 50% less likely to engage in substance use compared to those with a favorable attitude [AOR: 0.50, 95% CI: (0.25, 0.97)]. Regarding family history, adolescents with family members who used substances were about nine times more likely to use substances themselves [AOR: 9.28, 95% CI: (5.63, 15.31)]. Similarly, adolescents whose peers' used substances were three times more likely to use substances [AOR: 3.16, 95% CI: (1.82, 5.48)].

Parental control over adolescents' activities was also significantly associated with substance use among urban adolescents. Those without family supervision over their activities outside the home were 82% more likely to use substances [AOR: 1.82, 95% CI: (1.05, 3.14)].

For rural adolescents, occupation, attitude towards substance use, parental substance use, and peer substance use were significant predictors of substance use. Specifically, adolescents who were merchants were found to be 62% less likely to use substances compared to those who were students [AOR: 0.38, 95% CI: (0.16, 0.90)]. The likelihood of substance use among rural adolescents decreased by about 80% for those with an unfavorable attitude towards substance use compared to their counterparts [AOR: 0.20, 95% CI: (0.10, 0.43)]. Additionally, adolescents whose parents' used substances were 22 times more likely to use substances themselves [AOR: 22.14, 95% CI: (11.77, 41.63)], and those with substance-using peers were about three times more likely to engage in substance use [AOR: 2.95 CI: (1.67, 5.21)] (Table 2).

Table 2 Factors associated with substance use among adolescents in Gedeo Zone, South Ethiopia 2021.

Background Characteristics	Urban			Rural		
	Substance use No. (%)	COR (95% CI)	AOR (95% CI)	Substance use No. (%)	COR (95% CI)	AOR (95% CI)
Occupation						
Student only	177(19.1)	1	1	194(29.5)	1	1
Unemployed	13(17.6)	0.66(0.39,1.12)	0.55(0.17,1.78)	35(18.5)	1.58(0.92,2.73)	0.74(0.32,1.71)
Student & work	15(34.1)	0.60(0.28,1.31)	1.62(0.50,5.30)	27(45.0)	0.86(0.46,1.62)	3.83(0.94,15.68)
Merchant	11(19.3)	1.45(0.65,3.23)	0.39(0.13,1.17)	29(17.5)	3.09(1.49,6.39)	0.38(0.16,0.90)
Others*	21(26.3)	0.67(0.29,1.53)	0.91(0.39,2.12)	18(20.9)	0.80(0.41,1.54)	0.25(0.09,0.73)
With whom adolescents live						
With parents	174(18.8)	1	1	231(25.1)	1	1
With relatives	21(22.3)	1.25 (0.75-2.08)	0.89(0.33,2.40)	21(22.6)	0.87 (0.52-1.45)	0.69(0.14,3.48)
Other	45(25.9)	1.51 (1.04-2.20)	1.56(0.81,3.02)	62(36.7)	1.73 (1.22-2.45)	0.77(0.34,1.75)
Sexually active						
Yes	98(36.3)	1	1	142(38.4)	1	1
No	142(15.4)	0.32 (0.24 - 0.43)	0.51(0.28,0.91)	172(21.2)	0.43 (0.34 - 0.56)	0.66(0.36,1.20)
Attitude towards substance use						
Favorable	41(35.4)	1	1	83(50.3)	1	1
Unfavorable	182(17.8)	0.40(0.26,0.60)	0.50(0.25,0.97)	207(21.9)	0.28(0.20,0.39)	0.20(0.10,0.43)
Parental Substance use						
Not use substance	34(5.7)	1	1	28(4.3)	1	1
Use substance	89(40.5)	11.33(7.31,17.57)	9.28(5.63,15.31)	148(56.7)	29.24(18.63,45.89)	12.14(11.77,21.63)
Peer use substance						
Not use	126(13.6)	1	1	140(16.6)	1	1
use	90(44.8)	4.89(3.61,6.61)	3.16(1.82,5.48)	130(49.2)	4.89(3.61,6.61)	2.95(1.67,5.21)
Parental supervision						
Yes	136(16.5)	1	1	147(21.3)	1	1
No	78(26.0)	1.78(1.30,2.44)	1.82(1.05,3.14)	99(28.0)	1.44(1.07,1.93)	1.54(0.87, 2.24)

3.3 Discussion

Adolescents' substance use was influenced by various factors, including attitudes toward abusive substances and family-related factors such as familial substance use and parental supervision. These factors were significant contributors to drug use among both urban and rural adolescents.

The overall prevalence of substance use in this study was 23.3%. Reports from various studies worldwide, including other regions in Ethiopia, indicate alarming trends in substance abuse, with prevalence rates ranging from 20% to 50% [21-25]. The 6.7% rate of illicit drug use among adolescents in the current study is relatively lower than the 13.2% prevalence reported in Botswana [26] and the 12% in South Africa [27].

Distinct factors contributed to substance use among rural and urban adolescents in this study. An unfavorable attitude toward substance use significantly reduced the risk of substance use in both groups. This finding aligns with previous research suggesting that positive attitudes toward substance use among adolescents or their significant others increase the likelihood of substance use [28 -30].

The family environment is a critical domain for risk factors related to adolescent substance abuse [32]. Families can expose adolescents to abusive substances either through their own substance use or by providing inadequate supervision. In this study, substance use by family members significantly increased the risk of substance use among both urban and rural adolescents. This finding is supported by studies from various parts of the world, indicating that parental substance use often affects multiple family members across generations [33]. Research has shown that nearly 50% of the risk for substance use among adolescents has familial origins [34]. Behavioral modeling of substance use through exposure to parental substance use early in life contributes to this familial association with substance use disorders [35].

In the current study, parental supervision was found to decrease the risk of substance use among urban adolescents. Evidence from the National Institute on Drug Abuse highlights that lack of parental supervision is a significant risk factor for substance use among adolescents [13]. A study on adolescents' perceptions of substance use in the UAE identified parental involvement as crucial for preventing substance abuse. Strengthening family ties, communication, support, and understanding were viewed as key protective factors that encourage open discussions about substance use [36]. Parenting practices characterized by low levels of supervision, inconsistent discipline, poor problem-solving skills, and low emotional support have been linked to negative psychological and behavioral outcomes in children. High levels of marital conflict or family stress also increase the risk of negative outcomes, including substance abuse [32]. Similarly, a Norwegian population-based study identified family alcohol problems, parental involvement, peer substance use, and household economy as factors associated with adolescent substance use [37].

Peer substance use emerged as a major risk factor for both urban and rural adolescents. Numerous studies emphasize the role of peers in influencing substance use, with findings consistently showing that adolescents who associate with drug-using peers exhibit higher levels of drug use. Having friends who use drugs is a strong predictor of adolescent substance use [32]. Research in the UAE also indicated that peers serve as channels for accessing drugs [36]. Parents and guardians can mitigate this risk by monitoring adolescents' activities and maintaining open lines of communication [38]. A study conducted among adolescents in Mexico found that those with peers who used alcohol and other drugs were more likely to engage in substance use [39]. Similar evidence has been reported in South Africa [40].

3.4 Strengths and Limitations of the Study

This study is community-based and involved a sufficiently representative sample of adolescents recruited through probability sampling methods, allowing for comparisons between different

segments of the adolescent population. However, there are notable limitations to acknowledge. The primary limitation is the exclusion of younger adolescents aged 10-12 years and those living in vulnerable conditions, such as street or homeless adolescents.

3.5 Conclusion and Recommendations

The level of substance use among adolescents in this study is moderately high, with a significant number of adolescents exhibiting poor or no awareness of abusive substances. Adolescents in rural settings were found to be more likely to engage in substance use. Key factors influencing substance use include personal attributes such as attitudes toward abusive substances, family-related factors like familial substance use and parental supervision, and peer substance use.

This study recommends that all relevant stakeholders, including the Gedeo Zone Health Office and the regional health office, should design tailored health education interventions aimed at reducing substance use among adolescents in the Gedeo Zone.

Consent to Publish

Not applicable

Availability of data and material

The data of this study is readily available and could be obtained from the corresponding author on reasonable request at any time.

Competing interests

There is not any competing interest among authors or anyone else.

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RESEARCH ARTICLE

The magnitude of co-morbid depression with post-traumatic stress disorder symptom in Africa, 2024 Systematic review and meta-analysis

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Abstract

Objective: Depression is a significant public health concern arising from a complex interplay of environmental, psychological, biological, and social factors. Traumatic life experiences, such as war, disasters, accidents, and abuse, are prevalent in Africa and often lead to various mental health conditions. This review aims to assess the pooled burden of comorbid depression among individuals experiencing PTSD symptoms in Africa in 2024.

Method: This study conducted a systematic review and meta-analysis, focusing on individuals diagnosed with both depression and post-traumatic stress disorder (PTSD). A comprehensive literature search was conducted across six major databases: PubMed, Scopus, Embase, PsycINFO, AJOL, and Google Scholar. Eligible studies published between 2008 and 2024 were included in the analysis. Statistical assumptions for random-effects models, heterogeneity, and publication bias were tested and met. Data extraction was performed using Microsoft Excel, with subsequent statistical analyses conducted using STATA-18 software.

Result: This systematic review and meta-analysis integrated nineteen cross-sectional studies from Africa, encompassing a total of 3,249 participants. The pooled prevalence estimate of comorbid depression among individuals exhibiting PTSD symptoms was 61% (95% CI: 49-72; $I^2 = 99.2\%$, $P < 0.0001$). A subgroup analysis based on study settings and sub-regions of the African continent revealed the highest prevalence of comorbid depression in refugee populations, reaching 75% (95% CI: 70-79, $P < 0.0001$). Regional subgroup analysis indicated a comorbid depression prevalence of 58% (95% CI: 51-65, $P < 0.0001$) in East Africa and 74% (95% CI: 52-97, $P < 0.0001$) in West Africa.

Conclusion: This review indicates that more than half of respondents with PTSD in African populations also have comorbid depression, with the highest prevalence observed in refugee settings and West African countries. Comprehensive psychosocial intervention guidelines are needed to effectively manage both conditions in clinical and humanitarian settings.

Keywords: Co-morbidity, Depression, Meta-analysis, Post-traumatic stress disorder,Systematic review, Africa

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1 Introduction

1.1 Background

Depression is a global mental health condition characterized by a loss of interest, depressed mood, and social withdrawal. It affects over 280 million individuals worldwide and significantly impairs daily functioning, including self-care, social interactions, and occupational performance. In severe cases, it can lead to life-threatening outcomes [1]. Trauma, whether natural or man-made, often results in intrusive thoughts, nightmares, sadness, anger, and fear [2, 3]. While an emotional response to life-threatening events is normal, persistent intense emotions can lead to mental health issues like depression and PTSD. This prolonged response can hinder daily life, impacting work, sleep, relationships, and overall well-being [4, 5].

Individuals with post-traumatic stress disorder (PTSD) often avoid trauma-related situations and struggle with social engagement and activities they once enjoyed. Symptoms may include hypervigilance, easily startled responses, and sensitivity to noise. This constant state of arousal can lead to fatigue, difficulty concentrating, and memory problems [6, 7].

Globally, approximately 70% of the population experiences trauma, with 5.6% developing PTSD. The economic burden of PTSD is significant due to increased healthcare costs, unemployment, and reduced quality of life. The WHO predicts that stress-related disorders, including PTSD, will be among the leading causes of disability [8-11]. Continuous conflicts in Africa, such as civil wars and ethnic violence, contribute to high rates of PTSD and depression, with displacement and social disruption exacerbating these conditions. The prevalence of PTSD among African refugees is significantly higher than global averages, underscoring the severe psychological impact of these conflicts [12-14].

Depression poses a significant public health concern in Africa, affecting nearly a quarter of the population. Women are particularly vulnerable due to factors like sexual violence and societal pressures. Stigma surrounding mental health hinders help-seeking behavior, exacerbating the issue [15-18]. Trauma increases the risk of depression by altering brain chemistry and can lead to PTSD. The challenges of managing PTSD, such as isolation and difficulty with daily tasks, can contribute to feelings of worthlessness and hopelessness, further exacerbating depression. This co-occurrence of trauma, PTSD, and depression creates a complex and debilitating cycle [19, 20].

Previous studies have shown a 12.8% comorbidity rate of depression and PTSD among adult war survivors globally (1989-2019) [21]. Individuals living in war-affected areas, as well as refugees and internally displaced persons (IDPs) in Africa, face significant cultural and systemic barriers to accessing treatment for PTSD and depression. Cultural beliefs that associate mental illness with supernatural causes or personal weakness often result in the stigmatization of mental health conditions [22]. This social stigma can discourage individuals from seeking help, fearing social ostracism or judgment. Traditional healing practices, such as prayer and the use of topical medicines, are often prioritized over modern mental health care, leading to delays in accessing evidence-based interventions [23].

Systemic barriers, including limited access to inadequate infrastructure, a shortage of mental health care providers, and underfunded healthcare systems, hinder the availability and accessibility of quality care. Cultural misunderstandings between clients and healthcare providers can negatively affect the effective treatment of mental health conditions. Additionally, a lack of culturally appropriate interventions, language barriers, and insufficient training on trauma-informed care further complicate the situation [24].

To address these cultural and systemic barriers, a multifaceted approach is needed that includes culturally appropriate training for healthcare providers, community involvement to reduce stigma, and increased funding for mental health services for vulnerable populations. Despite repeated exposure to various trauma experiences and contributing cultural factors, there is

a scarcity of studies and regional representation [25].

A systematic review and meta-analysis of PTSD and depression in African populations is crucial for understanding the burden of these conditions across regions frequently exposed to violence, war, and displacement [26]. The co-occurrence of both conditions in resource-limited settings results in exacerbated symptoms, prolonged illness, and hindered recovery [27]. The findings will inform mental health professionals, policymakers, and community organizations in designing comprehensive psychopharmacological interventions in both clinical and humanitarian settings. Additionally, the results will contribute to the development of culturally appropriate interventions and prevention programs tailored to different regions of the African population. Individuals with these comorbid conditions would benefit from a comprehensive biopsychosocial intervention plan that shortens their course of illness and improves their recovery. Therefore, this study review aimed to determine the magnitude of comorbid depression among peoples with PTSD symptoms and explicitly describe the regional burden across different regions of Africa, 2024.

2 Methodology

2.1 Type of Study

The systematic review and meta-analysis included quantitative studies that examined the co-morbidity of depression among individuals with PTSD symptoms in various traumatic contexts, such as internally displaced populations, refugees, war-affected areas, and those involved in car accidents. Only articles containing relevant data and information were included.

2.2 Type of outcomes

The primary outcome of interest is the comorbidity of depression with PTSD symptoms in traumatic areas.

2.3 Search strategies

Peer-reviewed papers from electronic databases were included in the search, specifically targeting PubMed, Scopus, Embase, PsycINFO, AJOL, and Google Scholar. To ensure that no similar reviews had been conducted, the Cochrane Library was also searched. The abstracts of the returned articles were examined to determine eligibility when the titles were insufficient for assessment. Keywords and MeSH terms were employed to facilitate the search, utilizing specific syntax and indexing terms for each database. Boolean operators “AND” and “OR” were combined with key terms such as (“Co-morbid depression” [All Fields] OR “Depressive symptoms” [All Fields] OR “PTSD” [All Fields]) AND (“military” OR “Internally displaced persons” [All Fields] OR “Refuge” [All Fields] OR “Car accident” [All Fields] OR “traumatic event” [All Fields] OR “war-affected areas” [All Fields]) AND “Africa” [All Fields].

A total of 3,249 articles were identified through electronic databases and manual searches. After removing duplicate records, 1,432 records were screened for this review. Based on their titles and abstracts, 967 articles were excluded. Additionally, 432 articles were assessed for eligibility, with 413 excluded based on the established criteria.

The inclusion criteria for this systematic review and meta-analysis were: published quantitative cross-sectional studies, respondents aged 18 and older, studies conducted in African countries, and clear statistical outputs for the outcome variable. The exclusion criteria included unclear statistical associations between PTSD and depression, articles not in English, qualitative studies, and research conducted outside the African continent. Ultimately, 19 articles were included in this review. The PRISMA flow diagram was used to summarize the selection process (Figure 1).

2.4 Study quality assessment

The methodological quality of the studies was evaluated using specific criteria. During the initial search, all studies were assessed against the inclusion criteria. This study was submitted for registration with the PROSPERO protocol. The PRISMA checklist was followed to ensure methodological rigor (see Supplementary Material). Methodological quality was appraised

using a critical framework to eliminate substandard studies. Data extraction forms were utilized to gather results from the remaining studies, resulting in a final list of included studies. Additionally, the assessment was conducted by an independent reviewer and the principal investigator.

2.5 Critical appraisal tools

Before inclusion in the review, the study team used standardized critical evaluation measures from the Joanna Briggs Institute Assessment and Review Instrument (JBI-Quantitative) to assess the methodological validity of the selected publications. This appraisal tool is specifically designed for quantitative studies and includes a checklist tailored to various study designs, evaluating key aspects such as sample representativeness, methodological robustness, clearly defined exposures or interventions, and the validity of outcome measurements. The JBI Assessment and Review Instrument (JBI-Quantitative) is provided as supplementary material (Supplementary Material 2).

2.6 Statistical methods and data analysis

Microsoft Excel was used to extract data based on research type, year, region, sample size, and the prevalence of co-morbid depression among individuals with PTSD symptoms. In cases of disagreement regarding article inclusion, the article was referred to a colleague or independent reviewer for evaluation and discussion before making a final decision. Further analysis was conducted using STATA version 18.

The heterogeneity of the included studies was assessed using the I^2 statistic, where values of 25%-50% were considered low heterogeneity, 50%-75% moderate, and greater than 75% high heterogeneity. The overall pooled estimate of co-morbid depression among individuals with PTSD symptoms in Africa was calculated using the metaprop command in STATA. A subgroup analysis was performed based on the year of publication, study setting, and sub-region to examine the pooled estimate of co-morbid depression.

The influence of each study on the overall pooled estimate was evaluated through sensitivity analysis. Additionally, the small-study effect was assessed using Egger's regression test, funnel plot analysis, and p-values. To evaluate publication bias, both visual and statistical methods were employed. Visually, the funnel plot was inspected to display the relationship between study effect size and precision. In the absence of publication bias, the plot typically appears symmetrical and inverted. However, any observed asymmetry may indicate potential publication bias. Egger's test was utilized to assess the association between study precision and effect size, with a significant p-value providing further evidence of potential publication bias, suggesting that the asymmetry in the funnel plot may not be due to chance.

3 Results

Out of the 19 studies included in this review and meta-analysis, 11 were from Ethiopia, 3 from Nigeria, and 1 each from Rwanda, Kenya, Uganda, South Sudan, and Sudan. The PRISMA flow diagram summarizes the selection process (see Figure 1). Data was collected from a total of 5,360 respondents, with an average of 46.5% of the participants being female. Regarding the study settings, more than one-third of the studies were conducted in internally displaced persons (IDP) camps and war-affected areas. The included articles were published between 2008 and 2024. All respondents were adults aged 18 and older, with the largest sample size among the included studies being 1,109 (see Table 1).

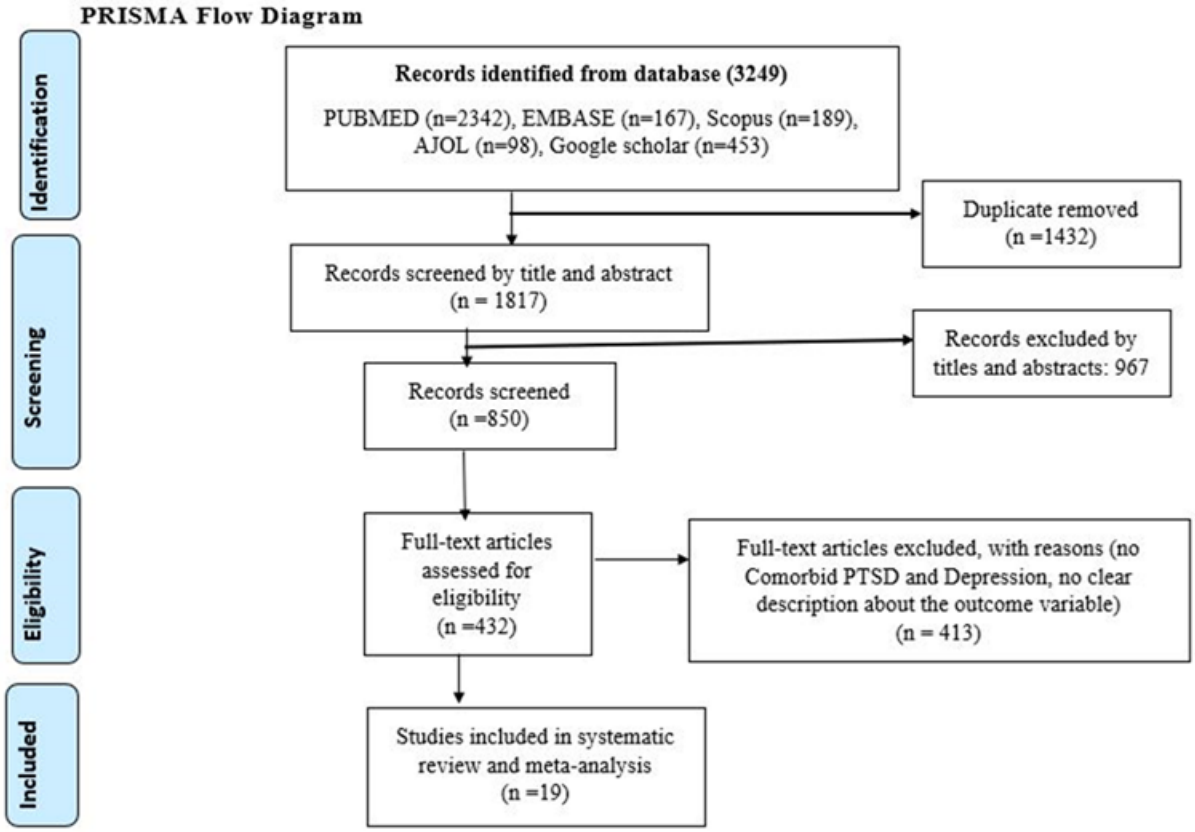


Figure 1 PRISMA flow diagram for the systematic review and meta-analysis of co-morbid depression on PTSD clients in Africa, 2024

Table 1 A descriptive summary of the included studies for the systematic review and meta-analysis on co-morbidity of depression among respondents who developed PTSD in traumatic areas in Africa, 2024.

S.N.	Country	Authors	Publication Year	SD	Study Area	Study setting	Inclusion	DCT	Gender Female (%)	Sample size	Depression (%)
1	Ethiopia	Madoro *et al.* [28]	2020	CS	Gedeo zone	IDP	Adults (18+)	HSCL-25)	47.5	365	62.4
2	"	Birhan *et al.* [29]	2023	CS	Dessie town	War	"	PHQ-9	39.2	207	48.3
3	"	Bedaso *et al.* [30]	2020	CS	Southern Ethiopia	Car accident	"	PHQ-9	27.2	66	22
4	"	Ali *et al.* [31]	2022	CS	Maikadra town	War	"	PHQ-9	43	365	59.1
5	"	Alenko *et al.* [32]	2019	CS	Jimma zone	Car accident	"	SRQ-20	-	50	74
6	"	Kassaye *et al.* [33]	2022	CS	Woldia town	War	"	PHQ-9	44.89	336	63.9
7	"	Tadesse *et al.* [34]	2022	CS	North Gondar	Refuge	"	PHQ-9	66.2	251	72.1
8	"	Adugna *et al.* [35]	2024	CS	Dire dawa	Military personnel	"	PHQ-9	12.6	105	100
9	"	Melese *et al.* [36]	2024	CS	Dabat district	War	"	PHQ-9	38	126	53.9
10	"	Teshome *et al.* [37]	2023	CS	Nefas Meewcha town	War	"	PHQ-9	46.5	328	66.5
11	"	Anbesaw *et al.* [38]	2022	CS	Dessie town	War	"	PHQ-9	43.1	162	51.4
12	South Sudan	Ayazi *et al.* [39]	2012	CS	Greater Bahrel Ghazal states	War	"	MINI	44	331	33.8
13	Rwanda	Munyandamutsa *et al.* [40]	2012	CS	Five provinces of Rwanda	War	"	MINI	58.9	250	68.4
14	Uganda	Robert *et al.* [41]	2008	CS	Gulu and Amuru district	IDP	"	HSCL-25	60	653	67
15	Kenya	Im *et al.* [42]	2020	CS	Somali refuge	Refuge	"	HSCL-25	57.2	62	82.8
16	Nigeria	Ibrahim *et al.* [43]	2023	CS	Yobe state	IDP	"	HSCL-25	55.1	424	98.8
17	Nigeria	Aluh *et al.* [44]	2020	CS	Maiduguri	IDP	"	PHQ-9	44.9	1109	73.6
18	Nigeria	Nwoga *et al.* [45]	2019	CS	Yobe state	IDP	"	HSC	54.5	159	37
19	Sudan	Elhabiby *et al.* [46]	2015	CS	Southern Darfur	IDP	"	DSM-V	98.2	11	54.5

P. Year= Publication year, CS= cross sectional, IDP= internally displaced people, DSM-V= Diagnostic statistical manual four, PHQ=Patient health questioner, HSCL=Hopkins symptoms checklist, MINI= mini-international neuropsychiatric interview, DCT=Data collection tool

Methods of assessment

Across the 18 survey studies, co-morbid depression was measured using adapted, validated, and translated versions of various scales. More than half of the included studies utilized the Patient Health Questionnaire (PHQ-9) to assess co-morbid depression among individuals with PTSD symptoms. The majority of the studies (n = 14; 58.3%) reported on the prevalence of co-morbid depression over the past month (see Table 2).

Table 2 Sampling technique, data collection tool, and data collection methods used in the original studies to assess depression for the systematic review and meta-analysis on co-morbidity of depression among respondents who developed PTSD in traumatic areas in Africa, 2024

Authors	Publication year	Sampling technique	Data collection tool	Methods of data collection
Madoro *et al.*	2020	Simple random sampling	HSCL-25	IA
Birhan *et al.*	2023	Systematic random sampling	PHQ-9	IA
Bedaso *et al.*	2020	Purposive sampling	PHQ-9	IA
Ali *et al.*	2022	Multistage sampling	PHQ-9	IA
Alenko *et al.*	2019	Census sampling	SRQ-20	IA
Kassaye *et al.*	2022	Multi-stage sampling	PHQ-9	IA
Tadesse *et al.*	2022	simple random sampling	PHQ-9	IA
Adugna *et al.*	2024	Simple random sampling	PHQ-9	IA
Melese *et al.*	2024	Systematic random sampling	PHQ-9	IA
Teshome *et al.*	2023	Multi-stage sampling	PHQ-9	IA
Anbesaw *et al.*	2022	Systematic random sampling	PHQ-9	IA
Azazi *et al.*	2012	Multistage sampling	MINI	IA
Munyandamutsa *et al.*	2012	Simple random sampling	MINI	IA
Robert *et al.*	2008	Multistage sampling	HSCL-25	IA
Im *et al.*	2020	snowball sampling	HSCL-25	IA
Ibrahim *et al.*	2023	Multistage sampling	HSCL-25	IA
Aluh *et al.*	2020	Purposive sampling	PHQ-9	IA
Nwoga *et al.*	2019	Systematic random sampling	HSC	IA and SCI
Elhabiby *et al.*	2015	Purposive sampling	DSM-V	SCI

IA = Interviewer administered, SA = Self-administered, SCI = Structured clinical interview. PCL-C = Post-Traumatic Stress Disorder Checklist for Civilians, PCL-5 = Post-Traumatic Stress Disorder Checklist for DSM-5, DSM = Diagnostic and Statistical Manual of Mental Disorder

Pooled prevalence of co-morbid depression among people experiencing PTSD symptoms

A forest plot illustrated the magnitude of co-morbid depression among individuals with PTSD symptoms. The pooled prevalence estimate of co-morbid depression in this population was found to be 61% (95% CI: 49–72; I^2 = 99.2%). The analysis revealed that the highest prevalence of co-morbid depression was in Nigeria, at 99% (95% CI: 97–99), while the lowest prevalence was in Ethiopia, at 33% (95% CI: 23–43) (see Figure 2).

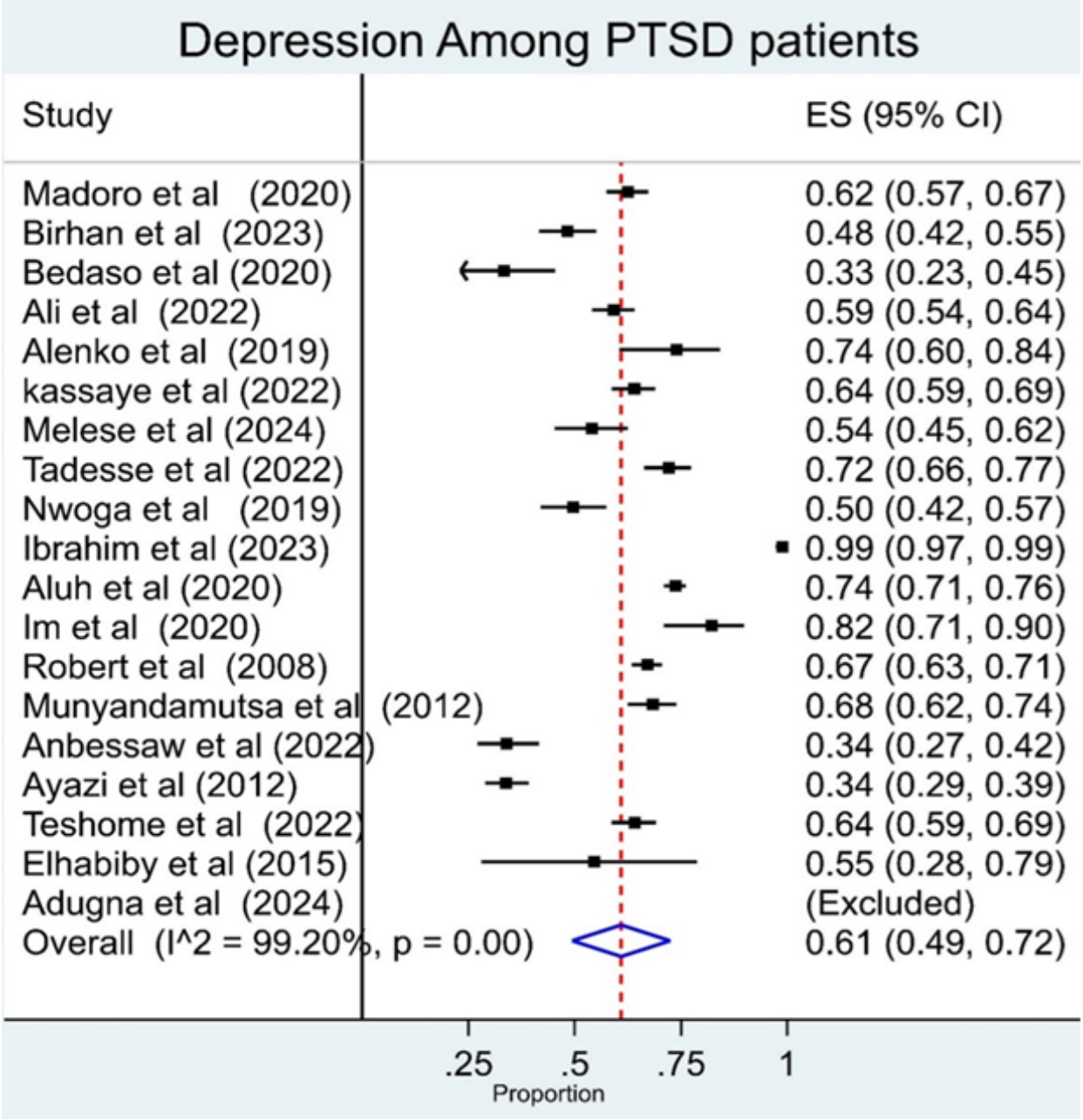


Figure 2 Forest plot of magnitude of co-morbid depression among peoples with PTSD symptoms in Africa, 2024

Subgroup analysis

Subgroup analysis was conducted to examine the magnitude of co-morbid depression among individuals with PTSD symptoms based on the year of publication (< 2018 or > 2018). The findings indicated that the prevalence of co-morbid depression among respondents with PTSD symptoms in studies published after 2018 was 62% (95% CI: 50–75).

Additionally, a subgroup analysis based on study setting revealed that the prevalence of co-morbid depression among individuals with PTSD symptoms in refugee settings was 75% (95% CI: 70–79%). According to the sub-region analysis, the prevalence of co-morbid depression among individuals with PTSD symptoms in West Africa was found to be 74% (95% CI: 52–97) (see Figures 3, 4, and 5).

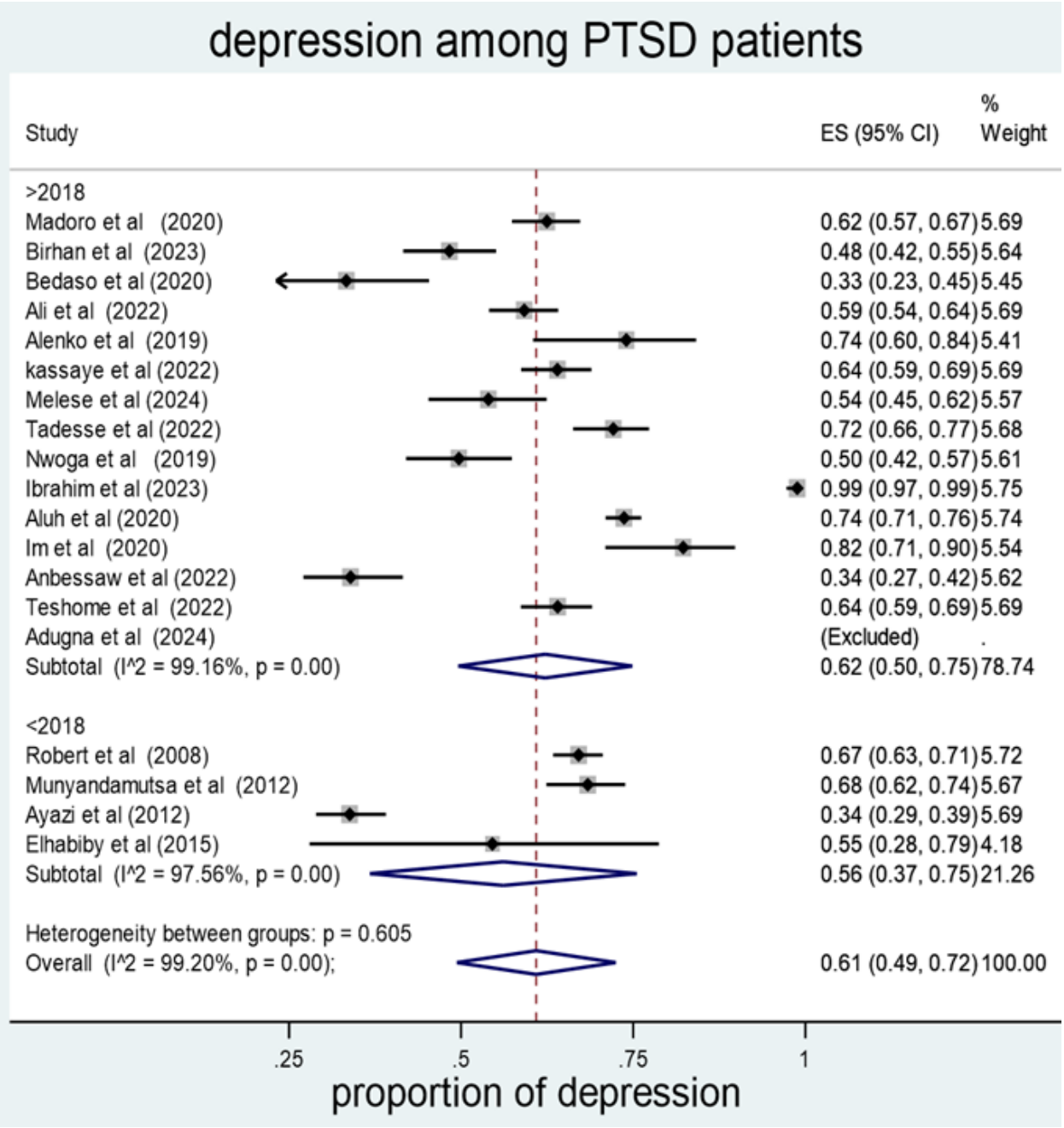


Figure 3 Subgroup analysis by year of publication for the pooled proportion of co-morbid depression among peoples with PTSD in Africa, 2024

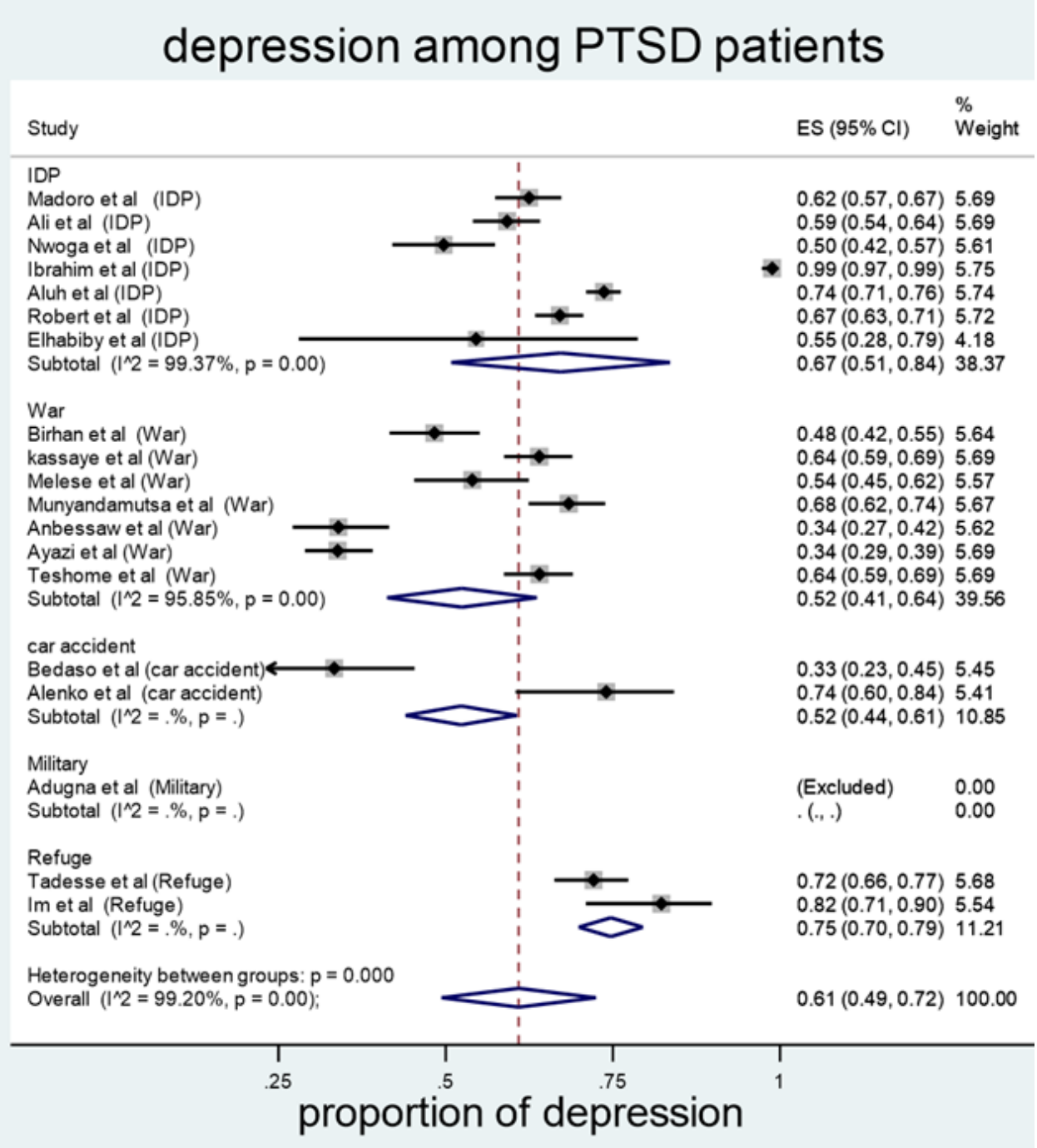


Figure 4 Subgroup analysis by study setting for the pooled proportion of co-morbid depression among peoples with PTSD in Africa, 2024.

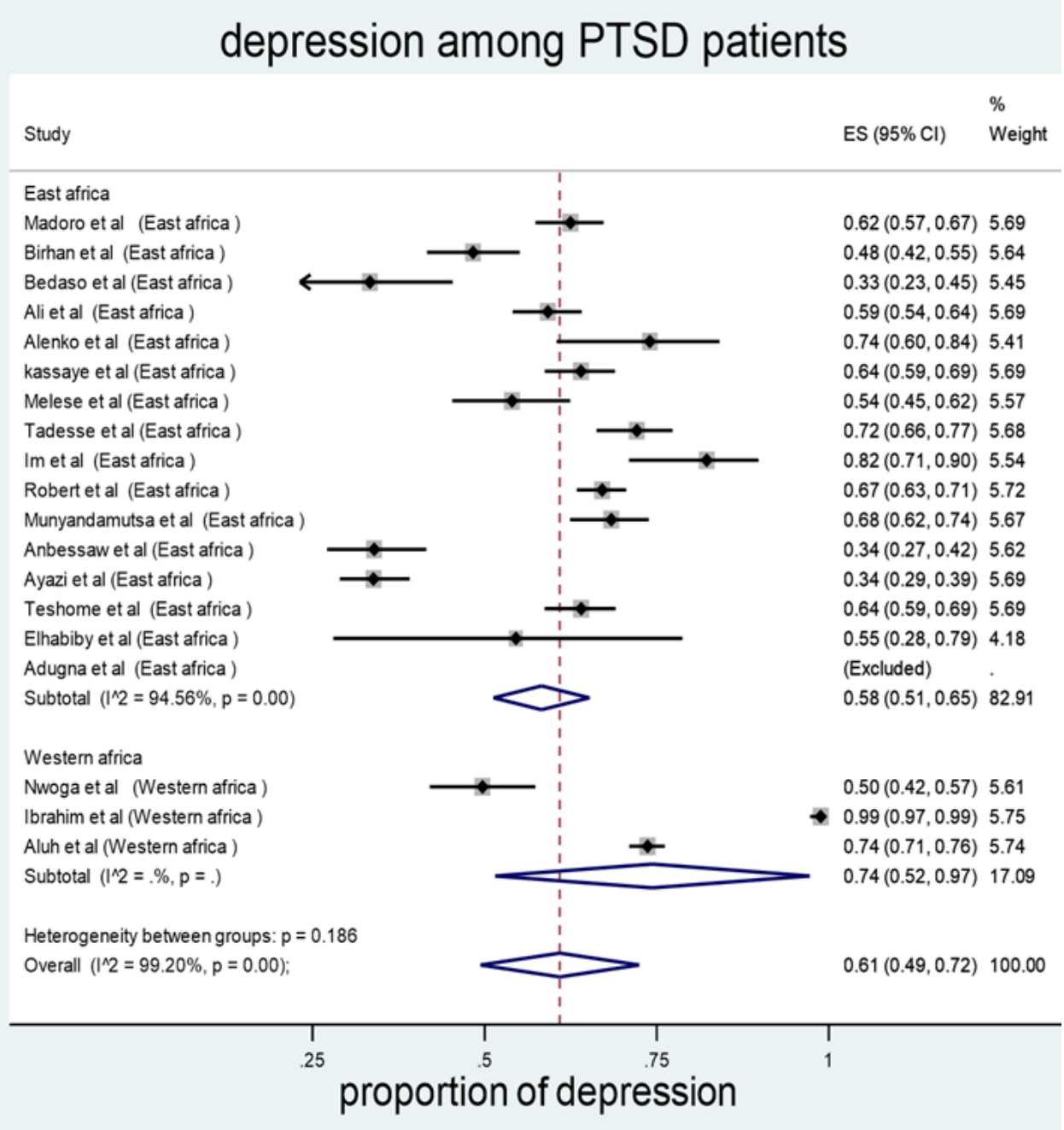


Figure 5 Subgroup analysis by subregions for the pooled proportion of co-morbid depression among peoples with PTSD in Africa, 2024

Sensitivity analysis test

A sensitivity analysis was conducted to assess the impact of each included study on the pooled estimate of co-morbid depression among individuals with PTSD symptoms. The results of the sensitivity analysis indicated that no single study significantly affected the pooled estimate of co-morbid depression in the fitted meta-analytic model (see Figure 6).

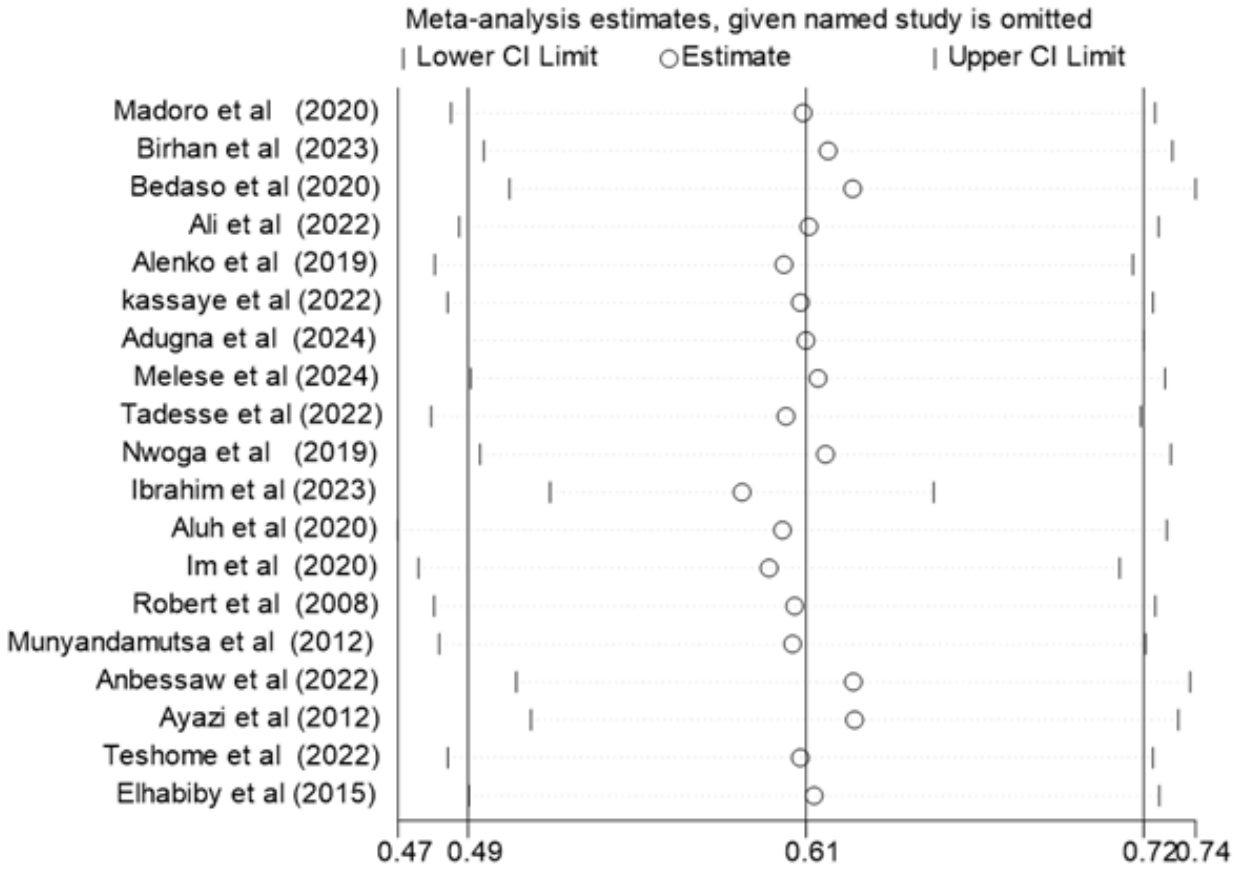
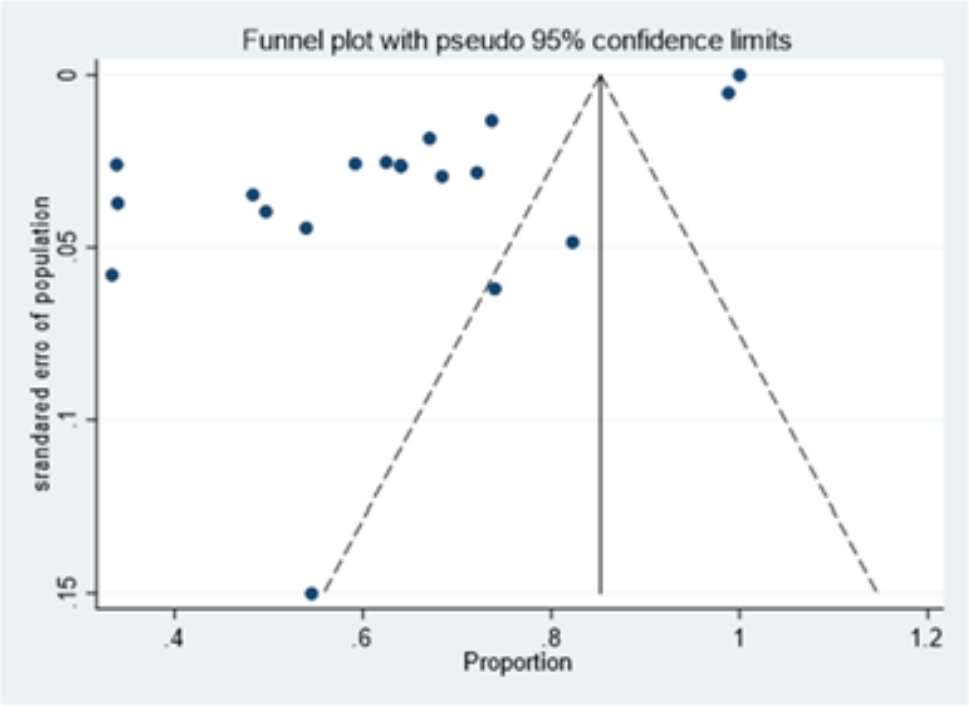


Figure 6 Subgroup analysis by subregions for the pooled proportion of co-morbid depression among peoples with PTSD in Africa, 2024

Publication bias

The funnel plot indicated that the distribution of studies was asymmetrical. However, Egger's test was not statistically significant for the estimated magnitude of co-morbid depression in relation to PTSD ($p = 0.143$), suggesting that there was no evidence of publication bias (see Figure 7).



Egger test

Number of studies = 19					Root MSE = 6.375	
Std_Eff	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
slope	1.020229	.0383521	26.60	0.000	.9389266	1.101532
bias	-13.18166	2.188501	-6.02	0.143	-17.82108	-8.542248

Figure 7 Funnel plot and Egger's test of studies reporting co-morbid depression among peoples with PTSD symptoms in Africa, 2024

4 Discussions

Post-traumatic stress disorder (PTSD) and depression are prevalent co-morbid mental health conditions that arise in individuals experiencing traumatic events. In many African countries, natural and man-made disasters, such as war, ethnic conflict, and flooding, are common triggers for these emotional conditions [47]. This study aimed to investigate depression among individuals exhibiting PTSD symptoms in Africa. The pooled prevalence estimate of co-morbid depression among people with PTSD symptoms was found to be 61% (95% CI: 49–72; I^2 = 99.2%). The analysis revealed the highest prevalence in Nigeria at 99% (95% CI: 97–99) and the lowest in Ethiopia at 33% (95% CI: 23–43). In the subgroup analysis based on the year of publication, studies published after 2018 reported a prevalence of 62% (95% CI: 50–75). Additionally, a subgroup analysis by study setting showed that the prevalence of co-morbid depression among individuals in war-affected areas was 52% (95% CI: 41–64). Furthermore, the region-based subgroup analysis indicated a prevalence of 58% (95% CI: 51–65) in East Africa and 74% (95% CI: 52–97) in West Africa. The pooled prevalence estimate of co-morbid depression among people with PTSD symptoms (61%) is slightly higher than the 52% prevalence reported in a review study conducted among the U.S. population [48]. This disparity may be attributed to the inclusion of both U.S. and international subjects and various trauma types, including combat, accidents, natural disasters, and interpersonal

trauma. Cultural attitudes towards reporting depression related to trauma also play a significant role. In Africa, ongoing conflicts, violence, and political unrest contribute to higher prevalence rates [49]. In this study, the prevalence of depression among individuals with PTSD symptoms in war-affected areas was 52%, which is higher than a study conducted in Sweden from 1989 to 2015, estimating that about 117 million individuals experience co-morbid PTSD and depression [50]. The Swedish study included 14,718 participants from 14 countries affected by war, but variations in trauma types across different countries may skew overall prevalence estimates [51]. Among internally displaced populations, the magnitude of co-morbid depression was found to be 67%. This finding is higher than a cross-sectional study conducted in Mogadishu, which reported a prevalence of 59.4% among internally displaced persons (IDPs) [52]. Variations in findings may stem from differences in study design, tools used, timing, and cultural factors affecting reporting of depression and trauma. Notably, a community-based study in Tigray, which has been significantly impacted by conflict, found a prevalence of 81.2% among IDPs [53]. This rate is significantly higher compared to similar studies in other countries, likely due to the widespread violence, forced displacement, and ongoing humanitarian crises in the region. The pooled prevalence of depression in PTSD patients, based on region, was 58% in East Africa and 74% in West Africa. Variations in prevalence rates may relate to cultural, economic, and healthcare access factors, as well as exposure to trauma and ongoing instability [54-56]. The co-occurrence of depression and PTSD exacerbates emotional symptoms, significantly affecting victims' functioning. The impacts range from job loss and social disconnection to increased healthcare costs. These effects extend beyond individual victims to their families, communities, and the broader economy [52]. Identifying the co-morbidity of PTSD and depression in Africa is crucial for designing effective intervention plans for prevention, early diagnosis, and treatment. It is essential to evaluate this co-morbidity and its impacts, along with the need for feasible treatment interventions that address both conditions. Furthermore, existing psychological interventions should be tailored to support individuals dealing with both depression and PTSD.

Limitations The findings of this study should be interpreted with the following limitations in mind: variability in the tools used to assess depression and PTSD across studies, potential sampling bias, differences in study quality, and cultural variations. While Egger's test was non-significant, this does not completely rule out publication bias, as unpublished or inaccessible studies are common in resource-limited settings in Africa. Additionally, the included studies primarily come from English-language databases, which may limit the generalizability of the findings to non-English publications.

5 Conclusion

This study highlights the significant impact of co-occurring depression and PTSD, with a staggering pooled prevalence of 61%, which greatly impairs emotional well-being and overall functioning. This critical public health issue requires immediate and concerted action from all stakeholders. Policymakers must prioritize mental health within humanitarian contexts by increasing resource allocation for mental health services, developing comprehensive policies that ensure access to culturally appropriate and affordable care, implementing stigma reduction initiatives, and strengthening social safety nets. Mental health practitioners play a crucial role by providing integrated care, ensuring adequate training for healthcare providers, developing community-based interventions, and advocating for policy change. By working collaboratively, policymakers and mental health practitioners can effectively address this urgent public health challenge, alleviate the suffering caused by co-occurring depression and PTSD, and enhance the overall mental well-being of individuals in humanitarian settings. This refined conclusion strengthens the call to action by emphasizing the necessity for immediate action, offering specific policy recommendations, highlighting the role of mental health practitioners, and underscoring the importance of collaboration among all stakeholders.

Declaration

Abbreviations

PTSD	Post-traumatic stress disorder
CI	Confidence Interval
P. Year	Publication year
CS	cross-sectional
IDP	internally displaced people
DSM-V	Diagnostic statistical manual four
PHQ	Patient health questioner
HSCL	Hopkins symptoms checklist
MINI	mini-international neuropsychiatric interview
DCT	Data collection tool
PRISMA	Preferred Reporting Items for System atic Reviews and Meta-Analyses
STATA	Data Analysis and Statistical Software
IA	Interviewer administered
SA	Self-administered
SCI	Structured clinical interview
PCL-C	Post-Traumatic Stress Disorder Check list for Civilians
PCL-5	Post-Traumatic Stress Disorder Check list for DSM-5
DSM	Diagnostic and Statistical Manual of Mental Disorder

Acknowledgments

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Data availability statement

The data set used in this review was uploaded as a supplementary material.

Supplementary Materials

Supplementary 1: Prisma checklist
Supplementary 2: Joanna Briggs Institute (JBI) tool

Ethical consideration

Not applicable

Authors 'Contributions

All authors contributed equally in drafting the manuscript, data analysis, and revising the manuscript.

Disclosure

All authors declare that they have no conflicts of interest in this paper.

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RESEARCH ARTICLE

Non-psychiatric help-seeking and associated factors among patients attending mental health services at Dilla University Referral Hospital, Gedeo Zone, South Ethiopia Region, Ethiopia, 2023

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Abstract

Background: Mental health disorders are a significant public health concern globally, particularly affecting low- and middle-income countries. Ethiopia, like many developing nations, faces challenges in providing adequate mental healthcare services. Previous studies have highlighted the underutilization of psychiatric care and a preference for non-psychiatric treatment options among individuals with mental health issues in the country. Understanding the factors associated with non-psychiatric help-seeking is crucial for developing effective interventions to improve mental health outcomes.

Objective: This study aimed to assess the prevalence of non-psychiatric help-seeking and its associated factors among patients attending mental health services at Dilla University Referral Hospital, Gedeo Zone, South Ethiopia Region, in 2023.

Method: The study was conducted at Dilla University Referral Hospital from July to October 2023, using an institutional-based cross-sectional design. A systematic random sampling technique was employed to recruit a sample of 423 participants. Data were collected using various tools, including questionnaires and interviews, to assess non-psychiatric treatment-seeking behaviors, social support, mental health literacy, and perceived stigma. Quantitative data were gathered using the Epi-Collect smartphone application and analyzed using SPSS version 26. Bivariate and multivariate logistic regression analyses were conducted to identify factors associated with routes to psychiatric care. Statistical significance was set at $p < 0.05$.

Result: A substantial majority (92.7%) of participants initially sought non-psychiatric care for mental health issues. Factors associated with non-psychiatric treatment-seeking included younger age (AOR=4.28, 95% CI=2.178-10.635), female sex (AOR=2.30, 95% CI=1.767-3.742), lower education (AOR=3.20, 95% CI=1.423-9.164), specific diagnoses (such as schizophrenia and bipolar disorder), poor social support (AOR=4.90, 95% CI=1.562-18.024), low mental health literacy (AOR=3.53, 95% CI=2.723-5.677), low income (AOR=3.01, 95% CI=1.602-6.934), limited awareness of psychiatric services (AOR=2.00, 95% CI=1.239-3.618), high perceived stigma (AOR=3.00, 95% CI=2.223-4.443), and residing more than 5 km from a health facility (AOR=2.16, 95% CI=1.562-3.621).

Conclusion: This study highlights the substantial reliance on non-psychiatric care for mental health issues among individuals seeking treatment. Factors such as age, gender, education, diagnosis, social support, mental health literacy, income, awareness of psychiatric services, perceived stigma, and geographical accessibility significantly influenced help-seeking behaviors. Understanding these determinants is crucial for developing targeted interventions to improve access to and utilization of appropriate mental healthcare services.

Keywords: Non-psychiatric help-seeking, Mental health services, Ethiopia, Associated factors, Gedeo Zone

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1 Introduction

Mental health is a critical component of overall well-being, yet it remains a neglected aspect of healthcare in many parts of the world, particularly in low- and middle-income countries (LMICs) [1]. The burden of mental disorders is substantial, significantly contributing to disability and mortality [2]. Despite this, access to specialized mental health services remains limited due to a scarcity of resources, including human capital, infrastructure, and financial investments [3]. The World Health Organization (WHO) estimates that one in four people globally will experience a mental health condition. In Africa, over 80% seek healthcare from traditional healers, with 40-60% specifically for mental health problems [4, 5].

Studies across Asia illustrate that seeking mental health care often involves indirect routes, especially in rural areas. In China, a staggering 80% of individuals relied on indirect pathways compared to just 20% who approached a mental health professional directly [6]. Similar trends emerge in India, where only 8% to 57% of patients, depending on the hospital setting (general vs. psychiatric), had a psychiatrist as their primary contact [7]. Recent studies focusing on rural populations in India reinforce this point, with only 9% to 15% initiating care with a psychiatrist [8]. In Bali, Indonesia, 87% of new patients at a mental health hospital had consulted a traditional healer before seeking formal help, often visiting multiple healers [8].

In developing nations, particularly in sub-Saharan Africa, many individuals with mental health conditions seek guidance from traditional healers either as their primary source of care or as their exclusive provider for mental health services [9]. Multiple factors influence the paths patients take when seeking mental health care, resulting in treatment delays or complete avoidance of formal care, which perpetuates the mental health treatment gap [10]. In regions like Ethiopia, individuals with mental health conditions often explore treatment options from a diverse range of formal and informal sources if they choose to pursue mental health care at all [9].

For instance, nearly 80% of individuals with mental illnesses in some parts of Nigeria first sought treatment from unofficial providers such as priests, spiritualists, or herbalists [11]. In Lagos, Nigeria, approximately 70% of individuals diagnosed with schizophrenia initially sought therapy from spiritualists or traditional healers [12]. The Zulu people of South Africa believe that traditional healers are the only ones who can truly understand mental disorders, perceiving Western medicine as effective for physical illnesses but potentially ineffective for mental illness [13]. This cultural perspective influences their pathways to psychiatric treatment.

Ethiopia faces a significant burden of mental health disorders, with limited access to care being a critical issue [14]. Studies indicate a high prevalence of mental illness, ranging from 11.6% to 40.4% (15, 16). Stigma surrounding mental illness poses a major barrier, with traditional beliefs often attributing mental health problems to supernatural causes or bad luck [17]. This stigma discourages individuals from seeking professional help. Additionally, the lack of qualified mental health professionals is a significant challenge, as Ethiopia has a low psychiatrist-to-population ratio, making access to specialized care difficult [18]. Mental health services are primarily concentrated in urban areas, leaving rural populations with limited options [19].

Understanding the pathways people take to seek mental healthcare is key to addressing delays in accessing professional help in Ethiopia—a situation common across Africa. These delays in reaching qualified professionals or proper facilities can have serious consequences, leading to worse outcomes for patients in the long run [20-22].

While understanding why people choose non-psychiatric treatment for mental health concerns is crucial for predicting and preventing underutilization of services, there is a dearth of studies on this topic in Ethiopia [23, 24]. To address this gap, this study aims to investigate the prevalence of non-psychiatric help-seeking behaviors among patients attending mental health services at Dilla University Referral Hospital and to iden-

tify the associated factors influencing this behavior. By understanding these factors, this study seeks to contribute to the development of more effective mental health service delivery models in the region.

2 Methods

2.1 Study area and study period

The study was conducted between July 2023 and November 2023 at Dilla University Referral Hospital, located in the Gedeo Zone of southern Ethiopia, approximately 365 kilometers from the capital city, Addis Ababa. This teaching hospital provides medical education for various healthcare professionals and offers services across six major departments: internal medicine, surgery, obstetrics, pediatrics, dentistry, and ophthalmology. Additionally, the hospital provides essential services such as radiology, psychiatry, pharmacy, clinical laboratory, nursing, and midwifery care.

2.2 Study Design

An institutional-based cross-sectional design was employed.

2.3 Population

This study focused on a source population comprising all patients receiving ongoing mental health care at Dilla University Referral Hospital. This included both inpatients (admitted to the hospital) and outpatients (receiving follow-up care). The study population consisted of all patients in follow-up and inpatient units during the data collection period. To ensure accurate diagnoses, only patients with confirmed mental disorders based on the DSM-5 classification system were included. Confirmation was provided by a senior mental health professional with a Master of Science degree in Psychiatry working at the hospital, ensuring the expertise of the personnel involved in diagnosing participants.

2.4 Eligibility Criteria

Participants were recruited based on strict criteria. To be included, individuals had to be 18 years old or older, aligning with Ethiopia's legal age of consent. A confirmed diagnosis of a mental health disorder using the DSM-5 was mandatory. Additionally, participation was limited to patients currently receiving treatment at the mental health service of Dilla University Referral Hospital. The willingness to provide informed consent was also crucial.

To ensure data quality, specific groups were excluded from the study. Patients with severe cognitive impairment that could limit their understanding or ability to consent were not included. Similarly, those experiencing an acute mental health crisis or active psychosis were excluded, as this could affect the accuracy of their responses. To prevent the repeated inclusion of patients with monthly visits and ensure that each patient was included only once, we utilized a log comprising medical record numbers and visit dates during the study period. For patients with multiple visits, only data from their first qualifying encounter was used.

2.5 Sample Size Determination

We used a standard statistical formula to determine the minimum number of participants needed for the study involving psychiatric patients. This formula considers the desired level of precision (a 5% margin of error) and a high level of confidence (95%). Initially, we explored using an estimate of the expected proportion (prevalence) based on a previous study; however, this resulted in a lower minimum sample size than we deemed necessary. Due to a lack of specific knowledge about the prevalence of different routes to care in the target population, we opted for a more conservative approach. We used a neutral value of p= 0.5, q=0.5 (assuming an equal likelihood of using any route) in the formula, which yielded a minimum sample size of 384 participants. To account for potential dropouts, we added a 10% buffer, bringing the final target sample size to 423.

2.6 Sampling technique and procedure

This study employed systematic random sampling to select participants. Since hospital records indicated an average of 400 psychiatric patients visiting Dilla University Referral Hos-

pital each month, the total estimated population size (N) was 2000 (400 patients/month * 5 months). To ensure a representative sample, we used systematic random sampling. This method involves selecting participants at regular intervals throughout the population list. The interval size (k) was calculated by dividing the total population (N) by the desired sample size (n): k = N/n = 2000 patients/ 423 participants ≈ 5. Since a perfect interval of 4.7 wasn't feasible, we opted for every 5th patient on the list (k ≈ 5). Finally, to avoid bias in choosing the starting point, a random number between 1 and 5 was chosen using a lottery method. This random number determined the first participant on the list to be included in the sample, and then every 5th patient thereafter was selected until the target sample size was reached.

2.7 Study variable

The dependent variable in this study was non-psychiatric treatment seeking. The independent variables included various sociodemographic factors such as age, sex, marital status, religion, educational status, economic status, place of residence, and distance to a health facility. Additionally, clinical and psychosocial factors were considered as independent variables, including social support, perceived stigma, awareness of the availability of mental health services, perceived severity of illness, and diagnosis based on the DSM-5.

2.8 Operational Definitions/Measurements

Non-Psychiatric Treatment Seeking: A semi-structured, interviewer-administered questionnaire was developed for this study based on the pathway encounter form designed for the WHO collaborative study [25]. This tool collected data on the number of patients with mental disorders who sought services from various psychiatric providers in both the formal and informal sectors in Ethiopia. It allowed for an estimated comparison of individuals with mental disorders who consulted traditional healers, religious leaders (faith-based prayer), and medical care providers (general practitioners) before attending the outpatient unit at Dilla University Referral Hospital for mental health services. Non-psychiatric treatment seeking is defined as individuals who initially sought help from sources such as religious leaders, general practitioners, or traditional healers before reaching a mental health professional. Previous studies have employed a similar approach [23, 26].

Traditional Healer/Religious Leader: This term refers to herbalists and faith healers (Imams/Sheiks, Orthodox Church clergy, and Protestant pastors) found in the Gedeo Zone. Similar definitions have been used in prior studies [27, 28].

General Practitioner: A general practitioner is defined as a medical doctor who provides primary healthcare services, including the diagnosis and management of common medical conditions, and may also offer basic counseling or referrals for mental health concerns.

Social Support: The Oslo Social Support Scale (OSSS-3) was employed to measure social support [29]. The OSSS-3 assigns a total score ranging from 3 to 14, with scores of 3 to 8 indicating poor social support, 9 to 11 indicating moderate support, and 12 to 14 indicating strong social support. Prior research has demonstrated acceptable internal consistency for the OSSS-3 ($\alpha = 0.640$). This tool has also been successfully utilized in previous studies conducted in Ethiopian settings [30-33.

Time to Treatment: A semi-structured questionnaire was used to interview patients and their caregivers to assess time to treatment. Similar to a prior study conducted in Ethiopia, treatment was considered delayed if the reported duration of untreated illness exceeded the median/mean total duration reported in the sample [23, 33].

Awareness of Psychiatric Treatment Availability: Awareness was assessed using a single item with a "yes" or "no" option. Previous studies in Ethiopia have employed a similar assessment approach [33].

Mental Health Literacy: The 36-item Mental Health Literacy Tool (MHLT-36) assesses indi-

viduals' understanding of mental health. This standardized tool evaluates knowledge, attitudes, and beliefs about mental illness (34). MHLT-36 includes items that test the ability to recognize symptoms of common mental disorassessch as depression, anxiety, and schizophrenia, and assesses knowledge about causes, treatments, and prognosis. While it does not directly measure help-seeking behavior, it can indirectly gauge attitudes toward seeking professional help. Scoring is based on a four-point Likert scale, with higher scores indicating greater mental health literacy. The MHLT-36 has established reliability and validity across diverse populations (35-37) and has been used in previous studies in Ethiopia [27, 38-40].

Perceived Stigma Scale (PSS-4): This scale was used to assess individuals' perceptions of negative attitudes and beliefs toward people with mental illness (41). The PSS-4 consists of four core items that participants rate on a Likert scale to indicate their level of agreement. Some statements are reverse scored, meaning that strong disagreement results in a higher score. After reverse scoring, a total score is calculated by summing the scores across all four statements. Higher total scores indicate a stronger perception of stigma associated with mental illness. The PSS-4 has been established as a reliable and valid tool in various research settings and has been utilized in previous studies in Ethiopia.

2.9 Data collection procedure

Data was collected through face-to-face interviews using semi-structured questionnaires, which covered socio-demographic, clinical, and psychosocial factors, supplemented by document reviews. The data collection was carried out by three trained Bachelor of Science (BSc) degree holders in psychiatric nursing, who gathered information directly from the patients. To ensure the quality and consistency of the data collected, a two-day intensive training program was provided to these data collectors. This training included detailed explanations of the study objectives, ethical considerations (such as maintaining confidentiality and securing informed consent), and a thorough review of each questionnaire item to ensure consistent administration and accurate recording of responses. The entire data collection process was supervised by a Master of Science holder in mental health at the study site.

The questionnaire included scales and items detailed in the "Operational Definitions/Measurements" section, such as the Oslo Social Support Scale, MHLT-36, PSS-4, and specific items designed to assess non-psychiatric help-seeking, time to treatment, and awareness of the availability of psychiatric treatment. The English version of the questionnaire was carefully translated into Amharic, then into Gedeuffa (the local language) by a professional translator, and subsequently back translated into English by an independent translator to verify consistency and accuracy. Patients were approached for data collection during their visits to the psychiatry unit, with interviews conducted in a separate outpatient unit to ensure participant comfort and confidentiality. Before each interview, data collectors clearly explained the purpose of the study, ensured participants understood their right to withdraw at any time, and obtained informed consent.

2.10 Data Quality Control

The questionnaire was initially prepared in English and then translated into Amharic and Gedeuffa, the local language of the Gedeo Zone. To ensure consistency and clarity, the translated versions were back translated into English by two experts. Pre-testing was conducted on 5% of the sample size at Hawassa Comprehensive Specialized Hospital, and the feedback obtained from this pre-test was used to refine the final version of the questionnaire.

Data collectors and supervisors received training from the principal investigator on the questionnaire, data collection methods, quality control measures, and ethical considerations. The reliability of the questionnaire and participants' understanding were assessed. During data collection, site supervisors provided oversight. Once the data collection process was complete, the questionnaires were checked for completeness and consistency.

2.11 Data processing and analysis

The collected data were gathered using the Epi-Collect smartphone application and subsequently exported to SPSS version 26 for analysis. Crude and adjusted odds ratios were calculated to measure the association between independent variables and pathways to psychiatric care. Chi-square tests were employed for categorical independent variables to assess assumptions. Results were presented using frequency tables and charts, and the normality of the data was checked.

Descriptive statistics were reported using means and standard deviations for normally distributed numerical data. Both multivariable and bivariate logistic regression models were utilized to assess the association of independent variables with the dependent variable. Variables with a p-value of ≤ 0.025 in the bivariate logistic regression analysis were selected for inclusion in the multivariable logistic regression analysis. Variables with a p-value of <0.05 in the multivariable logistic regression analysis were considered statistically significant for non-psychiatric treatment seeking.

3 Result

3.1 Sociodemographic characteristics of study participants

The most common age group among participants was 31-40 years, accounting for 54.4% of the total. In terms of sex, there were slightly more males (50.6%) than females (49.4%). Just over half (53.2%) of the participants were married, while 28.6% were single. The majority identified as Protestant (61.2%), followed by Orthodox (22.5%) and Muslim (15.1%).

Regarding education, the largest group (44%) had completed elementary school, followed by those with a high school education (27.9%) and those holding a degree or higher (24.6%). The most common occupation was daily laborer (22.5%), followed by farmer (20.6%) and housewife (21.5%). Most participants (52%) reported a monthly income between 1001-3000 birr (see Table 1).

Table 1 Sociodemographic characteristics of study participants at Dilla University Referral Hospital, Gedeo Zone, South Ethiopia Region, 2023

Variable	Category	Frequency	Percent
Age (in year)	18-30	78	18.4
	31-40	230	54.4
	41-50	85	20.1
	≥51	30	7.1
Sex	Male	214	50.6
	Female	209	49.4
Marital status	Married	225	53.2
	Single	121	28.6
	Divorced	59	13.9
	Widowed	18	4.3
Religion	Orthodox	95	22.5
	Muslim	64	15.1
	Protestant	259	61.2
	Other	5	1.2
Educational Status	Unable to read and write	15	3.5
	Elementary school	186	44
	High school	118	27.9
	Degree and above	104	24.6
Occupational status	Jobless	31	7.3
	Daily laborer	95	22.5
	Farmer	87	20.6
	Private business	58	13.7
	Student	35	8.3
	Housewife	91	21.5
	Civil servant	26	6.1
Monthly income	0-1000birr	175	41.4
	1001-3000birr	220	52.0
	>3001	28	6.6

3.2 Distribution of participants' Demographics, Referral Sources, Treatment History, and Diagnoses

The study examined various factors related to mental health service utilization. Regarding the source of healthcare provider recommendations, the majority of patients (51.1%) were referred by family members, followed by former patients (15.6%), while 10.2% sought care independently. A significant proportion of patients (87.7%) did not have a referral letter, indicating a potential gap in access to formal healthcare.

Past mental health service utilization was reported by 39.2% of participants, suggesting a history of treatment. The most prevalent DSM-5 diagnoses included epilepsy (44.4%), schizophrenia (31.7%), and other psychotic disorders (9.5%). In terms of care settings, traditional healers were the most frequently accessed (42.3%), followed by religious leaders (40.2%), highlighting the importance of traditional and spiritual practices in mental healthcare seeking (see Table 2).

Table 2 Distribution of participant demographics, referral sources, treatment history, and diagnoses at Dilla University Referral Hospital, Gedeo Zone, South Ethiopia Region, 2023

Variables	Category	Frequency	Percent
Who recommended a healthcare provider	Patient himself	43	10.2
	Former patient	66	15.6
	Family	216	51.1
	Others	98	23.2
Does the patient have a referral letter	Yes	52	12.3
	No	371	87.7
Has the patient received mental health	Yes	166	39.2
services in the past	No	257	60.8
Diagnosis based on DSM-5	Schizophrenia spectrum disorder	174	41.2
	Major depressive disorder	25	5.9
	Bipolar Disorder	23	5.4
	Epilepsy	188	44.4
	Anxiety	13	3.1
Where did you receive care	Traditional healer	179	42.3
	Psychiatric service	31	7.3
	Religious leader	170	40.2
	General practitioner	43	10.2

3.3 Help-Seeking Behaviors, Perceived Causes of Mental Illness, and Treatment Utilization

The study examined factors influencing help-seeking behaviors and perceptions of mental illness among participants. Family members and relatives were identified as the primary referral sources, accounting for 52.2%, followed by neighbors (13.2%) and friends (13%). A small percentage sought help independently (4.3%) or based on recommendations from former patients or health professionals (4.3% each).

The most common reasons for seeking care were functional impairment and worsening illness, each representing 39.2% of cases. Other significant factors included suicidal behavior (13%) and aggressive behavior (8.5%). The main barriers to earlier help-seeking were financial difficulties (36.9%) and a lack of awareness about available mental health services (41.6%). Additional obstacles included the distance to services (11.6%) and financial constraints (36.9%).

Perceptions of mental illness varied widely. Commonly attributed causes included the evil eye (37.6%) and sinful acts (24.3%), with spiritual possession cited by 24.1%. A smaller percentage associated mental illness with stress (1.2%), family history (8.5%), or were unsure (4.3%).

In terms of care-seeking behaviors, traditional healers were the most frequently utilized service providers (42.3%), followed by religious leaders (40.2%). Access to psychiatric services and general practitioners was less common, at 7.3% and 10.2%, respectively.

Table 3 Help-seeking behaviors, perceived causes of mental illness, and treatment utilization among patients attending mental health services at Dilla University Referral Hospital, Gedeo Zone, South Ethiopia Region, 2023

Variables	Category	Frequency	Percent
Who recommended that you seek care?	Neighbor	56	13.2
	Family/relative	22	1 52.2
	Friends	55	13.0
	Patient himself	18	4.3
	Former patient	55	13.0
	Health professional	18	4.3
What was the main problem	Suicidal behavior	55	13.0
	Aggressive behavior	36	8.5
	Functional impairment	166	39.2
	Worsening illness	166	39.2
Reasons for not seeking care sooner	Financial difficulties	156	36.9
	Didn't know where to seek help	176	41.6
	Lack of mental health service	42	9.9
	Distance	49	11.6
Perceived causes of mental illnesses	Evil eye	159	37.6
	Sinful act	103	24.3
	Stress	5	1.2
	Spiritual possession	102	24.1
	Family history	36	8.5
	I don't know	18	4.3
Where did you receive care	Traditional healer	179	42.3
	Psychiatric service	74	7.3
	Religious leader	170	40.2
	General practitioner	43	10.2

3.4 Distribution of Beliefs about Cures, Treatments, Causes, and Severity of Mental Illness

The study examined participants' perceptions of mental illness. A majority of respondents (61.9%) believed that mental illnesses are not curable, while 33.8% were uncertain. In terms of treatment options, religious practices—such as prayer, exorcism, and holy water—were predominantly viewed as effective, accounting for 51.1% of responses. Traditional healing methods, including herbalism and witchcraft, were also widely recognized (41.6%), while a smaller proportion identified mental health professionals as viable treatment options (7.3%).

Participants had varied perceptions of who is susceptible to mental illness. A significant portion associated mental illness with substance use (36.4%), while others identified individuals experiencing crises (30.7%) and those exhibiting anger or stress (13.5%) as at risk. Additionally, 17% of respondents viewed overthinking as a potential risk factor.

The perceived severity of mental illnesses was predominantly high, with 66.7% rating them as highly severe and an additional 17% as very severe. Stigma associated with mental illness was pronounced, with a combined 96.5% of respondents acknowledging some level of shame related to the condition. Only a small minority (3.6%) did not perceive mental illness as shameful.

Table 4 Distribution of beliefs about cures, treatments, causes, and severity of mental illness among study participants at Dilla University Referral Hospital, Gedeo Zone, South Ethiopia Region, 2023

Variables	Category	Frequency	Percent
Are mental illnesses curable?	Yes	18	4.3
	I am not sure	143	33.8
	No	262	61.9
Which treatment can be used to treat mental illness?	Mental health professional	31	7.3
	Church for prayer/Exorcise	156	36.9
	Holy water	60	14.2
	Traditional healer/herbalist	85	20.1
	Traditional healer/witchcraft	91	21.5
Which kinds of people are affected by mental illnesses?	People with crisis	130	30.7
	Angry and stressed	57	13.5
	People who use drugs	154	36.4
	Those who think a lot	72	17.0
	Others	10	2.4
Perceived severity of mental illnesses	Less severe	13	3.1
	Severe	56	13.2
	Highly severe	282	66.7
	Very highly severe	72	17.0
Perception of mental illness	Very highly shameful	68	16.1
	Highly shameful	180	42.6
	Shameful	160	37.8
	Not as such shameful	10	2.4
	Not at all shameful	5	1.2

3.5 Distribution of treatment type, Social Support, Mental Health Literacy, and Perceived Stigma

Most participants (92.7%) sought non-psychiatric treatment as their initial point of contact for mental health concerns, while a smaller proportion (7.3%) directly accessed psychiatric services. In terms of treatment timeliness, a significant number of participants (68.3%) sought help early, whereas 31.7% experienced delays in initiating treatment.

Social support varied among participants, with a large proportion reporting poor social support (69.3%). A smaller percentage indicated intermediate (28.8%) or strong social support (1.9%). Mental health literacy levels were relatively balanced, with 50.4% of participants scoring low in mental health literacy and 49.6% scoring high. Awareness of available mental health services was notably low, with 88.2% of participants unaware of such resources.

Perceived stigma towards mental illness was prevalent, as 43.5% of participants reported high levels of stigma. Additionally, a significant majority (75.9%) lived more than 5 kilometers away from a health facility, which could potentially affect access to care.

3.6 The magnitude of Non-psychiatric and Psychiatric treatment-seeking

A substantial majority of individuals experiencing mental disorders in this study sought treatment from non-psychiatric sources as their initial point of care. Specifically, 92.7% of participants (95% Confidence Interval: 89.9% - 95%) reported consulting traditional healers, religious leaders, or general practitioners as their first point of contact for addressing mental health concerns. This finding highlights the significant role these providers play in mental health service utilization within the study population.

Table 5 Distribution of treatment type, time to treatment, social support, mental health literacy, and perceived stigma among participants attending mental health services at Dilla University Referral Hospital, Gedeo Zone, South Ethiopia Region, 2023

Variable	Category	Frequency	Percent
Treatment sought as first point contact	Non-psychiatric treatment	392	92.7
	Psychiatric Treatment	31	7.3
Time to treatment	Early comer to treatment	289	68.3
	Delayed to treatment	134	31.7
Social Support	Poor social support	293	69.3
	Intermediate social support	122	28.8
	Strong social support	8	1.9
Level of mental health literacy	Low MHL score	213	50.4
	High MHL score	210	49.6
Awareness about the availability of mental health service	Yes	50	11.8
	No	373	88.2
Perceived stigma	High	184	43.5
	Low	239	56.5
Distance from health facility	≤5Km	102	24.1
	>5Km	321	75.9

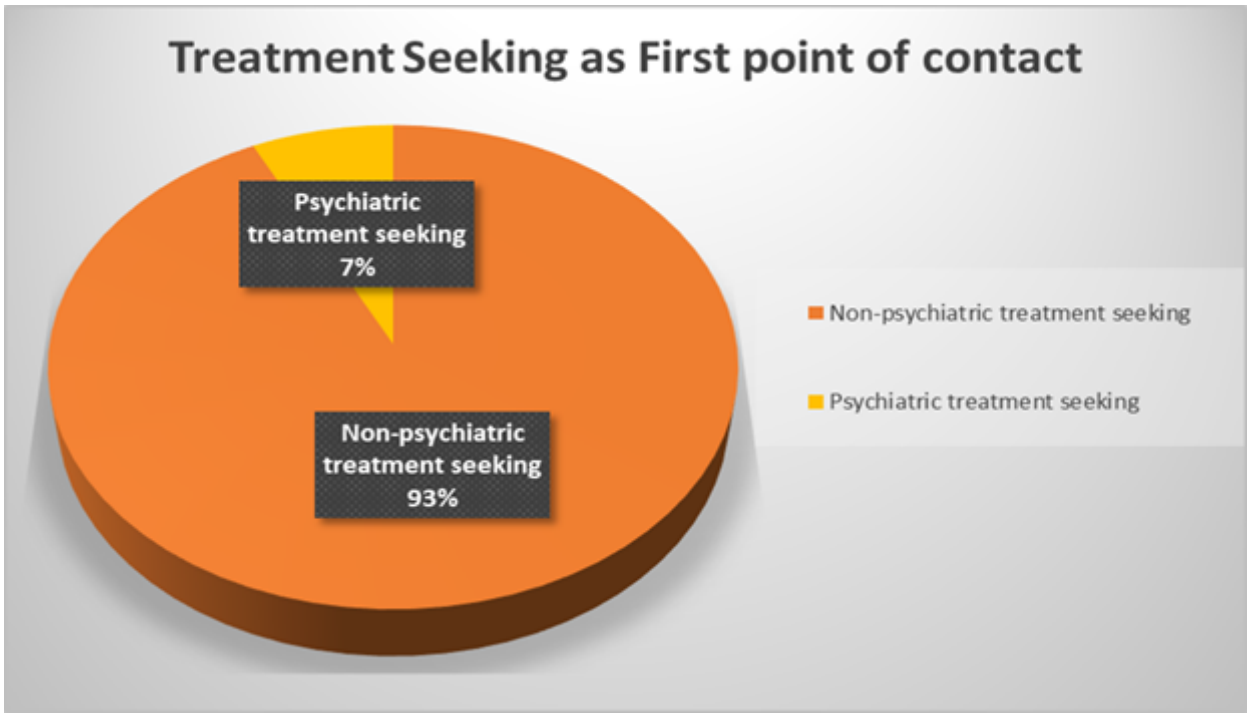

Figure 1 Showing the magnitude of Non-psychiatric treatment seeking among study participants at Dilla University Referral Hospital, Gedeo Zone, South Ethiopia Region, Ethiopia, 2023

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Table 6 Description of bivariable and multivariable binary logistic regression analysis showing the association between non-psychiatric care seeking and associated factors among study participants at Dilla University, Gedeo Zone, South Ethiopia Region

Variables	Category	Treatment sought as first contact		Crude Odd Ratio (95% CI)	Adjusted Odd Ratio (95% CI)	P-Value
		Non-psychiatric treatment	psychiatric treatment			
Age (in year)	18-30	66	12	4.81(1.871 , 12.380)	4.28(2.178, 10.635)*	0.01
	31-40	5	226	0.019(0.006 , 0.061)	0.012(0.007, 0.050)*	0
	41-50	5	79	0.055(0.017 , 0.176)	0.031(0.021, 0.146)*	0
	≥51	16	14	1		
Sex	Male	39	165	1	1	
	Female	79	130	2.57(1.644 , 4.021)	2.30(1.767, 3.742)	0.000
Educational Status	Unable to read and write	8	7	3.6 (1.191, 10.954)	3.2(1.423, 9.164)*	0.01
	Elementary school	61	125	1.54(0.895 , 2.657)	1.34(0.977, 2.434)	0.06
	High school	28	90	0.98(0.530, 1.824)	0.89(0.585, 1.652)	0.47
	Degree and above	25	79	1	1	
Diagnosis based on DSM-5	Schizophrenia spectrum disorder	120	54	3.55(1.112 , 11.371)	3.12(1.340, 9.433)*	0.01
	Major Depressive disorder	10	15	1.06(0.270 , 4.216)	0.89(0.337, 3.380)	0.46
	Bipolar Disorder	16	7	3.65(0.878 , 15.242)	3.17(1.104, 12.116)*	0.03
	Epilepsy	7	181	0.06(0.016 , 0.238)	0.04(0.020, 0.192)	0.000
	Anxiety Disorder	5	8	1	1	
Social Support	Poor social support	223	70	5.30(1.238 , 22.779)	4.90(1.562, 18.024)*	0.01
	Intermediate Social support	22	100	0.36(0.081 , 1.650)	0.32(0.104, 1.295)	0.09
	Strong social support	5	3	1	1	
Mental health literacy level	Low	173	40	3.9(2.538 , 6.091)	3.53(2.723, 5.677)*	0
	High	110	100	1	1	
Monthly Income	0-1000ETB	100	75	3.33(1.393 , 7.979)	3.01(1.602, 6.934)*	0.000
	1001-3000ETB	50	160	0.78 (0.324 , 1.882)	0.67(0.374, 1.634)	0.2
	≥3001ETB	8	20	1	1	
Awareness about the availability	Yes	33	17	1	1	
of psychiatric treatment	No	300	73	2.11(1.118 , 4.009)	2.00(1.239, 3.618)*	0.01
Perceived Stigma	High	134	50	3.14(2.080 , 4.748)	3.00(2.223, 4.443)*	0
	Low	110	129	1	1	
Distance from health facility	≥5km	72	30	2.37(1.441 , 3.925)	2.16(1.562, 3.621)*	0.000
	<5km	111	110	1	1	

NB: Hosmer and Lemeshow test result was p-value=0.65, * indicating factors with significant association.

3.7 Factors associated with non-psychiatric treatment-seeking

This study revealed significant disparities in help-seeking behaviors among patients with mental health conditions. Individuals aged 18-30 were significantly more likely (AOR = 4.28, 95% CI = 2.178-10.635, p <0.01) to seek non-psychiatric treatment compared to those aged 41-50. Similarly, women were twice as likely (AOR = 2.30, 95% CI = 1.767-3.742, p = 0.000) as men to opt for non-psychiatric care.

Educational status also influenced help-seeking patterns. Those unable to read and write were three times more likely (AOR = 3.2, 95% CI = 1.423-9.164, p = 0.01) to seek non-psychiatric treatment compared to individuals with a degree or higher. Regarding diagnosis, individuals with schizophrenia spectrum disorder (AOR = 3.12, 95% CI = 1.340-9.433, p = 0.01) and bipolar disorder (AOR = 3.17, 95% CI = 1.104-12.116, p = 0.03) were significantly more likely to seek non-psychiatric treatment than those with anxiety disorder.

Patients with poor social support (AOR=4.90, 95% CI = 1.562-18.024, p=0.01) and low mental health literacy (AOR = 3.53, 95% CI = 2.723-5.677, p = 0.00) were also more inclined to choose non-psychiatric treatment. Furthermore, individuals with lower monthly income (AOR = 3.01, 95% CI = 1.602-6.934, p = 0.000) and limited awareness of psychiatric services (AOR = 2.00, 95% CI = 1.239-3.618, p = 0.01) were more likely to seek non-psychiatric care. Lastly, those with high perceived stigma (AOR = 3.00, 95% CI = 2.223-4.443, p = 0.00) and those residing more than 5 kilometers from a health facility (AOR = 2.16, 95% CI = 1.562-3.621, p = 0.000) were also more likely to opt for non-psychiatric treatment.

4 Discussion

A significant majority of individuals in this study sought non-psychiatric treatment as their initial point of care for mental health concerns. Despite the prevalence of mental disorders, an impressive 92.7% (95% Confidence Interval: 89.9% - 95%) of participants initially turned to traditional healers, religious figures, or general practitioners rather than specialized psychiatric services. This finding underscores the critical role these providers play in mental healthcare within the study population and highlights the need for a comprehensive understanding of the factors influencing this trend.

The study further explores characteristics associated with seeking non-psychiatric treatment, examining variables such as age, gender, education, diagnosis, social support, mental health literacy, income, awareness of psychiatric services, perceived stigma, and geographic location. The aim is to identify key determinants of this healthcare-seeking behavior.

The current study reveals a substantial reliance on non-psychiatric treatment for mental health issues, with 92.7% of participants initially seeking care from traditional or religious healers or general practitioners. This figure is notably higher than previous research in Ethiopia. For instance, a study at Mekele Comprehensive Specialized Hospital reported that 77.5% of participants utilized religious healers or traditional medicine, while another study at Amanuel Mental Specialized Hospital found a lower rate of 59% seeking non-psychiatric care.

This disparity may be due to several factors, particularly the geographic location of the hospitals. Amanuel Mental Specialized Hospital, located in Addis Ababa, the capital city, likely attracts a higher proportion of individuals with severe mental health conditions who are aware of specialized psychiatric services, resulting in lower reliance on non-psychiatric care.

Furthermore, the high prevalence of non-psychiatric treatment-seeking in this study (92.7%) is considerably greater than that reported in a study conducted in Ghana, where 47.7% of participants sought non-psychiatric care. Several factors may account for this discrepancy. The disparity in healthcare infrastructure between Ethiopia and Ghana could significantly influence treatment-seeking behaviors, as Ethiopia may have more limited access to specialized mental health services, particularly

in rural areas, driving individuals toward traditional and religious healers for care. In contrast, Ghana might have a more developed mental health system, offering greater accessibility to psychiatric care.

Cultural and socio-economic factors also play a pivotal role. The strong influence of traditional and religious beliefs in Ethiopian society may foster a preference for non-psychiatric treatment options, while Ghana might have a more balanced integration of Western medicine and traditional practices, reducing reliance on non-psychiatric care.

Additionally, this study reveals a notably high rate of non-psychiatric treatment-seeking (92.7%) among participants, contrasting with findings from Bangladesh (84%) and Central India (69%), suggesting significant regional disparities in help-seeking behaviors for mental health issues. Factors contributing to these differences warrant further exploration, including variations in cultural attitudes toward mental illness, accessibility of psychiatric care, and socio-economic conditions.

The finding that 92.7% of participants in this Ethiopian study sought non-psychiatric treatment aligns closely with research conducted in Bali, Indonesia, which reported a similarly high rate of 87% for initial help-seeking from non-psychiatric services. These comparable findings suggest that reliance on non-psychiatric care for mental health issues may be a common phenomenon across various cultural and socio-economic contexts.

Our findings indicate that individuals aged 18-30 were significantly more likely to seek non-psychiatric treatment compared to those aged 41-50. This observation aligns with previous research highlighting adolescents' avoidance of professional mental health services. To address this, interventions targeting young adults should prioritize early identification of mental health concerns, reduce stigma associated with seeking professional help, and enhance the accessibility and acceptability of mental health services for this age group.

The study found that women were twice as likely as men to seek non-psychiatric treatment for mental health issues. This aligns with a study conducted in Singapore, which reported a higher likelihood of women seeking help from non-psychiatric providers, such as traditional healers, for mental health concerns. This gender disparity underscores the need for gender-sensitive interventions. Tailored mental health services, including community-based programs that address cultural and gender-specific beliefs, may be crucial in increasing help-seeking among women and improving access to appropriate care for both genders.

Our findings reveal a significant disparity in non-psychiatric treatment-seeking behavior based on educational attainment. Individuals with no formal education were three times more likely to utilize non-psychiatric treatment options compared to those with a degree or higher. This observation aligns with a study in South Africa that identified a correlation between lower educational levels and a preference for non-psychiatric providers. These results underscore the need for targeted interventions to improve access to mental healthcare among less educated populations.

The study indicates that individuals with schizophrenia or bipolar disorder were significantly more likely to seek non-psychiatric treatment than those with anxiety disorder. This aligns with previous research highlighting the disproportionate use of traditional healers by individuals with severe mental illness (SMI). The complex symptoms and treatment challenges associated with schizophrenia and bipolar disorder may contribute to greater reliance on alternative care providers, potentially resulting in delays in accessing evidence-based psychiatric care.

Our findings underscore the role of mental health literacy and awareness of psychiatric services in shaping help-seeking behaviors. Individuals with low mental health literacy were 3.5 times more likely to opt for non-psychiatric treatment compared to their more informed counterparts. Similarly, those with limited knowledge about available psychiatric treatment were twice as likely to seek alternative care. These results

highlight the impact of community misconceptions about mental disorders and the reliance on traditional healing as barriers to appropriate care. Comprehensive interventions are imperative, prioritizing mental health literacy through community-based education programs that emphasize the nature of mental illnesses, available treatment options, and the importance of seeking professional help. Additionally, increasing the accessibility and visibility of psychiatric services is essential, which can be achieved by expanding mental health infrastructure and integrating services into primary care settings.

Our findings also indicate a strong association between perceived stigma and help-seeking behaviors. Individuals with high perceived stigma were three times more likely to seek non-psychiatric treatment compared to those with lower stigma. These results support previous research suggesting that perceived stigma drives individuals with mental health issues to avoid specialized psychiatric care. To effectively address this, it is crucial to implement strategies that destigmatize mental illness, such as public education campaigns that challenge negative stereotypes and promote understanding. Increasing accessibility to mental health services and reducing barriers to care are essential steps to ensure individuals receive the appropriate support they need.

Finally, we found a strong association between geographical accessibility to healthcare facilities and treatment-seeking behavior for mental health conditions. Individuals living more than 5 kilometers from a health facility were twice as likely to opt for non-psychiatric care compared to those living closer. This corroborates previous studies suggesting that proximity to mental healthcare services influences treatment preferences, with patients often favoring more accessible options like non-psychiatric treatment. To enhance access to mental healthcare, strategies should focus on improving geographical accessibility by expanding the network of mental health facilities in underserved areas. Additionally, implementing mobile mental health services and exploring telehealth interventions can bridge the gap for individuals in remote regions.

In summary, this study found a significantly high prevalence of non-psychiatric treatment seeking for mental health issues, particularly among young individuals, women, those with lower education, and people with severe mental illnesses. Factors such as limited access to psychiatric care and perceived stigma contributed to this trend.

Study strengths and limitations

The current study contributes to the growing body of literature on non-psychiatric help-seeking behaviors among individuals with mental health issues in Ethiopia by providing valuable insights into the prevalence and associated factors among patients attending Dilla University Referral Hospital. The study's large sample size enhances the generalizability of the findings. Additionally, the inclusion of various sociodemographic and clinical variables allowed for a comprehensive exploration of factors influencing non-psychiatric help-seeking.

However, the study has certain limitations. Being a cross-sectional design, it cannot establish causality between the identified factors and non-psychiatric help-seeking behaviors. Moreover, the study was confined to patients attending a single hospital, which may limit the generalizability of the findings to other settings. Additionally, the reliance on self-reported data may be subject to recall bias. Future longitudinal studies with a larger sample size and incorporating qualitative methods are recommended to further explore the complex interplay of factors influencing non-psychiatric help-seeking behaviors.

5 Conclusion

This study revealed a high prevalence of non-psychiatric help-seeking among patients with mental disorders. Several factors were significantly associated with non-psychiatric help-seeking, including young age, female gender, lower educational status, diagnosis (schizophrenia spectrum and bipolar disorder), poor social support, low mental health literacy, low-income status, lack of awareness about available psychiatric services, perceived stigma, and residing more than 5 kilometers from a health facility.

Understanding these factors is crucial for developing targeted interventions to improve access to and utilization of appropriate mental healthcare services.

Recommendation

The high prevalence of non-psychiatric help-seeking among patients with mental health conditions at Dilla University Referral Hospital underscores the need for targeted mental health interventions. To address the identified factors, we recommend the following:

Firstly, to improve low mental health literacy and limited awareness of available mental health services, it is important to conduct regular panel discussions with community members. Additionally, capacity building through targeted training for health extension workers on mental health packages is crucial. While this package has recently been integrated into health extension services, specific training for these workers has not yet been provided. This intervention will enhance early detection and referral of patients at the grassroots level.

Secondly, to address issues of poor social support and low-income status that contribute to affordability challenges, advocacy and awareness campaigns promoting the utilization of health insurance are essential. These efforts can help mitigate the financial barriers that drive patients towards non-psychiatric care.

Lastly, to overcome geographical accessibility challenges, it is vital to draw governmental attention to facilitate the establishment of mental health services within primary healthcare settings, specifically in primary hospitals and health centers.

These concrete actions will collectively strengthen the mental health service delivery system, improve access to appropriate care, and ultimately reduce non-psychiatric help-seeking behaviors.

Abbreviations

AOR	Adjusted Odds Ratio
BSc	Bachelor of Science
CHMS	College of Health and Medical Sciences
CI	Confidence Interval
COR	Crude Odds Ratio
DU	Dilla University
DURH	Dilla University Referral Hospital
DSM-5	Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition
OSSS-3	Oslo Social Support Scale
MHLT	Mental Health Literacy Tool
PSS	Perceived Stigma Scale
SPSS	Statistical Package for Social Sciences

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Authors' contributions

All authors significantly contributed to the published work, including the generation of ideas, study design, execution, data collection, analysis, and interpretation. MN prepared the manuscript for publication and participated in writing, revising, and critically evaluating the article. MN also gave final approval for the version to be published, agreed to the journal for submission, and accepted responsibility for all aspects of the work. Therefore, all authors have contributed to the article and approved the submitted version.

Availability of data and materials

The data sets used and/or analyzed during the current study are available from the corresponding authors upon reasonable request.

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Declarations

Ethics approval and consent to participate

Ethical approval was obtained from the Institutional Review Board (IRB) of Dilla University College of Medicine and Health Sciences prior to conducting the study. Participants provided informed consent after being informed about the study's purpose. Personal identification was kept confidential throughout the study, and participants were assured that they could withdraw from the study at any time if they wished.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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RESEARCH ARTICLE

Sexually Transmitted Infections Treatment Seeking Behaviour and Associated Factors among Symptomatic Students in Hawassa Teacher's education Colllege, South Ethiopia:A cross sectional study

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Abstract

Background: Sexually transmitted infections (STIs) pose a significant public health challenge globally, impacting quality of life and leading to severe illness and mortality. While treatment-seeking behavior is critical for disease prevention and management, there is limited data on this behavior and its influencing factors in the study area.

Objective: To evaluate treatment-seeking behavior and associated factors for STIs among symptomatic students at Hawassa Teachers Education College, Southern Ethiopia.

Methods: An institution-based cross-sectional study design was employed, involving 415 students selected through simple random sampling. Data were entered using Epi-data version 3.1 and analyzed with Statistical Package for Social Science version 25. Bivariate and multivariable binary logistic regression analyses were conducted to identify variables significantly associated with the outcome, using Adjusted Odds Ratios (AOR) and 95% Confidence Intervals (CI). A p-value of $\leq$ 0.05 was considered statistically significant.

Results: The prevalence of treatment-seeking behavior was 47.2% (95% CI: 42.3-52.2). Factors significantly associated with treatment-seeking behavior included: female sex (AOR: 0.16, 95% CI: 0.06-0.46), students earning pocket money of 1501-2000 birr (AOR: 3.22, 95% CI: 1.19-8.66), preference for self-treatment (AOR: 0.20, 95% CI: 0.07-0.61), comfort in expressing symptoms to health professionals (AOR: 2.76, 95% CI: 1.01-7.59), and poor knowledge of STIs (AOR: 0.32, 95% CI: 0.11-0.92).

Conclusion: The prevalence of treatment-seeking behavior among students was low. Factors such as sex, financial resources, perception of disease burden, privacy concerns, and STI knowledge were significantly associated with treatment-seeking behavior. It is recommended to discourage self-treatment and embarrassment while enhancing participants' knowledge about STIs.

Keywords: Hawassa education college, Southern Ethiopia, Treatment-seeking behaviour, STIs, associated factors

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1 Introduction

1.1 Background

Sexually transmitted infections (STIs) represent a major public health challenge worldwide, adversely affecting quality of life and leading to serious illness and death [1]. STIs significantly impact the physical, mental, and social health of children, adolescents, and adults globally [2]. Some STIs directly influence reproductive and child health by causing infertility, genital cancer, and negative pregnancy outcomes [3]. Additionally, they indirectly affect health by facilitating the sexual transmission and acquisition of the Human Immunodeficiency Virus (HIV) [4].

Every day, more than 1 million people worldwide contract an STI that can be treated [5]. However, among high-risk groups, the prevalence of STIs has been reported to range from 3.5% to 12% [6]. Demographic and Health Surveys conducted in 20 countries in Sub-Saharan Africa indicate that up to 11% of female and 16% of male adolescents reported having an STI in the 12 months prior to the surveys [7]

Several studies from Ethiopia have highlighted the prevalence of risky sexual behavior among school-age youth and university students, which increases their vulnerability to STIs [8-12]. According to the national reproductive health report of 2006, the highest infection rates in the country are currently observed among young women aged 15 to 24 [13].

Individual behavior is typically understood as a product of a person's personality, the environment in which they live, and the interactions between these factors [14]. Treatment-seeking behavior refers to any action taken by individuals who believe they are susceptible to a health issue or are unwell in order to find appropriate treatment [15]. Without effective treatment-seeking behavior, patients may carry infections for extended periods, increasing the risk of comorbidities, complications, or even related mortality [16]. Achieving good treatment-seeking behavior is challenging, as it is influenced by a decision-making process shaped by individual and household behaviors, community norms and expectations, and provider-related characteristics [17].

In 2016, the World Health Organization (WHO) released its Global Health Sector Strategy on STIs, aiming for zero new infections, zero STI-related complications and deaths, and zero discrimination. The vision is a world where everyone has free and easy access to STI prevention and treatment services, enabling people to live long and healthy lives. The goal is to end STI epidemics during the period from 2016 to 2021 [18].

Even though developing countries are included in this agenda, they face numerous challenges in controlling STIs, including a lack of accurate data, high incidence and prevalence in certain populations, a high rate of complications and sequelae, significant issues with antibiotic resistance, a dramatic interaction with HIV infection, substantial socioeconomic impacts, and insufficient or nonexistent control programs [19].

Self-medication with antibiotics or other methods is another contributing factor; self-treatment using ineffective techniques can prolong the period of infection before appropriate treatment is received and may lead to the emergence of resistant strains [20]. Service providers worldwide utilize etiologic, clinical, and syndromic diagnostic techniques (e.g., diagnosing based on symptoms like genital ulcers). However, the majority of developing countries primarily rely on syndromic methods due to resource constraints [18]. Ethiopia has adopted the syndromic approach since 2001, aligning with WHO general recommendations as its national STI control guidelines [3]

HIV and STIs significantly amplify each other, exhibiting epidemiological synergism; STIs facilitate HIV transmission, while HIV contributes to the spread of other STIs by prolonging their duration and infectiousness [21]. Therefore, early and effective treatment and control of STIs are crucial for preventing HIV transmission. Achieving effective treatment-seeking behavior is a vital component of disease prevention, early diagnosis, and management, helping to reduce costs, morbidity, and disease-related mortality [22].

In developing countries, STIs and their complications rank among the top five disease categories for which adults seek health care [24]. The incidence, burden, and distribution of STIs in Ethiopia are generally comparable to those in other developing countries [25, 27]. STIs compromise not only the quality of life but also the sexual and reproductive health of mothers, newborns, and children. STIs during pregnancy can have serious consequences for both mothers and infants [28, 29].

A variety of risk factors contribute to young people's exposure to STIs, including physiological and behavioral factors, cultural or social influences, lack of knowledge about the transmission and contraction of sexually transmitted diseases (STDs), difficulties accessing prevention services, inadequate adult supervision, and the number of sexual partners [30].

The 2016 Ethiopian Demographic and Health Survey indicates that 66.7% of women and 64.6% of men who experienced STIs or STI symptoms in the 12 months prior to the survey did not seek any advice or treatment [27].

In Ethiopia, various interventions have been implemented to reduce the burden of STIs, including promoting male circumcision, screening and early treatment for pregnant mothers during antenatal care (ANC) follow-ups, improving access to health care, and HIV screening programs [31]. Despite these efforts, the prevalence of STIs and HIV remains high in the country [3]. This suggests that, despite available services, many young people struggle with seeking treatment for STIs due to one or more distinct barriers.

Consequently, it is important to examine the factors influencing students' treatment-seeking behavior to address their health challenges related to diseases that disproportionately affect them. While several studies have explored the prevalence of STIs and associated factors in various regions of Ethiopia, there have been relatively few investigations into how college students seek treatment for symptomatic STIs. Therefore, this study aims to assess treatment-seeking behavior and associated factors among students at Hawassa Teachers College of Education. The findings and recommendations will be valuable for developing appropriate health interventions to prevent the spread of STIs and HIV/AIDS in high-risk settings like colleges and universities, serving as a resource for researchers and program developers.

2 Methods and Materials

2.1 Study setting and period

This study was conducted among students at Hawassa Teachers Education College, one of the oldest public colleges in Hawassa. The city is situated 268.4 kilometres south of Addis Ababa, the capital of Ethiopia. Hawassa Teachers Education College is in the heart of the city. According to the college registrar, during the 2021/2022 academic year, there were 2,446 students enrolled, comprising 1,817 males and 629 females. The college hosts four active student clubs, including two focused on Gender and HIV/AIDS. Additionally, there is a student clinic and a separate sexual and reproductive health clinic within the college. The study was conducted from October 17 to December 11, 2021, at Hawassa Teachers Education College, Southern Ethiopia.

2.2 Study design

The school-based cross-sectional study design was employed.

2.3 Source population

All regular program students who had experienced the symptoms of STIs were the source population.

2.4 Study population

Students enrolled in the regular program and who had STIs symptom during the study period.

2.5 Inclusion and exclusion criteria

All regular program students who reported STI symptoms during a one-year recall period were included in the study. Students who reported STI symptoms but were unable to communicate

or were absent during the data collection period were excluded.

2.6 Sample size and sampling techniques

Sample size determination

The sample size for the quantitative portion of the study was calculated using a single population proportion formula based on the following assumptions: a proportion (p) of 56.8% from a study conducted in Gambella town, Ethiopia, a margin of error (d) of 5%, and a confidence level (Cl) of 95%. Additionally, a 10% non-response rate was factored in, resulting in a maximum calculated sample size of 415.

$n = \frac{(z_{\alpha/2})^2 P(1-P)}{d^2} = 378$, adding 10% [38] non-response rate = 415.

Where: n=the desired sample size, z=1.96 which corresponds to 95% confidence level

P=56.8% from the study conducted in Gambella town, Ethiopia, d=5%, which is the margin of error, q=1-p = 0.44

Sample size was also calculated using factors affecting treatment seeking behaviour (self treatment) 35.3% in southern Ethiopia, 10 non response rate. Then the sample size was 385. The largest sample, 415 was used for this study.

Sampling Techniques

A survey was conducted among students at Hawassa Teachers Education College to identify those who reported experiencing STI symptoms in the past 12 months. A simple random sampling technique was then employed to select study participants from the students who identified as STI symptom positive during the survey. Out of a total of 2,446 regular students, 2,300 were reached, and 532 were identified as having STI symptoms in the past year. From this group, 415 students were randomly selected for the study (see Figure 1).

2.7 Variables of the study

Dependent variable

Treatment-seeking behavior (Yes/No)

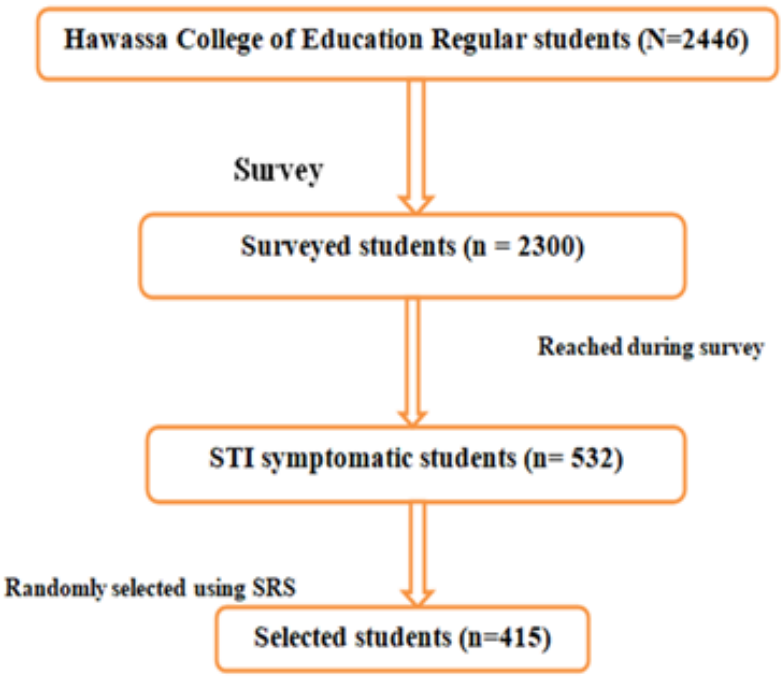

Figure 1 Schematic representation of the sampling procedure for different objectives for the study of treatment-seeking behaviour among college students in Hawassa education college students, 2021

Independent variables

The independent variables in this study include socio-demographic factors (such as sex, marital status, religion, level of education, and economic status), perceived severity of illness, use of traditional medicine and self-medication, cost of healthcare services, the approach of healthcare professionals (HCPs), privacy concerns, and the duration of illness. Additional independent variables include past sexual history, self-reported STIs, STI history, comprehensive knowledge of HIV, presence or absence of STI symptoms, and the source of service (e.g., governmental hospital, private clinic, pharmacy, or traditional healer).

2.8 Data collection tools and procedures

Data were collected using a structured, self-administered questionnaire. The questionnaire focused on socio-demographic characteristics, health system factors, past sexual history, previous sexually transmitted diseases, knowledge-related factors, and personal behavioral characteristics. Five trained master's students collected the data under the supervision of the researcher. A structured, self-administered Amharic questionnaire was distributed to 415 randomly selected students, with oversight provided by the data collectors and overall supervision by the principal investigator.

2.9 Data quality control

The questionnaire and consent documents were initially developed in English and subsequently translated into Amharic for data collection. To ensure consistency, subject matter experts retranslated the questionnaire back into English in collaboration with a translation expert. Necessary corrections were made accordingly. Data collectors and supervisors received two days of training prior to the actual data collection. Overall supervision was provided by the researcher. Questions were reviewed daily by supervisors and the lead investigator for completeness and consistency, and feedback was given to data collectors the following morning.

2.10 Operational definition

Behaviour: Is defined as the internally coordinated responses of individuals and groups to an external or internal stimulus that is variable [14].

Treatment-seeking behaviour: This is the process of seeking treatment in individuals' use of formal healthcare facilities to improve perceived illness [15].

Sexually transmitted infections (STI): This study evaluates treatable syndromic sexually transmitted infections (STIs) based on self-reporting.

Delay in seeking health care: Waiting more than seven days without seeking treatment [31].

The male student was considered STIs positive: If he reported one or more of the following syndromes: a history of Genital ulcer or sores, urethral discharge, scrotal swelling, inguinal bubo syndromes in the past 12 months before data collection [10].

A female student was considered STIs positive: If she reported one or more of the following syndromes: abnormal vaginal discharge, genital ulcer or sores, and lower abdominal pain syndromes in the past 12 months before data collection [10].

Knowledge of STIs and HIV/AIDS: Students who scored the mean or above on knowledge assessment questions were considered to have a good knowledge of sexually transmitted diseases and HIV/AIDS, while students who scored below the mean were considered to have poor knowledge [9].

2.11 Data processing and analysis

Data were checked for completeness, coded, and entered Epi-data version 3.1, then exported to SPSS version 25.0 for analysis. Multicollinearity was assessed using the variance inflation factor (VIF), which was found to be below 8.6. The Hosmer-Lemeshow model fitness test indicated a p-value of 0.75. Frequencies and percentages were used to summarize descriptive statistics. Bivariate and multivariable binary logistic regression analyses were conducted to identify variables associated with treatment-seeking behavior for STIs among students at Hawassa Teachers

Education College. Variables with a p-value of less than or equal to 0.25 in bivariate analysis were included in the multivariable logistic regression. Finally, variables with an adjusted odds ratio (AOR), 95% confidence interval (CI), and a p-value of less than or equal to 0.05 were considered to have a significant association. Results were presented using text, tables, and figures.

3 Results

3.1 Socio-demographic characteristics of participants

Out of the 415 students recruited for the study, all 415 completed the questionnaire, resulting in a response rate of 100%. Nearly half of the participants were female, and most respondents reported their marital status as single (Table 1).

Table 1 Socio-demographic characteristics of college students in Hawassa Teachers education college students, 2021 (n= 415)

Characteristics	Category	Frequency	Percent (%)
Sex	Male	233	56.1
	Female	182	43.9
Marital status	Single	338	81.4
	Married	58	14
	Divorced	19	4.6
Age	19-23	202	48.7
	24-28	213	51.3
Education	Year one Student	57	13.7
	Second year Student	245	59
	Third year Student	113	27.2
Religion	Protestant	199	48
	Orthodox	132	31.8
	Islam	74	17.8
	Others	10	2.4
Pocket money	1000-1500	228	54.9
	1501-2000	185	45.1

Note: *other = catholic, Adventist.

3.2 Knowledge level of respondents on STIs and HIV/AIDS

Only two hundred fifteen (51.8%) and two hundred twenty-five (54.2 %) of the study participants were assessed as having good knowledge of STIs and HIV/AIDs respectively (figure 2).

3.3 Respondent's history of sexually transmitted infections

One hundred ninety-seven participants (47.5%) reported a history of STIs. Among those with a history, 103 (52.3%) had one episode of exposure, while 94 (47.7%) reported two or more episodes of exposure.

3.4 Barriers to seeking treatment for sexually transmitted infections

Three hundred fifteen participants (75.9%) reported that the cost of services influenced their treatment-seeking behavior. Additionally, 214 participants (51.6%) indicated that the approach of healthcare professionals negatively impacted their treatment-seeking behavior, while 189 participants (45.5%) expressed concerns about the confidentiality of information shared with health professionals.

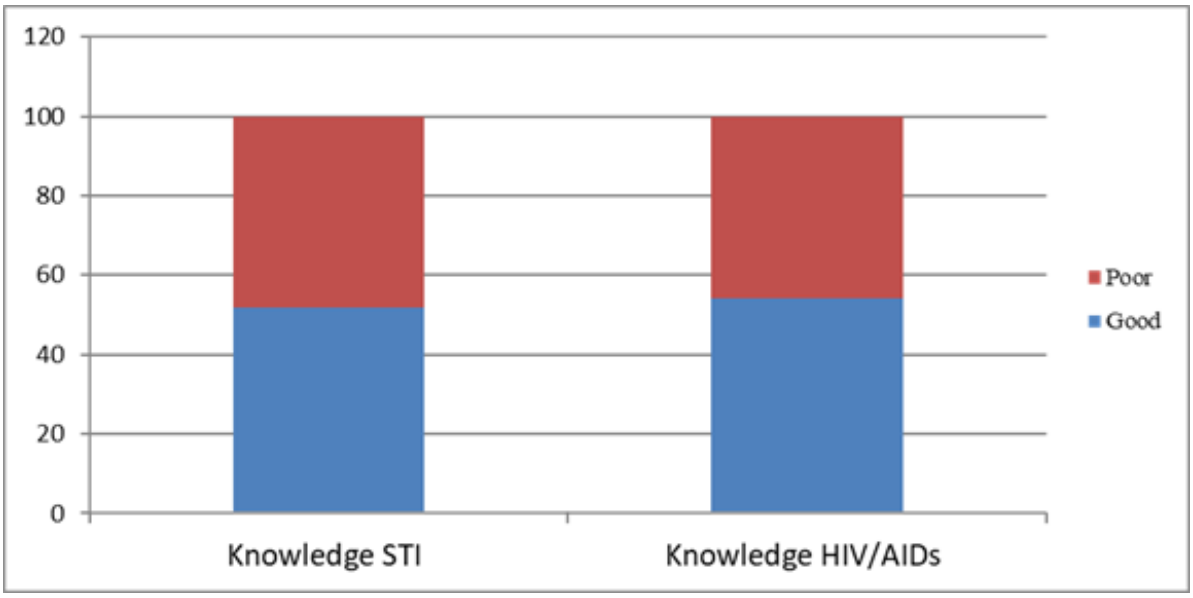

Figure 2 Knowledge level of respondents on sexually transmitted infections and HIV/AIDS among college students in Hawassa teachers education college students, 2021(n = 415)

3.5 Treatment seeking behaviour

In this study, treatment-seeking behavior was below 50%. This was determined by assessing whether participants sought care at any formal healthcare facility for one or more symptoms of STIs (see Figure 3).

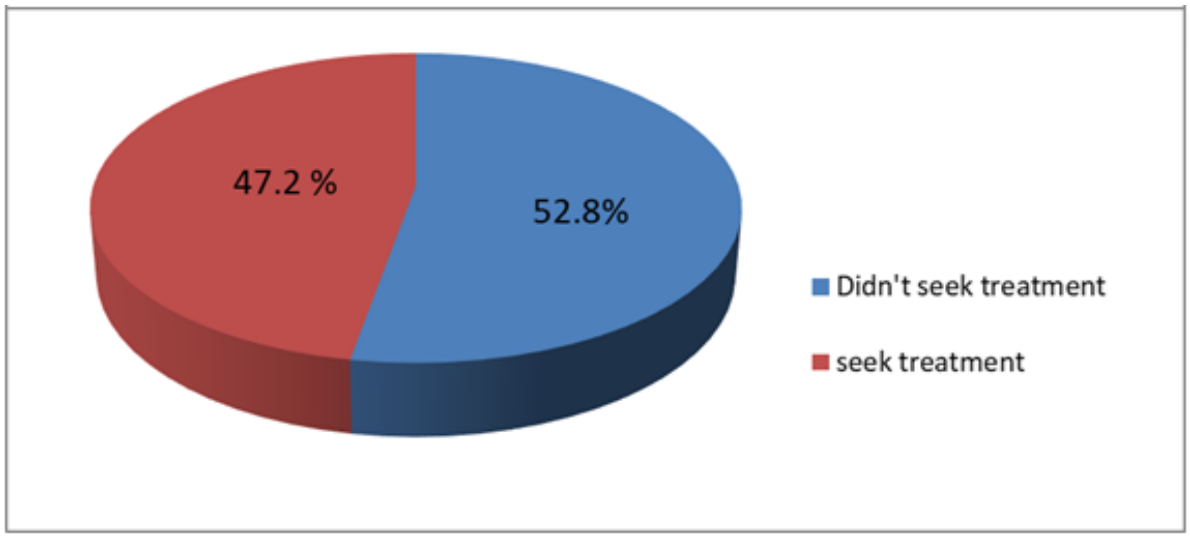

Figure 3 Treatment-seeking behaviour for Sexual Transmitted Infections among students in Hawassa of teacher education College 2021 (n =415)

Several variables remained significantly associated with treatment-seeking behavior in the multivariable logistic regression, including starting sexual contact, episodes of STIs, drug retail without a prescription, concerns about confidentiality, pocket money, self-treatment, and knowledge of STIs and HIV.

Female students were 84% less likely to seek treatment for STIs compared to male students [AOR: 0.16; 95% CI (0.06-0.46)]. The odds of seeking treatment were six times higher among

students who had two or more episodes of STIs compared to those with only one episode [AOR: 5.88; 95% CI (2.11-16.42)]. Students who did not easily access medication without a prescription were 3 times more likely to seek treatment than their counterparts [AOR: 2.97; 95% CI (1.02-8.66)]. Additionally, students who were not concerned about confidentiality were 17.9 times more likely to seek treatment than those who were [AOR: 17.91; 95% CI (6.22-51.61)]. Students earning pocket money between 1501-2000 birr were 3 times more likely to seek treatment compared to those earning 1000-1500 birr [AOR: 3.22; 95% CI (1.19-8.66)]. Furthermore, students who preferred self-treatment were 80% less likely to seek treatment compared to their counterparts [AOR: 0.20; 95% CI (0.07-0.61)]. Those unembarrassed to express their symptoms to health professionals had 2.8 times higher odds of seeking treatment compared to embarrassed students [AOR: 2.76; 95% CI (1.01-7.59)].

Table 2 Factors associated with treatment-seeking behaviour for sexually transmitted infections among students at Hawassa teachers' education college, Hawassa, southern, Ethiopia, 2021 (n=415)

Variables	Treatment seeking behaviour		COR(95%CI)	AOR (95%CI)
	Yes	No		
Sex of the respondent				
Male	147(63%)	86(36.9%)	1	1*
Female	49(26.9%)	133(73.1%)	4.64 (3.04-7.07)	0.16(0.06-0.46)
Prefer-self treatment				
Yes	86(42.0%)	119(58.9%)	1	1*
No	110(52.4%)	100(47.6%)	1.52 (1.03-2.24)	0.20 (0.06-0.60)
STI history				
Yes	102(51.8%)	95(48.2%)	1	1
No	94(43.1%)	124(56.9%)	0.78 (0.53-1.15)	0.48 (0.44-1.32)
Ashamed to express Symptoms				
Yes	75(37.7%)	124(62.3%)	1	1*
No	121(56.0%)	219(52.8%)	2.11 (1.42-3.12)	2.76 (1.01-7.59)
Discussing RH problems				
Yes	124(49.6%)	126(50.4%)	1	1
No	72(43.6%)	93(56.4%)	0.78 (0.53-1.17)	0.43 (0.14-1.28)
Worried about Information Confidentiality				
Yes	74(39.2%)	115(60.8%)	1	1*
No	122(54.0%)	104(46.0%)	1.82 (1.23-2.69)	17.91 (6.22-51.62)
Pocket money				
1000-1500	89(39.0%)	139(61.0%)	1	1*
1501-2000	107(57.2%)	80(42.8%)	2.08 (1.41-3.09)	3.22(1.19-8.67)
Episode of STIs				
1 episode	38(36.9%)	65(63.1%)	1	1*
≥2 episode	64(68.1%)	30(31.9%)	3.65 (2.02-6.58)	5.88(2.11-16.42)
Retailed medication without prescription				
Yes	60(30.2%)	139(69.8%)	1	1*
No	136(63.0%)	80(37.0%)	3.94 (2.61-5.93)	2.97 (1.02-8.66)
Knowledge on STIs				
Good	135 (62.8%)	80(37.2%)	1	1*
Poor	61 (30.5%)	139(69.5%)	0.26 (0.17-0.39)	0.32 (0.11-0.91)
Knowledge on HIV				
Good	131 (58.2%)	94(41.8%)	1	1*
Poor	65(34.2%)	125(65.8%)	2.68 (0.25-0.56)	0.18 (0.07-0.46)

Note: 1= indicates the reference group; *=indicates significantly associated variables in multivariable regression

Students with poor knowledge of sexually transmitted infections were 68% less likely to seek treatment compared to those with good knowledge [AOR: 0.32; 95% CI (0.11-0.92)], and the odds of seeking treatment for STIs were 82% lower among students with poor knowledge of HIV compared to those with good knowledge [AOR: 0.18; 95% CI (0.07-0.46)] (see Table 3).

4 Discussions

This study aimed to assess treatment-seeking behavior and associated factors among students at Hawassa Teachers Education College. Variables such as sex, episodes of STIs, drug retail without prescriptions, concerns about information confidentiality, pocket money, self-treatment, and knowledge of STIs and HIV were significantly associated with treatment-seeking behavior. The findings revealed that STIs-related treatment-seeking behavior was present in 47.2% of participants [95% CI (42.3-52.2)]. This rate is lower than that reported in studies conducted in Laos (32), the Nkomazi East area of Mpumalanga (33), Kenya (34), and Nigeria (35). A possible reason for these discrepancies may be differences in exposure; female sex workers often experience the disease and its symptoms more frequently and may be more likely to seek treatment.

In contrast, this study's findings were higher than those from the Gambella region of Ethiopia (31) and relatively higher compared to a study on reproductive-age women in Ethiopia, where STIs-related care-seeking behavior was reported at 33.3% (36). This difference may be attributed to variations in service accessibility, socio-demographic factors, and study populations.

The study found that female students were 84% less likely to seek treatment for STIs compared to male students. This finding is consistent with research indicating that factors such as marital status, sex, economic status, and educational status significantly influence treatment-seeking behavior [32-38]. Additionally, the odds of treatment-seeking behavior for STIs were three times higher among students who received more pocket money compared to those with less. This aligns with findings from Jamaica, where educational status and higher socio-economic class were found to be significantly associated with treatment-seeking behavior [39]. A possible explanation for this trend is that participants with higher education and income levels may have a better understanding of the importance of seeking treatment and are more likely to afford the necessary services than their counterparts.

This study found that the odds of treatment-seeking behavior for STIs were 2.8 times higher among students who were not embarrassed to express their symptoms to health professionals compared to those who were embarrassed. This finding is supported by research from the Gambella region of Ethiopia, which indicated that respondents who perceived stigma related to STIs were less likely to seek treatment than their counterparts [31]. This may be because individuals who feel stigma or embarrassment lack the motivation to seek treatment.

In the current study, the rate of self-treatment among students was found to be 49.4%. In contrast, a study among female sex workers in 20 cities of Peru reported a self-treatment rate of 32% for STIs [40], which is relatively lower than that observed in this study. The difference may stem from variations in educational levels and socio-economic status. A study conducted in Kenya found that 30.0% of female sex workers who experienced STI symptoms did not seek treatment due to unfriendly health professionals, while 27.7% of respondents in the current study cited the unapproachable demeanor of healthcare providers as a reason for not seeking treatment.

These findings have significant implications for STI prevention strategies among young students. Notably, the results indicate the need to tailor STI treatment services differently for males and females. Additionally, the majority of self-treatment appears to involve obtaining medications from pharmacies without prescriptions, which poses serious risks by potentially exacerbating drug-resistant STIs. Therefore, it is crucial to enforce regulations on pharmacies to prevent the dispensing of medications without a

physician's prescription.

Limitations of the study

The study did not use laboratory tests to rule out the symptoms, it relies based on study participant self-report, and there might be a classification or information bias.

5 Conclusion

The study identified that many symptomatic students with STIs did not seek treatment at formal health facilities. It revealed that factors such as sex (male/female), pocket money, self-treatment, using drugs without a prescription, underestimating the burden of disease, privacy concerns, confidentiality, the number of STI episodes, and knowledge of STIs and HIV were statistically associated with students' treatment-seeking behavior regarding STIs.

Recommendations

It is recommended to prepare health education sessions focused on sexually transmitted infections to enhance students' knowledge and strengthen health clubs that promote sexual and reproductive health. Collaborating with pharmacies to curb non-prescription sales of medications is essential. Additionally, treatment strategies should consider gender differences, such as establishing female-friendly clinics and male-targeted awareness campaigns. Finally, further studies employing mixed methods are encouraged.

Acronyms

AOR	Adjusted Odd Ratio
BRHP	Butajira Rural Health Program
CI	Confidence Interval
CDC	Centers for Disease Control and Prevention
COR	Crude Odd Ratio
EDHS	Ethiopia Demographic and Health Survey
FGD	Focus Group Discussion
FSWs	Female Sex Workers
HCPs	Health Care Professionals
HIV	Human Immunodeficiency Virus
HPV	Human Papilloma Virus
IDI	In-depth Interview
OR	Odd Ratio
SRS	Simple Random Sampling
SPSS	Statistical Package for Social Science
UNAIDS	Joint United Nations Program on HIV/AIDs
STDs	Sexually Transmitted Diseases
STIs	Sexually Transmitted Infections
WHO	World Health Organization

Declaration

Ethical consideration

Ethical approval was obtained from the Institutional Review Board (IRB)of DillaUniversity College of Health Science and Medicine, after describing the purpose and objective of the study. A support letter was secured from the Department of Reproductive Health and Submitted to Hawassa College of Teacher Education to conduct the study. Written consent was obtained from each study participant. Participants were also informed that participation is voluntary and that they can withdraw at any time if they are not satisfied with the questionnaire. To maintain confidentiality, information was collected through separate interviews throughout, excluding names as identifying data.

Consent for publication

Not applicable

Data availability statement

The datasets used in this study can be available from the corresponding author upon reasonable request.

Competing interest

The authors declare no conflict of interest.

Author contribution

All authors made a significant contribution to the work reported; BB, GN, RH, and MM participated in the conception, study design, execution, and acquisition of data. BB, GN, RH, and MM contributed to the 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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RESEARCH ARTICLE

Expressed Emotions Among Caregivers of Schizophrenia Patients in Southern Ethiopia: Associations with Caregiver and Patient Characteristics

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Abstract

Background: Expressed Emotion (EE) measures family caregivers' attitudes and behaviors toward mentally ill family members. This concept is crucial in mental health research, as it assesses criticism, unfriendliness, or support from immediate family. This study addresses a significant gap by evaluating caregivers of schizophrenia patients in Ethiopia. The findings aim to assist policymakers and healthcare professionals in enhancing mental health support in the region.

Objective: To determine the magnitude of Expressed Emotions among caregivers of patients with schizophrenia and its association with caregivers' and patients' characteristics in Southern Ethiopia, 2022.

Method and Materials: A cross-sectional study design was employed, involving 202 caregivers providing care to patients with schizophrenia at the psychiatry clinic of Dilla University Referral Hospital. Data collection utilized mobile software Epi.INFO version 7 through interviewer administration, supplemented by relevant chart reviews. Caregivers' EE levels were evaluated using two domains: Critical Comment (CC) and Emotional Over-Involvement (EOI), using validated tools. A systematic random sampling technique was employed to select participants. Data were analyzed using SPSS version 22, with bivariate analysis conducted for potential EE predictors (P-value < 0.2). Variables meeting this criterion were further analyzed using multivariable logistic regression, with a P-value < 0.05 considered statistically significant.

Results: High expressed emotion was observed in 50.5% (43.1-57.4) of respondents. Factors significantly associated with high expressed emotion included caring for patients with schizophrenia for 6-8 years (AOR=3.5; 95% CI: 2.1-6.3), being a female caregiver (AOR=1.2; 95% CI: 1.15-4.1), experiencing moderate to severe caregiver overload (AOR=2.0; 95% CI: 1.81-5.4), and a total duration of illness of 6-10 years (AOR=1.6; 95% CI: 1.42-3.9).

Conclusion: The present study reported a high level of EE among nearly half of the family members. Factors such as being a female caregiver, caring for a patient for 6-8 years, experiencing moderate to severe overload, and a total illness duration of 6-10 years were significantly associated with elevated EE. This underscores the need for psychosocial nursing care for all family members of schizophrenia patients, which can help them effectively cope with the stress of managing a mentally ill family member at home.

Keywords: Caregivers, Expressed emotion, Patients with schizophrenia, Dilla, Ethiopia

"A preprint has previously been published [1]"

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1 Introduction

Expression Emotion (EE) refers to attitudes, moods, or behaviors based on family caregivers' emotional reactions toward ill family members. It comprises three components: Critical Comments (CC), which reflect negative assessments of the patient's behavior; Hostility (H), which indicates a negative view of the patient as a person; and Emotional Over-Involvement (EOI), characterized by feelings of desperation, self-sacrifice, and excessive protection of the patient. Since CC and H share similarities, EE is primarily based on CC and EOI [3, 4].

It manifests in traits of Low Expressed Emotion (LEE) or High Expressed Emotion (HEE) [4, 5]. Family caregivers exhibiting LEE are typically characterized by their tolerance, non-intrusiveness, and sensitivity to the needs of the patient. In contrast, HEE is marked by patterns of critical comments (CC), hostility, or emotional over-involvement (EOI). These behaviors may include rejection, irritability, ignorance, blaming, overprotection, self-sacrifice, or excessive intrusiveness. Such reactions from HEE family caregivers can create a negative emotional environment, leading to increased stress for individuals with schizophrenia and potentially triggering a relapse [4, 5].

Schizophrenia is a severe and chronic mental illness characterized by significant disruptions in thinking, perception, mood, and social behavior, which affect an individual's ability to function in daily life [5-7]. Since 1990, families have assumed a central role as caregivers for those with severe mental disorders, playing a crucial part in early intervention and treatment [3, 7]. This involvement, combined with pharmacological and psychosocial approaches, is essential for achieving a positive prognosis. However, the dual nature of the family environment can either support or impede the course of the illness [3].

Globally, schizophrenia ranks among the top 25 causes of disability, with caregivers' expressed emotions identified as a key factor contributing to adverse effects and a higher relapse rate in individuals with high expressed emotion [3, 7]. In developing nations, where individuals with schizophrenia often reside with immediate family members, family support is vital for treatment adherence [3, 8]. Family engagement is recognized as a significant influencer in the onset and progression of mental illnesses, including schizophrenia [8].

While family involvement can lead to better outcomes, it also poses risks of negatively affecting the illness trajectory, highlighting the complex interplay between family dynamics and mental health outcomes [3, 8]. Therefore, assessing levels of expressed emotion in this context is significant, as it can provide valuable insights to enhance mental health services. The findings may serve as critical input for refining existing services and contribute essential information for policymakers in shaping mental health policies.

Findings from previous studies highlight various factors contributing to high expressed emotion in caregivers of individuals with schizophrenia, including illness severity, patient age, number of previous episodes, gender, degree of kinship, daily time spent together, caregiving burden, and duration of care [3, 5, 9]. Caregivers' attitudes, often shaped by insufficient knowledge about schizophrenia and its treatments, significantly contribute to this phenomenon and can serve as potential negative prognostic factors [6]. The consequences of high expressed emotion, which frequently lead to relapse, underscore the need for psychosocial interventions alongside pharmacotherapy to improve outcomes and facilitate the successful integration of individuals with mental illness into society [10, 11].

International studies examining predictors of high expressed emotion (EE) in caregivers of individuals with schizophrenia reveal a range of influencing factors. In Brazil, patient age, family burden, and daily time spent together emerged as predictors, with higher patient age associated with a reduced risk of high EE [3]. In Thailand, significant contributors included illness severity, caregiver mental health, burden, family functioning, and stigma [5]. Indian studies linked EE to patient age, illness duration, family income, marital status, type of family, unemploy-

ment, and urban residence [6]. A longitudinal study in Pakistan highlighted varying rates of high EE among different kinships, with mothers frequently rated as high-EE caregivers [12]. In Nigeria, female gender and a higher number of previous episodes were associated with high expressed emotion [13]. In Ethiopia, high expressed emotion among caregivers was linked to the duration of care, absence of chronic medical or physical conditions, and the number of illness episodes in patients [9]. These findings collectively underscore the diverse and complex factors influencing expressed emotion in schizophrenia caregiving across global contexts.

In Ethiopia, despite the substantial number of individuals diagnosed with schizophrenia receiving care at Dilla University Referral Hospital (DURH), research on expressed emotion is notably scarce. Until the completion of this study, there has been limited exploration of the emotional dynamics within the caregiver-patient relationship, particularly in the specific context of DURH. This highlights a significant gap in our understanding of how expressed emotion manifests among caregivers of individuals with schizophrenia in this region.

2 Methods

2.1 Study area and period

From August 15 to November 15, 2022, this study was conducted at Dilla University Referral Hospital (DURH) in Dilla Town, Southern Ethiopia. Established in 1977 E.C. (Ethiopian Calendar) / 1985 G.C. (Gregorian Calendar), the hospital was originally known as Dilla Hospital until it was renamed DURH on June 11, 2001 E.C. It is located approximately 90 kilometers from Hawassa and 360 kilometers from Addis Ababa, serving a catchment population of around 2 million people with therapeutic and rehabilitation services.

At its inception, DURH employed around 154 staff members, including 104 health professionals and additional support staff. The hospital currently has five wards: Medical, Surgical, Obstetrics and Gynecology, Pediatrics, and Psychiatry. It provides care for nearly 3 million individuals, 95% of whom belong to the Gedeo ethnic group. The psychiatry unit offers both outpatient and inpatient services, averaging about 100 cases per month.

2.2 Study design

At DURH, a quantitative cross-sectional study design was employed to examine the frequency and contributing factors of expressed emotion among caregivers of patients with schizophrenia.

2.3 Study population

2.4 Source population

All caregivers who are giving care for patients with schizophrenia at DURH.

2.5 Study population

Caregivers of patients with schizophrenia at DURH and who were sampled for the current study.

2.6 Eligibility criteria

2.7 Inclusion criteria

Caregivers who were giving care for patients with schizophrenia and age 18 and above were included in the study. Caregivers who pass most of his/her time with the patient were included in the current study which means the primary caregivers.

2.8 Exclusion criteria

Caregivers who were not competent to give information due to difficulty of communication and critically ill during data collection period were excluded from the study.

2.9 Sample size calculation

The required sample size for the study was calculated using a single population proportion formula, based on an estimated prevalence of expressed emotion of 43.6% from a study conducted at Jimma University Medical Center's psychiatry outpatient unit in southwestern Ethiopia. A 5% margin of error, a 95% confidence interval, and a 10% non-response rate were also considered.

$n = \frac{Z^2 * P(1-P)}{d^2}$

$n = \frac{Z^2 * P(1-P)}{d^2} = \frac{1.96^2 * 0.436(1-0.436)}{0.05^2} = 377.86$
$n \approx 378$

By considering 10% non-response rate the final sample size is $n = 415.8 \approx 416$.

Since, the total population is <10,000 (358) using a correction formula: $n = \frac{n}{1+\frac{n}{N}} = \frac{416}{1+\frac{416}{392}} = 201.82 \approx 202$ is corrected sample size (nc) of the study.

2.10 Sampling technique

A systematic random sampling technique was used to select the study population. The skipping interval (K) for data collection was determined by dividing the anticipated number of cases during the data collection period (extracted from the average case count reported in the Hospital Health Management Information System, or HMIS) by the actual sample size. Specifically, this involved dividing 392 (the expected cases) by 202 (the actual sample size), resulting in a skipping interval of 1.94. Rounding this value, a skipping interval of 2 was established. This means that every second case was systematically chosen during the data collection process. The selected primary caregiver was then interviewed, and patient care was reviewed for other variables.

2.11 Study variable

Dependent variable: Expressed Emotion
Independent variables included caregiver burden (measured by the Zarit Burden Interview), caregiver socio-demographic factors (age, gender, ethnicity, educational status, occupation, average household monthly income, residence, relationship with the patient, family size, distance from the hospital in kilometers, duration of caregiving, daily time spent together, and known comorbid physical illnesses), as well as the socio-demographic factors of patients (age, gender, marital status, educational status, occupation) and clinical factors (first onset of illness, number of episodes, hospital admissions, duration of untreated psychosis, total duration of illness, and comorbid diagnoses).

The Family Questionnaire (FQ) was used to evaluate the level of expressed emotion (EE) and its components: Critical Comments (CC) and Emotional Over-Involvement (EOI). Developed and validated by Wiedemann, Rayki, Feinstein, and Hahlweg in 2002, the FQ contains 20 items divided into two domains: CC (10 items: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20) and EOI (10 items: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19), each with a maximum score of 40 points. The items reflect various situations that family members encounter while coping with daily problems related to the patient. Respondents indicated how frequently they dealt with these situations, with possible responses ranging from "never or very rarely" to "very frequently" (scoring from one to four for each item). A higher score indicates a greater number of critical comments and increased emotional over-involvement among family members. The cut-off values for the FQ, as determined by the original authors, are CC = 23 and EOI = 29.

The Zarit Burden Interview (ZBI), a valid and reliable instrument for assessing caregiver burden, consists of 22 items with scores ranging from zero to four. The overall score ranges from zero to 88, with higher scores indicating a greater perception of overload. In this study, the ZBI score was computed as a numerical variable.

2.12 Operational definition

Expressed emotion (EE) is gauged through two components: CC and EOI. Each component comprises 20 questions, divided equally. These questions are structured as Likert scale items, ranging from a score of one to four. Consequently, the total score for each component is 40.

To identify EE levels, family members scoring below 23 in the CC domain and below 29 in the EOI domain are categorized as having low EE. Conversely, those with either high CC or high EOI scores are considered to have high EE [2, 15].

Caregiver burden is assessed based on the Zarit Burden Interview (ZBI) total score, and the classifications are as follws:No overload: Indi-

viduals with a ZBI total score lower than 21 are considered to have no overload, indicating a relatively low level of caregiver burden. **Mild to Moderate Overload:** Caregivers scoring between 22 and 40 on the ZBI total score are categorized as experiencing mild to moderate overload, indicating a moderate level of caregiver burden. **Moderate to Severe Overload:** Those with a ZBI total score ranging from 41 to 60 are identified as facing moderate to severe overload, reflecting a higher level of caregiver burden. **Intense Overload:** Caregivers who score higher than 61 on the ZBI total score are classified as experiencing intense overload, indicating a significant and severe level of caregiver burden. **Caregivers:** Individuals who spend the most time with a patient with schizophrenia and are familiar with all their needs.

2.13 Data collection tool/instrument

A structured questionnaire, developed after reviewing related literature, was used to collect data on caregivers' and patients' socio-demographic variables. The patients' clinical variables and most recent psychiatric diagnoses were obtained from their medical records.

2.14 Data collection procedure

Data was collected using a mobile software program called Online Epi Info, supplemented by face-to-face interviews conducted by an interviewer. Medical chart reviews were utilized to determine the patient's diagnosis and any concomitant disorders. The questionnaire was designed with a closed-ended structure, developed and modified after reviewing relevant literature, and organized to achieve specific objectives. Two trained data collectors, who had recently completed their training, carried out the data collection process.

2.15 Data quality management

When developing the data collection tools, significant emphasis was placed on ensuring data quality. The surveys were created in English, translated into Amharic, and then translated-back into English to maintain consistency. Before exporting data to SPSS, Epi Info version 7 evaluated and verified the collected data for completeness. Respondents were informed that they were not required to provide their names.

2.16 Data processing, analysis & presentation

Epi Info version 7 was used to validate and clean the coded data before exporting it for analysis in the Statistical Package for Social Sciences (SPSS) version 22.0. The prevalence of expressed emotion (EE) and the socio-demographic and clinical characteristics of caregivers and patients were described using frequencies, means, standard deviations, and pie charts. Bivariate analysis was conducted to determine the relationships between each independent factor and the dependent variable. Multivariate analysis was then performed on factors identified as significantly associated with EE during the bivariate analysis (with a p-value of less than 0.25). In the multivariate analysis, a p-value of 0.05 was considered statistically significant.

3 Result

3.1 Socio-demographic characteristics of caregivers

A total of 202 caregivers of patients with schizophrenia participated in the study, achieving a response rate of 100%. All sampled individuals were interviewed, and no one declined to take part. Among the participants, 120 (59.4%) were male, and the majority, 132 (65.3%), were married. The mean age of participants was 35 years (SD $\pm$ 17.4), and 58 (28.7%) were parents. Nearly one-fifth (21.3%) of respondents attended primary education. Regarding occupation, 27 (13.4%) were farmers. More than half of the respondents, 105 (52.0%), lived in urban areas, while 91 (45.0%) lived within 8 km of the hospital. Additionally, 156 (77.2%) caregivers reported a monthly income greater than 2000 ETB (Table 1).

Table 1 Socio-demographic characteristics of caregiver of patient with schizophrenia at DURH psychiatry clinic, Southern Ethiopia 2022 (n=202)

Variable	Category	Frequency (n)	Percent (%)
Age	18-27	51	25.2
	28-37	71	35.1
	38-47	72	35.6
	>47	8	4.1
Sex	Male	120	59.4
	Female	82	40.6
Marital status	Single	48	23.8
	Married	132	65.3
	Divorced	13	6.4
	Widowed	9	4.5
Educational status	Primary education	43	21.3
	Secondary education	34	16.8
	Higher education & above	125	61.9
Occupation	Student	54	26.7
	House wife	16	7.9
	Farmer	27	13.4
	Merchant	39	19.3
	Gov't employee	28	13.9
	Private employee	22	10.9
	Unemployed	16	7.9
Average house hold monthly income in ETB	201-1000	15	7.4
	1001-2000	31	15.3
	>2000	156	77.2
Place of residence	Rural	97	48
	Urban	105	52
Relation to the patient	Parent	58	28.7
	Child	32	15.8
	Siblings	26	12.9
	Aunt/Uncle	14	6.9
	Spouse	51	25.2
	Others*	21	10.4
Distance from the hospital in KM	≤8Km	91	45
	9-23KM	61	30.2
	24-50KM	27	13.4
	>50KM	23	11.4

*Others, Half siblings and far relatives

3.2 Socio-demographic characteristics of patients

The mean age of the patients was 40 years, with more than half (168, 83.2%) aged 25 and older. Nearly half of the patients (106, 52.5%) were male. About one-third (76, 37.6%) of the patients were single, while nearly half (103, 51.0%) were married. Sixty patients (29.7%) had attended higher education or above, and 27 (13.4%) were unemployed. Approximately 18.8% of the patients were homemakers. Almost 72.3% had a history of hospital admissions, and 34.7% had experienced 1-2 episodes of illness. Around 30.2% had a duration of illness exceeding 10 years, and 80.5% had no comorbidities (see Table 2).

Table 2 Socio-demographic characteristics and clinical factors of patients with schizophrenia at DURH psychiatry clinic, Southern Ethiopia 2022 (n=202)

Variable	Category	Frequency (n)	Percent (%)
Age	15-24	34	16.8
	25-34	91	45
	35-44	52	25.7
	>44	25	12.4
Sex	Male	106	52.5
	Female	96	47.5
Marital status	Single	76	37.6
	Married	103	51
	Divorced	16	7.9
	Widowed	7	3.5
Educational status	Not able to read & write	23	11.4
	Only able to read & write	21	10.4
	Primary education	44	21.8
	Secondary education	54	26.7
	Higher education & above	60	29.7
Occupation	Student	43	21.3
	House wife	38	18.8
	Farmer	12	5.9
	Merchant	35	17.3
	Gov't employee	17	8.4
	Private employee	17	8.4
	Unemployed	27	13.4
	Retired	7	3.5
First onset of illness	≤ 18yrs	33	16.3
	19-23yrs	86	42.6
	24-30yrs	63	31.2
	>30yrs	20	9.9
Number of episode	1-2episode	70	34.7
	3-4episode	80	39.6
	>4episode	52	25.7
Hospital admission	Yes	146	72.3
	No	56	27.7
Number of admission	None	56	27.7
	1 admission	29	14.4
	2 admission	10	5
	3 admission	40	19.8
	4 admission	67	33.2
Total duration of illness	≤ 2yrs	39	19.3
	3-5yrs	42	20.8
	6-10yrs	60	29.7
	>10yrs	61	30.2
Comorbid diagnosis	Yes, specify if yes*	30	14.9
	No	172	85.1

*Specify if yes, neuropsychiatric, substance use and medical disorder

3.3 Clinical characteristics of patients

Out of the total patients, 30 (14.9%) had comorbid neuropsychiatric, substance use, and medical disorders. The mean duration of illness was 9.53 years (SD ± 4.35), and the mean age at first onset of illness was 23.28 years (SD ± 10.45). Additionally, 70 patients (34.7%) had experienced 1-2 episodes. Among the patients, 56 (27.7%) had no history of hospitalization, while 67 (33.2%) of those with a hospitalization history had been admitted four times (see Table 2).

3.4 Status of expressed emotions among caregivers of patient with schizophrenia

Of the total study participants, 71 (35.1%) reported high critical comments (CC) and 94 (46.5%) reported high emotional over involvement (EOI). (See Table 3).

Table 3 Status of components of expressed emotion at DURH psychiatry clinic, Southern Ethiopia 2022 (n=202)

Variable	Category	Frequency (n)	Percent (%)
Critical comments	High critical comments	71	35.1
	Low critical comments	131	64.9
Emotional over involvement	High emotional over involvement	94	46.5
	Low emotional over involvement	108	53.5
Total EE	High EE	102	50.5
	Low EE	100	49.5

Overall, the status of expressed emotion among caregivers, measured by either high Critical Comments (CC) or high Emotional Over-Involvement (EOI), indicated that 102 caregivers (50.5%, 95% CI: 43.1-57.4) exhibited higher levels of expressed emotion (see Table 3).

3.5 Factors associated with expressed emotions among caregivers of patients with schizophrenia

The results of the simple binary logistic regression analysis indicated that age, sex, residence, caregiving duration, and caregiver burden, as well as caregiver sex, marital status, first onset of illness, and total duration of illness of patients, were significantly associated with expressed emotion.

3.6 Multivariate analysis

As shown in the table below, caregiver age, caregiver sex, caregiver residence, caregiving duration, patient sex, patient marital status, first onset of illness, total duration of illness, and caregiver burden were included in the final model. In the multivariate analysis, only caregiver sex, caregiving duration, total duration of illness, and caregiver burden were retained as associated factors for expressed emotion (see Table 4).

Table 4 Factors associated in bivariate & multivariate regression at DURH psychiatry clinic, Southern Ethiopia 2022 (n=202)

Variable	n(%)	Expressed emotion		COR (95%CI)	AOR (95%CI)	P-value (<0.05)
		High n(%)	Low n(%)			
Caregiver Sex						
Male	120(59.4)	50(41.7)	70(58.3)	1	1	
Female	82(40.6)	52(63.4)	30(36.6)	1.4(1.2-8.7)	1.2(1.15-4.1)	0.002**
Duration of CG						
≤ 2 years	65(32.2)	36(55.4)	29(44.6)	1	1	
3-5 years	50(24.8)	30(60)	20(40)	0.8(0.3-1.7)	2.1(0.8-6.6)	0.401
6-8 years	48(23.8)	23(47.9)	25(52.1)	2.4(1.1-5.6)	3.5(2.1-6.3)	0.005**
>8 years	39(19.3)	13(33.3)	26(66.7)	1.3(0.6-2.8)	1.5(0.3-5.7)	0.412
Duration of illness						
≤ 2 years	39(19.3)	14(35.9)	25(64.1)	1	1	
3-5 years	42(20.8)	28(66.7)	14(33.3)	0.3(0.1-0.7)*	0.2(0.01-1.4)	0.1
6-10 years	60(29.7)	36(60)	24(40)	3.4(1.2-3.8)	1.6(1.42-3.9)	0.008**
>10 years	61(30.2)	24(39.3)	37(60.7)	0.9(0.3-1.9)	0.03(0.0-1.9)	0.096
Caregiver burden						
No overload	20(9.9)	15(75)	5(25)	1	1	
Mild to moderate	143(70.8)	68(47.5)	75(52.5)	2.8(0.8-9.4)	0.07(0.01-1.2)	0.088
Moderate to severe	37(18.3)	19(51.4)	18(48.6)	3.3(1.1-9.5)	2.0(1.81-5.4)	0.01**
Intense overload	2(1.0)	0(0)	2(100)	4.8(0.000)	0.03(0.01-1.9)	0.096

NB: *=p-value<0.25 significantly associated in bivariate analysis; **= p-value<0.05 significantly associated in multivariate analysis 1= reference value

4 Discussion

This study encompassed a total of 202 caregivers of individuals with schizophrenia. The observed proportion of expressed emotion (EE) in this study was 50.5%, closely aligning with findings from similar studies in Hong Kong (50.9%), Thailand (53.77%), Pakistan (48.51%), Kano, Nigeria (52%), and Lagos, Nigeria (50%) [2, 5, 11, 17-19].

The proportion of expressed emotion observed here is comparatively lower than in cross-sectional studies conducted in the UK and Brazil, which reported rates of around 60% and 68%, respectively [4, 20]. This variance may be attributed to differences in sample sizes, as those studies included approximately 20 participants in the UK and 89 in Brazil. Additionally, variations in geographical location, cultural differences, and distinctions in healthcare setups may also influence these discrepancies.

The current finding of expressed emotion is higher than the results from studies conducted in Jimma, Ethiopia (43.6%) and India (21%) [9, 21]. This disparity could stem from the use of different assessment tools, variations in sample sizes, and international cultural differences.

The findings indicate that female caregivers are 1.2 times more likely to exhibit high expressed emotion compared to male caregivers, consistent with results from a cross-sectional study conducted at Lagos University Teaching Hospital, Department of Psychiatry, Nigeria [19]. This trend may be attributed to women's tendency to be more empathetic and to assume a larger share of caregiving responsibilities, potentially contributing to higher levels of expressed emotion. Implementing gender-sensitive approaches in mental health support programs could lead to more effective and tailored interventions for caregivers of individuals with schizophrenia.

The study reveals that individuals providing care for 6-8 years are 3.5 times more likely to experience high expressed emotion compared to those caring for less than 2 years. This aligns with findings from a similar study in Jimma, Ethiopia [9].

Prolonged caregiving may increase the dependence of individuals with schizophrenia on their caregivers for daily tasks, leading caregivers to perceive their lives as consistently disrupted by ongoing responsibilities. Incorporating periodic assessments of caregiver well-being and offering tailored interventions based on caregiving duration could enhance overall mental health support for caregivers.

The current study also indicates that patients with a total illness duration of 6-10 years are 1.6 times more likely to experience high expressed emotion compared to those with an illness duration of ≤ 2 years. This is consistent with findings from studies in India and the USA, where caregivers of individuals with longer illness durations are more inclined to exhibit high expressed emotion [6, 22]. This inclination may be due to increased exhaustion on the part of the caregiver as the illness progresses, leading caregivers to seek more attention and express their emotions due to heightened burden. Encouraging open communication between caregivers and healthcare professionals may further address the emotional needs of both caregivers and patients.

In addition to the identified factors significantly contributing to expressed emotion (EE), this study reveals that caregivers facing moderate to severe overload are 2.0 times more likely to experience high expressed emotion compared to those without overload. A study in Brazil similarly found that the risk of experiencing high EE levels rises with increasing Zarit Burden Interview (ZBI) scores [3]. As caregiver burden intensifies, there may be an elevated risk of neglect or lapses in caregiving due to increased strain. Therefore, fostering a supportive network for caregivers is recommended.

A notable limitation of this study was the lack of measurements for two crucial aspects: the intensity of patients' symptoms and their functional status. The study did not incorporate specific assessments to gauge the severity or intensity of symptoms exhibited by the patients, nor was there a measurement of the patients' functional status, which includes their ability to perform daily activities.

This limitation implies that the study might not have captured the full spectrum of patients' experiences, as symptom intensity and functional status can greatly influence overall well-being and quality of life. Without these measurements, understanding of the nuanced impact of the variables under investigation may be incomplete.

To address this limitation and enhance the robustness of future research, it is recommended that subsequent studies incorporate validated instruments or methodologies to assess both symptom intensity and functional status among the patient population. This would contribute to a more comprehensive understanding of the factors being studied.

5 Conclusion

The present study reported a high level of expressed emotion (EE) among nearly half of the family members, with caregiver sex, caregiving duration, total duration of illness, and caregiver burden identified as associated factors. In light of these results, healthcare professionals should prioritize routine psychosocial assessments for caregivers, incorporating screening tools for expressed emotion and caregiver burden during follow-up visits. Providing tailored psychosocial support services, psychoeducation, and stress management interventions can help mitigate the adverse effects of high EE.

List of Abbreviation and Acronyms

AOR	Adjusted Odds Ratio
CC	Critical Comment
CCs	Critical Comments
CFI	Camberwell Family Interview
DURH	Dila University Referral Hospital
EE	Expressed Emotion
EOI	Emotional Over-Involvement
FQ	Family Questionnaire
H	Hostility
HEE	High Expressed Emotion
LEE	Low Expressed Emotion
LEES	Level of Expressed Emotion Scale
PLWS	People Living with Schizophrenia
SMI	Severe Mental Illness
TEES	Thi Expressed Emotion Scale
ZBI	Zarit Burden Interview

Declarations

Ethical approval and consent to participate

The proposal was reviewed and approved by the Institutional Review Board (IRB) of Dilla University College of Health Sciences and Medicine. An ethical approval letter from the board was submitted to all relevant parties, and permission was obtained from all departments. After informing participants (caregivers) about the purpose and objectives of the study, both oral and written assent and informed consent were secured before data collection commenced. To ensure the anonymity of respondents, they were informed that they could withdraw from the study at any time. To maintain confidentiality, participants were assured that they could choose to withhold their names. All necessary methods were conducted in accordance with institutional guidelines and the Declaration of Helsinki.

Consent for publication

Not applicable

Availability of data and materials

The datasets generated and/or analyzed during the current study are not publicly available to preserve participant anonymity. However, they are available from the corresponding author upon reasonable request (Anteneh Gashaw, antenehgashaw77@gmail.com).

Competing interests

All authors assert that they have no competing interests

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Authors' contributions

YS designed the study, participated in data collection, analysis, and interpretation of the results, and drafted the paper, contributing to all versions of the manuscript. AG and MM assisted in the study design and proposal development, monitored data collection, aided in the analysis, and revised subsequent drafts of the paper. All authors read and approved of the final manuscript.

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