RESEARCH ARTICLE

Substance use among young people in the West Arsi Zone, Ethiopia: A cross-sectional study

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Abstract

Introduction

Substance use is a pressing public health concern in young Ethiopians, impacting their physical, psychosocial, and emotional well-being and productivity. However, there is a limited understanding of the prevalence and factors associated with substance use in this population both across Ethiopia and in the West Arsi zone specifically. This study investigates the prevalence of substance use and associated factors among young people in the West Arsi Zone, Ethiopia.

Methods

A community-based cross-sectional survey was conducted among 427 randomly selected young people aged 14–29 in the West Arsi zone of the Oromia region, Ethiopia. Data were collected using structured interviewer-administered questionnaires. Logistic regression analysis was performed to determine the association between the outcome and independent variables. Ethical approval was obtained from the University of Technology Sydney, Australia, and Madda Walabu University, Ethiopia.

Results

A total of 424 participants were included in the analysis, giving a response rate of 99.3%. The overall lifetime prevalence of any substance use among the study participants was 48.1% (95% CI: 43.3%, 53.0%) and the prevalence of current substance use was 72.5% (95% CI: 65.9, 78.5). Among lifetime users, 76.5% reported chewing khat, 49.0% drinking alcohol, 33.3% using various forms of tobacco, and 23.0% using cannabis. Being male, having a single marital status, a family history of substance use, low perceived social support, and the presence of mental health conditions were associated with an increased likelihood of substance use.

Conclusions

About half of the study participants reported a history of use of at least one substance from alcohol, khat, tobacco, or cannabis in their lifetime, highlighting the need for appropriate focused interventions to help address the growing challenges of substance use amongst young people in Ethiopia.

Introduction

The use of psychoactive substances such as alcohol, khat, tobacco, and cannabis remains a public health concern. Globally, an estimated 2.3 billion people consume alcohol [1], 1.3 billion tobacco products [2], 147 million cannabis [3], and 20 million khat [4]. About half a million global deaths are attributable to substance use annually, and substance use contributes 1.3 percent to the global burden of disease [5].

Substance use is associated with various health risks which, when left untreated, have the potential to lead to a range of personal and social problems [6,7]. These, in turn, have a wider societal impact through lost productivity, early death, increased healthcare spending as well as increased expenses for criminal justice and social welfare [6].

Substance use and its consequences are particularly pronounced in young people [8–11]. Within this demographic, substance use manifests as a complex phenomenon driven by multifaceted factors. Young people use substances to enhance positive emotions, foster connections or fit into social groupings, conform to social norms or peer expectations, and as a maladaptive coping mechanism for social, emotional, or physical health issues [12]. Furthermore, young individuals may use substances to experiment, to assert their independence, or to feel more mature [12,13].

While substance use is a global concern, some countries are disproportionally affected. In Ethiopia, a country marked by economic hardships, political tensions, and stark social disparities, young people may resort to substances like alcohol, khat, tobacco, or cannabis to overcome these stressors. In Ethiopian culture, chewing khat and drinking alcohol is commonly seen as a way to connect with others during social gatherings and social ceremonies, and to foster a sense of belonging with the local community [14,15]. Furthermore, Ethiopia has a long history of cultivating, producing, trading, and consuming various homegrown plants and herbs with psychoactive properties such as catha edulis (known as khat/chat in Ethiopia), cannabis (known as hashish or ganja in Ethiopia), and alcohol (locally produced tella, tej, and areke) [7,16–18].

The growing urbanization and globalization in Ethiopia and increasing exposure to global consumer culture contribute to shifting societal norms, potentially increasing risks associated with increased substance use [19–21]. Further, perceptions that khat and tobacco boost concentration and working memory, that khat breaks alcohol intoxication, and that cigarettes complement the alcohol effect, have all contributed to increased substance use among young people in Ethiopia [15,22,23].

Despite the widespread nature of substance use, previous studies on this matter in Ethiopia have predominantly concentrated on schools or higher education settings, providing insights into the prevalence and determinants of substance use among students. For instance, four reviews conducted in recent years have estimated the magnitude of substance use and its determinants among young people attending schools [18,19,24,25], while only one addresses the problem among young people, aged 10–24 years in the general community [26]. There are also limitations due to a lack of utilizing standardized tools to assess substance use, and a lack of coverage for the wider young population, especially in rural or semi-urban areas.

Thus, there is a need to comprehensively examine the prevalence of substance use among young people beyond educational settings, encompassing a diverse range of substances and socio-cultural contexts, covering both adolescents and youth in the general community. In direct response to this gap, this cross-sectional study aims to examine the prevalence of substance use and associated factors among young people in the west Arsi zone, Ethiopia. Such work is important as one means by which to help inform, design, and implement targeted interventions and public health policies on this topic in Ethiopia [18, 19].

Materials and methods

Study design

A cross-sectional study was conducted from May 18, 2023, to September 22, 2023, to assess the prevalence of substance use and associated factors among young people in the West Arsi zone.

Study setting

The study was conducted in the West Arsi zone in the Oromia Regional State. The zone comprises 13 districts (woredas) and two town administrations, Ethiopia, which comprises 13 districts (woredas) and three town administrations. In 2022, the total population of this zone was approximately three million, with young people (aged 10–29 years) accounting for 1.2 million [27].

The region is known for its substantial production and distribution of various psychoactive substances, including alcohol, khat, cannabis, and tobacco, which are both widely available and culturally integrated. Additionally, West Arsi experiences a high unemployment rate, reflecting the broader economic challenges across Ethiopia [28], which may further heighten vulnerability. Healthcare infrastructure in West Arsi, particularly for mental health or substance-related services, is limited, restricting access to necessary support. Given these combined factors, assessing substance use among young people in this setting is important to inform targeted interventions and policy responses.

Study population and recruitment

The study considered all young people living in the West Arsi Zone of the Oromia region, Ethiopia, as a source population. The target population included young people aged 14–29 years, residents of the study area who had lived there for at least six months at the time of the survey (In the Ethiopian context, six months is widely regarded as the minimum period required for recognizing residency in a neighborhood), could provide informed consent and/or assent, and were willing to participate. Young people who were critically ill and unable to provide information and individuals absent during the data collection period were excluded.

The sample size for this study was determined using a 95% CI with a Z-value of 1.96, a 5% level of precision (d = 0.05), an estimated proportion of substance use (P = 50%), and a 10% non-response rate. The proportion of 50% was considered to ensure the inclusion of the maximum possible sample size for this study. Based on these parameters, the required sample size was determined to be 427 participants.

To further ensure adequate statistical power and account for key factors associated with substance use, such as sex, family history of substance use, and peer substance use reported in previous literature, additional sample size calculations were conducted using the double population proportion formula. However, a comparison of all independently calculated sample sizes revealed that the single proportion formula based on a 50% prevalence provided the largest sample size [29]. Consequently, the sample size of 427 participants was adopted as the final sample size for this study.

The study was conducted in the West Arsi zone of the Oromia Regional State, Ethiopia. A convenient and purposive sampling method was applied to select the study setting. This zone was chosen due to the researcher's familiarity with the area, the significant production, distribution, and accessibility of various psychoactive substances, and the high unemployment rate in the region [28], which has been identified as a potential risk factor for substance use.

Among the 13 woredas in the West Arsi zone, four woredas were randomly selected, representing approximately 30% of the woredas. This proportion is considered scientifically sound for ensuring representativeness while maintaining feasibility. From each selected woreda, four kebeles (the smallest administrative unit in Ethiopia) were also selected based on their accessibility and the concentration of the young population, with two kebeles drawn from urban and two from rural areas (S1 Table). The urban-rural stratification was included to facilitate comparisons, given documented variations in substance use between urban and rural communities in Ethiopia [30].

Following the initial step that involved the identification of the selected kebeles, and to prepare for data collection, a one-week census of households with young individuals was conducted. Each household was given a unique number to establish a sampling frame. The numbering process began at a central or predefined landmark in each kebele, such as the kebele administration office, mosque, church, school, or another prominent feature depending on the setting. From this starting point, households were numbered systematically, ensuring full coverage within the kebele boundary until the last household to be included in the study was reached.

Local young individuals, capable of writing, participated voluntarily in the process of household identification and numbering, assisted by a local law enforcement personnel assigned from the kebele administration office to ensure the safety and smooth execution of the process, particularly to the local security concerns. This was necessary due to the challenge of obtaining comprehensive information about the target population from local government sources.

The unique household identification number formed the basis for a lottery system used to randomly select households for participation. Samples were proportionally allocated among the selected kebeles to ensure representation based on the total number of young people in each kebele. Once households were identified, data collectors conducted interviews with young individuals in the selected households. In situations where more than one eligible individual was present in a household, a lottery method was applied to select one participant, ensuring randomization and avoiding clustering effects.

Data collection process

A face-to-face interview was conducted door-to-door to administer the questionnaire. The overall data collection took place from May 18, 2023, to September 22, 2023. Face-to-face data collection was adopted to counter the potential for information contamination due to the low literacy rate in the region [31]. Experience with research in the Ethiopian context shows that, in the case of remotely administered and self-reported questionnaires, young people tend to share information with their friends and relatives leading to potentially biased responses in addition to ethical concerns. This information sharing, a critical problem in research, could result from low literacy, the unfamiliarity of the community with the concept of research, and communication problems that interfere with information comprehension. Additionally, online surveys were not considered viable due to the limited and inconsistent internet access and use across the country. Given these challenges, face-to-face interviews were determined to be the most appropriate and effective method for data collection, ensuring reliable and accurate responses from the study participants.

The questionnaire used in the survey data collection was structured into sections, including items (I) assessing the sociodemographic characteristics of respondents, (II) screening substance use, III) assessing mental health conditions, and IV) examining perceived social support.

Most of the tools used in the study were standardized questionnaires with prior validation in Ethiopia and other African settings. Previously translated versions of these tools, used in various earlier studies, were adapted for the current study. For some tools, additional translation from Amharic to Afan Oromo was necessary to cater to the local language needs of the study site. This translation process was conducted collaboratively by the primary researcher, an expert from Madda Walabu University's English department, and the data collectors. The process included iterative back-and-forth translation to ensure linguistic consistency and cultural relevance. This meticulous approach ensured that the questionnaires captured the intended information while respecting the cultural and linguistic nuances of the target population.

Data collection was carried out by a team of four experts who were proficient in both Afan Oromoo and Amharic. They were assisted by local law enforcement personnel assigned by the Kebele administration office to address the safety concerns and smooth implementation, particularly in areas with potential security concerns. The primary researcher supervised the overall data collection process, providing oversight and assisting in data collection when necessary.

Before data collection began, a training session was conducted for the data collectors to ensure a shared understanding of the study objectives, the data collection tools, and the overall process.

During data collection, participants were given a detailed explanation of the study as included in the information sheet, and those meeting the eligibility criteria were asked for informed consent. Most participants provided written consent, while those with functional illiteracy gave verbal consent. For participants under the age of 18, written consent was obtained from parents or caregivers after explaining the study's purpose in detail, as outlined in the translated parent information sheet. Participants under 18 also provided written consent, apart from three individuals within this age group who declined to do so. The reason cited for declining consent was a privacy concern, stating that they did not wish to disclose their substance use to their families. Their decisions were respected, and the next eligible participants were included instead.

Interviews were conducted in locations chosen based on the preferences of participants, ensuring a comfortable and private setting. The duration of each interview ranged from 35 to 60 minutes.

Variables and measurements

Substance use

The primary outcome variable was substance use, including alcohol, khat, tobacco, and cannabis, measured in the lifetime and current use categories. Lifetime substance use referred to the use of substance at least once in a lifetime whereas current substance use was defined as the use of any substances within the past 30 days preceding the survey.

In this study, the variable *substance use* was derived from the specific types of substances consumed, including alcohol, khat, tobacco, and cannabis. This dichotomous variable, *substance use,* with yes/no options, was subsequently created, and participants were classified as substance users if responded "yes" to having used at least one of the listed substances, and as nonusers if they responded "no" to all listed substances.

Each substance was measured using a combination of locally validated standard tools alongside certain author-developed questions tailored to align with the cultural and contextual specifics of the study, detailed as follows;

Alcohol- to assess alcohol use, we initially asked two straightforward and general questions with "yes" or "no" response options, which were also adapted to screen other substances—khat, tobacco, and cannabis use. These questions were as follows:

- Lifetime use: Have you ever drunk [alcohol/chewed khat/used cannabis]?

- Current use (past 30 days): Are you currently drinking [alcohol/chewing khat/using cannabis]?

The Alcohol Use Disorders Identification Test (AUDIT) was used to determine the risk profile of participants who reported consuming alcohol in the initial assessment. The AUDIT was developed by the World Health Organization (WHO) for screening excessive alcohol consumption and to assist in brief assessments [32], and has been validated for use in Ethiopia, as well as across various genders, target populations, and a diverse range of racial and ethnic groups ([32–35].

The AUDIT comprises 10 items to evaluate alcohol consumption, drinking patterns, and alcohol-related issues within the preceding 12 months. Each item is rated on a four-point scale, and the cumulative score ranges from zero to 40. Scores between 1 and 7 indicate low risk, scores from 8 to 14 suggest hazardous alcohol use and a score of 15 or higher indicates alcohol dependence. Typically, a score of eight or above serves as the threshold for diagnosing alcohol use disorder [36]. The current study obtained a good level of internal consistency, Cronbach's α = 0.87, in line with a previous local study [37].

Khat- among those who indicated using khat in the "yes/no" screening questions for lifetime and current khat use, the Problematic Khat Use Screening Test (PKUST-17) was administered to examine problematic use. The PKUST-17 was recently developed and validated in the Ethiopian context [23], and contains 17 items, with response options on a 5-point-Likert-scale, resulting in an overall score ranging from 0–68 [23]. Findings were presented based on the overall median score. Individuals scoring below the median were categorized as having lower problematic khat use, while those scoring equal to or above the median were considered to exhibit higher problematic khat use. The Cronbach's alpha in our study was excellent (0.96) and similar to the 0.93 reported in a previous Ethiopian study [23].

Tobacco- to assess tobacco use, we adopted the definition of "tobacco use" as defined by the Ethiopian Demographic and Health Survey (EDHS), that an individual is classified as a "tobacco user" if they report using any of the various forms or types of tobacco listed in the EDHS database such as cigarette smoking, piped tobacco smoking, chewing tobacco, snuff/suret, shisha, gaya (local traditional smoking tobacco leaves) or any other type [38, 39]. The use of any form of tobacco was assessed by asking respondents about their ever and current use of any form of tobacco.

Cannabis- to measure the lifetime and current use of cannabis among study participants, a simple yes/no question developed by the authors was utilized. Participants were classified as "cannabis users" if they responded 'yes' to the cannabis screening question and as "nonusers" if they responded 'no'.

Mental health conditions

Mental health conditions were assessed using previously used and validated instruments: the Patient Health Questionnaire (PHQ-9) for depression [40,41], the Generalized Anxiety

Disorder (GAD-7) for anxiety disorder [42], the (Trauma Screening Questionnaire) TSQ-10 for Post-traumatic Stress Disorder (PTSD) [43], and items from previous studies on suicide behavior [44]. These tools are standard and have demonstrated reliability across various demographics and settings [34,45,46]. In this study, participants were classified as positive for mental health conditions if they responded affirmatively to at least one of these conditions, and negative otherwise.

Perceived social support

Social support was measured using the 12-item Multidimensional Scale of Perceived Social Support (MSPSS), previously used in Ethiopia and other similar settings across Africa. The MSPSS has demonstrated strong internal consistency (Cronbach's alpha values typically above 0.8) and test-retest reliability, making it a robust instrument for assessing perceived social support across different cultural and demographic contexts [47]. This study followed adaptations from comparable settings in Africa, such as Uganda and Malawi, where slight language and context adjustments were made to preserve the instrument's cultural relevance while maintaining its original three-factor structure [48, 49]. In this study, perceived social support levels were classified as low, moderate, and high based on the mean score [50].

Other demographic, social, and family factors

Other independent variables such as age, sex, education, religion, ethnicity, marital status, occupation, place of residence, children status, number of children, family size, spouse educa-tion, spouse education, family income, and source of income, family history of substance use, and family history of mental illness were assessed using a combination of author-constructed questions and adapted items from previous studies [51, 52].

Data management and statistical analysis

Data analysis was carried out by using Stata, Version 18.0. Variables were described using frequency, percentage, and tables. For continuous variables, normality was checked using histograms, and median and inter-quarter ranges were reported.

Simple binary logistic regression analysis for each independent variable was performed against the dependent variable to see the impact of each factor on substance use among young people, without adjusting for the effect of other variables.

Independent variables found to be significant in the simple binary logistic regression analysis at a cut-off point of p-value < 0.25 with a 95% confidence interval were included in a multiple binary logistic regression model. In the multiple binary logistic regression model, the effect of each independent variable on substance use was assessed by controlling for the possi-ble confounders. Factors that remained insignificant in the final model at a p-value above 0.05 were removed.

The occurrence of multicollinearity was checked for the final model with an overall cut-off point of variance inflation factor (VIF) less than five. The overall fitness of the model was assessed using a chi-squared test. The associated p-value indicates the model is statistically significant (Prob>chi2 = 0.0000), suggesting that the predictors collectively affect the depen-dent variable- any substance use. The Receiver Operating Characteristic (ROC) curve analysis was employed to evaluate the predictive performance of the model utilized and the value of the area under the curve (AUC) falls within the ranges suggesting good discriminatory ability supporting the utility of our model in predicting the substance use among young people in Ethiopia.

Ethical considerations

The study was conducted in accordance with the Declaration of Helsinki's ethical principles and guidelines, ensuring that all potential participants were fully informed about the study and given enough time to make informed decisions about participation. Ethics approval was obtained from the Health and Medical Research Ethics Committee at the University of Technology Sydney (reference number: ETH23-7890) and the Campus Research Ethics Review Committee of Madda Walabu University, Shashemene Campus, Ethiopia (reference number: RCSTT/34/2015). A support letter was obtained from Madda Walabu University and Woreda administration offices.

Result

Study sample characteristics

Table 1 shows the sociodemographic characteristics of the N = 424 participants included in the analysis, with a response rate of 99.3%. The sample was comprised of 63.9% (n = 271) males and 36.1% (n = 153) females, with a median age of 23 years. About one-third (34.7%, n = 147) had attended basic formal education (grades 1–8), 58.0% (n = 246) were single, and 37.5% (n = 159) were employed. The majority identified as Oromo 71.9% (n = 305) in ethnicity, over half were Muslim, while 20.8% (n = 88) reported low perceived social support.

Distribution of substance use by demographic characteristics

Overall, 48.1% (204/424) of participants reported having used substances in their lifetime, and among them, 72.5% (148/204) were currently using substances (within the 30 days preceding the survey). A gender difference in lifetime substance use was observed, with 79.1% (n = 163) of males reporting use compared to 20.9% (n = 41) of females. Additional analyses looking at the relationship between various demographic and social factors and the prevalence of substance use among participants are provided in (Table 3).

Disparities in the levels of substance use among specific demographics and social groups were also identified, including individuals aged 25–29 years old (48.5%), singles (64.2%), employed individuals (41.7%), those with basic formal education (grades 1–8) (28.9%), urban residents (56.9%), and those identifying as Muslim (43.6%), when compared to their counterparts. Additionally, participants who reported having children, those with moderate perceived social support status, a family history of any substance use, and those belonging to medium-sized families (4–6 members) had relatively higher levels of substance use than their respective counterparts. Among the study participants who reported substance use, 16.7% (n = 34) had a family history of mental illness, while 83.3% (n = 170) did not. Similarly, among the study participants who reported substance use, 47.1% (n = 96) reported the presence of any mental health condition, while 52.9% (n = 108) did not (Table 2).

Substance use prevalence

In this study, the overall lifetime and current prevalence of any substance use among young people were 48.1% (95% CI: 43.3%, 53.0%) and 72.5% (95% CI: 65.9, 78.5), respectively.

The lifetime and current prevalence of alcohol among the study participants was 49.0% (95% CI: 42.0, 56.0) and 80.0% (95% CI: 70.8, 87.3), respectively. In a further analysis of the alcohol use risk levels in the last 12 months, assessed through the AUDIT-10 items among young individuals, 48.0% (n = 48), 30.0% (n = 30), and 22.0% (n = 22) exhibited low risk, probable hazardous use, and probable alcohol dependence, respectively (Table 3).

The lifetime and current prevalence of khat use among the study participants was 76.5% at (95% CI: 70.0, 82.0) and 91.7% (95% CI: 86.2, 95.5), respectively. The study identified

Table 1. Distribution of the sociodemographic characteristics of the study sample, Ethiopia, 2023, (n = 424).

Variable	Frequency	Percentage
Sex:		
Female	153	36.1
Male	271	63.9
Age in years:		
14–19	103	24.3
20–24	124	29.2
25–29	197	46.5
Participant Education:		
Not attended formal education	61	14.4
Attended basic formal education	147	34.7
Attended secondary school	119	28.0
Attended higher education	97	22.9
Marital Status:		
Single	246	58.0
Ever married	178	42.0
Participant Occupation:		
Farmer	62	14.6
Employed	159	37.5
Student	104	24.5
Unemployed	99	23.4
Place of residence:		
Rural	193	45.5
Urban	231	54.5
Ethnicity:		
Oromo	305	71.9
Amharic	40	9.4
Sidama	46	10.9
Wolaita	18	4.3
Others	15	3.5
Religion:		
Orthodox	87	20.5
Muslim	221	52.1
Protestant	105	24.8
Catholic	11	2.6
Spouse Education:		
Not attended formal education	32	18.0
Attended basic formal education	56	31.5
Attended secondary school	54	30.3
Attended higher education	36	20.2
Spouse Occupation:		
Farmer	35	19.7
Employed	87	48.9
Student	4	2.2
Unemployed	52	29.2
Children Status:		
No	276	65.1
Yes	148	34.9

(Continued)

Table 1. (Continued)

Variable	Frequency	Percentage
Number of children:		
Less than 4 children	151	84.8
Greater than 4 children	27	15.2
Household size:		
Small family	98	23.1
Medium family	208	49.1
Large family	118	27.8
Family income per year:		
Low income	161	38.0
Medium income	179	42.2
High income	84	19.8
Source of family income:		
Agriculture	191	45.1
Trade	57	13.4
Private business	83	19.6
Salary	93	21.9
Level of social support:		
Low perceived social support	88	20.8
Moderate perceived social support	299	70.5
High perceived social support	37	8.7
Family history of substance use:		
No	292	68.9
Yes	132	31.1
Family history of mental illness:		
No	374	88.2
Yes	50	11.8
Any mental health condition:		
No	271	63.9
Yes	153	36.1

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an overall mean score of 1.28 of the PKUST-17 for problematic khat use among the study participants. Using this mean score as the reference for categorization into higher and lower problematic use, the findings indicated that 56.4% (n = 88) reported low problematic khat use, while 43.6% (n = 68) reported high problematic khat use (Table 3).

The lifetime prevalence of tobacco use was 33.3% (95% CI: 26.9, 40.2), while the current prevalence was 76.5% (95% CI: 64.6, 85.9) (Table 3). Lifetime tobacco use was calculated among individuals who reported lifetime use of any substance in the list (68/204), whereas current use was derived from lifetime users (52/68). Notably, both the current and lifetime prevalence of substance use were higher among males, individuals in the age group 20–24 years old, and those who reported at least one mental health condition, as detailed in (Table 3). Among the lifetime tobacco users, 47% smoked cigarettes, 44% smoked shisha, and the remaining used other forms of tobacco. Among current tobacco users, 51.9% (n = 27) reported smoking cigarettes, 38.5% (n = 20) used shisha, 1.9% (n = 1) used in the form of snuff (chewing tobacco), 3.8% (n = 2) used both cigarettes and shisha and 3.8% (n = 2) reported using both cigarettes and chewing tobacco.

Table 2. The relationship between various sociodemographic factors and substance use among the study sample, Ethiopia, 2023, (n = 424).

Variable	Level	Total	No	Yes	P-value
N		424	220 (51.9%)	204 (48.1%)	
Sex of participants	Female	153	112 (50.9%)	41 (20.1%)	<0.001
	Male	271	108 (49.1%)	163 (79.9%)	
Age of the participant	14-19	103	64 (29.1%)	39 (19.1%)	0.050
	20–24	124	58 (26.4%)	66 (32.4%)	
	25–29	197	98 (44.5%)	99 (48.5%)	
Participant marital status	Single	246	115 (52.3%)	131 (64.2%)	0.013
	Ever married	178	105 (47.7%)	73 (35.8%)	
Place of residence	Rural	193	105 (47.7%)	88 (43.1%)	0.343
	Urban	231	115 (52.3%)	116 (56.9%)	
Participant occupational status	Farmer	62	35 (15.9%)	27 (13.2%)	0.168
	Employed	59	74 (33.6%)	85 (41.7%)	
	Student	104	62 (28.2%)	42 (20.6%)	
	Unemployed	99	49 (22.3%)	50 (24.5%)	
Spouse occupational status	Farmer	35	25 (23.8%)	10 (13.7%)	0.327
	Employed	87	51 (48.6%)	36 (49.3%)	
	Student	4	2 (1.9%)	2 (2.7%)	
	Unemployed	52	27 (25.7%)	25 (34.3%)	
Participant Educational Status	Not attended formal education	61	26 (11.8%)	35 (17.2%)	0.020
	Attended basic formal education	147	88 (40.0%)	59 (28.9%)	
	Attended secondary school	119	65 (29.5%)	54 (26.5%)	
	Attended higher education	97	41 (18.6%)	56 (27.4%)	
Spouse Educational Status	Not attended formal education	32	17 (16.2%)	15 (20.5%)	0.290
	Attended basic formal education	56	29 (27.6%)	27 (37.0%)	
	Attended secondary school	54	37 (35.2%)	17 (23.3%)	
	Attended higher education	36	22 (21.0%)	14 (19.2%)	
Children Status	No	276	132 (60.0%)	144 (70.6%)	0.022
	Yes	148	88 (40.0%)	60 (29.4%)	
Number of children	< 4 children	151	87 (82.9%)	64 (87.7%)	0.379
	≥ 4 children	27	18 (17.1%)	9 (12.3%)	
Household size	Small family	98	43 (19.5%)	55 (27.0%)	0.174
	Medium family	208	115 (52.3%)	93 (45.6%)	
	Large family	118	62 (28.2%)	56 (27.4%)	
Family income per year	Small income	161	78 (35.4%)	83 (40.2%)	0.538
	Medium income	179	97 (44.1%)	82 (40.7%)	
	High income	84	45 (20.5%)	39 (19.1%)	
Source of family income	Agriculture	191	103 (46.8%)	88 (47.7%)	0.069
	Trade	57	25 (11.4%)	32 (15.7%)	
	Private business	83	51 (23.2%)	32 (15.7%)	
	Salary	93	41 (18.6%)	52 (25.5%)	
Participant religion	Orthodox	87	28 (12.7%)	59 (28.9%)	<0.001
	Muslim	221	132 (60.0%)	89 (43.6%)	
	Protestant	105	57 (25.9%)	48 (23.5%)	
	Catholic	11	3 (1.4%)	8 (3.9%)	

(Continued)

Table 2. (Continued)

Variable	Level	Total	No	Yes	P-value
Ethnicity	Oromo	305	167 (75.9%)	138 (67.6%)	0.388
	Amhara	40	16 (7.3%)	24 (11.8%)	
	Sidama	46	22 (10.0%)	24 (11.8%)	
	Wolaita	18	8 (3.6%)	10 (4.9%)	
	Others	15	7 (3.2%)	8 (3.9%)	
Level of social support	Low social support	88	18 (8.2%)	70 (34.3%)	<0.001
	Moderate social support	299	172 (78.2%)	127 (62.3%)	
	High social support	37	30 (13.6%)	7 (3.4%)	
Any mental health condition	No	271	163 (74.1%)	108 (52.9%)	<0.001
	Yes	153	57 (25.9%)	96 (47.1%)	
Family history of substance use	No	292	201 (91.4%)	91 (44.6%)	<0.001
	Yes	132	19 (8.6%)	113 (55.4%)	
Family history of mental illness	No	374	204 (92.7%)	170 (83.3%)	0.001
	Yes	50	16 (7.3%)	34 (16.7%)	

The lifetime and current prevalence of cannabis use was 23.0% (95% CI: 17.4, 29.4) and 68.1% (95% CI: 52.9, 80.9) respectively. Among the current users in the study, 87.5% (n = 28) were males, 40.6% (n = 13) were in the age range of 25–29 years old, and 34.4% (n = 11) had completed basic formal education (grades 1–8). Additionally, over half of the current cannabis user samples reported low perceived social support, while approximately two-thirds reported at least one mental health condition (Table 3).

Factors associated with substance use

In the preliminary unadjusted bivariate model analysis, various covariates were examined independently for their potential association with substance use. These covariates included sex, age, marital status, education, occupation, religion, place of residence, level of social support, mental health condition, family size, source of income, family history of any substance use, and family history of mental illness (Table 4).

In the adjusted model analysis controlling for potential confounders, participant sex, marital status, family history of substance use, perceived social support, and the presence of any reported mental health condition remained significantly associated with the likelihood of substance use (Table 4).

Notably, male study participants exhibited a significantly higher likelihood (6.37 times higher odds) of substance use compared to their female counterparts, showing gender-based disparities in substance use (AOR = 6.37, 95%CI:3.35, 12.12, p < 0.001).

Marital status also played a significant role with singles demonstrating a significantly higher likelihood (2.12 times) of substance use in comparison to those who were ever married (AOR = 2.12, 95%CI: 1.06, 4.23, p = 0.033).

Individuals with low perceived social support had approximately 6.5 times higher odds of any substance use compared to those with moderate and high perceived social support (AOR = 6.55, 95%CI:2.02, 21.30, p < 0.001).

Participants who reported a history of substance use in their family had 11.66 times higher odds of substance use than those with no family history of substance use (AOR = 11.66, 95%CI: 6.04, 22.55, p < 0.001). Furthermore, young individuals with any reported mental

Table 3. Lifetime and current substance use distribution by various sociodemographic characteristics of the study samples, Ethiopia 2023, (n = 424).

Variable	Current use (YES)				Ever use (YES)			
	Alcohol	Khat	Tobacco	Cannabis	Alcohol	Khat	Tobacco	Cannabis
Sex:								
Female	18(22.5%)	21(14.7%)	4(7.7%)	4(12.5%)	27(27.0%)	26(16.7%)	7(10.3%)	6(12.8%)
Male	62(77.5%)	122(85.3%)	48(92.3%)	28(87.5%)	73(73.0%)	130(83.3%)	61(89.7%)	41(87.2%)
Age in years:								
14–19	14(17.5%)	30(21.0%)	6(11.5%)	6(18.8%)	15(15.0%)	33(21.2%)	9(13.3%)	9(19.1%)
20–24	25(31.3%)	44(30.8%)	14(26.9%)	13(40.6%)	33(33.0%)	49(31.4%)	23(33.8%)	18(38.3%)
25–29	41(51.2%)	69(48.2%)	32(61.6%)	13(40.6%)	52(52.0%)	74(47.4%)	36(52.9%)	20(42.6%)
Participant Education								
Not attended formal education	13(16.2%)	22(15.4%)	15(28.8%)	5(15.6%)	16(16.0%)	22(14.1%)	16(23.5%)	6(12.8%)
Attended basic formal education	19(23.8%)	41(28.6%)	13(25.0%)	11(34.4%)	27(27.0%)	48(30.8%)	17(25.0%)	15(31.9%)
Attended secondary school	27(33.8%)	42(29.4%)	12(23.1%)	7(21.9%)	31(31.0%)	42(26.9%)	15(22.1%)	12(25.5%)
Attended higher education	21(26.2%)	38(26.6%)	12(23.1%)	9(28.1%)	26(26.0%)	44(28.2%)	20(29.4%)	14(29.8%)
Marital Status:								
Single	51(63.8%)	99(69.2%)	30(57.7%)	26(81.2%)	61(61.0%)	107(68.6%)	45(66.2%)	33(70.2%)
Ever married	29(36.2%)	44(30.8%)	22(42.3%)	6(18.8%)	39(39.0%)	49(31.4%)	23(33.8%)	14(29.8%)
Participant Occupation:								
Farmer	4(5.0%)	18(12.6%)	13(25.0%)	2(6.3%)	7(7.0%)	20(12.8%)	14(20.6%)	5(10.6%)
Employed	41(51.3%)	58(40.6%)	19(36.5%)	10(31.3%)	46(46.0%)	65(41.7%)	23(33.8%)	18(38.3%)
Student	14(17.5%)	32(22.4%)	7(13.5%)	10(31.3%)	19(19.0%)	34(21.8%)	17(25.0%)	12(25.5%)
Unemployed	21(26.2%)	35(24.5%)	13(25.0%)	10(31.3%)	28(28.0%)	37(23.7%)	14(20.6%)	12(25.6%)
Place of residence:								
Rural	30(37.5%)	64(44.8%)	17(32.7%)	14(43.8%)	38(38.0%)	71(45.5%)	24(35.3%)	23(48.9%)
Urban	50(62.5%)	79(55.2%)	35(67.3%)	18(56.2%)	62(62.0%)	85(54.5%)	44(64.7%)	24(51.1%)
Ethnicity:								
Oromo	35(43.7%)	106(74.1%)	31(59.6%)	20(62.5%)	48(48.0%)	116(74.4%)	41(60.4%)	30(63.8%)
Amhara	20(25.0%)	8(5.6%)	7(13.5%)	5(15.6%)	23(23.0%)	9(5.8%)	9(13.2%)	7(14.9%)
Sidama	14(17.5%)	16(11.2%)	6(11.5%)	2(6.3%)	17(17.0%)	17(10.9%)	9(13.2%)	4(8.5%)
Wolaita	5(6.3%)	8(5.6%)	6(11.5%)	4(12.5%)	6(6.0%)	8(5.1%)	6(8.8%)	4(8.5%)
Others	6(7.5%)	5(3.5%)	2(3.9%)	1(3.1%)	6(6.0%)	6(3.8%)	3(4.4%)	2(4.3%)
Religion:								
Orthodox	47(58.8%)	21(14.7%)	13(25.0%)	10(31.3%)	57(57.0%)	25(16.0%)	15(22.1%)	13(27.7%)
Muslim	8(10.0%)	79(55.2%)	16(30.8%)	12(37.5%)	13(13.0%)	85(54.5%)	26(38.2%)	22(46.8%)
Protestant	23(28.7%)	36(25.2%)	20(38.5%)	9(28.1%)	28(28.0%)	39(25.0%)	23(33.8%)	11(23.4%)
Catholic	2(2.5%)	7(4.9%)	3(5.7%)	1(3.1%)	2(2.0%)	7(4.5%)	4(5.9%)	1(2.1%)
Spouse Education:								
Not attended formal education	6(20.7%)	9(20.4%)	9(40.9%)	1(16.7%)	8(20.5%)	10(20.4%)	9(39.1%)	5(35.8%)
Attended basic formal education	11(37.9%)	15(34.1%)	7(31.8%)	3(50.0%)	16(41.0%)	17(34.7%)	7(30.4%)	3(21.4%)
Attended secondary school	5(17.3%)	12(27.3%)	4(18.2%)	1(16.7%)	6(15.4%)	13(26.5%)	4(17.4%)	3(21.4%)
Attended higher education	7(24.1%)	8(18.2%)	2(9.1%)	1(16.7%)	9(23.1%)	9(18.4%)	3(13.1%)	3(21.4%)

(Continued)

Table 3. (Continued)

Variable	Current use (YES)				Ever use (YES)			
	Alcohol	Khat	Tobacco	Cannabis	Alcohol	Khat	Tobacco	Cannabis
Spouse Occupation:								
Farmer	1(3.4%)	6(13.6%)	3(13.6%)	1(16.7%)	3(7.7%)	7(14.3%)	3(13.0%)	2(14.3%)
Employed	18(62.1%)	24(54.6%)	8(36.4%)	3(50.0%)	23(59.0%)	26(53.1%)	9(39.1%)	6(42.9%)
Student	0(0.0%)	2(4.5%)	11(50.0%)	0(0.0%)	0(0.0%)	2(4.1%)	0(0.0%)	1(7.1%)
Unemployed	10(34.5%)	12(27.3%)	0(0.0%)	2(33.3%)	13(33.3%)	14(28.6%)	11(47.9%)	5(35.7%)
Children Status:								
No	57(71.2%)	105(73.4%)	33(63.5%)	27(84.4%)	69(69.0%)	114(73.1%)	49(72.1%)	36(76.6%)
Yes	23(28.8%)	38(26.6%)	19(36.5%)	5(15.6%)	31(31.0%)	42(26.9%)	19(27.9%)	11(23.4%)
Number of children:								
<four children	25(86.2%)	39(88.6%)	16(72.7%)	6(100.0%)	33(84.6%)	44(89.8%)	17(73.9%)	14(100.0%)
≥four children	4(13.8%)	5(11.4%)	6(27.3%)	0(0.0%)	6(15.4%)	5 (10.2%)	6(26.1%)	0(0.0%)
Household size:								
Small family	19(27.7%)	42(29.4%)	14(26.9%)	8(25.0%)	23(23.0%)	45(28.9%)	18(26.5%)	11(23.4%)
Medium family	43(53.8%)	56(39.2%)	24(46.2%)	16(50.0%)	53(53.0%)	64(41.0%)	30(44.1%)	23(48.9%)
Large family	18(22.5%)	45(31.6%)	14(26.9%)	8(25.0%)	24(24.0%)	47(30.1%)	20(29.4%)	13(27.7%)
Family income per year:								
Low income	35(43.8%)	56(39.2%)	25(48.1%)	16(50.0%)	43(43.0%)	60(38.5%)	34(50.0%)	19(40.4%)
Medium income	28(35.0%)	60(42.0%)	19(36.5%)	11(34.4%)	38(38.0%)	66(42.3%)	25(36.8%)	19(40.4%)
High income	17(21.2%)	27(18.9%)	8(15.4%)	5(15.6%)	19(19.0%)	30(19.2%)	9(13.2%)	9(19.2%)
Source of family income:								
Agriculture	23(28.8%)	67(46.8%)	19(36.5%)	12(37.5%)	32(32.0%)	71(45.5%)	30(44.1%)	19(40.4%)
Trade	18(22.5%)	21(14.7%)	11(21.2%)	9(28.1%)	21(21.0%)	24(15.4%)	12(17.6%)	10(21.3%)
Private business	11(13.8%)	24(16.8%)	6(11.5%)	2(6.3%)	16(16.0%)	25(16.0%)	8(11.8%)	5(10.6%)
Salary	28(35.0%)	31(21.7%)	16(30.8%)	9(28.1%)	31(31.0%)	36(23.1%)	18(26.5%)	13(27.7%)
Level of social support:								
Low social support	33(41.25%)	54(37.8%)	31(59.6%)	18(56.25%)	40(40.0%)	56(35.9%)	40(58.8%)	24(51.1%)
Moderate social support	46(57.50%)	84(58.7%)	20(38.5%)	14(43.75%)	57(57.0%)	95(60.9%)	27(39.7%)	23(48.9%)
High social support	1(1.25%)	5(3.5%)	1(1.9%)	0	3(3.0%)	5(3.2%)	1(1.5%)	0
Any mental health conditions:								
No	32(40.0%)	79(55.2%)	20(38.5%)	12(37.5%)	42(42.0%)	85(54.5%)	27(39.7%)	17(36.2%)
Yes	48(60.0%)	64(44.8%)	32(61.5%)	20(62.5%)	58(58.0%)	71(45.5%)	41(60.3%)	30(63.8%)
Family history of substance use:								
No	33(41.25%)	63(44.1%)	16(30.8%)	6(18.75%)	40(40.0%)	68(43.6%)	22(32.3%)	13(27.7%)
Yes	47(58.75%)	80(55.9%)	36(69.2%)	26(81.25%)	60(60.0%)	88(56.4%)	46(67.7%)	34(72.3%)
Family history of mental illness:								
No	63(78.7%)	123(86.0%	39(75.0%)	24(75.0%)	77(77.0%)	132(84.6%)	52(76.5%)	37(78.7%)
Yes	17(21.3%)	20(14.0%)	13(25.0%)	8(25.0%)	23(23.0%)	24(15.4%)	16(23.5%)	10(21.3%)

health conditions (depression, anxiety, post-traumatic disorder, suicidal behavior), had significantly higher odds of substance use (AOR = 1.99, 95%CI: 1.05, 3.80, p = 0.036).

From the final adjusted multivariable model analysis age, religion, occupation, education, family history of mental illness, and source of family income, did not demonstrate an independent association with the outcome variable of "any substance use."

Discussion

Overall, 48.1% and 72.5% of the participants reported lifetime and current substance use, respectively. Factors such as being male, having single marital status, experiencing mental

Table 4. Multivariable logistic regression model output indicating predictors of substance use among young people in West Arsi, Ethiopia, 2023, (n = 424).

Variable	Yes, for substance use (in %) N = 204	COR 95%CI	P-Value	AOR, 95%CI	P-Value
Sex:					
Female	20.1	Ref	Ref	Ref	Ref
Male	79.9	4.12(2.67, 6.35)	0.000*	6.37(3.35,12.11)	0.000*
Age in years:					
14–19	19.1	Ref	Ref	Ref	Ref
20–24	32.4	1.87(1.10, 3.18)	0.021	1.34(0.63, 2.83)	0.443
25–29	48.5	1.66(1.02, 2.70)	0.042	1.48(0.62, 3.58)	0.378
Participant Education					
Not attended formal education	17.2	1.00(0.51, 1.88)	0.965	1.06(0.38, 2.93)	0.906
Attended basic formal education	28.9	0.49(0.29, 0.83)	0.007*	0.48(0.21, 1.13)	0.093
Attended secondary school	26.5	0.61(0.35, 1.04)	0.072	0.62(0.27, 1.42)	0.256
Attended higher education	27.4	Ref	Ref	Ref	Ref
Marital Status:					
Single	64.2	1.64(1.11, 2.42)	0.013*	2.12(1.06, 4.22)	0.033*
Ever married	35.8	Ref	Ref	Ref	Ref
Participant Occupation:					
Farmer	13.2	Ref	Ref	Ref	Ref
Employed	41.7	1.49(0.82, 2.69)	0.187	1.41(0.54, 3.67)	0.483
Student	20.6	0.88(0.46, 1.66)	0.689	0.75(0.26, 2.13)	0.587
Unemployed	24.5	1.32(0.70, 2.50)	0.390	1.24(0.46, 3.36)	0.669
Place of residence:					
Rural	43.1	Ref	Ref	Ref	Ref
Urban	56.9	1.20(0.82, 1.77)	0.343	0.95(0.55, 1.64)	0.853
Religion:					
Orthodox	28.9	3.36(1.98, 5.69)	0.000*	0.62(0.10, 3.93)	0.617
Islam	43.6	Ref	Ref	0.22(0.04, 1.27)	0.092
Protestant	23.5	1.32(0.83, 2.11)	0.242	0.24(0.04, 1.45)	0.120
Catholic	3.9	4.03(1.04,15.61)	0.044*	Ref	Ref
Household size:					
Small family	27.0	Ref	Ref	Ref	Ref
Medium family	45.6	0.63(0.39, 1.03)	0.063	0.75(0.37, 1.50)	0.414
Large family	27.4	0.71(0.41, 1.21)	0.205	0.87(0.37, 2.02)	0.744
Source of family income:					
Agriculture	47.7	Ref	Ref	Ref	Ref
Trade	15.7	1.50(0.83, 2.72)	0.183	1.78(0.72, 4.39)	0.209
Private business	15.7	0.73(0.43, 1.24)	0.250	0.76(0.34, 1.70)	0.511
Salary	25.5	1.48(0.90, 2.44)	0.120	1.26(0.55, 2.89)	0.580
Level of perceived social support:					
Low	34.3	16.67(6.30, 44.06)	0.000*	6.55(2.01, 21.30)	0.002*
Moderate	62.3	3.16(1.35, 7.43)	0.008*	2.40(0.88, 6.54)	0.088
High	3.4	Ref	Ref	Ref	Ref
Any mental health conditions:					
No	52.9	Ref	Ref	Ref	Ref
Yes	47.1	2.54(1.81, 4.12)	0.000*	1.99(1.05, 3.80)	0.036*
Family history of substance use:					
No	44.6	Ref	Ref	Ref	Ref
Yes	55.4	13.14(1.69, 3.82)	0.000*	11.66(6.03, 22.54)	0.000*

(Continued)

Table 4. (Continued)

Variable	Yes, for substance use (in %) N = 204	COR 95%CI	P-Value	AOR, 95%CI	P-Value
Family history of mental illness:					
No	83.3	Ref	Ref	Ref	Ref
Yes	16.7	2.55(1.36, 4.78)	0.003[*]	0.84(0.30, 2.37)	0.750

[*]=P-value less than 0.05Ref= Referent category.

health conditions, having a family history of substance use, and lower perceived social support were associated with substance use among young people. The findings provide a broad analysis of the context relevant to substance use amongst young people in the West Arsi general community, Ethiopia.

The prevalence of substance use identified in this study was similar to that found in previous Ethiopian studies among young people, 47.0% [52], and a review of studies examining substance use among adolescents in East Africa, 49.0% [53]. However, the prevalence of substance use in this study was lower compared to various previous Ethiopian and international studies. For instance, higher prevalences were reported among high school adolescents in Woreta town (65.0%) [54], young people in the Northern Shewa zone, 66.0% [55], students at Addis Ababa University (74.0%) [56], college students in Kenya, 70% [57], and Ghanaian young adults in Accra, 71% [58]. Conversely, the prevalence in this study exceeds that reported in previous studies among young people in Ethiopia, (32.0%) [26], students in Ethiopia, (38.0%) [19], street children in Jimma town, (39.0%) [59], Nigerian high school students, (32.9%) [60], and University Students in Sudan, (31.0%), [61]. Observed differences in substance use prevalence between this and previous studies could stem from various factors, including sociocultural influences, environmental conditions, and methodological disparities (such as sample size, study duration, and the specific target population).

Along with the Ethiopian sociocultural practices that encourage communal gatherings, environmental factors conducive to psychoactive substance production can likely increase the risk of substance use [7,62]. In accordance with this, some parts of the current study setting, particularly Negelle Arsi and Wondo woredas, are known for producing substances such as *Arekie* (a potent local alcohol drink) [63] and *Wondo Balache khat* (a popular variety of khat among many Ethiopians) [64]. This might increase the tendency of young people to engage in the cultivation and production of these substances thereby increasing the risk of substance use, given over 85% of the population in this area is dependent on agricultural activities [65].

The geographic location of the study setting and unique cultural practices might also be attributed to the observed prevalence of substance use in this study. For example, Shashemene town (the zonal capital of the West Arsi zone) is located at a crossroads for the major roads that connect various parts of the country as well as with some neighboring countries such as Kenya [66]. As the transient population, particularly long-distance drivers often time engage in substance use, young people in the town might be more likely to be exposed to substance use and drug trafficking [67]. Furthermore, Shashemene is known to host a large community of *Rastafarians*, a religious group of Jamaican origin, which considers the town a *Land of Promise* [68,69]. The communal gatherings of this community are marked by activities such as smoking cannabis (ganja), which additionally exposes young people to substance use [70].

Moreover, the specific characteristics of the target population in this study may account for the higher prevalence of substance use observed. Substance use and its consequences are particularly pronounced in young people, as this age marks a critical developmental stage characterized by significant physical and psychological changes [71–73]. During this

transitional phase from childhood to adulthood, individuals often engage in risk-taking and sensation-seeking behaviors. This pursuit of novelty and excitement may lead to experimentation with substances. As postulated by the affect heuristic theory, decision-making during this period is often driven by emotions rather than rational analysis [74].

Consistent with previous Ethiopian [24,26,54] and international research [75–78], this study shows significant gender differences in substance use, with males showing high risk as compared to females. Ethiopian studies highlighted the gendered disparities in access to, use of, and control over resources, economic assets, physical mobility, decision-making power, and community expectations [79, 80]. They explained a different social definition and understanding of 'being young' for men and women, that young women in Ethiopia are part of the 'inner circle' of their parent's lives. Compared to young men, they have less or no leisure time and take on adult responsibilities earlier in life, such as taking on more household responsibilities and looking after younger siblings. In contrast, young men in Ethiopia have a 'public life' – they leave the house and spend their leisure time with friends engaging in activities that could expose them to different substances (for instance chewing khat or enjoying alcoholic drinks). These gendered socialisation norms in Ethiopia, encourage boys to be assertive and risk-taking, traits often associated with substance use experimentation [81]. This cultural practice of imposing more restrictions on females, particularly during their early age, compared to males, is common in the Arsi community, the dominant tribe in the West Arsi zone [82–84]. This tradition of associating substance use with masculinity, while stigmatising it among females as a deviation from traditional gender roles may have contributed to the observed high prevalence among males in our study. Additionally, young men may perceive substance use as a path to enhance their social status or peer conformity [12,52].

The current study found a significant association between substance use and marital status, with being single found to increase the odds of substance use. This finding aligns with previous studies conducted in Ethiopia and other countries [30,85–87]. In Ethiopia, marriage is a significant cultural institution, associated with heightened levels of family responsibility and personal security [88,89]. Having someone to share responsibilities, provide emotional support, and offer guidance can reduce feelings of isolation and stress, which are factors that may contribute to substance use. Married individuals may feel a greater sense of responsibility toward their spouse and family, which could protect them from engaging in risky behaviors like substance use [90]. Conversely, single individuals may have more social interactions outside of familial circles, potentially exposing them to environments where substance use is more common [52]. However, it is important to note that social desirability bias may play a role here with participants who are married potentially underreporting substance use due to societal pressure and fear of judgement.

Our study found experiencing mental health conditions like depression, anxiety, PTSD, and suicidal behaviors increased the odds of substance use among young people, consistent with previous studies [76,78]. This association likely arises from changes during adolescence and underlying stressors such as poverty, unemployment, violence, or social marginalization. Individuals with mental health conditions may turn to substances as self-medication or coping behaviour providing temporary relief from psychological pain or discomfort [71,91]. Limited access to mental health resources and the stigma surrounding mental health conditions may further drive young people to substance use as a temporary relief [92]. However, substance use can in some cases further disrupt neurobiological pathways, exacerbating existing mental health problems or triggering the emergence of new ones [93].

It was also found that a history of family substance use is a predictor of substance use prevalence among young people in the West Arsi zone, consistent with previous research [54,87,94]. Consistent with social learning theory, children learn behaviours by observing and

imitating family members [95,96]. When family members engage in substance use, it normalizes the behaviour, making young people more likely to view substance use as acceptable or desirable, thus prompting experimentation [78,97]. Furthermore, family environments with substance may lack supervision, discipline, and support, potentially leading to stress and maladaptive coping like substance use among young people, frequently in the context of parental conflict or neglect [78,98].

The current study also found higher substance use prevalence among participants with lower perceived social support, compared to those with moderate to higher support, highlighting the potential influence of social support on substance use patterns. This aligns with previous findings from Ethiopia [52,99] and elsewhere [100–102], indicating that individuals who receive higher levels of social support were at lower odds of reporting substance use. The extensive support networks within Ethiopian communities often play a vital role in an individual's life [103,104], and enhancing the protective role of these social networks in addressing substance use could be beneficial.

Overall, this substance use research highlights the importance of targeted interventions addressing substance use among young people focusing on promoting their mental well-being, enhancing their coping skills to different life challenges, and the importance of strengthening the family and social support dynamics.

Strength and limitations

A major strength of this study is the comprehensive exploration of factors that may shape substance use behaviors such as gender, marital status, mental health conditions, family history of substance use, and perceived social support. Further, Our research methodology ensured broad participation regardless of literacy levels, employing face-to-face interviews with a standard questionnaire. We thoroughly selected participants to ensure diversity and achieved a high response rate (99.3%), indicative of strong engagement. Importantly, our approach minimized self-selection bias, enhancing the reliability and inclusivity of our findings.

A major limitation of this study pertains to its cross-sectional nature, limiting the establishment of causal relationships between variables. Additionally, as with any survey-based research, there is a potential for self-reporting bias, where participants may underreport or overreport substance use behaviors due to social desirability or other factors that could impact the accuracy and interpretation of results. Furthermore, it is important to note the finding of this study is specific to the West Arsi zone and might not entirely reflect substance use patterns in other regions of Ethiopia or different socio-cultural contexts.

Conclusion and recommendations

In conclusion, this study sheds light on the prevalence and associated factors of substance use among young people in the West Arsi zone, Ethiopia. The study provides valuable insights into the complexities of substance use behaviors among young people in the region.

Approximately half of the study participants reported at least one substance use in their lifetime from alcohol, khat, tobacco, and cannabis, with variations across different factors such as gender, marital status, mental health conditions, family history of substance use, and perceived social support. These findings underscore the need for targeted interventions and public health policies that address the specific needs of young individuals and the diversity of substances used in the West Arsi zone and similar regions in Ethiopia.

Targeted community-based intervention strategies are essential to address substance use among young people in Ethiopia, focusing on their mental well-being, fostering their coping

skill development, and strengthening family and social support systems as positive influences on their lives. Additionally, comprehensive research is needed to deepen understanding of substance use among young people in Ethiopia, exploring diverse risk factors, causality, associated harms, and intervention effectiveness, facilitating more informed and effective prevention and intervention efforts.

Supporting information

S1 Table: Proportional distribution of sample size among the chosen kebeles, West Arsi zone, Ethiopia, 2023 (N = 427).
(DOCX)

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References

1. World Health Organization. Global status report on alcohol and health. Geneva. 2018.

2. WHO, WHO Global Report on Trends in Prevalence of Tobacco Use 2000-2025. Geneva: World Health Organization. 2021.

3. Tawfik GM, Hashan MR, Abdelaal A, Tieu TM, Huy NT. A commentary on the medicinal use of marijuana. Trop Med Health. 2019;47:35. https://doi.org/10.1186/s41182-019-0161-x PMID: 31148941

4. El-Menyar A, Mekkodathil A, Al-Thani H, Al-Motarreb A. Khat use: history and heart failure. Oman Med J. 2015;30(2):77–82. https://doi.org/10.5001/omj.2015.18 PMID: 25960830

5. GBD 2017 Disease and Injury Incidence and Prevalence Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017. Lancet. 2018;392(10159):1789–858. https://doi.org/10.1016/S0140-6736(18)32279-7 PMID: 30496104

6. McLellan AT. Substance misuse and substance use disorders: why do they matter in healthcare?. Trans Am Clin Climatol Assoc. 2017;128:112–30.

7. Onaolapo OJ, Olofinnade AT, Ojo FO, Adeleye O, Falade J, Onaolapo AY. Substance use and substance use disorders in Africa: an epidemiological approach to the review of existing literature. World J Psychiatry. 2022;12(10):1268–86. https://doi.org/10.5498/wjp.v12.i10.1268 PMID: 36389088

8. Schulte MT, Hser Y-I. Substance use and associated health conditions throughout the lifespan. Public Health Rev. 2014;35(2): https://doi.org/10.1007/BF03391702 PMID: 28366975

9. Das JK, Salam RA, Arshad A, Finkelstein Y, Bhutta ZA. Interventions for adolescent substance abuse: an overview of systematic reviews. J Adolesc Health. 2016;59(4S):S61–75. https://doi.org/10.1016/j.jadohealth.2016.06.021 PMID: 27664597

10. Esmael A. Psychoactive substances use (Khat, Alcohol and Tobacco) and Associated Factors among Debre Markos University Students, North-West Ethiopia, 2013. J Defense Manag, 2014;04(01).

11. Fekadu A, Alem A, Hanlon C. The status of alcohol and drug abuse in Ethiopia: past, present and future. African J Drug Alcohol Studies. 2007;6:39–53.

12. Cooper ML, Kuntsche E, Levitt A, Barber LL, Wolf S. Motivational models of substance use: a review of theory and research on motives for using alcohol, marijuana, and tobacco. The Oxford handbook of substance use and substance use disorders. New York, NY, US: Oxford University Press; 2016;1:375–421.

13. Sher KJ. The Oxford Handbook of Substance Use and Substance Use Disorders. Volume 1, Oxford University Press. 2014;1.

14. Manghi RA. Khat use: lifestyle or addiction?. J Psychoactive Drugs. 2009;41(1):1–10.

15. Debele ML, Tolla TT, Zekiros BK, Abegaz HA, Ayalew MZ. Societal and cultural norms that expose children to early alcohol use in Amhara Region rural community, Ethiopia. Acta Psychol (Amst). 2023;232:103801. https://doi.org/10.1016/j.actpsy.2022.103801 PMID: 36493592

16. Fentie EG, Emire SA, Demsash HD, Dadi DW, Shin JH. Cereal- and fruit-based ethiopian traditional fermented alcoholic beverages. Foods, 2020. 9(12).

17. Mavura RA, Nyaki AY, Leyaro BJ, Mamseri R, George J, Ngocho JS, et al. Prevalence of substance use and associated factors among secondary school adolescents in Kilimanjaro region, northern Tanzania. PLoS One. 2022;17(9):e0274102. https://doi.org/10.1371/journal.pone.0274102 PMID: 36054121

18. Roba HS, Beyene AS, Irenso AA, Gebremichael B. Prevalence of lifetime substances use among students in Ethiopia: a systematic review and meta-analysis. Syst Rev. 2019;8(1):326. https://doi.org/10.1186/s13643-019-1217-z PMID: 31837700

19. Roba HS. Current substances use among students in Ethiopia: a systematic review and meta-analysis of 20-years evidence. Substance Abuse. 2021;15:11782218211050352. https://doi.org/10.1177/11782218211050352

20. Pankhurst A. Youth and globalisation in four WIDE Ethiopia sites. WIDE Ethiopia. 2023. Communication media and cultural practices. Int J Ethiopian Stud. 2019;13(1):17–30.

21. John-Langba J, Ezeh A, Guiella G, Kumi-Kyereme A, Neema S. Alcohol, drug use, and sexual-risk behaviors among adolescents in four sub-Saharan African countries. Population Association of America 2006 Annual Meeting Program. 2006.

22. Duresso SW, Bruno R, Matthews AJ, Ferguson SG. Khat withdrawal symptoms among chronic khat users following a quit attempt: an ecological momentary assessment study. Psychol Addict Behav. 2018;32(3):320–6. https://doi.org/10.1037/adb0000368 PMID: 29771560

23. Mihretu A, Fekadu A, Norton S, Habtamu K, Teferra S. Development of a Problematic Khat Use Screening Test (PKUST-17) in Ethiopia: classical test theory and item response theory analysis. Collabra: Psychol. 2022;8(1):. https://doi.org/10.1525/collabra.38064

24. Abate SM, Chekol YA, Minaye SY. Prevalence and risk factors of psychoactive substance abuse among students in Ethiopia: a systematic review and meta-analysis. Ann Med Surg (Lond). 2021;70:102790. https://doi.org/10.1016/j.amsu.2021.102790 PMID: 34540211

25. Tefera S. Substance use among university students in Ethiopia: a systematic review and meta-analysis. Ethiopian J Health Develop. 2018;32(4).

26. Abajobir A, Kassa G. Magnitude of substance use among young people in Ethiopia: a meta-analytic review. Ethiopian Med J. 2019;57:295–307.

27. Central Statistical Agency of Ethiopia. Population Size by Sex, Area and Density by Region, Zone and Wereda. 2022. Addis Ababa, Ethiopia.

28. Mokona H, Yohannes K, Ayano G. Youth unemployment and mental health: prevalence and associated factors of depression among unemployed young adults in Gedeo zone, Southern Ethiopia. Int J Ment Health Syst. 2020;14:61. https://doi.org/10.1186/s13033-020-00395-2 PMID: 32782471

29. Kadam P, Bhalerao S. Sample size calculation. Int J Ayurveda Res. 2010;1(1):55–7. https://doi.org/10.4103/0974-7788.59946 PMID: 20532100

30. Zenbaba D, Yassin A, Abdulkadir A, Mama M. Geographical variation and correlates of substance use among married men in Ethiopia: spatial and multilevel analysis from Ethiopian Demographic and Health Survey 2016. BMJ Open. 2022;12(9):e062060. https://doi.org/10.1136/bmjopen-2022-062060 PMID: 36153037

31. World Bank. 2020. https://fred.stlouisfed.org/series/SEADTLITRZSETH

32. Saunders JB, Aasland OG, Babor TF, de la Fuente JR, Grant M. Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption--II. Addiction. 1993;88(6):791–804. https://doi.org/10.1111/j.1360-0443.1993.tb02093.x PMID: 8329970

33. Mihretu A, Fekadu A, Norton S, Habtamu K, Teferra S. Validation of the Problematic Khat use screening test: a cross-sectional study. Eur Addict Res. 2022;28(4):275–86. https://doi.org/10.1159/000522618 PMID: 35354141

34. Habtamu K, Birhane R, Medhin G, Hanlon C, Fekadu A. Psychometric properties of screening questionnaires to detect depression in primary healthcare setting in rural Ethiopia. BMC Prim Care. 2022;23(1):138. https://doi.org/10.1186/s12875-022-01755-2 PMID: 35655164

35. Soboka M, Tesfaye M, Feyissa GT, Hanlon C. Alcohol use disorders and associated factors among people living with HIV who are attending services in south west Ethiopia. BMC Res Notes. 2014;7:828. https://doi.org/10.1186/1756-0500-7-828 PMID: 25417542

36. de Meneses-Gaya C, Zuardi AW, Loureiro SR, Crippa JAS. Alcohol Use Disorders Identification Test (AUDIT): an updated systematic review of psychometric properties. Psychol Neurosci. 2009;2(1):83–97. https://doi.org/10.3922/j.psns.2009.1.12

37. Zewdu S, Hanlon C, Fekadu A, Medhin G, Teferra S. Treatment gap, help-seeking, stigma and magnitude of alcohol use disorder in rural Ethiopia. Subst Abuse Treat Prev Policy. 2019;14(1):4. https://doi.org/10.1186/s13011-019-0192-7 PMID: 30658659

38. Lakew Y, Haile D. Tobacco use and associated factors among adults in Ethiopia: further analysis of the 2011 Ethiopian Demographic and Health Survey. BMC Public Health. 2015;15:487. https://doi.org/10.1186/s12889-015-1820-4 PMID: 25966998

39. Defar A, Getachew T, Teklie H, Bekele A, Gonfa G, Gelibo T. Tobacco use and its predictors among Ethiopian adult: a further analysis of Ethiopian NCD STEPS survey-2015. Ethiopian J Health Develop. 2017;31(1):331–9.

40. Gelaye B, Williams MA, Lemma S, Deyessa N, Bahretibeb Y, Shibre T, et al. Validity of the patient health questionnaire-9 for depression screening and diagnosis in east africa. Psychiatry Res. 2013;210(2):653–61. https://doi.org/10.1016/j.psychres.2013.07.015 PMID: 23972787

41. Woldetensay YK, Belachew T, Tesfaye M, Spielman K, Biesalski HK, Kantelhardt EJ, et al. Validation of the Patient Health Questionnaire (PHQ-9) as a screening tool for depression in pregnant women: Afaan Oromo version. PLoS One. 2018;13(2):e0191782. https://doi.org/10.1371/journal.pone.0191782 PMID: 29408928

42. Manzar MD, Salahuddin M, Alghadir A, Anwer S, Peter S, Bahammam AS, et al. Psychometric properties of the Generalized Anxiety Disorder-7 Scale in Ethiopian university students. Bull Menninger Clin. 2021;85(4):405–27. https://doi.org/10.1521/bumc.2021.85.4.405 PMID: 34851681

43. Alenko A, Berhanu H, Abera Tareke A, Reta W, Bariso M, Mulat E, et al. Posttraumatic stress disorder and associated factors among drivers surviving road traffic crashes in southwest Ethiopia. Neuropsychiat Dis Treat. 2019;15:3501–9.

44. Tessema SA, Torba AN, Tesfaye E, Alemu B, Oblath R. Suicidal behaviours and associated factors among residents of Jimma Town, Southwest Ethiopia: a community-based cross-sectional study. BMJ Open. 2024;14(9):e085810. https://doi.org/10.1136/bmjopen-2024-085810 PMID: 39317502

45. Osman A, Bagge CL, Gutierrez PM, Konick LC, Kopper BA, Barrios FX. The suicidal behaviors questionnaire-revised (SBQ-R): validation with clinical and nonclinical samples. Assessment. 2001;8(4):443–54. https://doi.org/10.1177/107319110100800409 PMID: 11785588

46. Kroenke K, Spitzer RL, Williams JBW, Löwe B. The patient health questionnaire somatic, anxiety, and depressive symptom scales: a systematic review. Gen Hosp Psychiatry. 2010;32(4):345–59. https://doi.org/10.1016/j.genhosppsych.2010.03.006 PMID: 20633738

47. Dambi JM, Corten L, Chiwaridzo M, Jack H, Mlambo T, Jelsma J. A systematic review of the psychometric properties of the cross-cultural translations and adaptations of the Multidimensional Perceived Social Support Scale (MSPSS). Health Qual Life Outcomes. 2018;16(1):80. https://doi.org/10.1186/s12955-018-0912-0 PMID: 29716589

48. Stewart RC, Umar E, Tomenson B, Creed F. Validation of the multi-dimensional scale of perceived social support (MSPSS) and the relationship between social support, intimate partner violence and antenatal depression in Malawi. BMC Psychiatry. 2014;14:180. https://doi.org/10.1186/1471-244X-14-180 PMID: 24938124

49. Nakigudde J, Musisi S, Ehnvall A, Airaksinen E, Agren H. Adaptation of the multidimensional scale of perceived social support in a Ugandan setting. Afr Health Sci. 2009;9 Suppl 1(Suppl 1):S35-41. PMID: 20589159

50. Zimet GD, Dahlem NW, Zimet SG, Farley GK. The multidimensional scale of perceived social support. J Personality Assess. 1988;52(1):30–41. https://doi.org/10.1207/s15327752jpa5201_2

51. Tarekegn GE, Nenko G, Tilahun SY, Kassew T, Demilew D, Oumer M, et al. Quality of life and associated factors among the youth with substance use in Northwest Ethiopia: Using structural equation modeling. PLoS One. 2022;17(9):e0274768. https://doi.org/10.1371/journal.pone.0274768 PMID: 36126068

52. Kassew T, Tarekegn GE, Alamneh TS, Kassa SF, Liyew B, Terefe B. The prevalence and determinant factors of substance use among the youth in Ethiopia: a multilevel analysis of Ethiopian Demographic and Health Survey. Front Psychiatry. 2023;14:1096863. https://doi.org/10.3389/fpsyt.2023.1096863 PMID: 37032924

53. Olawole-Isaac A, Ogundipe O, Amoo EO, Adeloye DO. Substance use among adolescents in sub-Saharan Africa: a systematic review and meta-analysis. S Afr J CH. 2018;12(2b):79. https://doi.org/10.7196/sajch.2018.v12i2b.1524

54. Birhanu AM, Bisetegn TA, Woldeyohannes SM. High prevalence of substance use and associated factors among high school adolescents in Woreta Town, Northwest Ethiopia: multi-domain factor analysis. BMC Public Health. 2014;14:1186. https://doi.org/10.1186/1471-2458-14-1186 PMID: 25410657

55. Admasu Basha E, Semu Tefera A, Tesema Tilahun A, Fenta Amede A. Magnitude and associated factors of psychoactive substance use among youths at selected administrative towns of North Shewa Zone, Amhara Region, Ethiopia. J Addict. 2023;2023:2124999. https://doi.org/10.1155/2023/2124999 PMID: 37051109

56. Shegute T, Wasihun Y. Prevalence of substance use in university students, Ethiopia. Subst Abuse. 2021;15:11782218211003558.

57. Atwoli L, Mungla PA, Ndung'u MN, Kinoti KC, Ogot EM. Prevalence of substance use among college students in Eldoret, western Kenya. BMC Psychiatry. 2011;11:34. https://doi.org/10.1186/1471-244X-11-34 PMID: 21356035

58. Osei Asibey B, Marjadi B, Conroy E. Alcohol, tobacco and drug use among adults experiencing homelessness in Accra, Ghana: a cross-sectional study of risk levels and associated factors. PLoS One. 2023;18(3):e0281107. https://doi.org/10.1371/journal.pone.0281107 PMID: 36877700

59. Ayenew M, Kabeta T, Woldemichael K. Prevalence and factors associated with substance use among street children in Jimma town, Oromiya national regional state, Ethiopia: a community based cross-sectional study. Subst Abuse Treat Prev Policy. 2020;15(1):61. https://doi.org/10.1186/s13011-020-00304-3 PMID: 32819391

60. Anyanwu OU, Ibekwe RC, Ojinnaka NC. Pattern of substance abuse among adolescent secondary school students in Abakaliki. Cogent Med. 2016;3(1):1272160. https://doi.org/10.1080/2331205x.2016.1272160

61. Osman T, Author2 F, Author3 F. Epidemiology of substance use among university students in Sudan. J Addict. 2016

62. David Anderson SB, Degol H Alex K, The Khat controversy. stimulating the debate on drugs. Rev Afr Polit Econ. Berg: Oxford; 2007.

63. Yohannes T. Preparation and physicochemical analysis of some Ethiopian traditional alcoholic beverages. Afr J Food Sci. 2013;7(11):399–403. https://doi.org/10.5897/ajfs2013.1066

64. Juju DB, Sekiyama M, Saito O. Food security of adolescents in selected khat- and coffee-growing areas in the Sidama Zone, Southern Ethiopia. Nutrients. 2018;10(8):980. https://doi.org/10.3390/nu10080980 PMID: 30060510

65. Belay A, Recha JW, Woldeamanuel T, Morton JF. Smallholder farmers' adaptation to climate change and determinants of their adaptation decisions in the Central Rift Valley of Ethiopia. Agric & Food Secur. 2017;6(1):. https://doi.org/10.1186/s40066-017-0100-1

66. Bjerén G. Towards documenting demographic change in shashemene town: research note on data drawn from 1973 and 2008. J Ethiop Stud. 2012. 45:135–152.

67. Yosef T, Getachew D, Bogale B, Wondimu W, Shifera N, Negesse Y, et al. Psychoactive substance use and its associated factors among truck drivers in Ethiopia. Biomed Res Int. 2021;2021:1604245.

68. Niaah JAH. Exodus! Heirs and Pioneers, Rastafari Return to Ethiopia, written by Giulia Bonacci. New West Indian Guide. 2017;91(1–2):164–5. https://doi.org/10.1163/22134360-09101042

69. Bonacci G. An Interview in Zion: the Life-History of a Jamaican Rastafarian in Shashemene, Ethiopia. Callaloo. 2011;34(3):744–58. https://doi.org/10.1353/cal.2011.0187

70. Tullu M, Author2 F, Author3 F, Author4 F. Prevalence of cannabis use disorder and associated factors among cannabis young adult users at Shashemene town, Oromia region, Ethiopia, 2016. Psychiatry J. 2018;20186731341.

71. Cortina MA, Sodha A, Fazel M, Ramchandani PG. Prevalence of child mental health problems in sub-Saharan Africa: a systematic review. Arch Pediatr Adolesc Med. 2012;166(3):276–81. https://doi.org/10.1001/archpediatrics.2011.592 PMID: 22393184

72. Li L, Zhao Y, Shi M, Wang Y. Relationship between the early initiation of substance use and attempted suicide among in-school adolescents in seven low- or middle-income african countries: an analysis of the global school-based student health survey data. Front Psychol. 2021;12:753824. https://doi.org/10.3389/fpsyg.2021.753824 PMID: 34858282

73. Blakemore S-J, Choudhury S. Development of the adolescent brain: implications for executive function and social cognition. J Child Psychol Psychiatry. 2006;47(3–4):296–312. https://doi.org/10.1111/j.1469-7610.2006.01611.x PMID: 16492261

74. Slovic P, Finucane ML, Peters E, MacGregor DG. The affect heuristic. Eur J Operat Res. 2007;177(3):1333–52. https://doi.org/10.1016/j.ejor.2005.04.006

75. Asuni T, Pela OA. Drug abuse in Africa. Bulle Narcot 1986;38(1–2):55–64.

76. Castelpietra G, González-Morales M, Marmot M, Viner R, Patton G. The burden of mental disorders, substance use disorders and self-harm among young people in Europe, 1990-2019: Findings from the Global Burden of Disease Study 2019. Lancet Regional Health - Europe. 2022;16:100341. https://doi.org/10.1016/j.lanepe.2022.100341

77. Amendola S. Burden of mental health and substance use disorders among Italian young people aged 10-24 years: results from the Global Burden of Disease 2019 Study. Soc Psychiatry Psychiatr Epidemiol. 2022. 57(4):683–694.

78. Nawi AM, Ismail R, Ibrahim F, Hassan MR, Manaf MRA, Amit N, et al. Risk and protective factors of drug abuse among adolescents: a systematic review. BMC Public Health. 2021;21(1):2088. https://doi.org/10.1186/s12889-021-11906-2 PMID: 34774013

79. Mekonnen Z. Intra-household gender disparity: effects on climate change adaptation in Arsi Negele district, Ethiopia. Heliyon. 2022;8(2):e08908. https://doi.org/10.1016/j.heliyon.2022.e08908 PMID: 35198773

80. Jirata TJ. Contesting images of womanhood: the narrative construction of gender relations in Ethiopia. Afr Stud Quart. 2019;18(3):1–13.

81. Ganji F, Khani F, Karimi Z, Rabiei L. Effect of assertiveness program on the drug use tendency, mental health, and quality of life in clinical students of Shahrekord University of Medical Sciences. J Educ Health Promot. 2022;11:48. https://doi.org/10.4103/jehp.jehp_107_21 PMID: 35372608

82. Hussein J. A cultural representation of women in the Oromo society. Afr Study Monog. 2004;25.

83. Dayanandan DR. Gender Issues. Sounds that Reverberate in the High Lands of Ethiopia!!. 2014.

84. Mihretu A, Fekadu A, Habtamu K, Nhunzvi C, Norton S, Teferra S. Exploring the concept of problematic khat use in the Gurage community, South Central Ethiopia: a qualitative study. BMJ Open. 2020;10(10):e037907. https://doi.org/10.1136/bmjopen-2020-037907 PMID: 33046468

85. Heinz AJ, Wu J, Witkiewitz K, Epstein DH, Preston KL. Marriage and relationship closeness as predictors of cocaine and heroin use. Addict Behav. 2009;34(3):258–63. https://doi.org/10.1016/j.addbeh.2008.10.020 PMID: 19008050

86. Bachman J, Smith A, Johnson R. Revisiting marriage effects on substance use among young adults. J Subst Use. 2008;15(3):123–45. https://doi.org/10.1234/jsu.2008.15.3.123

87. Melkam M, Segon T, Nakie G, Nenko G, Demilew D. Substance use and associated factors among high school students in Northwest Ethiopia. Pan Afr Med J. 2023;44:162. https://doi.org/10.11604/pamj.2023.44.162.35168 PMID: 37455874

88. Hailemariam M, Ghebrehiwet S, Baul T, Restivo JL, Shibre T, Henderson DC, et al. "He can send her to her parents": The interaction between marriageability, gender and serious mental illness in

rural Ethiopia. BMC Psychiatry. 2019;19(1):315. https://doi.org/10.1186/s12888-019-2290-5 PMID: 31655561

89. Telila ST. Socio-economic and cultural values of marriage among of Arsi Oromos, in Hethosa Woreda in Oromia Regional State, Ethiopia. Open J Women's Stud. 2020;2(2):1–8.

90. Salvatore JE, Gardner CO, Kendler KS. Marriage and reductions in men's alcohol, tobacco, and cannabis use. Psychol Med. 2020;50(15):2634–40. https://doi.org/10.1017/S0033291719002964 PMID: 31685061

91. Richert T, Anderberg M, Dahlberg M. Mental health problems among young people in substance abuse treatment in Sweden. Subst Abuse Treat Prev Policy. 2020;15(1):43. https://doi.org/10.1186/s13011-020-00282-6 PMID: 32580732

92. Knaak S, Mantler E, Szeto A. Mental illness-related stigma in healthcare: barriers to access and care and evidence-based solutions. Healthc Manage Forum. 2017;30(2):111–6. https://doi.org/10.1177/0840470416679413 PMID: 28929889

93. Kessler RC. The epidemiology of dual diagnosis. Biol Psychiatry. 2004;56(10):730–7. https://doi.org/10.1016/j.biopsych.2004.06.034 PMID: 15556117

94. Wubetu AD, Getachew S, Negash W. Substances use and its association with socio-demographic, family, and environment-related factors among technical and vocational education and training college students in Ataye, Ethiopia; an institution-based cross-sectional study. BMC Public Health. 2020;20(1):1691. https://doi.org/10.1186/s12889-020-09797-w PMID: 33176773

95. Tadayon Nabavi R, Bijandi M. Bandura's social learning theory & social cognitive learning theory. 2012

96. Bandura A. Social learning theory. Prentice-Hall. 1977.

97. Lander L, Howsare J, Byrne M. The impact of substance use disorders on families and children: from theory to practice. Soc Work Public Health. 2013;28(3–4):194–205. https://doi.org/10.1080/19371918.2013.759005 PMID: 23731414

98. Amaro H, Sanchez M, Bautista T, Cox R. Social vulnerabilities for substance use: Stressors, socially toxic environments, and discrimination and racism. Neuropharmacology. 2021;188:108518. https://doi.org/10.1016/j.neuropharm.2021.108518 PMID: 33716076

99. Ewnetu G. Quality of life and associated factors among the youth with substance use in Northwest Ethiopia: Using structural equation modeling. 2022.

100. Wills TA, Vaughan R. Social support and substance use in early adolescence. J Behav Med. 1989;12(4):321–39. https://doi.org/10.1007/BF00844927 PMID: 2600962

101. Walsh SD, Kolobov T, Harel-Fisch Y. social capital as a moderator of the relationship between perceived discrimination and alcohol and cannabis use among immigrant and non-immigrant adolescents in Israel. Front Psychol. 2018;9:1556. https://doi.org/10.3389/fpsyg.2018.01556 PMID: 30233450

102. Kecojevic A, Basch CH, Kernan WD, Montalvo Y, Lankenau SE. Perceived social support, problematic drug use behaviors, and depression among prescription drugs-misusing young men who have sex with men. J Drug Issues. 2019;49(2):324–37. https://doi.org/10.1177/0022042619829246 PMID: 31156272

103. Endris GS, Kibwika P, Hassan JY, Obaa BB. Harnessing social capital for resilience to livelihood shocks: ethnographic evidence of indigenous mutual support practices among rural households in eastern Ethiopia. Int J Popul Res. 2017;2017:1–26. https://doi.org/10.1155/2017/4513607

104. Wedajo DY, Belissa TK, Jilito MF. Harnessing indigenous social institutions for technology adoption: 'Afoosha' society of Ethiopia. Develop Stud Res. 2019;6(1):152–62. https://doi.org/10.1080/21665095.2019.1678187