

Research Article

# Khat Chewing and Associated Factors Among Elementary School Early Adolescent Students in Eastern Ethiopia: Multicenter Cross-sectional Study

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## Abstract

**Background:** Khat chewing practices are common in the Arabian Peninsula and in Eastern Africa, including Ethiopia. Khat chewing is popular among adolescents in Ethiopia. However, there are no studies on the practice of Khat chewing among early adolescents in school children in the eastern part of the country, where the majority of khat in the country is produced and exported. **Objective:** This study aimed to assess khat chewing and associated factors among early adolescent school children in Haramaya district from September 1 to 30, 2023. **Methods and Materials:** A school-based cross-sectional study was conducted in Haramaya District from September 1 to 30, 2023. A total of 592 early adolescent school children were selected sampling technique with simple random sampling. Trained data collectors collected data structured questionnaires. The data were entered into EpiData version 4.6. The data were then exported to the SPSS version 23 statistical package for further data processing and analysis. Descriptive statistical tests and bivariate and multivariate logistic regression analyses were used to determine predictors of Khat chewing among early adolescents. The level of significance was set at a P value of less than 0.05. **Results:** The current prevalence of khat chewing was 38.9% (CI: 34.0%-42.1%). Among the studied variables, male sex [AOR=2.47; 95% CI: (1.61-3.86)], peer pressure [AOR=3.67; 95% CI: 2.45-5.40], easy availability of khat [AOR=1.95; 95% (1.01-3.78)], and living with khat chewers [AOR=7.48; 95% CI: (4.60-12.16)] were significantly associated with current khat chewing practices. **Conclusion:** Khat chewing is prevalent among early adolescents in elementary school in the study area. The factors most strongly associated with khat chewing were male sex, peer pressure, living with khat chewers and easy availability of khat. The findings suggest the need to create public awareness among the community, particularly for adolescents and their parents.

## Keywords

Khat Chewing, Early Adolescence, Students, Associated Factors, Haramaya, Ethiopia

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## 1. Introduction

The khat (*Catha edulis*) is an evergreen tree of the Celastraceae family that is cultivated mainly in East Africa and the Arabian Peninsula [1]. Cathinone and cathines are the two primary chemicals found in khat leaves. Both are structurally related to the effects of amphetamine on the human nervous system [2], resulting in euphoric feelings, excessive enthusiasm and increased energy and alertness [3]. In Ethiopia, khat is a stimulant that is widely grown and commonly used for social recreation and religious rituals [4].

Khat is widely consumed by Ethiopian adolescents for different purposes; students chew quickly, believing that it improves memory, alertness, and clear thinking [5]; however, it has many negative effects on different body systems. Khat chewing has major effects on the gastrointestinal system, such as dental problems, mouth ulcers, gastritis, hemorrhoids, constipation, liver disease, and intestinal obstruction of the central nervous system; alertness, tolerance, dependence, anxiety, depression, delusion and insomnia. In the cardiovascular system, excessive use of khat also causes hypertension, arrhythmia, myocardial infarction, stroke and death [6]. Few studies on appetite hormones have reported that regular users of khat may experience reduced hunger and increased fullness [7], but it may also interfere with nutrition and absorption, potentially leading to malnutrition [8].

Drug abuse (khat chewing) throughout early adolescence can also have an impact on the youth's family, community, and society as a whole [9]. Currently, the Ethiopian government has not put in place an efficient plan to lower or regulate khat consumption, despite the negative effects that chewing khat has on one's health and society [10]. The only measure it has taken is placing high taxes on the trade of khat.

Khat is widely produced in the study area, Haramaya district, Ethiopia, and many early adolescents in the region use it for various reasons. In the study area, khat use is widely accepted and encouraged, with users relying on it for energy to cultivate and sell more khat, creating a self-sustaining cycle. On the basis of simple observations, khat users are physically tiny and bony, probably because the chemicals in khat may suppress their appetite. Globally, khat chewing leads to a loss of work hours, decreased economic production, divorce, health problems, conflicts and malnutrition [11]. In Yemen and East Africa, chewing khat poses a serious health risk to millions of people [12]. Khat users suffer from serious negative impacts on their social, physical, and mental health. Owing to its economic importance, it is currently grown for both local and export markets, which poses a challenge. Control over crops may become more difficult as export potential increases [5].

In Ethiopia, 85-90% of the khat produced is exported, contributing significantly to the country's foreign exchange earnings [13]. However, several studies have shown that chewing khat has negative physical and psychological re-

percussions that are detrimental to both the individual and the community [14].

In Ethiopia, Khat is the second most widely used psychoactive substance after alcohol. Psychoactive substance (khat, cigarettes and alcohol) use in the early stages of adolescence increases the risk of developing addiction, mental disorders, and substance use disorders [15]. Another study revealed that using khat in the early stages of adolescence is linked to addiction later in adult life [16]. Substance misuse and related problems are currently a global concern since they may lead to mental health disorders in individuals aged 10-19 years, accounting for 1 in 7 (14%) of all illnesses worldwide [9, 17].

Numerous studies have shown that chewing khat is linked to male sex, peer pressure, similar habits among family members, and the availability of khat around residential areas [18, 19]. Muslims, age, living in rural areas, parental education, school grade, parental occupation, having friends chew khat and smoking [20-22] and peer substance use were found to be positively correlated with increased early adolescent drug use [23]. Chewing khat could result in addiction to other substances and drugs. Some people who chew khat consume alcohol, cigarettes, hashish, shisha, and other powerful habit-forming substances [24].

Although khat is popular among adolescents in Ethiopia, only a few studies have investigated its prevalence in different sections of the community. In particular, in eastern Ethiopia, the majority of khat in the country is produced and exported abroad [25]. There is little information available for elementary school early adolescent students regarding "khat" chewing, although it has been discussed and written about extensively among postprimary, elementary school, and nonstudent populations. As a result, this study offered information on khat chewing among early adolescents and the factors related to it. The present study can fill this gap in knowledge about khat chewing and its associated factors among elementary school early adolescent students. However, no study has investigated khat chewing and its associated factors among early adolescents. Therefore, this study aimed to assess khat chewing and its associated factors among elementary school early adolescent students.

## 2. Methods and Materials

### 2.1. Study Setting and Period

The Haramaya district in Eastern Ethiopia's Oromia Region's East Hararge zone served as the study location. The Haramaya district is located 500 km away from Addis Ababa, the capital city of Ethiopia. It shares borders with the Kurfa Chele district to the south, Kersa to the west, Dire Dawa to the north, Kombolcha to the east, and the Harari region to the southeast. There are 32 rural and 2 urban kebeles in the Ha-

ramaya district. According to the data obtained from the woreda's health office, the total population of the woreda in 2012 (E.C.) was estimated at approximately 310,363, of which 155379 were males and 154984 were females. Approximately 29% of the total population was between 10 and 19 years old (89900). There is one university, two high schools, and 76 elementary schools, totaling 66520 male and female students. Enrolled and registered for the 2015 EC academic year.

A survey of the land in Haramaya woreda revealed that 36.1% of the land was arable or cultivable, 2.3% was pasture, 1.5% was forest, and the remaining 60.1% was considered built-up, degraded or otherwise unusable. Khat, vegetables and fruits are important cash crops. Kombolcha and Haramaya are major producers of khat and vegetables. Study was conducted from September 1 to 30, 2023.

## 2.2. Study Design

A school-based cross-sectional study design was conducted.

## 2.3. Source Population

The source population of the study was all early adolescents enrolled in elementary schools in the Haramaya districts.

## 2.4. Study Population

The study population included all early adolescents registered for the academic year of 2023.

## 2.5. Inclusion Criteria

All early adolescents aged 10-14 years who provided parental consent to participate in research from the selected elementary schools were included.

## 2.6. Exclusion Criteria

Early adolescents who were unable to respond due to critical illness during data collection were excluded from the study.

## 2.7. Sample Size Determination And Sampling Method

The sample size of the first objective was calculated single

population proportion formula, which considers a 24.5% prevalence of khat chewing, as in a similar study [25]. A 0.05 level of significance and 0.05 marginal error at the 95% confidence level were used, and a 10% nonresponse rate was added as follows:

$$n = \frac{(Z \alpha/2)^2 \times p(1-p)}{d^2}$$

Where,

n= minimum sample size required for study

p= estimated prevalence from the literature 24.5% (0.245)

Z  $\alpha/2$  = critical value at the 95% confidence level of certainty (1.96).

d= margin of error 5% (0.05).

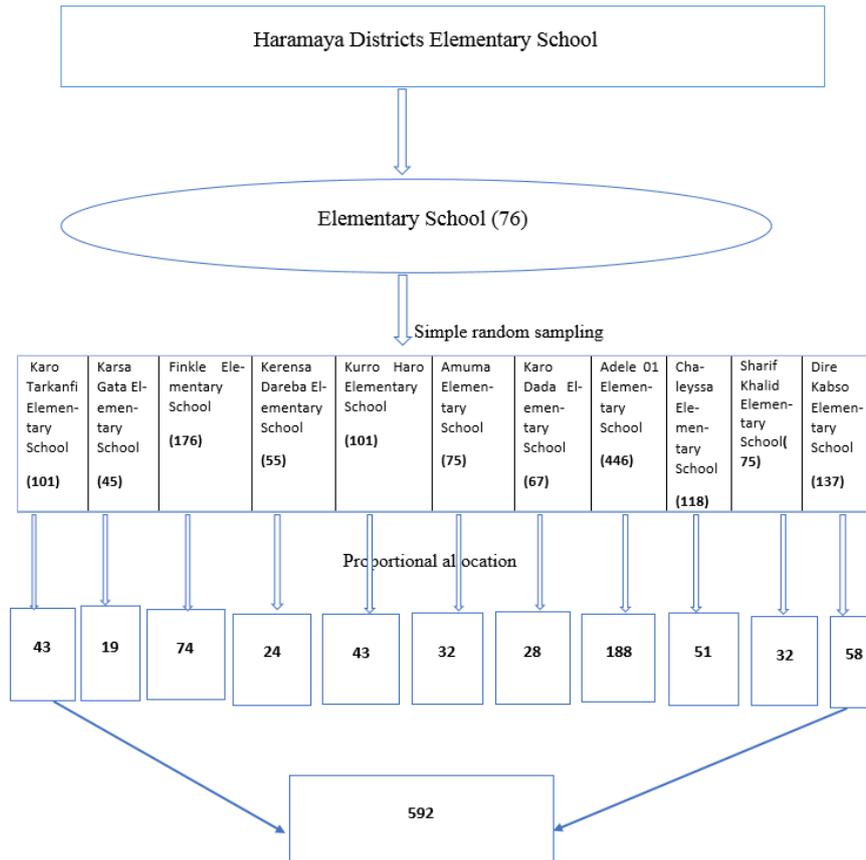
Thus, n is calculated as:

$$n = \frac{1.96^2 \times 0.245(0.755)}{0.05^2} = 266$$

The ultimate sample size, after adding a 10% nonresponse rate, was 296.

The sample size for the second objective, which refers to factors related to khat chewing, was determined using the Epi Info statistical software version 7 statistical calculation with the following assumptions for some of the factors related to khat chewing that were gathered from various types of literature. Assuming a 95% confidence interval, 80% power, and a 1:1 ratio of exposed to unexposed. Finally, the bigger sample size of 296 was utilized for this study out of the two objectives of prevalence (296) and associated factors (273); take into consideration the design effect of 2 (296\*2) =592. Consequently, 592 people contributed to the study's final sample size.

First, 11 schools were chosen using a simple random sampling technique out of the district's 76 schools. Thus, Karo Tarkanfi Elementary School, Karsa Gata Elementary School, Finkle Elementary School, Kerensa Dareba Elementary School, Kurro Haro Elementary School, Amuma Elementary School, Karo Dada Elementary School, Adele 01 Elementary School, Chaleyssa Elementary School, Sharif Khalid Elementary School, and Dire Kabso Elementary School are the districts (schools) that were chosen. In accordance to the number of students in the classroom, children from grades 7 and 8 were chosen for the second stage using simple random sampling procedure. Following that, the names of each chosen elementary school and their unique code number were used to frame each early adolescents (Figure 1).



**Figure 1.** Schematic presentation of sampling procedure of early adolescents in elementary school students in Haramaya District, Oromia, Ethiopia, 2023.

### 2.8. Study Variables and Measurements

After a thorough analysis of related research instruments and an understanding of the study's objectives, self-administered questions were created [25, 26]. A WHO student drug-use survey was used to guarantee validity. The questionnaire asked questions about behavioral factors, environmental factors, motives for chewing khat, and socio-demographic features.

The WHO student drug use questionnaire was modified into a structural questionnaire [27], and related research instruments were employed. English and Afan Oromo were used to translate the questionnaire. Finally, the questions remain consistent, and clear language is used in the translation from the Afaan Oromo version to the English version.

### 2.9. Operational Definitions

*Current khat chewing:* Students who chew Khat within 30 days preceded the study [28].

*Adolescents:* population aged 10-19 years [9].

*Early adolescents:* population aged between 10 and 14 years [9].

*Primary education* is classified into the primary first cycle, which encompasses grades 1--4, and the primary second cycle

from grades 5-8 [29].

### 2.10. Data Collection Procedures

Training was given for data collectors and supervisors, how to interview and how to approach to the participants. Data were collected using face to face interview using semi-structured structured questionnaire. Data were collected by using Afan Oromo version of questionnaires.

### 2.11. Data Quality Control

Before the main study was conducted, a pretest was performed on thirteen cases from near school, which were not included in the main study. The pretest was performed on 5% of the sample size before the data collection period. On the basis of the pretest results, the questionnaire was modified as necessary. The data collectors informed the students about the objective of the study and then administered the questionnaire. The collected data were checked for completeness and consistency.

### 2.12. Data Processing and Analysis

The data were checked for completeness, clarity, and consistency. The data were entered into EpiData Version 4.6 and

analyzed using SPSS Version 23 software. Descriptive statistics were conducted to describe the characteristics of the participants accordingly. A bivariable logistic regression analysis was performed to determine the associations between the dependent variable and each independent variable. The collinearity effect was checked by the variance inflation factor (VIF), and non-collinear covariates were included in the independent final binary logistic regression model to assess the possible associations of outcome variables. All variables that were significant at  $p$  values  $< 0.25$  in the bivariable analysis were considered for multivariable analysis to control all possible confounders. Adjustments along with 95% intervals were estimated to identify factors associated with the outcome variable multivariate logistic regression. The level of statistical significance was defined as a  $p$  value less than 0.05.

### 2.13. Ethical Clearance

The study was carried out under consideration of the Helsinki Declaration of medical research ethics. Ethical clearance was obtained from the institutional health research ethics review committee (IHRERC)/116/2022 of the College of Health and Medical Science, and a written permission letter was obtained from the Haramaya Woreda Education Office for each selected school's cooperation during the data collection period. All study participants' information was given about the study before the data were collected on its possible risk, benefit, confidentiality, privacy, voluntary activity, right to withdrawal, and time the questionnaire was taken, and then informed, voluntary, written, and signed consent was obtained from each participant's parent or guardian before starting the data collection. Personal identification was written on the

questionnaire, and all information that was obtained from them was kept confidential for the study participants. In the event that individuals are found to be addicted to khat chewing, their awareness of the disadvantages of khat chewing and other associated risk factors should be increased to change their attitudes toward khat chewing at all selected schools.

## 3. Results

### 3.1. Sociodemographic Characteristics of Early Adolescents

A total of 592 students participated in this study, yielding a response rate of 100%. More than half of the students (350, 59.1%) were in Grade 7. Two hundred forty-two patients (40.9%) were Grade 8. The mean age of the students was 13.61 ( $\pm 0.58$  SD) years, ranging from 12--14 years. The majority 560 (94.8%) of the students who participated were aged 13--14 years. More than half of the students (390, 66.9%) were males.

The main ethnicity group was Oromo, accounting for 564 (95.3%) individuals, followed by Amara, which accounted for 28 (4.7%) individuals. Approximately 556 (93.9%) and 33 (5.6%) of the sampled students were Muslim and Orthodox Christian, respectively, followed by protestant followers 2 (0.2%). Among the students who participated in this study, 569 (96.4%) were single. A total of 426 (72.3%), 80 (13%), and 45 (7.6%) fishermen were the main sources of household income. The majority, 519 (87.7%), were living with their parents (Table 1).

**Table 1.** Sociodemographic characteristics of early adolescents in elementary school students in Haramaya District, Oromia, Ethiopia, 2023 ( $n=592$ ).

Variables		Frequency	Percent (%)
Age (in years)	10-12 yrs. Old	32	5.6%
	13-14yrs. Old	560	94.4%
Sex	Male	390	65.9%
	Female	202	34.1%
Grade	Grade 7	350	59.1%
	Grade 8	242	40.9%
Ethnicity	Oromo	564	95.3%
	Amhara	28	4.7%
	Muslim	556	93.9%
Religion	Orthodox	35	5.9%
	Others	1	0.2%
Marital status	Single	582	98.3%

Variables		Frequency	Percent (%)
Residence	Married	9	1.5%
	Divorce	1	0.2%
	Rural	372	62.8
	Urban	220	37.2
Family's main source of income	Farmers	428	72%
	Government employee	46	7.8%
	Daily Labore's	38	6.5%
	Merchants	80	13%
Educational status of father	Others	1	0.5%
	No formal education	81	13.7
	Primary school (1-8)	463	78.2
	Secondary school (9-12)	27	4.6
	Diploma	11	1.9
Educational status of mother	Degree and above	9	1.5
	No formal education	128	21.6
	Primary school (1-8)	441	74.5
	Secondary school (9-12)	13	2.2
	Diploma	8	1.4
Living with	Degree and above	2	.3
	Family	519	87.7%
	Relative	46	7.8%
	Friend	10	1.7%
	Husband	12	2%
	Alone	5	0.8%

### 3.2. Prevalence of Khat Chewing

The current prevalence of khat chewing was 230 (38.9%) [95% CI: 34.9%-42.9%]; the current prevalence of khat chewing among male students was 174 (29.4%), and that among female students was 56 (9.4%). Almost all 222 (96.5%) of the students among the current chewers were between 13 and 14 years old. Among the students who were current chewers, 56 (24.3%) and 163 (70.9%) reported that they chewed daily a week and one to three times a week, respectively. The majority (n=206, 89.6%) of the chewers chewed with school friends, 5 (2.2%) chewed with friends out of

school, 11 (4.8%) chewed alone, and 3.5% chewed with their parents. Students who obtained khat—almost half of the chewers—110 (47.8%) and 94 (40.9%)—got khat from their family and the khat farm, respectively.

Among the main reasons given by the current respondents for starting chewing khat, 1.3% (n=3) reported khat to kill time, 10.9% (n=25) reported khat for socialization, 12.1% (n=31) reported khat because of easy availability, 46.5% (n=107) reported khat for study purposes, 19.1% (n=44) reported khat for peer pressure, 5.2% (n=12) reported khat to increase performance and concentration, and 3.9% (n=8) reported khat for religious purposes (Table 2).

**Table 2.** Characteristics of current khat chewing among early adolescents in elementary school students in Haramaya District, Oromia, Ethiopia, 2023.

Variables	Current khat chewers		Percent (%)	
	Male (n %)	Female (n %)		
Khat chewing frequency	Every Day/Daily	38(21.8%)	18(32.1%)	56 (24.3%)
	1-3 Days a week	127(73%)	36(64.3%)	163(70.9%)
	Occasionally	9(5.2%)	2(3.1%)	11(4.8%)
Where do you get the khat for chewing	From my school friends	14(8%)	3(5.4%)	17(7.4%)
	From khat store	5(2.9%)	4(7.1%)	9(3.9%)
	From my family	92(52.9)	18(32.1%)	110(47.8%)
When did you start khat chewing	From khat Farm	63(36.2%)	31(55.4%)	94(40.9%)
	5-6 grade	47(27%)	12(21.4%)	59(25.7%)
	Grade 7 <sup>th</sup>	83(47.7%)	29(51.8%)	112(48.7%)
First Age to start khat chewing	Grade 8 <sup>th</sup>	45(25.3%)	15(26.8.7%)	59(25.7%)
	10 yrs. or more less	5(2.9%)	0	5(2.2%)
	11-12years. Old	43(24%)	13(32.6%)	56(24.4%)
Common source of money to buy khat	13-14 years. Old	126(72.4%)	43(76.7%)	169 (73.4%)
	Family	114(65.5%)	24(42.9%)	138(60%)
	Friends	4(2.3%)	1(1.8%)	5(2.2%)
Commonly with whom did you chew khat?	Relatives	4(2.3%)	3(5.4%)	7(3%)
	My income	9(5.2%)	3(5.4%)	12(5.2%)
	No, I can't buy khat	43(24.7%)	25(44.6%)	68(29.6%)
Where did you commonly chew khat?	With my school friends	163(93.7%)	43(76.8%)	206(89.6%)
	With my family	3(1.7%)	5(8.9%)	8(3.5%)
	Alone	8(4.6%)	3(5.4%)	11(4.8%)
Where did you commonly chew khat?	With my friends out of schools	0	5(8.9%)	5(2.2%)
	At school	1(0.6%)	0	1(0.3%)
	At home	61(35.1%)	34(60.7%)	95(41.3%)
	At Relative Home	3(1.7%)	2(3.6%)	5(2.2%)
	At my friend's home	58(33.3%)	13(23.2%)	71(30.9%)
	At study house	37(21.3)	3(5.4%)	40(17.4%)
	At others place	14(8%)	4(7.1%)	18(7.8%)

### 3.3. Factors Associated with Khat Chewing

The bivariate analysis revealed that sex, age, religion, school grade, ethnicity, family main source of income, residence, living with khat chewers, easy availability of khat, having family chew khat, having peers chew, and cigarette smoking were associated with khat chewing (<0.25). In the

multivariate logistic regression analysis, of the ten independent variables that were significant in the bivariate analysis, only four variables were significantly associated with khat chewing. Compared with female students, male students had close to three times higher odds of chewing khat [AOR = 2.47; 95% CI: 1.61, 3.86]. Similarly, early adolescents living with khat chewers had 7.48 higher odds of chewing than did

[AOR=7.48; 95% CI: 4.60, 12.16] students who did not live with khat chewers. Compared with those who chewed khat, peers who chewed khat had 3.67 higher odds of khat chewing [AOR = 3.67; 95% CI: 2.45-5.40] students who did not have a history of peers who chewed khat. Similarly, the khat chewing rate was 1.95 times higher among early adolescents who

easily obtained khat around residential areas [AOR = 1.95; 95% (1.01--3.78)] than among those who did not get khat easily in nearby areas. Cigarette smoking was statistically significant in the binary (crude) analysis but not when adjusted for other variables in the final model (Table 3).

**Table 3.** Bivariable and multivariate logistic regression analysis of factors associated with khat chewing among early adolescents in elementary school students in Haramaya District, Oromia, Ethiopia, 2023.

Variables	Current Khat chewers		COR	P Value	AOR	P value
	Yes N (%)	No N (%)	COR (95%CI)		AOR (95%CI)	
Age (completed years)						
10-12	8	24	1		1	
13-14	222	338	1.97(0.87-4.46)	0.10	0.72(0.27-1.90)	0.50
Sex						
Male	174	216	2.10(1.45-3.03)	0.00	2.47(1.61-3.86)*	0.00
Female	56	146	1		1	
Ethnicity						
Oromo	223	341	1.96(0.82-4.29)	0.13	0.98(0.31-3.10)	0.62
Amhara	7	21	1		1	
School Grade						
Grade 7	125	226	1		1	
Grade 8	105	136	1.39(0.98-1.95)	0.05	1.33(0.88-2.01)	0.15
household main Occupation						
Farmers	172	256	1.84(0.91-3.60)	0.08	2.07(0.91-4.46)	0.06
Civil Servants	12	33	1.48(0.71-2.90)	0.30	1.13(0.49-2.59)	0.76
Daily Laborer	12	26	0.90(0.56-1.47)	0.60	1.12(0.06-2.06)	0.69
Merchants	34	46	1		1	
Religion						
Muslim	221	335	2.22(0.99-4.99)	0.05	0.78(0.28-2.11)	0.62
Orthodox	8	27	1		1	
Peers pressure						
Yes	152	114	4.31(3.02-6.12)	0.00	3.55(2.30-5.49)*	0.00
No	78	248	1		1	
Easily Availability of khat						
Yes	212	254	4.96 (2.91-8.40)	0.00	1.95 (1.01-3.78)*	0.041
No	18	107	1		1	
Living with khat chewers						
Yes	195	133	9.55(6.28-14.50)	0.00	7.48(4.60—12.16)*	0.00
No	35	228	1		1	
Cigarettes Smoking						

Variables	Current Khat chewers		COR	P Value	AOR	P value
	Yes N (%)	No N (%)	COR (95%CI)		AOR (95%CI)	
Yes	51	38	2.42(1.53-3.84)	0.00	1.35(0.76-2.38)	0.30
No	179	324	1		1	

\*P < 0.05 = significant at the 95% CI.

## 4. Discussion

This study aimed to determine the prevalence of khat chewing and its associated factors among early adolescents in elementary schools in Haramaya District, Eastern Ethiopia. Accordingly, this study revealed that the current prevalence of khat chewing among early adolescents in elementary school in Haramaya District was high (38.9%). Male sex, having peers chew khat, residential area availability of khat and living with khat chewers were the most significant predictors of current khat chewing among early adolescents in elementary school.

The results of this study were greater than those of studies conducted among 14-year-old primary school students in Kenya (27.5%) [30], adolescents in intermediate schools in Jazan, Saudi Arabia (16.2%) [31] and Tanzania (19.1%) [32]. These findings are higher than those of studies carried out among school-aged adolescents in the Harari Region (20.4%); [18]; Dire Dawa and Harar, Eastern Ethiopia, 24.2% [25, 33]; North Shoa, 13.25% (34); Woreta school-aged adolescents, 13.8% [35]; Bale, Southeast Ethiopia, 5.6% [36]; and Shakiso, Southwest Ethiopia, [37]. legal status [38]. Owing to variations in the study population, the timing, design, and setting differed from those of earlier studies conducted in various parts of Ethiopia, and the findings of the present study were greater. This conclusion is rationally justified because khat is easily accessible, affordable, and widely available in the study area because the local community depends economically on the cultivation of khat trees. Additionally, some Islamic believers use khat for their daily prayers, or "duway," although this practice is not mandated by religion. Furthermore, chewing khat was accepted as usual in the culture.

Numerous studies indicate that the early stages of adolescence, between the ages of 12 and 14, represent a crucial risk window for the onset of substance use [39]. Owing to their accessibility and the strong influence of their classmates, many early adolescents begin taking khat in their early years. However, chewing khat contributes to poor academic performance and absenteeism in children of all levels, including high school pupils [40].

In this study, male early adolescents had greater odds of chewing khat than female early adolescents did, which is in line with research findings from the Jazan Saudi Arabia [41],

the Harari region, eastern Ethiopia [18], and southwestern Ethiopia [37]. This may be due to the greater sociocultural acceptance of male substance use in Ethiopia and other countries.

This study also revealed that peer pressure is strongly and positively significantly associated with khat chewing. This result was consistent with those of previous studies conducted in Harar senior secondary school adolescents [18], Axum school adolescents [42] and Hawassa South Ethiopia [43]. This may be because adolescents who chewers friends cope with their peer pressure.

This study revealed that the khat-chewing rate was 1.95 times greater among early adolescents who easily obtained khat availability around residential areas or near living areas. The findings of this study support the research results from Eastern Ethiopia [18] and Eastern Ethiopia [22]. The possible reason might be that cultivation and consumption of khat are common in the study area, and in social and economic exchanges, the community views the harvest as a commodity to be used in competition with others. Because it grows locally, everyone, young and old, may obtain it for less or for free. This is why the relatively easy availability of khat appears to rank highest among the factors influencing the habits of early adolescents in their ability to chew khat.

The likelihood of early adolescents chewing khat was 7.48 times greater when they lived with khat chewers. This result is consistent with research from West China, Eastern Ethiopia [22], Axium North Ethiopia [42], and South Africa [44]. As part low puts it, a person's actions speak louder than words about the treatment they receive from friends, family, peers, or surroundings [45]. Close family members' use of khat, such as parents and older siblings, was a significant risk factor for exposing early adolescents to khat and tobacco use. Examples of this included asking the child to join other family members in consuming khat, sending their children to buy khat or cigarettes on their behalf, and storing drugs in easily accessible places. Most early adolescents grow up in households where the parents either sell or chew khat as a means of subsistence. It was believed that early teenagers from these households had considerably easier access to khat and were more likely to view its usage as socially acceptable.

Early adolescents in this study started khat consumption at a young age. In the past, chewing khat was supposed to start at age 20, but nowadays, people in Eastern African nations start consuming the substance earlier. This is particularly true in

eastern Ethiopia, where khat chewing among youth has become widespread [19]. This could be as a result of the fact that socially acceptable use, growing, cultivation, and availability are prevalent in Eastern Ethiopia. However, early-onset substance use (such as khat, tobacco, and alcohol) is usually associated with negative health consequences.

According to Wondemagegn et al. (2017), this issue can be psychological, physical, interpersonal, social, educational, or legal [3]. Drug usage can have detrimental impacts on one's health at any age, but teenagers who abuse drugs are especially vulnerable [46]. This explains why students who self-reported having a problem with chewing khat had issues with sleep (21.6%), addiction (32.4%), and digestive system issues such as constipation, appetite loss, tooth damage (30.4%), and weight loss (9.5%). Furthermore, drug abusers have an increased chance of engaging in sexual activities that could lead to early or teenage pregnancy, contracting HIV, and contracting other STDs [44].

The primary justifications for khat chewing among early adolescents in the current study were availability 41 (12.1%), peer group influence 44 (19.5%), and study purpose 107 (46.5%). This study is comparable to that carried out in Eastern Ethiopia's. According to a survey, the most often cited motivation for chat chewing was to improve academic or work performance (73.3%), followed by peer pressure (24.3%) and the need to stay awake (51.5%). The primary motivation for beginning khat chewing (54.6%) was cited as being for study purposes, which was comparable to the lower percentage reported in prior research carried out at Jimma University. Socialization goals came in second (42.3%).

## 5. Limitations of the Study

The study's limitations prevented the measurement of important variables such as knowledge, attitudes toward benefits, perceptions, and associations with mental health conditions such as stress, anxiety, and depression. Determining whether there are any patterns among primary school pupils was challenging because of the dearth of local literature on the topic of conversation in relation to Hararghe. This cross-sectional study shows only the prevalence of khat chewing and is unable to draw cause-effect associations between the studied variables. Moreover, as the study was conducted in a specific geographic area and among a particular demographic group, the findings may not be easily generalizable to other regions in Ethiopia or similar contexts.

## 6. Conclusions

Khat chewing is prevalent among elementary school early adolescent students in the study area. The factors most strongly associated with khat chewing were male sex, peer pressure, living with khat chewers, and the easy availability of khat, all of which are highly correlated with the use of khat by

school-aged adolescents in eastern Ethiopia. This finding suggests that to reduce the negative impacts of khat use on one's health, finances and social life, early intervention directed toward primary school and elementary school early adolescents is needed. Therefore, public awareness campaigns to inform adolescents and their parents are needed to reduce khat chewing among early adolescents. Moreover, the policy maker would better give due attention, and it is important to conduct a longitudinal study to investigate the causal relationship between khat use and its associated factors.

## Abbreviations

AOR	Adjusted Odds Ratio
CI	Confidence Interval
CRC	Cluster Resource Center
OR	Odds Ratio
EDHS	Ethiopian Demographic Health Survey
MOH	Ministry of Health
ORHB	Oromia Regional Health Bureau
SPSS	Statistical Package for Social Science
WHO	World Health Organization

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## Ethics Approval and Consent to Participate

The study was carried out under consideration of the Helsinki Declaration of medical research ethics. Ethical clearance was obtained from the institutional health research ethics review committee (IHRERC)/116/2022 of the College of Health and Medical Science, and a written permission letter was obtained from the Haramaya Woreda Education Office for each selected school's cooperation during the data collection period. All study participants' information was given about the study before the data were collected on its possible risk, benefit, confidentiality, privacy, voluntary activity, right to withdrawal, and time the questionnaire was taken, and then informed, voluntary, written, and signed consent was obtained from each participant's parent or guardian before starting the data collection. Personal identification was written on the questionnaire, and all information that was obtained from them was kept confidential for the study participants. In the event that individuals are found to be addicted to khat chewing, their awareness of the disadvantages of khat chewing and other associated risk factors should be increased to change their attitudes toward khat chewing at all selected schools

## Consent for Publication

Not applicable.

## Trial Registration

Not applicable.

## Author Contributions

**Ibrahim Adem:** Conceptualization, Data curation, formal analysis, methodology, writing - original draft, writing - review & editing

**Tesfaye Gobena:** Conceptualization, Data curation, formal analysis, methodology, writing - original draft, writing - review & editing

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**Bethlehem Fekadeselassie Lemma:** Conceptualization, Data curation, formal analysis, methodology, writing - original draft, writing - review & editing

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## Availability of Data and Materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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## Conflicts of Interest

The authors declared no conflicts of interest.

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