

Life Time Prevalence of Khat Chewing and Its Socio Demographic Correlates Among Adults Age 15-49 Years in Ethiopia: A Population Based Study Using the 2016 Demographic and Health Survey Data

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Abstract

Background: Khat chewing has been practiced from ancient by people in the Eastern part of Africa, the Arabian, Peninsula and other parts of the world. In Ethiopia, khat chewing is becoming habitual and the proportion of people chewing khat has significantly risen over the years and chewers' population in Ethiopia is now 16% from the country's population

The main aim of this study was to provide national data on life time prevalence of khat chewing and associated factors that will serve as evidence for policy and planning and as baseline data for further studies.

Methods: The data for this study was extracted from the 2016 EDHS. The 2016 EDHS is the fourth and most recent in the Demographic and Health Survey series in Ethiopia. Socio demographic variables were selected based on their availability in the dataset. Our analysis included all men and women age 15-49 years which resulted in a total weighted sample of 27,289. Descriptive statistics were employed to show the distribution of socio-demographic characteristics. Logistic regression model was used to determine the true association between chat chewing and basic socio-demographic factors.

Results: Of the total sample of 27289 of men and women age 15-49 years at the time of survey, 18.3% (n = 5006) have life time khat chewing in Ethiopia,

About 71.7% of the variation in the outcome variable (khat chewing) is explained by the independent variables included in model.

Men and women in the 15-19 age group 9.952 (AOR 9.952; 95% CI 6.156- 16.091) and Men and women age 15-49 years in urban areas 34.040 (AOR 34.040; 95% CI: 21.028–55.105) were found to be major contributing factors to the khat chewing.

Conclusions: Younger age and urban residence had a statistically significant association with khat chewing. Therefore, to effectively control khat chewing in Ethiopia, creating awareness and increasing knowledge on the harmful effects of khat chewing are recommended. A particular attention should be given to young adolescent and urban areas.

Introduction

Khat chewing has been practiced from ancient by people in the Eastern part of Africa, the Arabian, Peninsula and other parts of the world (1-4)

In Ethiopia the proportion of people chewing khat has significantly risen over the years and chewers' population in Ethiopia is now 16% from the country's population (5)

In Ethiopia, khat has started to rapidly replace the precious cereal, coffee, fruits and other crops found in the highlands of Ethiopia. Farmers prefer khat due to different reasons including, its profitability as a cash crop than others, less vulnerability to drought, and less labor power cost required for its cultivation.

However, khat producing farmers in Ethiopia start consuming khat and this culture is also continued expanding to the nearby secondary schools and urban dwellers (6)

The Magnitude of students' khat use in Ethiopia ranges from 13.4% to 41% for lifetime. Youths' substance use contributes to the creation of a community with; substance use dependence, juvenile delinquencies, crimes, socio-economic and other public health problems. (7)

In Ethiopia, studies conducted among students of Jimma University showed that the current prevalence of khat chewing was 30.8% (8). Moreover, in Ethiopia, 42% of university instructors were lifetime khat chewers (9). Besides, other studies have also presented that the use of khat was significantly associated with age, gender and place of residence (10)

Similarly, a study in Gondar town revealed that the prevalence of khat chewing was high with statistically significant associations with sex, religion, and monthly income (11)

A 2011 report from the Ethiopian Demographic and Health (EDHS) survey showed khat chewing was more common in the Eastern, Central and Northeastern parts of the country; the highest wealth index quintile, older age group, unskilled workforce, rural residents, exposure to mass media and administrative regions were factors statistically associated with khat chewing practice (12)

Literature has revealed that a number of factors cause the increased khat consumption in different regions of Ethiopia. Among them are normalization in the community, social mobility to most khat chewing community, perceived non-side effect, affordability, type of occupation and availability of khat leaf in the whole year (12,13).

To assist policy formation for coping with all forms of drug abuse in specific risk groups and the general population of Ethiopia, epidemiological studies are needed to identify risk groups and patterns of drug use behavior (14)

The consumption of khat leaves is mostly practiced by adults in all regions and ethnic groups. Hence, most khat chewers are adults and exist in the active production stage, country labor force economic production, and chewers' livelihood situation remains questionable. This implies reducing number of chewers through identifying and reducing determinants is essential.

The main aim of this study was to provide national data on life time prevalence of khat chewing and socio demographic factors associated with it and the findings of this study will serve as evidence for policy and planning, and as baseline data for further studies.

Methods

Data source, sampling and data collection

The data for this study was extracted from the 2016 EDHS. The 2016 EDHS is the fourth and most recent in the Demographic and Health Survey series in Ethiopia [15]. The survey was conducted in nine regional states and two city administrations of Ethiopia [15]. Further details on sampling strategy can be found in the DHS manual [15].

A total of 16,583 eligible women and 11,606 eligible men between 15 and 49 years were approached to be interviewed. A response rate of 95% was observed with 15,683 women completing the interviews and response rate 86% among 11,606 men interviewed. The interviews included several standard questionnaires recording information ranging from basic socio-demographic information to detailed bio-medical information.

Our analysis included all men and women age 15-49 years which resulted in a total weighted sample of 27,289

Outcome variable

Life time prevalence of Khat chewing: The proportion of men and women age 15-49 years who had ever chewed Khat in their life time

According to EDHS all men and women age 15-49 years asked whether they ever chewed chat or not (1 if they ever chew chat, 0 otherwise).

Co-variables

The basic socio-demographic variables were selected based on their availability in the dataset The included basic socio-demographic factors are highest education level (categorized as "no education", "primary", "secondary", "more than secondary") and working status in the past 12 months ("not working" or "working and occupation status ("not working", "non-agriculture" and "agriculture"), marital status ("never married", "currently married", "Living together", "Divorced/separated" and "Widowed") age ("15-19 years", "20-24 years", "25-29 years", "30-34 years", "35-39 years", "40-45 years" and "45-49 years") and mothers exposure to mass media ("no" or "yes").

Number of living children ("1", "1-2", "3-4" and "5+"), Literacy ("Cannot read at all", "Can read part/whole sentence" and "Other")

Household factors included household wealth index (categorized as "poorest", "poorer", "middle", "richer" and "richest"),

The household wealth index was calculated using scores based on household assets with analyses conducted by the National Population Commission and Inner City Fund (ICF) International based on a methodology developed from previous DHSs [16, 17] and using methods recommended by the World Bank Poverty Network and United Nations International Children's Emergency Fund (UNICEF) [18].

Community level factors recorded were the place of residence ("rural" or "urban") and geographical region.

The geographical regions were grouped into nine regional states of Ethiopia; namely Afar, Amhara, Benishangul-Gumuz, Gambella, Harari, Oromia, Somali, Southern Nations Nationalities and Peoples' Region (SNNP), and Tigray, and two city administrations named Addis Ababa and Dire Dawa [15].

Statistical analysis

Sampling weights provided with the EDHS dataset were used during analysis. Further details on sample weights can be found in the EDHS report [15].

Descriptive statistics were employed to show the distribution of background characteristics. We used logistic regression model to determine the true association between chat chewing and basic socio-demographic factors. Both unadjusted and adjusted odds ratios (ORs) were reported with 95% confidence intervals (95% CI). Besides, diagnostic tests were done, particularly goodness of fit of the model by the Hosmer and Lemeshow test; (where p-value of 0.875 was found), The Cronbach's alpha result of the variables is 0.900 The Nagelkerke R Square shows that about 71.7% of the variation in the outcome variable (chat chewing) is explained by this logistic model The overall accuracy of this model to predict subjects who ever chew chat (with a predicted probability of 0.5 or greater) is 89.4% All analyses were performed using statistical software SPSS (Version 16.0).

Ethics approval

This study is a secondary analysis of publicly available dataset where permission was obtained through registering with the DHS website and therefore no ethics approval was required.

Result

Baseline characteristics

Of the total sample of 27289 of men and women 15-49 years at the time of survey, 18.3% (n = 5006) had life time prevalence of khat chewing (Table 3).

As summarized in Table 1, majority (57.5%) of the respondents were female and a predominant percentage of the men and women 15-49 years lived in rural areas (78.8%), respondents in the regions of Oromia were (37.1%) and Amhara (24.3%). 32.1% of men and women 15-49 years reported not working in the past 12 months at the time of survey, and 39.2% did not have any formal education. In addition to education status, around 45.9% of men and women 15-49 years reported having poor literacy skills and could not read at all

Majorities (39.8%) of the respondent's occupation were agriculture, 28.1% were non agriculture employee in addition, and 43.8% of the respondents were orthodox religion followers

In terms of men and women 15- 49 years age, overall 21.8% of men and women were between 15 and 19 years of age

Most men and women 15- 49 years (58.9%) reported as currently married at the time of the survey. Of the total, only 16.4% were in lowest wealth quintile and 26.0 % were in the highest wealth quintile

In terms of the number of living children , about 39.7 % of men and women 15- 49 years reported to have one living children and 20.7 % had more than 5 number of living children during survey .

Regarding exposure to mass media, 6.2% read newsletter, 18.1% watch to TV and 21.7% listen to radio

Bi-variable analysis

An increase in one-year in age (COR = 0.174; 95% CI: 0.165– 0.183) were less likely to chew chat

Odds of chat chewing among men and women age 15-49 years in urban areas were 9.709 (COR19.709; 95% CI: 18.303–21.223) times higher than rural areas

Men and women age 15-49 years in afar are 0.799 (COR 0.799; 95% CI: 0.719– 0.888) times less likely to chew chat than tigray region of Ethiopia

Men and women age 15-49 years in Amhara are 0 .002 (COR 0 .002; 95% CI: 0.002–0.003) times less likely to chew chat than tigray region of Ethiopia

Men and women age 15-49 years in poorest category are 0.649 (COR 0.649; 95% CI: 0.598- 0.704) less likely to chew chat than poorer categories

Men and women age 15-49 years who were never married 0 .078 (COR 0 .078; 95% CI: 0.072-0.084) less likely to chew chat than married

Multivariable analysis

residence they live had significant association with men and women 15-49 years living in urban areas were 34.040 times higher odds of chat chewing (AOR 34.040; 95% CI: 21.028–55.105) compared to men and women 15-49 years who had live in rural areas

Demographically, since age is a quantitative numerical variable, an increase in one-year in age has 9.952 (AOR9.952 95% CI 6.156- 16.091) times decrease in odds of chat chewing

Table 2 shows unadjusted and adjusted odds ratios (AOR) that were calculated to determine the strength of association between the co-variables and life time prevalence of chat chewing

Discussion

Life Time Prevalence of Khat Chewing

Of the total sample of 27289 of men and women 15-49 years at the time of survey, 18.3% (n = 5006) have life time prevalence of chat chewing which is comparable to previous studies 13.4% to 41%,17.5% ,17.9% , 18.3% respectively [7,9,19,20] and higher compared to 15.3%, 16%,15.36% , 14% 7.5%, 15.8%, 15.3%, 9.6% respectively [12,21-27].and lower compared to 46%, 23.0%, 19%, 19.9% , 48.6%, 50%,30.6%, 19.6%, 24.7%, 74.55%, 22.3% , 23.61% , 29.6% , 27.14%, 37.1%, 65.6% respectively (8,24,25,28,29,30-34,36-41) and Study by(35) is also higher compared to this finding

Furthermore, the possible explanations for the observed differences in khat chewing could be due to differences in sample characteristics, in the definitions used by studies. In our study life time prevalence of Khat use was measured by asking whether they ever chew chat in their previous life and others used define Khat use as “using of Khat for the previous one year or one month” and methodological differences.

Socio demographic factors associated with life time prevalence of khat chewing

In our study the life time prevalence of khat chewing was not statistically significantly higher in males compared with females similar to findings from 2015 national Non-communicable diseases STEPS survey (25).

According to our findings life time prevalence of khat chewing in the general population of Ethiopia was 26.7 % among men and 12.1 % among women of 15–49 years which is similar with EDHS 2011 27.3% among men and 11.0% among women of 15–49 years [26].

In our study age and area of residence significantly associated with khat chewing contrarily with study in Southwestern Saudi Arabia (41)

In this study an increase in one-year in age has 9.952 (AOR9.952 95% CI 6.156- 16.091) times decrease in odds of chat chewing which is similar to previous studies (8-9, 21, 27,38,41-43).

This study is contrarily with previous studies [12, 48, 21, 39)

Many factors increase the risk of khat chewing during adolescence, including socioeconomic status, neighborhood, cultural context, peer influence, teachers’ influence and perhaps most importantly, family influences (44).

It is reported that social acceptability of khat chewing and socialization of this habit increase the likelihood of adolescents adopting the behaviour in Jazan Region (45). For Yemenis, khat may be less of a drug than a medium for socialization (4).

This fall in the age of initiation of khat chewing indicates the failure of prevention strategies (46).

Teenagers who want to try new things and can be convinced by their friends and may try to chew khat for the purpose of relaxation (28).

This indicates that the more educated groups who represent the most productive sections of the society are affected by the khat chewing habit (8). This showed that the above ages are in the age group called teenage in which those who are in this period want to try everything by themselves and can be exposed to different kinds of substances (9, 43). The most frequent reasons for continuing chewing khat were promoting dialogue and social discussion, making the chewer feel refreshed, more energetic, alert and attentive(41).

Similar claims of positive physiological aspects to khat chewing and strong energizing effect of workers have been reported elsewhere (47).

It implies older individuals may be deciding to wait for not chewing in order to deal with their family cases unlike younger that may be sensitive to do what they observe in their life and khat chew.

In this study residence had significant association with men and women 15-49 years living in urban areas were 34.04 times higher odds of chat chewing (AOR 34.040; 95% CI: 21.028–55.105) compared to men and women 15-49 years who had live in rural areas which is similar to previous studies (25,32,42,49) and contrarily to studies (12, 33).

In this study Higher prevalence in urban observed because from no educated respondents (10701) majority of 54.0% (5779) respondents in urban residence have no education.

According to previous study education is a protective factor for current khat chewing. Participants who are in the no education group are more likely to chew khat than those who are educated (25) Lower educational status was found to be a significant independent predictor of current khat chewing (37).

The study conducted from the Jazan region, Saudi Arabia, which showed that illiterates were at higher odds of chewing khat [50].

The reason could be uneducated men would have a lack of information on the negative consequences of khat on their health [51].

In our study age and residence significantly associated with life time prevalence of khat chewing and this is similar with the previous study that reported khat chewing was associated with age and residence [52].

Limitations Of The Study

The cross sectional nature of the study design might not show the cause and effect relationships between the explanatory variables and Khat use. Furthermore, Khat use has a social taboo, in which participants might under report their experience and this may introduce social desirability bias.

Conclusion

Younger age (15-19) and urban residence had a statistically significant association with life time prevalence of khat chewing.

Therefore, to effectively control khat chewing in Ethiopia, Creating awareness and increasing knowledge on the harmful effects of khat chewing are recommended. A particular attention should be given to young adolescent and urban areas.

Abbreviations

AOR: Adjusted odds ratio; CI: Confidence interval; COR: crude odd ratio; DHS: Demographic health survey; EDHS: Ethiopian demographic and health survey; ICF: Inner city fund; UNICEF: United Nations International Children's Emergency Fund

Declarations

Ethics approval and consent to participate

This study is a secondary data analysis of the EDHS, which is publicly available, approval was sought from MEASURE DHS/ICF International and permission was granted for this use. The original DHS data were collected in conformity with international and national ethical guidelines. Ethical clearance was provided by the Ethiopian Public Health Institute (EPHI) (formerly the Ethiopian Health and Nutrition Research Institute (EHNRI)

Review Board, the National Research Ethics Review Committee (NRERC) at the Ministry of Science and Technology, the Institutional Review Board of ICF International, and the United States Centers for Disease Control and Prevention (CDC). Written consent was obtained from respondents and data were recorded anonymously at the time of data collection during the EDHS 2016.

Consent for publication

Not applicable.

Availability of data and materials

The survey datasets used in this study was based on publicly available dataset that is freely available online with no participant's identity from <http://www.dhsprogram.com/data/available-datasets.cfm>. Approval was sought from MEASURE DHS/ICF International and permission was granted for this use.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

KTT, ETT, AAA and MKT were involved in formatting the research question. KTT performed the analysis with assistance from ETT, AAA and MKT. All authors prepared the initial draft of the manuscript. ETT, AAA, AMD and KTT critically revised the manuscript for intellectual content. All authors approved the final version of the manuscript.

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Tables

Table 1. Individual, household and community level characteristics of men and women 15-49 years, Ethiopia 2016.

Socio-demographic factors	N(%)
SEX	
Male	11606(42.5%)
Female	15683(57.5%)
Wealth index	
Lowest	4472(16.4%)
Second	4927(18.1%)
Middle	5224(19.1%)
Fourth	5566(20.4%)
Highest	7098(26.0%)
Residence	
Urban	5779(21.2%)
Rural	21509(78.8%)
Age category	
15-19	5953 (21.8%)
20-24	4645 (17.0 %)
25-29	4934 (18.1%)
30-34	3980(14.6%)
35-39	3318(12.2%)
40-44	2496(9.1%)
45-49	1961(7.2%)
Religion	
Orthodox	11946(43.8%)
working status (past 12 months)	
Working	18518(67.9%)
Marital status	
Married	16059(58.9%)
Literacy	
Cannot read at all	12530(45.9%)
Number of living children	
0	10843(39.7%)
1-2	5972(21.9%)
3-4	4834(17.7%)
>5	5640 (20.7)
Frequency of reading newspaper	
yes	1703(6.2%)
no	25586(93.8%)
Frequency of listening to the radio	
yes	5919(21.7%)
no	21370(78.3%)
Frequency of watching TV	

yes	4938(18.1%)
no	22351(81.9%)
Region	
Tigray	1837(6.7%)
Afar	210(0.8%)
Amhara	6628 (24.3%)
Oromiya	10110(37.1%)
Somali	760(2.8%)
Benishangul-Gumuz	278(1.0%)
SNNPR	5659(20.7%)
Gambela	79 (0.3%)
Harari	67(0.2%)
Addis Ababa	1503(5.5%)
Dire Dawa	156(0.6%)
Occupation	
Not working	8746(32.0%)
Non-agriculture	7669(28.1%)
Agriculture	10874(39.8%)
Educational Status	
No education	10701(39.2%)
Primary	11098(40.7%)
Secondary	3602(13.2%)
More than secondary	1887(6.9%)
N	27289

Table 2 Unadjusted and adjusted Odds Ratio for life time prevalence of khat chewing in Ethiopia 2016.

Variable	Unadjusted		Adjusted	
	OR	P-value	OR	P-value
Age	0.174,(0.165, 0.183)	0.000	9.952,(6.156, 16.091)	0.000
Residence				
Urban	19.709(18.303,21.22)	0.000	34.040, (21.028, 55.105)	0.000
Rural	1.00			
Region				
Tigray	0.979, (0.730, 1.312)	0.886	not Retained in model	
Afar	0.799, (0.719 , 0.888)	0.000	not Retained in model	
Amhara	0 .002 .(0.002, 0.003)	0.000	not Retained in model	
Wealth quintile				
Lowest	0 649, (0.598, 0.704)	0.000	not Retained in model	
Second	1.00			
Marital status				
Never married	0 .078, (0.072, 0-084)	0.000	not Retained in model	
Married	1.00			

Backward stepwise model with dichotomous outcome of (0 = no life time prevalence of chat chewing, 1= life time prevalence of chat chewing)

Table 3 socio demographic characteristics of men and women age 15-49 years according to life time prevalence of khat chewing in Ethiopia 2016.

	Wealth quintile		Residence		region				Age		Marital, status	
	Lowest	Second	urban	Rural	tigray	afar	amhara	Oromia	15-19	20-24	Never married	married
	Overall (n=27289)	4472 (16.4%)	4927 (18.1%)	5779 (21.2%)	21509 (78.8%)	1837 (6.7%)	210. (0.8%)	6628 (24.3%)	10110 (37.1%)	5953 (21.8%)	4645 (17.0%)	8918 (32.7%)
life time prevalence of chat chewing yes (n-5006)	2633 (52.6%)	2373 (47.4%)	3476 (69.4%)	1530 (30.6%)	1129 (22.6%)	128 (2.6%)	3714 (74.2%)	35 (0.7%)	3381 (67.5%)	1625 (32.5%)	4036 (80.6%)	970 (19.4%)
no (n-22283)	1839 (8.3%)	2554 (11.5%)	2303 (10.3%)	19979 (89.7%)	708 (3.2%)	82.(.4%)	2914 (13.1%)	10075 (45.2%)	2572 (11.5%)	3020 13.6%)	4882 (21.9%)	15089 (67.7%)