

Prevalence and predictors of khat chewing among pregnant women in Ethiopia: Insights from a national health survey

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Abstract

Background

Khat (*Catha edulis*) consumption has been associated with a range of biological, social, and psychological complications. Despite these known risks, national estimates of prevalence, patterns, and factors associated with khat use among pregnant women in Ethiopia remain poorly understood. This study aimed to address this gap by examining the prevalence and predictors of khat chewing among pregnant women using nationally representative data.

Methods

We analyzed data from the 2016 Ethiopian Demographic and Health Survey (EDHS), focusing on the couples' recode file. A total of 727 pregnant women with complete data on khat use and partner information were included. Khat chewing status was defined as ever having chewed khat. Descriptive statistics and chi-square tests were used to examine bivariate associations. Multivariable logistic regression was performed to identify independent predictors.

Results

The prevalence of khat chewing among pregnant women was 12.5%. It was higher among women aged 25–34 years, Muslims (89.0%), and those whose partners chewed khat (87.9%). In adjusted analysis, women aged 25–34 had twice the odds of khat chewing compared to those aged 15–24 (AOR = 2.02; 95% CI: 1.10–3.81; $p = 0.025$). Women in the middle wealth category had higher odds than those in the poor category (AOR = 2.31; 95% CI: 1.11–4.80; $p = 0.025$). Partner khat chewing was strongly associated with maternal use (AOR = 15.55; 95% CI: 6.54–43.11; $p < 0.001$). Maternal smoking showed a large but statistically non-significant positive association (AOR = 5.40; 95% CI: 0.78–35.82; $p = 0.078$).

Conclusion

Khat chewing during pregnancy is influenced by maternal age, middle household wealth, and particularly partner behavior. These findings highlight the need for targeted, culturally sensitive interventions integrated into maternal health programs that engage couples, address relationship dynamics, and consider socioeconomic and age-specific risk factors to reduce khat use and improve maternal and fetal outcomes.

1. Introduction

Khat (*Catha edulis* Forskal), known locally as “*chat*” in Ethiopia, is a stimulant plant widely chewed in East Africa and the Arabian Peninsula for its euphoric and appetite-suppressing effects (1). The primary

psychoactive compound, cathinone, acts as a natural amphetamine, increasing dopamine and serotonin release in the central nervous system (2). Fresh khat leaves are typically chewed slowly over several hours, with users ingesting 100–500 grams per session; the plant material is retained in the cheek and gradually swallowed, with the orally absorbed amount equating to 5 mg of amphetamine and 0.05 mg/kg of cathinone (3–5).

The adverse effects of khat chewing during pregnancy appear to intensify in proportion to the frequency and duration of use (6, 7). Various studies have reported that chewing khat during pregnancy has a negative health consequences such as low birth weight (LBW), fetal hypoxia (8); fetal growth restriction (FGR), small for gestational age (SGA) (9); prelabor rupture of membranes (PROM) (10); congenital malformations, preterm birth, stillbirth (8, 11, 12); maternal anemia and broader obstetric complications (10, 12); increased risk of anemia (13); cognitive and behavioral impact on the mother (14). Despite these risks, khat chewing remains deeply embedded in social and cultural practices in Ethiopia, where it is the second-largest export crop after coffee (15).

Khat use among pregnant women in Ethiopia varies from 11% in the south (16) to 66.9% in the east (17). A recent systematic review and meta-analysis found the pooled prevalence of khat use during pregnancy in Ethiopia to be 26.6% (95% CI: 17.8–35.5) (18), indicating a substantial public health burden. However, to the best of our knowledge, no previous study has utilized nationally representative data to investigate the practice of khat chewing among pregnant women and their partners. This study fills the gap by analyzing the Ethiopian Demographic and Health Survey (EDHS) 2016 to estimate national prevalence and identify individual and partner-level predictors of khat chewing among pregnant women using nationally representative data.

2. Materials and Methods

2.1. Study population and sampling

This study used data from the 2016 EDHS, the most recent nationally representative DHS conducted in Ethiopia at the time of analysis (19). The EDHS employed a two-stage stratified cluster sampling design across 645 clusters (202 urban, 443 rural). A total of 16,650 households were selected, with a 94.6% response rate, yielding data from 15,683 women aged 15–49. We analyzed the couples' recode dataset, which includes linked data for married or cohabiting women and their partners who both completed individual interviews. The unit of analysis was the couple. From this dataset, we identified 727 couples who had complete data on khat use.

2.2. Data collection

Data were collected using standardized questionnaires administered through face-to-face interviews. Five questionnaires were used to collect the EDHS data. We utilized the couples' recode dataset, which contains one record for each interviewed woman and her partner. Participants were asked two questions

regarding khat use: “Have you ever chewed khat?” and “In the last 30 days, how many days did you chew khat” (19).

2.3. Outcome and predictor variables

The outcome variable in this study was the khat chewing status of pregnant women. The predictor variables were maternal age, residence, religion, educational level, wealth index, employment status, maternal cigarette and alcohol use, partner’s educational level, partner’s khat chewing status, partner’s alcohol drinking status, and whether the partner helps in household chores.

2.4. Data analysis

Data analysis was performed using R software (version 4.4). Descriptive statistics were summarized using frequency tables. Bivariate associations were examined using chi-square tests, and multivariable logistic regression was used to identify factors associated with khat chewing status. As a sensitivity analysis, we also fitted a structural equation model (SEM) using the weighted least squares mean and variance adjusted (WLSMV) estimator to account for the binary nature of the outcome. The model included all significant predictors from the logistic regression and estimated their adjusted associations with khat chewing using probit coefficients. Variables with $p < 0.05$ were considered statistically significant, and the strength of the association was also measured with adjusted odds ratio at a corresponding 95% confidence interval.

3. Results

Among the 727 pregnant women included in the analysis, 12.5% reported chewing khat. Prevalence within each group differed significantly by age, with the highest proportion observed among women aged 25–34 years (61.5% of khat chewers) compared to 25.3% among those aged 15–24 ($p = 0.035$). Khat chewing was also markedly more common among Muslim women (89.0%) than among those of other religions (11.0%) ($p < 0.001$). Maternal education and household wealth index showed no significant associations in unadjusted analyses ($p = 0.068$ and $p = 0.112$, respectively). Partner characteristics showed strong associations with women’s khat chewing. A large majority of khat-chewing women had partners who also chewed khat (87.9% vs. 7.7% among non-chewers, $p < 0.001$). Notably, maternal alcohol use was strongly associated with khat chewing. The vast majority of khat chewers did not drink alcohol (94.5%) compared to 74.2% of non-chewers ($p < 0.001$) (Table 1).

Table 1
Sociodemographic characteristics of pregnant Ethiopian women aged 15–49,
Ethiopian Demographic and Health Survey 2016 (n = 727)

	Categories	Yes	No	P-value*
Maternal Age	15–24	23 (25.3)	241 (37.9)	0.035
	25–34	56 (61.5)	303 (47.6)	
	35–49	12 (13.2)	92 (14.5)	
Residence	Urban	19 (20.9)	122 (19.2)	0.809
	Rural	72 (79.1)	514 (80.8)	
Religion	Muslim	81 (89.0)	301 (47.3)	< 0.001
	Others	10 (11.0)	335 (52.7)	
Maternal Education	No education	59 (64.8)	340 (53.5)	0.068
	Primary	26 (28.6)	210 (33.0)	
	Secondary+	6 (6.6)	86 (13.5)	
Wealth Index	Poor	42 (46.2)	320 (50.3)	0.112
	Middle	20 (22.0)	87 (13.7)	
	Rich	29 (31.9)	229 (36.0)	
Maternal Working Status	No	68 (74.7)	463 (72.8)	0.794
	Yes	23 (25.3)	173 (27.2)	
Maternal smoking status	No	88 (96.7)	629 (98.9)	0.23
	Yes	3 (3.3)	7 (1.1)	
Mother drinks alcohol	No	86 (94.5)	472 (74.2)	< 0.001
	Yes	5 (5.5)	164 (25.8)	
Partner Educational Level	No education	49 (53.8)	243 (38.2)	0.009
	Primary	31 (34.1)	250 (39.3)	
	Secondary+	11 (12.1)	143 (22.5)	
Partner Helps with Chores	No	62 (68.1)	369 (58.0)	0.085
	Yes	29 (31.9)	267 (42.0)	
Partner Drinks Alcohol	No	74 (85.1)	384 (61.8)	< 0.001
*P-values are from Chi-square tests				

	Yes	13 (14.9)	237 (38.2)	
Partner Chews Khat	No	7 (8.0)	404 (65.1)	< 0.001
	Yes	80 (92.0)	217 (34.9)	
*P-values are from Chi-square tests				

Multivariable logistic regression analysis identified several significant predictors of khat chewing among pregnant women (Table 2). Women aged 25–34 years had twice the odds of khat chewing compared to those aged 15–24 years (AOR = 2.02; 95% CI: 1.10–3.81; $p = 0.025$), while the association for women aged 35–49 years was not statistically significant (AOR = 2.00; 95% CI: 0.81–4.84; $p = 0.126$). Compared with women from poor households, those in the middle wealth category had more than twice the odds of khat chewing (AOR = 2.31; 95% CI: 1.11–4.80; $p = 0.025$). Maternal smoking status showed a non-significant positive association (AOR = 5.40; 95% CI: 0.78–35.82; $p = 0.078$). Partner khat chewing was identified as a significant predictor: women whose partners chewed khat were over 15 times more likely to chew khat themselves (AOR = 15.55; 95% CI: 6.54–43.11; $p < 0.001$). The SEM results were directionally consistent with the logistic regression findings (Supplementary Table 1). In particular, partner khat chewing remained the strongest predictor (probit coefficient = 1.34, $p < 0.001$), followed by maternal age 25–34 years (probit coefficient = 0.40, $p = 0.040$) and middle wealth status (probit coefficient = 0.45, $p = 0.038$).

Table 2
Logistic regression of current khat chewing among pregnant Ethiopian women
aged 15–49, Ethiopia (n = 727)

	Categories	AOR	95% CI	p-value
Maternal Age	15–24	Ref		
	25–34	2.02	1.10 ; 3.81	0.025
	35–49	2.00	0.81 ; 4.84	0.126
Residence	Urban	Ref		
	Rural	0.48	0.20 ; 1.13	0.095
Religion	Muslim	Ref		
	Other	0.41	0.13 ; 1.18	0.113
Maternal Education	None	Ref		
	Primary	0.95	0.49 ; 1.81	0.879
	Secondary+	0.60	0.16 ; 1.99	0.417
Wealth Index	Poor	Ref		
	Middle	2.31	1.11 ; 4.80	0.025
	Rich	1.08	0.48 ; 2.33	0.856
Maternal Working Status	No	Ref		
	Yes	0.98	0.52 ; 1.78	0.938
Maternal smoking status	No	Ref		
	Yes	5.40	0.78 ; 35.82	0.078
Mother drinks alcohol	No	Ref		
	Yes	1.05	0.27 ; 3.82	0.939
Partner Educational Level	None	Ref		
	Primary	0.70	0.38 ; 1.30	0.268
	Secondary+	0.43	0.15 ; 1.14	0.097
Partner Helps with Chores	No	Ref		
	Yes	1.10	0.62 ; 1.96	0.736
Partner Drinks Alcohol	No	Ref		
AOR: Adjusted Odds Ratio; CI: Confidence Interval; Ref: Reference category				

	Yes	1.26	0.48 ; 3.23	0.632
Partner Chews Khat	No	Ref		
	Yes	15.55	6.54 ; 43.11	< 0.001
AOR: Adjusted Odds Ratio; CI: Confidence Interval; Ref: Reference category				

4. Discussion

This study provides the first national estimate of khat chewing among pregnant women in Ethiopia using linked couple data from the 2016 EDHS. The prevalence of khat chewing was 12.5%, comparable to the 11% reported in Southern Ethiopia (16), lower than the 15.5% reported in Eastern Ethiopia (20), and substantially below the national estimate reported prevalence of current khat use among women of reproductive age (65.9%, 95% CI: 63.5–68.2%) (18). These discrepancies likely reflect differences in study design, regional variation, and measurement. Our analysis assessed lifetime use (ever chewed), whereas others focused on current or recent use. Furthermore, our findings are based on a nationally representative sample, while most prior studies were facility- or community-based, often in high-prevalence regions such as Eastern Ethiopia, where khat cultivation is widespread and constitutes a major source of income and cash crop (17, 20).

We found women aged 25–34 had twice the odds of khat chewing compared with those aged 15–24 (AOR = 2.02; 95% CI: 1.10–3.81; $p = 0.025$). This finding is consistent with evidence suggesting that khat use increases with social independence and marital responsibilities, which are more common in this age group. Similarly, a study from Eastern Ethiopia showed that women aged 25–35 and those ≥ 35 years were more than twice as likely to chew khat as younger women (20). Previous research in Ethiopia and other East African settings similarly suggests that khat chewing rises during early adulthood and stabilizes or declines in later years (21–23). The higher prevalence among women aged 25–34 may reflect cultural acceptance, marital status, and greater autonomy.

Household wealth showed a non-linear association with khat use. Women in the middle wealth quintile were more than twice as likely to chew khat compared with those in the poorest group (AOR = 2.31; 95% CI: 1.11–4.80; $p = 0.025$). This suggests khat use is not limited to poverty-driven behavior but reflects sociocultural dynamics and affordability patterns. Similar non-linear relationships have been observed elsewhere, where middle-income groups both have the financial means to purchase substances and live in environments that normalize their use (16, 24). Women in the poorest households may be unable to afford khat, while those in the wealthiest groups may benefit from higher education and greater exposure to health promotion (25, 26). As noted in prior studies, khat use represents both a public health concern and a socio-economic challenge, with broad implications for households and communities (27). The strong association between maternal alcohol use and khat chewing observed in the bivariate analysis was not sustained in the adjusted model, suggesting that its effect is mediated or confounded by other factors, most notably partners' substance use behaviors and religious affiliation.

Another significant factor influencing khat chewing among pregnant women is whether their partners also engage in the practice. The analysis revealed that the most influential individual-level predictor of women's khat chewing behavior was the khat use of their male partners. Specifically, pregnant women whose partners reported chewing khat were found to be more than 15 times as likely to engage in the same practice themselves (AOR = 15.55; 95% CI: 6.54–43.11; $p < 0.001$). A systematic review and meta-analysis study found that pregnant women whose partners chewed khat were over six times more likely to chew khat themselves compared to those whose partners did not chew (23). This striking association underscores the powerful role of intimate partner influence in shaping women's substance use behaviors. Women whose partners chew khat are more likely to adopt the same behavior, highlighting the strong role of partner influence in shaping maternal health choices. Similar findings have been documented in prior studies, where spousal or household khat use significantly increased the likelihood of women's initiation and continuation of chewing (21, 28). Such results are consistent with social learning theory, which emphasizes the role of close interpersonal relationships in reinforcing health-related behaviors and emphasizes the importance of observing, modeling, and imitating the behaviors, attitudes, and emotional reactions of others (29). In contexts where khat chewing is normalized within family settings, partner behavior not only provides direct exposure and accessibility but also legitimizes the practice, thereby amplifying women's risk of khat consumption.

This study utilized nationally representative data from pregnant women and their partners. However, the relatively small sample size of 727 pregnant women, with only 91 khat chewers, may limit statistical power and contribute to wide confidence intervals. In addition, the cross-sectional design limits the ability to draw causal conclusions between khat chewing and health outcomes. The reliance on self-reported data also poses challenges, as recall bias or underreporting may occur, particularly given the sensitive nature of khat use during pregnancy. The survey instruments do not always capture detailed information on the frequency, intensity, or context of khat use, which restricts the depth of interpretation. Furthermore, cultural stigma and social desirability bias may cause some respondents to conceal their practices, leading to an underestimation of true prevalence. The couples' recode dataset also excludes single mothers and polygamous unions, which reduces the generalizability of findings to non-traditional family structures. Future research with larger sample sizes, more qualitative and longitudinal studies is needed to comprehensively assess the factors associated with khat chewing in Ethiopia. Studies should also consider community-level influences such as peer norms, local availability, and economic stressors.

5. Conclusion

This study demonstrates that khat chewing during pregnancy is a public health concern in Ethiopia, with a national prevalence of 12.5%. The behavior was most common among women aged 25–34, those in the middle wealth quintile, and women whose partners also chewed khat. Multivariable analysis identified maternal age and partner behavior as the strongest predictors: women aged 25–34 had approximately twice the odds of khat use compared with younger women, while having a partner who chewed khat increased maternal use more than fifteenfold. These findings highlight the need for targeted, culturally sensitive interventions that consider the social and familial contexts of substance

use. Given the dominant influence of partner behavior, prevention strategies should engage couples and address relationship dynamics, rather than focusing solely on women. Routine screening for khat use during antenatal care, supported by standardized referral pathways and evidence-based counseling services, could facilitate early identification and management. Beyond clinical care, public awareness campaigns and community-based engagement are critical to reduce stigma, challenge misconceptions, and promote healthier norms. Embedding prevention and support within maternal health programs, while addressing broader socioeconomic and cultural determinants, represents a practical pathway to reduce khat use in pregnancy and improve maternal and child health outcomes in Ethiopia.

Abbreviations

AOR
Adjusted Odds Ratio
CI
Confidence Interval
EDHS
Ethiopian Demographic and Health Survey
LBW
Low Birth Weight
SGA
Small for Gestational Age
PROM
Prelabor Rupture Of Membranes
WLSMV
Weighted Least Squares Mean and Variance

Declarations

Competing interests

The authors declare that they do not have any conflict of interest.

Ethical approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

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Authors' Contributions

NA conceived the study and analyzed the data. NA and EA wrote the first draft. NA, EA and SB reviewed and edited the final version. All authors approved the manuscript for publication.

Availability of data and materials

The dataset used in this study is available from DHS Program (<https://dhsprogram.com>) for legitimate reasons. The R code used in the analysis of the dataset is available at (https://github.com/NebyuDanielAmaha/Khat_EDHS)

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