Prevalence and associated factors of Khat chewing among people with HIV/AIDS at rural health centers of Ethiopia: a cross-sectional study

Zelalem Belayneh *, Birhanie Mekuriaw

1Dilla University, College of Health and Medical Science, Department of Psychiatry, Dilla, Ethiopia

Email address

Zelalem Belayneh (ZB): zelalembe45@gmail.com
Birhanie Mekuriaw (BM): biradilla@gmail.com

* Corresponding author

Email:zelalembe45@gmail.com (ZB):
Abstract

Objective: Khat, sometimes called “Qat” or “Chat” is fresh leaves a plant commonly chewed for its psycho-stimulant and euphorogenic effects of the brain. Although the adverse and complicated conspectuses of long term Khat use are evidenced, it is a commonly chewed in Ethiopia. Its burden and associated factors is not well addressed among HIV/AIDS in Ethiopia. This addressed this missed opportunity by assessing the frequency, pattern and associated factors of current Khat use among people with HIV/AIDS in Ethiopia. A systematic random sampling was used to select the study participants. Binary logistic regression was commutated to identify factors associated with Khat use.

Results: About 30.1% and 24.7% of people with HIV/AIDS had lifetime and current khat use southern Ethiopia. Male sex {OR=2.46 95% CI(1.28, 4.73)}, rural residency { OR=2.4695%: CI(1.28, 10.14)}alcohol drinking {OR=1.84:95% CI(1.00, 3.37)} and frequency of schedule {OR=5.2595%CI(2.33, 11.85)} had a statistically significant association with current Khat use. This alarms a need for designing appropriate preventive and intervention programs for people living with HIV.

Key words: Khat use, Khat and HIV/AIDS, substance abuse, Khat and HAART, Dilla, Gedeo
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]. Khat is found as having two amphetamines like controlled psychoactive substance substrates, called cathinone and Cathie [5, 6]. Khat chewing has pleasant effects such as euphoria, increased alertness, higher level of goal directed activities, high energy [7], stress reduction, better concentration [8] and lack of fatigue that diminishes after some hours [9, 10]. People also use Khat as a means of social engagement as the ceremony of chewing is performed with numbers of people gathered together, and share some sensitive topics of discussion [11].

Despite of these immediate pleasant effects of Khat, long term use had sleep disturbances, anorexia, gastric disturbances, depression, liver damage and cardiac complications [12-14]. Delusional behaviors [15], violence, suicidal depression, hallucinations, paranoia, and khat-

Current khat use was reported as a highly prevalent condition (60%) among people with HIV/AIDS in Ethiopia [19]. This increases the risky behaviors such as alcohol drinking, smoking and unsafe sex [20, 21]. It is also stated that HIV-positive individuals with Khat chewing are at a higher risk of Anti Retroviral Therapy (ART) non- adherence, poor viral load suppression and a higher comoridity of other opportunistic infections [22-24]. However, it is not well investigated among HIV-positive in Ethiopia. Therefore, this study was aimed to fill this gap by assessing the frequency, pattern and associated factors of Khat use among people with HIV/AIDS.
Main text

Methods

Study design and setting

This institutional-based cross-sectional study was conducted among people with HIV/AIDS attending at rural health centers from April 1st to May 1st, 2017. Gedeo one of the zones found in South Nation, Nationality and Peoples’ Regional States of Ethiopia and its zonal city is Dilla. Dilla is located at 359 km far from Addis Ababa (the capital city of Ethiopia).

Sample size determination and sampling procedure

For the sample size estimation, single population proportion formula with assumptions of; 95% CI, P=23% (prevalence of Khat use from Jimma hospital)[19] and a 5% margin of error was used for sample size. We used a 10% non-response rate and the total sample size was 300. After calculating the total number of people with HIV/AIDS in ART clinics of rural health centers, systematic random sampling technique was used based on the proportion of numbers of patients attending at each health center. We used an interval (K) calculated by dividing the total number of eligible participants to the proportionally allocated number of samples to each site.

Data collection instruments and procedures

Five trained nurses and two supervisors were participated in the data collection. We used an interviewer-administered questionnaire composed socio-demographic characteristics, Oslo-3 social support scale, Alcohol Use Disorders Identification Test (AUDIT), HIV/ AIDS-related clinical factors, and questions used to assess the pattern and frequencies of Khat use. The Amharic and Gedeu’fa (the commonly spoken languages in the study area) versions of the questionnaire was use a pre-test was done among 17 (5%) patients attending ART clinics at Chuko health center. Individuals with age
at least 18 years old and above and having ART follow-up visit were included in the study.

**Operational definitions**

**Lifetime Khat use**: Participants were considered as positive for life time khat use if he/she answered “Yes” to the question ‘Have you ever used khat?’ Follow up question related to the pattern, frequency and reasons for the initiation of khat chewing were also collected.

**Current Khat use**: Participants were asked about their Khat use within the last one month even once. If they answer “YES” we considered as a current Khat user, and otherwise not. This study used some methodology parts from a previously published work[23,25]

**Data processing and analysis**

The field questionnaires were manually checked for its completeness and consistency. The, the data were entered to SPSS version 20(software) for analysis and binary logistic regression was computed. Descriptive statistics were used to quantify the frequency, pattern and the reasons for the initiation of chewing. Results of the descriptive statistics were presented with narrative texts and tables. To identify the significantly associated factors of Khat use, multivariable analysis was computed. In multivariable analysis, a P-value of less than 0.05 was used as a base to identify the significance level of associated factors with Khat use with the corresponding 95% CI.

**Results**

**Sociodemographic factors**

Among a total of 300 individuals invited to participate, 296 (98.6%) participated and completed the interview. Most (68.9%) participants were females. And 51.7% of the participants were within the age range of 29-48 years, and. (Table 1)
Table 1: Sociodemographic characteristics of people on Highly Active Anti Retroviral Therapy attending rural health centers, southern Ethiopia (n=296)

| Variable          | Categories          | Frequency | Percentage |
|-------------------|---------------------|-----------|------------|
| Age in years      | 18-28               | 110       | 37.2       |
|                   | 29-48               | 153       | 51.7       |
|                   | 49-57               | 27        | 9.1        |
|                   | >58                 | 6         | 2.0        |
| Sex               | Male                | 92        | 31.1       |
|                   | Female              | 204       | 68.9       |
| Religion          | Orthodox            | 144       | 48.6       |
|                   | Protestant          | 108       | 36.5       |
|                   | Muslim              | 37        | 12.5       |
|                   | Catholic            | 7         | 2.4        |
| Residency         | urban               | 229       | 77.4       |
|                   | Rural               | 67        | 22.6       |
| Marital status    | Married             | 156       | 52.7       |
|                   | Single              | 47        | 15.9       |
|                   | Divorced            | 78        | 26.4       |
|                   | Widowed             | 15        | 5.1        |
| Educational level | Unable to read and write | 108   | 36.5       |
|                   | Primary school      | 77        | 26.0       |
|                   | Secondary school    | 75        | 25.3       |
|                   | diploma and above   | 36        | 12.2       |
| Social support level | Strong              | 111       | 26         |
|                   | Moderate            | 60        | 24         |
Clinical related characteristics

Most, (59.8%), of the participants were within stage I of the WHO HIV/AIDS clinical stage. About 56.8% of the study participants had more than five years of follow up visit. (Table 2)

Table 2: Clinical related characteristics of people on Highly Active Anti Retroviral Therapy attending rural health centers, southern Ethiopia (n=296)

| Variable                        | Categories          | Frequency | Percentage |
|---------------------------------|---------------------|-----------|------------|
| WHO HIV/AIDS stage              | I                   | 177       | 59.8       |
|                                 | II                  | 41        | 13.9       |
|                                 | III                 | 51        | 17.2       |
|                                 | IV                  | 27        | 9.1        |
| Recent CD4 count (cells/ml³)    | <200                | 48        | 16.2       |
|                                 | 201-499             | 95        | 32.1       |
|                                 | >500                | 26        | 8.8        |
|                                 | undetermined        | 127       | 42.9       |
| Follow up duration              | less than one years | 27        | 9.1        |
|                                 | 2-5 years           | 101       | 34.1       |
|                                 | >05 years           | 168       | 56.8       |
| Follow up frequency             | Every one month     | 107       | 36.1       |
|                                 | Every two month     | 72        | 24.3       |
|                                 | Every three months  | 62        | 20.9       |
Prevalence and reasons for the initiation of Khat chewing

The overall current and lifetime prevalence of khat chewing was 24.7% (95% confidence interval [CI]: 19.7%–29.4%) and 30.1% (95% CI: 25.7%–36.1%), respectively. There are numerous factors mentioned as reasons of Khat chewing among pregnant women with current chewing history. Almost all participants agreed that there were more than one possible reason for the initiation of their chewing practice. Getting relief from psychological stress and peer influence were the most attributed as single most important reasons for chewing accounts 29.6% and 21.1% of respondents, respectively (Fig.1).

Correlates of dysmenorrhea

Rural residency, male gender, alcohol consumption and longer follow up schedule had significant association with current regular Khat use. (Table 3)

| Variable        | Categories | Adherence level | COR 95% CI | AOR 95% CI |
|-----------------|------------|-----------------|------------|------------|
|                 |            | Non user | User     |            |            |
| Sex             | Male       | 60       | 32       | 2.12, (    | 1.22, 2.46 | (1.28,  |
|                         | Female | 163 | 41 | 1.00 | 1.00 |
|-------------------------|--------|-----|----|------|------|
| Residency               | Town   | 181 | 48 | 1.00 | 1.00 |
|                         | Rural  | 42  | 25 | 2.24(1.24, 4.04) | 2.46(1.28, 10.14)*** |
| Year of follow up       | Less than one year | 16 | 11 | 1.99(0.86, 4.64) | 3.58(1.36, 9.42) |
|                         | 1-5 years | 82 | 19 | 0.67(0.36, 1.23) | 0.702 (0.34, 1.41) |
|                         | >05 years | 125 | 43 | 1 | 1 |
| Schedule frequency      | Every one month | 90 | 17 | 1 | 1 |
|                         | Every two months | 55 | 17 | 1.63(0.77, 3.46) | 1.65(0.73, 3.74) |
|                         | Every three months | 49 | 13 | 1.40(0.63, 3.13) | 0.85(0.34, 2.08) |
|                         | Every six months | 29 | 26 | 4.74(2.26, 9.95) | 5.25(2.33, 11.85)* |
| Social support          | Strong | 111 | 26 | 1 | 1 |
|                         | Moderate | 60 | 24 | 1.70 (0.90, 3.23) | 1.28(0.63, 2.61) |
|                         | Poor | 52  | 23 | 1.88(0.98, 3.61) | 1.97(0.94, 4.09) |
| Alcohol consumption level | Hazardous | 64 | 33 | 2.05 (1.18, 3.53) | 1.84(1.00, 3.37)*** |
|                         | Non hazardous | 159 | 40 | 1 | 1 |

***P<001, **P<0.01, *P<0.05
Discussion

Findings from this study reported that the overall prevalence of current khat use among people on Highly Active Anti Retroviral Therapy was found to be 24.7% (95% CI: 19.7%–29.4%). This is in line with other similar studies of Gamo Gofa (27.0%) [20] and Jimma University Specialized Hospital. (23.0%) [18]. However, the magnitude of Khat uses among people living with HIV/AIDS lower than other similar studies done in Dirie Dawa (65%) [19]. This discrepancy might be explained by the difference in the operational definitions of Khat use. In our study current Khat use was measured for the use of khat for the last one month and others used define Khat use as “using of Khat for the previous one year”. Moreover, Dire Dawa is found near to the border of Ethiopia in which Khat is more commonly used than the other parts of the country [2].

The multi variable analysis result of this study showed that the odds of khat chewing among males were 2.4 times higher as compared to females. This might be explained by the fact that Khat chewing is more social taboo for females in Ethiopia. Furthermore, males are commonly exposed in Khat chewing areas and had a peer influence of chewing, and females are commonly stayed stay at home [2, 18].

Individuals resided in rural areas are 2.4 times more likely to chew Khat as compared to urban communities. This might be due to the highly accessible and cheaper price of Khat in the rural area as is commonly cultivated in the rural part of our study area. In addition, people from rural areas might not have adequate knowledge about the problems of Khat use for people on HAART [16].

Patients with an HIV/AIDS follow up visit of “Every six months” were 5 times more likely to use Khat as compared to patients with monthly follow up visits. This is parallel to the findings of other studies as people with longer appointments may not get frequent counseling and psychosocial
support [25]. Similarly, the odds of Khat use among individuals with hazardous alcohol drinking were increased by 1.8 times as compared to their counterparts. This might be explained by the fact that people who start to use one substance is most prone to combine other substances [25,26].

**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.

**Declarations**

**Ethics approval and consent to participate**

This study was ethically approved by from Dilla University, college of health and medical science. A brief explanation about the scope and purposes of the study was given to each participant, and then requested to provide written consent of participation. All participants have been informed that they have the right to refuse and or withdraw their participation at any time, and there will not be any harm will be imposed to them due to their refusal or withdrawal.

**Consent to publish**

Not applicable

**Data availability**

The raw data of this the manuscript is available, and can be accessed from Zelalem Belayneh through zelalembe45@gmail.com.

**Competing interests**

The authors declare that they have no competing interests.
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Author contributions

Both authors participated in the proposal development, supervision, data analysis, drafting, and writing and revising the article. We have read, and approved this version of the manuscript to be considered for publication in BMC Public Health Journal.

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References

1. Al-Hebshi N, Skaug N: Khat (Catha edulis)—an updated review. Addiction biology 2005, 10(4):299-307.
2. Stevenson M, Fitzgerald J, Banwell C: Chewing as a social act: cultural displacement and khat consumption in the East African communities of Melbourne. Drug and Alcohol Review 1996, 15(1):73-82.
3. Fasanmade A, Kwok E, Newman L: Oral squamous cell carcinoma associated with khat chewing. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology 2007, 104(1):e53-e55.
4. Luqman W, Danowski T: The use of khat (Catha edulis) in Yemen: social and medical observations. Annals of internal medicine 1976, 85(2):246-249.
5. Braenden OJ: Research on the chemical composition of khat. Problems of drug dependence 1979:320.
6. Szendrei K: The chemistry of khat. Bull Narc 1980, 32(3):5-35.
7. Brenneisen R, Fisch H, Koelbing U, Geisshusler S, Kalix P: *Amphetamine-like effects in humans of the khat alkaloid cathinone.* British journal of clinical pharmacology 1990, 30(6):825-828.

8. Atlabachew M, Chandravanshi BS, Redi M: *Concentration levels of essential and non-essential metals in Ethiopian khat (Catha edulis Forsk).* Biological trace element research 2010, 138(1-3):316-325.

9. Balint EE, Falkay G, Balint GA: *Khat—a controversial plant.* Wiener Klinische Wochenschrift 2009, 121(19-20):604.

10. Nencini P, Ahmed AM, Elmi AS: *Subjective effects of khat chewing in humans.* Drug and alcohol dependence 1986, 18(1):97-105.

11. Aden A, Dimba E, Ndolo U, Chindia M: *Socio-economic effects of khat chewing in north eastern Kenya.* East African Medical Journal 2006, 83(3):69.

12. Cox G, Rampes H: *Adverse effects of khat: a review.* Advances in Psychiatric Treatment 2003, 9(6):456-463.

13. Halbach H: *Medical aspects of the chewing of khat leaves.* Bulletin of the World Health Organization 1972, 47(1):21.

14. Al-Motarreb A, Al-Habori M, Broadley KJ: *Khat chewing, cardiovascular diseases and other internal medical problems: the current situation and directions for future research.* Journal of ethnopharmacology 2010, 132(3):540-548.

15. James Giannini A, Castellani S: *A manic-like psychosis due to Khat Catha edulis Forsk.* Journal of Toxicology: Clinical Toxicology 1982, 19(5):455-459.

16. Pantelis C, Hindler CG, Taylor JC: *Use and abuse of khat (Catha edulis): a review of the distribution, pharmacology, side effects and a description of psychosis attributed to khat chewing.* Psychological medicine 1989, 19(3):657-668.

17. Warfa N, Klein A, Bhui K, Leavey G, Craig T, Stansfeld SA: *Khat use and mental illness: a critical review.* Social Science & Medicine 2007, 65(2):309-318.
18. Megerssa B, Esayas A, Mohamed A: Socio-economic impact of khat in Mana district, Jimma zone, south western Ethiopia. Discourse journal of agriculture and food sciences 2014, 2(2):21-32.

19. Lifson AR, Workneh S, Shenie T, Ayana DA, Melaku Z, Bezabih L, Waktola HT, Dagne B, Hilk R, Winters KC: Prevalence and factors associated with use of khat: a survey of patients entering HIV treatment programs in Ethiopia. Addiction science & clinical practice 2017, 12(1):3.

20. Malaju MT, Asale GA: Association of Khat and alcohol use with HIV infection and age at first sexual initiation among youths visiting HIV testing and counseling centers in Gamo-Gofa Zone, South West Ethiopia. BMC international health and human rights 2013, 13(1):10.

21. Abebe D, Debella A, Dejene A, Degefa A, Abebe A, Urga K, Ketema L: Khat chewing habit as a possible risk behaviour for HIV infection: A case-control study. Ethiopian Journal of Health Development 2005, 19(3):174-181.

22. Alvi A, Rizwan M, Sunosi RA, Jerah ABA: Does khat chewing increases the risk of Mycobacterium tuberculosis infection by macrophage immune modulation? Medical hypotheses 2014, 82(6):667-669.

23. Soboka M, Tesfaye M, Feyissa GT, Hanlon C: Khat use in people living with HIV: a facility-based cross-sectional survey from South West Ethiopia. BMC psychiatry 2015, 15(1):69.

24. Teferra S, Hanlon C, Beyero T, Jacobsson L, Shibre T: Perspectives on reasons for non-adherence to medication in persons with schizophrenia in Ethiopia: a qualitative study of patients, caregivers and health workers. BMC psychiatry 2013, 13(1):168.

25. Belayneh Z, Alemu W, Mekuriaw B, Abebe Z: Bipolar spectrum disorders and associated factors among adults attending an antiretroviral therapy clinic in gedeo zone health centers, southern ethiopia. Neuropsychiatric Disease and Treatment 2019, 15:503.

26. Chasnoff IJ, Griffith DR, Freier C, Murray J: Cocaine/polydrug use in pregnancy: Two-year follow-up. Pediatrics 1992, 89(2):284-289.
