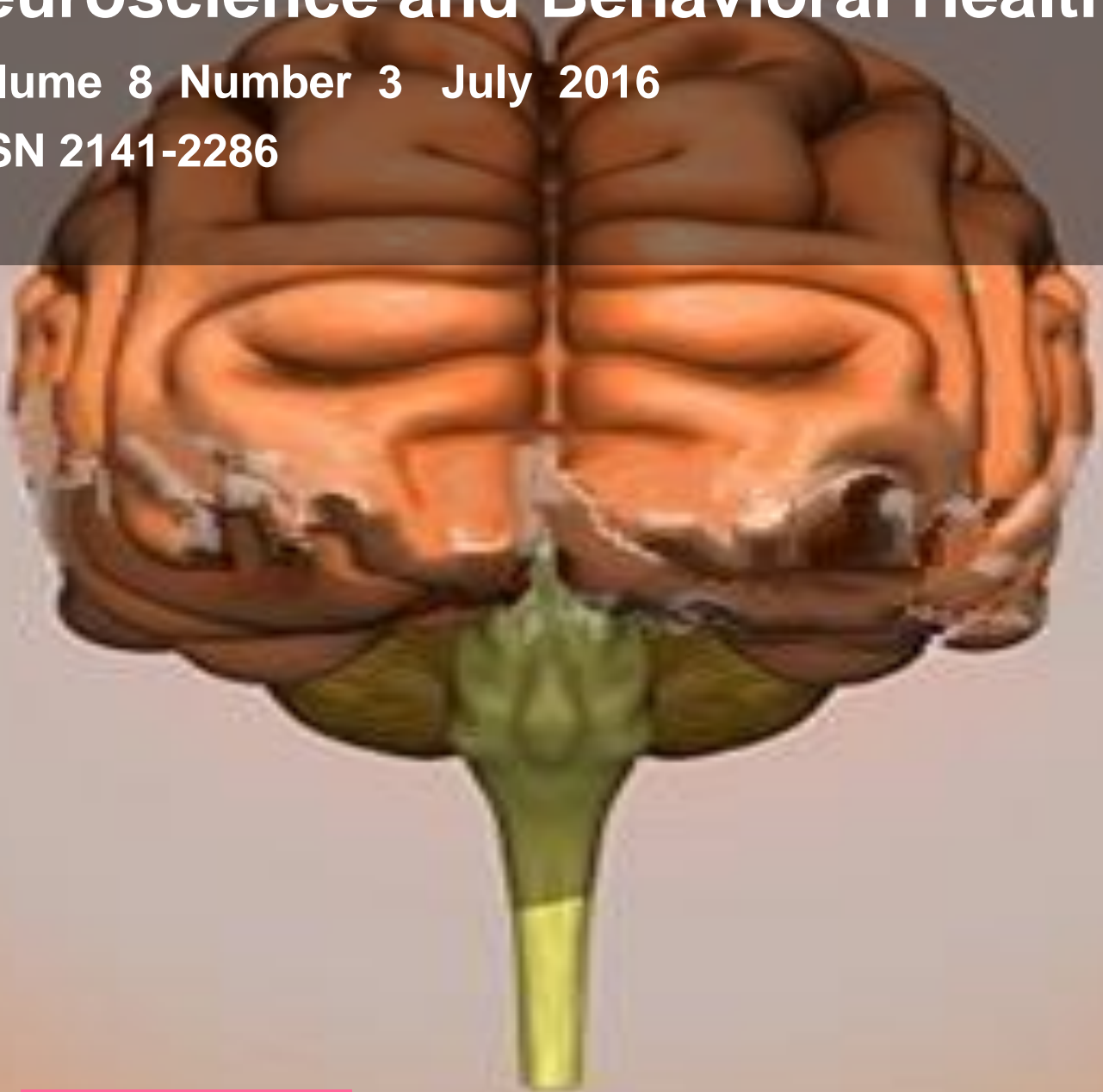


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# Journal of Neuroscience and Behavioral Health

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## ARTICLE

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Yosef Zenebe, Garumma Tolu Feyissa and Wolfgang Krahl

*Full Length Research Paper*

# Cigarette smoking among Jimma University Teaching and referral hospital outpatients attending services at psychiatry clinic Southwest, Ethiopia

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Smoking is currently considered one of the greatest problems in public health worldwide, and it is one of the most avoidable causes of death. Cigarette consumption killed more than 6 million people, nearly 80% in low and middle income countries in 2011. The objective of the current study was to assess the prevalence of cigarette smoking and its determinant factors among psychiatric outpatients in Jimma University Specialized Hospital (JUSH). A facility based cross-sectional study was carried out in persons with mental disorders from 1st to 15th of August 2013 in Jimma zone, south-west Ethiopia. The data were collected by interviewing all persons with mental disorders coming for treatment at JUSH by using an interviewer administered questionnaire. The overall current prevalence of cigarette smoking was 20.5%. The prevalence of cigarette smoking in persons with schizophrenia, bipolar I disorders and major depressive disorders were 28.2, 17.8 and 16.3%, respectively. Cigarette smoking was strongly associated with male gender, khat use and alcohol use disorders. The current prevalence of cigarette smoking was high amongst persons with mental disorders. Attention should be given routine screening for cigarette smoking in psychiatric patients and consequent management of smoking along with psychiatric management.

**Key words:** Cigarette smoking, determinants, Schizophrenia.

## INTRODUCTION

Cigarette use is the most preventable cause of death worldwide and is accountable for the deaths of approximately half of its long-term users. Cigarette use killed 100 million people in the 20<sup>th</sup> century and will kill 1 billion people in the 21<sup>st</sup> century if existing trends

continue. In 2011, cigarette consumption killed more than 6 million people, nearly 80% in low and middle income countries (Eriksen et al., 2013). On the average cigarette smokers lose about 15 years of their life (WHO, 2008). According to WHO estimates

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approximately 47% of men and 12% of women smoke cigarettes worldwide in 2010 (Tobacco free initiative, 2010). Studies revealed that national smoking prevalence among men in sub-Saharan Africa varies from 20 to 60% and the yearly cigarette consumption rates are on the rise for both men and women (Warren et al., 2000-2007). Cigarette smoking is well known as a risk factor for many of health problems such as lung cancer, cardiovascular diseases, intrauterine growth retardation, spontaneous abortion, antepartum hemorrhage, female infertility, peptic ulcer disease, chronic obstructive lung disease, sexual dysfunction in men, and so on. Passive smokers can also get diseases associated with cigarette smoking (Kassay et al., 1994; Wong and Bauman, 1997; Guslandi et al., 1997; Jee et al., 1999).

A research done in Australia discovered that the prevalence of current cigarette smoking was 66.6% (72% of males and 59% of females). In that study, the current frequency of cigarette smoking in schizophrenia, bipolar disorder and depressive disorders were 70, 61 and 58% respectively (Cooper et al., 2012). The smoking rate among people with bipolar disorder has been reported as 61% reported in the US (Lasser et al., 2000). Studies from Yemen exhibited that the prevalence of cigarette smoking was 24.3% (Abbas et al., 2014). A school based study done in Nigeria and a hospital based study conducted in Tanzania on cigarette smoking recognized that the prevalence was 8.3 and 38.6%, respectively (Raji et al., 2013; Hauli et al., 2011). A review of studies on cigarette smoking in different parts of Ethiopia publicized that the prevalence ranges from 7.5 to 19.17% (Kassa and Deyno, 2014; Tadesse, 2014).

There is also suggestion that smoking is associated with negative effects on quality of life in populations with psychiatric conditions. In a survey of 1843 psychiatric patients, subjects with nicotine dependence ( $n=280, 16.6\%$ ) were more likely to have a lower social status, experience more general health problems, have a higher rate of hospitalizations, and have poorer treatment compliance than subjects without nicotine dependence (Montoya et al., 2005).

Although the prevalence of cigarette smoking and its physiological and psychosocial effects have been studied in various populations and areas of Ethiopia, there are very few studies on the prevalence of cigarette smoking and its determinants in psychiatric outpatients. Therefore, the aim of this study was to determine the prevalence of cigarette smoking and associated factors among psychiatric outpatients.

## MATERIALS AND METHODS

### Study setting

This cross-sectional study was carried out in Jimma University Specialized Hospital (JUSH) Psychiatry Outpatient Department

(OPD) which is located in the south-western part of Ethiopia which is 355 km far from Addis Ababa. The study was carried out in August, 2013.

### Sample size and sampling procedures

The sample size was determined using single population proportion formula with the assumption of 95% confidence level, 5% marginal error, 10% non-response rate and the proportion of cigarette smoking to be 50%. The weekly patient load in the outpatient department of psychiatry clinic was 250. Therefore, to get the sample size of 385; we needed to collect the data for the duration of two weeks consecutively. All patients who met the inclusion criteria coming to JUSH psychiatry clinic during the data collection period were included. All eligible adult attendees of the psychiatric clinic at JUSH during the study period were invited consecutively to participate in the study.

### Study instruments

An interviewer administered questionnaire was used to collect data. The questionnaire consisted of items measuring cigarette smoking, alcohol use, pattern and frequency of khat use, mental disorder and sociodemographic variables. In our study, cigarette smoking was defined as having smoked cigarettes at least once in the last one month preceding the study. The WHO's Alcohol Use Disorder Identification Test (AUDIT) was used to measure alcohol use disorders (AUDs) (Babor TF et al., 2001). A study participant who had eight or more scores on the AUDIT was classified as having an alcohol use disorder (AUD).

### Data collection procedures

Data were collected by interviewing all persons with mental disorders coming for treatment to JUSH and the patients' diagnosis was extracted from medical charts. Five diploma level psychiatric nurses and five master's level postgraduate students in mental health collected data. Two supervisors who had bachelor degree in public health and the principal investigator also participated in the supervision. Before the data collection, a two days training was given for the data collectors and one day training for the supervisors.

### Data quality assurance

The data collectors and supervisors were trained. Data collection was carried out after the questionnaires were pretested on 5% of the total sample of persons with mental disorders at Mizan Hospital which is 298 km away from Jimma town. The supervisor monitored data quality and checked all questionnaires for completeness. Incomplete and unclear questionnaires were returned to the data collectors for correction.

### Data analysis

The collected data were cleaned, coded and entered into statistical package for social science (SPSS version 20). The outcome and explanatory variables were entered into a bivariate logistic regression analysis, one at a time, in order to estimate the strength of association using Odds Ratios (OR). All variables associated with cigarette smoking in the bivariate logistic regression with a  $p$ -value  $\leq 0.25$  were entered together into a multivariate logistic regression by using enter method in order to

control for potential confounders. Only variables with p-value lower than 0.05 in the multivariate analysis were considered statistically significant in the final model.

### Ethical considerations

Ethical clearance and permission was obtained from the Ethical Review Committee of Jimma University, College of Public Health and Medical Sciences. The study participants were free to enroll in the study and withdraw from it at any time. Data were collected from participants after getting informed consents. All the information obtained in due time were kept confidentially. Patients with cigarette smoking were referred to mental health professional specialists and psychologists for further evaluation and management.

## RESULTS

### Socio-economic and demographic characteristics

Out of 385 psychiatric outpatients participated in the study, 365 completed the questionnaires making the response rate of 94.8%. Among the study participants, 267(73.2%) were males, 214(58.6%) were Oromo ethnicity and 139(38.1%) were in the age ranges between 25 and 34 years. One hundred and ninety six (53.7%) were followers of Muslim religion followed by Orthodox Christian followers 137(37.5%) (Table 1).

The overall current prevalence of cigarette smoking was 20.5% (n=75). The frequency of cigarette smoking in males and females were 27.3 and 2.0%, respectively. A 33.3% prevalence of cigarette smoking was detected in College/University students whereas only 5.4% prevalence was reported by illiterate participants (Table 2).

There were respondents that were found in various levels of cigarette smoking. These include, Non-smoker 290(79.5%), mild smoker 10(2.7%), moderate smoker 22(6.0%) and heavy smoker 43(11.8%) (Figure 1).

With regard to mental disorders 16.3% of patients with major depressive disorders, 17.8% of patients with bipolar I disorders, 23.3% of patients with anxiety disorders, 28.2% of patients with schizophrenia and 20.8% of patients with other psychiatric disorders were smoking cigarettes.

In the bivariate analysis, being male, increased frequency of going to worship place, increased educational status, being a government employee, being single, and living alone, khat use, using shisha, family history of alcoholism, schizophrenia, alcohol use disorders and family monthly income of 1201 ETB and higher were strongly and positively associated with current cigarette smoking. However, some of the following variables such as ethnicity, religion, bipolar I disorders, anxiety disorders, other psychiatric disorders, family history of mental illness and age were not significantly associated with current cigarette smoking (Table 3).

On the other hand, the multivariate logistic regression indicated that being male, khat use and experiencing alcohol use disorders were found to be significantly associated with current cigarette smoking (Table 4).

Male patients were 7 times more likely to smoke cigarettes as compared to female patients [AOR: 7.29, 95%CI: (1.52, 34.87)]. Compared to non khat users, those who used khat were positively associated with cigarette smoking [AOR: 2.65, 95%CI: (1.07, 6.54)]. Patients with alcohol use disorders were 4 times more likely to smoke cigarettes when compared to those without alcohol use disorders [AOR: 4.32, 95%CI: (2.09, 8.90)].

## DISCUSSION

This study revealed that there is substantial burden of cigarette smoking in persons with mental disorders in Jimma University specialized hospital. The overall current prevalence of cigarette smoking in persons with mental health disorders in Jimma University specialized hospital was 20.5% which is in agreement with the study done among Dilla University students in which 19.17% of students were found to be cigarette smokers (Tadesse, 2014). However, the prevalence is higher as compared to that reported in studies carried out among the students of Aksum University (Gebreslassie et al., 2013), Hawassa University in Ethiopia (Kassa and Deyno, 2014) and in school adolescents in Nigeria (Raji et al., 2013) which revealed 9.3, 7.5 and 8.3% prevalence respectively. These findings were significantly lower than a similar study done in Australia, Timor and Mekelle, in which the current prevalence were 66.6, 40.3 and 29.5% respectively (Cooper et al., 2012; Siziya et al., 2008; Eticha and Kidane, 2014). Our findings were also lower than a similar study done in Spain, Tanzania and Yemen where the prevalence rate of cigarette smoking was 54.54, 38.6 and 24.3% respectively (Bobes et al., 2010; Hauli et al., 2011; Abbas et al., 2014). The possible explanation for the observed differences in cigarette smoking could be due to mental disorders condition, for instance, persons with mental disorders being less likely to smoke cigarettes because they felt ill or they thought that cigarette smoking may have a negative impact on the potency of the psychotropic medications. Another possible reason for the lower reported prevalence could be higher recall bias in our study. Furthermore; this difference may have arisen due to the difference in study setting, study population and sample size.

In the present study, the frequency of cigarette smoking in males was higher than females (27.3 Vs. 2.0%). This may be due to the high cultural restrictions in females. Our findings indicated that the prevalence of cigarette smoking in schizophrenia, bipolar I disorders



**Table 1.** Socio-economic characteristics of study participants in Southwest Ethiopia (n = 365).

<b>Variable</b>	<b>Frequency (%)</b>
<b>Sex</b>	
Male	267(73.2)
Female	98(26.8)
<b>Age in years</b>	
18-24	85(23.3)
25-34	139(38.1)
35-44	89(24.4)
45-70	52(14.2)
<b>Ethnicity</b>	
Oromo	214(58.6)
Amhara	67(18.4)
Guragie	32(8.8)
Others	52(14.2)
<b>Religion</b>	
Orthodox	137(37.5)
Muslim	196(53.7)
Others	32(8.8)
<b>Frequency of going to worship place</b>	
Never	37(10.1)
Sometimes	220(60.3)
Frequently	107(29.3)
<b>Educational status</b>	
Illiterate	56(15.3)
Primary	143(39.2)
Secondary	103(28.2)
College/university	63(17.3)
<b>Occupation</b>	
Unemployed	201(55.1)
Government employed	74(20.3)
Others	90(24.7)
<b>Mean family monthly income</b>	
≤1201 Birr	211(63.6)
>1201 Birr	121(36.4)
<b>Marital Status</b>	
Single	166(45.5)
Married	180(49.3)
Others	19(5.2)
<b>Living arrangement</b>	
Alone	34(9.3)
With family	315(86.3)
With relatives	16(4.4)

and major depressive disorders were (28.2, 17.8 and 16.3%) respectively which is contrary to the study finding in Australia schizophrenia (70%), bipolar disorder (61%) and depressive disorder (58%) (Cooper et al., 2012). This may be explained by the difference in cultural setting and socio-economic characteristics of the patients. In addition, the actual prevalence of

smoking might have been underreported due to social desirability bias.

In this study, male patients were seven times more likely to smoke cigarettes as compared with female patients [AOR: 7.29, 95%CI: (1.52, 34.87)]. The finding is in line with a study conducted in Harar and Mekelle, Ethiopia (Reda et al., 2012; Eticha and Kidane, 2014).

**Table 2.** Distribution of the current prevalence of cigarette smoking by socio-economic factors in Southwest Ethiopia (n=365).

Variable	Cigarette smoking		P- value	Unadjusted OR (95% CI)
	No, N (%)	Yes, N (%)		
<b>Sex</b>				
Male	194(72.7)	73(27.3)	0.001*	18.06(4.34,75.17)
Female	96(98.0)	2(2.0)		Reference
<b>Age</b>				
18-24	69(81.2)	16(18.8)	0.809	0.92(0.46,1.82)
25-34	111(79.9)	28(20.1)		Reference
35-44	66(74.2)	23(25.8)	0.315	1.38(0.74,2.59)
45-70	44(84.6)	8(15.4)	0.455	0.72(0.31,1.70)
<b>Ethnicity</b>				
Oromo	177(82.7)	37(17.3)	0.014*	0.46(0.25,0.86)
Amhara	46(68.7)	21(31.3)		Reference
Guragie	24(75.0)	8(25.0)	0.517	0.73(0.28,1.89)
Others	43(82.7)	9(17.3)	0.084*	0.46(0.19,1.11)
<b>Religion</b>				
Orthodox	105(76.6)	32(23.4)		Reference
Muslim	162(82.7)	34(17.3)	0.177*	0.69(0.40,1.18)
Others	23(71.9)	9(28.1)	0.572	1.28(0.54,3.05)
<b>Frequency of worship places going To</b>				
Never	24(64.9)	13(35.1)		Reference
Sometimes	176(80.0)	44(20.0)	0.044*	0.46(0.22,0.98)
Frequently	90(84.1)	17(15.9)	0.015*	0.35(0.15,0.82)
<b>Educational status</b>				
Illiterate	53(94.6)	3(5.4)		Reference
Primary	122(85.3)	21(14.7)	0.082*	3.04(0.87,10.64)
Secondary	73(70.9)	30(29.1)	0.002*	7.26(2.14,25.05)
College/university	42(66.7)	21(33.3)	0.001*	8.83(2.47,31.63)
<b>Occupation</b>				
Unemployed	168(83.6)	33(16.4)		Reference
Government employed	46(62.2)	28(37.8)	0.001*	3.10(1.70,5.65)
Others	76(84.4)	14(15.6)	0.853	0.94(0.47,1.85)
<b>Family monthly income</b>				
≤1201 Birr	173(82.0)	38(18.0)		Reference
>1201 Birr	87(71.9)	34(28.1)	0.033*	1.78(1.05,3.02)
<b>Marital Status</b>				
Single	124(74.7)	42(25.3)		Reference
Married	152(84.4)	28(15.6)	0.025*	0.54(0.32,0.93)
Others	14(73.7)	5(26.3)	0.923	1.05(0.36,3.10)
<b>Living arrangement</b>				
Alone	19(55.9)	15(44.1)		Reference
With family	260(82.5)	55(17.5)	0.001*	0.27(0.13,0.56)
With relatives	11(68.8)	5(31.2)	0.389	0.58(0.16,2.02)

\* P value ≤ 0.25 was considered as candidates for the multivariate analysis.

The odds of current cigarette smoking by the respondents with khat use were 3 times higher as compared to those who do not use khat [AOR: 2.65, 95% CI: (1.07, 6.54)] which is consistent with the study finding in Hawassa and Mekelle, Ethiopia (Kassa

and Deyno, 2014; Eticha and Kidane, 2014).

Patients with alcohol use disorders were more likely to smoke cigarettes when compared to those without alcohol use disorders [AOR: 4.32, 95% CI: (2.09, 8.90)]. The result is similar with the study done in

**Table 3.** Bivariate analysis of determinant factors associated with cigarette smoking in persons with mental disorders in Southwest Ethiopia (n=365).

Variable	Cigarette smoking		P- value	Unadjusted OR (95% CI)
	No, N (%)	Yes, N (%)		
<b>AUDs</b>				
No	204(91.5)	19(8.5)		Reference
Yes	86(60.6)	56(39.4)	0.001*	6.99(3.92,12.46)
<b>Khat use</b>				
No	117(90.0)	13(10.0)		Reference
Yes	173(73.6)	62(26.4)	0.001*	3.22(1.70,6.13)
<b>Using Shisha</b>				
No	289(80.3)	71(19.7)		Reference
Yes	1(20.0)	4(80.0)	0.013*	16.28(1.79,147.92)
<b>Family history of alcoholism</b>				
No	243(81.8)	54(18.2)		Reference
Yes	47(69.1)	21(30.9)	0.021*	2.01(1.11,3.64)
<b>Family history of mental illness</b>				
No	248(81.3)	57(18.7)		Reference
Yes	42(70.0)	18(30.0)	0.050*	1.87(1.00,3.48)
<b>Patients' psychiatric diagnosis</b>				
<b>Major depressive disorder</b>				
No	203(77.8)	58(22.2)		Reference
Yes	87(83.7)	17(16.3)	0.212*	0.68(0.38,1.24)
<b>Schizophrenia</b>				
No	196(83.8)	38(16.2)		Reference
Yes	94(71.8)	37(28.2)	0.007*	2.03(1.21,3.40)

\*P value  $\leq$  0.25 was considered as candidates for the multivariate analysis.

**Table 4.** Multivariate regression model estimates of determinant factors for cigarette smoking in Southwest Ethiopia (n=365).

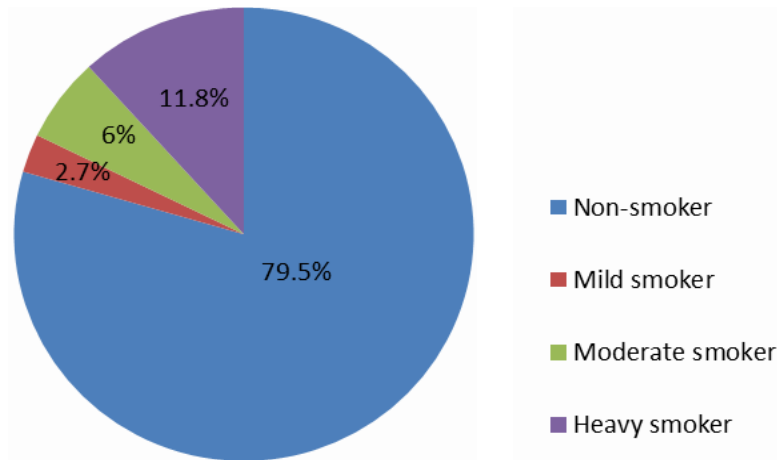
Variable	Frequency	P- value	AOR (95% CI)
<b>Gender</b>			
Male	267	0.013*	7.29(1.52,34.87)
Female	98		Reference
<b>Khat use</b>			
No	130		Reference
Yes	235	0.035*	2.65(1.07,6.54)
<b>Alcohol use disorders</b>			
No	223		Reference
Yes	142	0.001*	4.32(2.09,8.90)

\* P value < 0.05 in the multivariate analysis is declared as significant.

Hawassa, Ethiopia (Kassa and Deyno, 2014).

This study had some limitations; first, the study used a descriptive cross-sectional design that cannot establish trends and causality between cigarette smoking and potential risk factors. There may be under reporting of cigarette smoking due to social desirability bias.

In conclusion, the current prevalence of cigarette smoking was high amongst persons with mental disorders. This cannot be ignored in the management of psychiatric disorders in psychiatric hospitals. There should be a routine screening for cigarette smoking in psychiatric patients and subsequent management of the condition. This calls for appropriate standard of



**Figure 1.** Cigarette smoking classified based on the number of cigarettes smoked by study participants in Southwest Ethiopia (n=365).

operations to be adopted as a matter of standard clinical practice and policy in psychiatric hospitals.

### Conflict of Interests

The authors have not declared any conflict of interests.

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