Published in final edited form as:

Addict Behav. 2005 August ; 30(7): 1290–1299. doi:10.1016/j.addbeh.2005.01.002.

Prevalence and Correlates of Tobacco Use and Nicotine Dependence Among Psychiatric Patients in India

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Abstract

Tobacco use among psychiatric patients in developing countries has not been well-investigated. To address this issue, we screened consecutive admissions to a major psychiatric hospital in southern India, and assessed the prevalence and correlates of tobacco use and nicotine dependence. Patients ($n = 988$) provided information about their use of tobacco products, and participated in an interview that included the Fagerström Test for Nicotine Dependence as well as measures of other substance use. Three hundred and fifty-one patients (36%) reported current tobacco use, with 227 (65% of all users) reporting moderate to severe nicotine dependence. Current tobacco use as well as nicotine dependence were associated with male gender, a diagnosis of bipolar disorder, and risk of other substance use problems. The cultural context of these findings, and the implications for tobacco control among psychiatric patients, are discussed.

Keywords

Tobacco use; nicotine dependence; smoking; psychiatric patients; India

Epidemiological studies in developed, western countries reveal wide variability in tobacco use rates across population subgroups. In many European countries and the U. S., for example, it is known that persons with a history of mental illness are twice as likely as the general population to smoke; in the U. S., persons with a history of mental illness constitute one-half of the domestic tobacco market (Lasser et al., 2000). In contrast, the prevalence of smoking among persons with a mental illness living in developing countries has not been well-studied. The emergence of a global economy, the widespread marketing of tobacco products, and the

vulnerability of mentally ill persons make it likely that persons living with a mental disorder in developing countries may also use tobacco products at a disproportionate rate.

India has the world's second largest population, and is projected to surpass China in population by mid-century. In India, tobacco is consumed both through smoked and smokeless forms (Gupta & Hamner, 1992). Indians smoke tobacco mainly in the form of *beedis* and cigarettes. The Indian *beedi* consists of shredded, sun-dried tobacco in small quantities that is hand rolled into a piece of leaf called *tendu*. *Beedis* are popular in India and *beedi* smoking starts at an early age. The smokeless forms of tobacco consumption in India include chewing tobacco and inhalation of snuff. Chewing tobacco is mainly consumed in the form of *gutkha* and *zarda*. *Gutkha*, a sweetened mixture of tobacco, betel, and catechu, is sold in brightly colored packets; often used by women and children, it is chewed and then spit out. *Zarda*, a dried and colored residual tobacco, is obtained by boiling tobacco leaves with spices and lime.

Cross-sectional studies have provided data regarding the prevalence of tobacco use in the general population of India. The National Family Health Survey provided data from 301,984 adults in 26 Indian states during 1999 (Subramanian, Nandy, Kelly, Gordon, & Smith, 2004). In this impressive sample, the overall prevalence was 18.4% for tobacco smoking and 21% for tobacco chewing. Compared to men, Indian women were much less likely to smoke tobacco (3.4% vs. 33.3%), chew tobacco (13% vs. 29%), and use tobacco in both forms (15.5% vs. 50.2%). Per capita consumption data suggest that *beedi* smoking has been steadily rising during the past several decades (World Health Organization [WHO], 1997).

In the only published study that provides data on tobacco use among psychiatric patients in India, Srinivasan and Thara (2002) studied 510 male psychiatric patients. They reported that the prevalence of smoking was 38% among patients with schizophrenia, 24% among patients with mood disorders, and 23% among those with a non-psychotic disorder. Although valuable, this study sampled only men, assessed only smoking but not other forms of tobacco use, and did not assess the degree of dependence. Additional data are needed to inform public policy and clinical practice, and to guide tobacco control efforts among men and women in this vulnerable population.

The current study was designed to estimate the prevalence of tobacco use in both smoking and smokeless forms among male and female psychiatric patients in India. In addition, we sought to identify sociodemographic and diagnostic correlates of tobacco use and nicotine dependence. Based upon findings from the west, we expected to find elevated rates of tobacco use among male psychiatric patients with diagnoses of either schizophrenia-spectrum and bipolar disorders. We also hypothesised that tobacco use would be associated with a high likelihood of use of other substances (Farrell et al., 2001; Glassman et al., 1990).

Methods

Setting

The sample was recruited at the National Institute of Mental Health and Neurosciences (NIMHANS), a 600-bed psychiatric hospital in Bangalore. Consecutive inpatient admissions over an eight month period were screened and invited to participate if they were 18–65 years of age and able to provide informed consent. Patients were excluded if they were unable to participate meaningfully in the research or had an primary substance use disorder diagnosis.

Procedures

Recruitment—Patients were approached by a member of the research team, after determining their eligibility in consultation with the clinical team. Following an explanation of the

procedures, written informed consent was obtained either with a signature or by the patient making his or her mark after the consent form was explained.

Data collection—Data were obtained from a review of the medical chart and a structured interview. The chart review provided data regarding ICD-10 diagnosis made by a psychiatrist, duration of illness, duration of the current episode, drug compliance, and number of hospitalizations. Before beginning the interview, rapport was established with the patients to build a collaborative relationship, to optimize data quality. The interview was preferred over self-administered questionnaires to enhance cultural sensitivity, to minimize the respondent burden, and to avoid misunderstandings. The interviews, conducted in the language most comfortable to the patients, yielded sociodemographic data regarding age, gender, place of residence, living arrangement, marital status, education, income, and employment status.

To assess nicotine use, interviewers assessed type and frequency of tobacco used and administered the *Fagerström Test for Nicotine Dependence* (FTND; Heatherton, Kozlowski, Frecker, & Fagerström, 1991). The FTND was administered separately for cigarettes, *beedis*, and smokeless tobacco. For the latter, we modified 6 items to assess the number of tins/pouches of tobacco chewed per week, time of first use, difficulty refraining from chewing, frequency of use, and chewing when ill. To our knowledge, this modification is innovative but the FTND has not yet been validated for this purpose.

We assessed alcohol and drug use problems, respectively, with the *Alcohol Use Disorders Identification Test* (AUDIT; Saunders, Aasland, Babor, De La Fuente, & Grant, 1993) and the *Drug Abuse Screening Test* (DAST; Skinner, 1982), two widely-used, standardized measures. We assessed betel nut use frequency because (a) this substance is commonly used in the region (estimates range as high as 37% in the general population; Gupta & Warnakulasuriya, 2002), (b) it is the fourth most widely used addictive substance in the world (Boucher & Mannan, 2002), and (c) in India and in Pakistan, tobacco is often chewed with betel nut and catechin. We assessed betel nut use separately from tobacco, however, because (a) the two substances are not always used together; and (b) the active ingredient of betel nut is arecholine, which has effects on both nicotinic and muscarinic receptors, making this substance distinct from tobacco (Boucher & Mannan, 2002).

Data Analysis

First, prevalence estimates were computed for the sample as a whole and by gender. Second, to determine the correlates of tobacco use, the sample was divided into current smokers and non-smokers. Third, to determine the correlates of nicotine dependence, the sample was categorized into two groups: those with minimal dependence (FTND ≤ 3), and those with moderate to severe dependence (FTND > 3). *t*-tests and χ^2 tests evaluated the associations among tobacco use, nicotine dependence, and the sociodemographic and clinical variables. Logistic regression analyses were conducted to identify the predictors of nicotine use and dependence. The variables entered into the model were age, gender, education, occupation, marital status, locality, psychiatric diagnosis, betel nut use, and AUDIT and DAST scores.

Results

Sample Characteristics

During the study interval, 1,639 patients were admitted to adult psychiatry units. Of these, 389 could not be interviewed due to psychiatric instability, 222 were discharged or transferred before the interview could be completed, 21 were readmissions, 10 did not meet the age criterion, 3 declined to be interviewed, and 6 did not speak any language represented among our staff. Thus, the final sample consisted of 395 female and 593 male patients (M age = 31.7

years, $SD = 9.9$). Preferred languages were 39% Kannada, 17% Telugu, 12% Tamil, 7% Hindi, and 25% others. Religious affiliation was 83% Hindu, 11% Muslim, and 6% other.

Most patients had some formal education with 21% having completed primary level education, 28% high school, 15% pre-university, and 13% university. Only 45% were employed outside their home. Forty-three percent were married and living with their spouse, 9% were married and living apart, 43% were not married, 2% were divorced, and 3% widowed. Patients came from rural (44%), urban (39%), and semi-urban (17%) areas, and most lived in their family home (55%) or their own home (36%).

The most common primary diagnosis was a mood disorder ($n = 464$; 47%) with 309 diagnosed with bipolar/mania and 155 with depressive disorder; next most frequent was the psychotic disorders ($n = 388$; 39%) with 224 diagnosed with schizophrenia, 26 with acute psychosis, 23 with delusional disorder, 88 with unspecified psychosis, 9 with schizotypal disorder, and 18 with schizoaffective disorder; and 136 (14%) were diagnosed with neurotic and other disorders. The total duration of illness was less than 6 months in 207 (21%) cases, 6 to 12 months in 67 (7%) cases, 1 to 5 years in 327 (33%) cases, and more than 5 years in 387 (39%) cases. The mean number of previous psychiatric admissions was 2.0 ($SD = 1.8$).

Prevalence and Correlates of Tobacco Use

Table 1 displays prevalence estimates. As depicted there, 36% of patients (53% of men and 9% of women) reported tobacco use in at least one form. Men were more likely to smoke (45%) rather than chew (20%) tobacco; women were more likely to chew (8%) rather than smoke (<1%). Among the tobacco users, 39% ($n = 136$) used more than one form of tobacco.

Bivariate analyses determined the correlations of tobacco use with demographic, substance use, and psychiatric variables. Significant correlates of tobacco use were then entered into the logistic regression model as predictors for use. As can be seen in Table 2, significant predictors of tobacco use were male gender, older age, lower levels of education, diagnosis of bipolar disorder, and substance use (i.e., betel nut, alcohol and other drugs).

In an exploratory analysis, smokers were divided into those who smoked only *beedis* ($n = 106$) and those who smoked cigarettes ($n = 157$). Compared to cigarette smokers, *beedi* smokers were: older at the time of their first hospital admission [$M = 31.6$ vs. 29.2 years, $t(261) = 2.11$, $p = .036$], less educated [$M = 7.8$ vs. 11.3 years, $t(261) = 6.42$, $p < .001$], more likely to be married [54% vs. 36%, $\chi^2(1) = 7.86$, $p = .004$], more likely to come from a rural background [64% vs. 41%, $\chi^2(2) = 19.38$, $p < .001$], more likely to work as a casual laborer [34% vs. 16%, $\chi^2(2) = 11.66$, $p = .003$], and poorer [$M = 990.2$ vs. 2420.6 rupees per month, $t(190.4) = 2.91$, $p = .004$].

Prevalence and Correlates of Nicotine Dependence

Two hundred and twenty-seven of the 351 tobacco users (65%) reported dependence on nicotine. The dependence rates for *beedis*, cigarettes, and chewing tobacco were 56% ($n = 122$), 30% ($n = 47$), and 67% ($n = 101$), respectively. Seven patients were dependent on all three forms of tobacco. Among men, 199 of the 316 tobacco users (63%) had moderate to severe nicotine dependence; among women, 28 of the 35 tobacco users (80%) were similarly dependent.

Bivariate analyses identified demographic, substance use and psychiatric variables correlated with nicotine dependence. Significant variables were entered into the logistic regression models as predictors of dependence. As can be seen in Table 2, nicotine dependence was more likely among older, less-well-educated men. Nicotine dependence was also associated with

other substance use problems, but there was no association between nicotine dependence and the specific psychiatric diagnoses represented in this sample.

Discussion

This cross-sectional cohort study of consecutive admissions to a major psychiatric hospital in India provides important data regarding the tobacco use, arguably the leading behavioral cause of premature morbidity and mortality in the world (Murray & Lopez, 1997). Several findings warrant discussion.

First, rates of tobacco use across the entire sample indicate that at least 36% of psychiatric inpatients use tobacco products. Given the association between tobacco use and lung cancer, cardiovascular disease, tuberculosis, and other chronic lung diseases, tobacco use has been projected to account for 13% of all deaths in India by 2020 (WHO, 1997). Thus, the health, human, and financial consequences of tobacco use for such a populous country are staggering, and tobacco control measures in this population warrant immediate attention.

Second, among male patients, rates of smoking cigarettes or *beedis* (often combined with chewing) reached 45%. This rate is higher than that (31.6%) obtained by Srinivasan and Thara (2002) who used a convenience sample of 510 male outpatients, and also higher than that (33%) reported by Subramanian et al. (2004) for the general population of Indian men. Although sampling and methodological differences require that comparisons across studies be made cautiously, it would appear from our data with a representative sample of male psychiatric patients that they may be more likely to smoke than men from the Indian general population.

Third, this is the first published study to estimate tobacco use rates among female psychiatric patients in India. We found that 8% of women chewed tobacco, and less than 1% smoked cigarettes or *beedis*. We found no evidence that female patients used tobacco more than women from the general population; indeed, tobacco use rates among female psychiatric patients in our sample was lower than the rates reported in the general population of Indian women (3.4% of whom smoke, and 13% chew tobacco; Subramanian et al., 2004).

Fourth, within our psychiatric sample, there were marked gender differences in tobacco use patterns. As expected, men used tobacco products at a higher rate, and were dependent on nicotine to a greater degree, compared to women. These gender differences are larger than what have been found in studies of psychiatric patients from the west (Vanable et al., 2003). These cross-cultural differences may reflect an indirect 'benefit' of the social, cultural, and economic constraints faced by Indian women relative to women in more western countries. However, among women who used tobacco, dependence rates were 80%, indicating that mentally ill women in India are no less vulnerable to the addictive influence of nicotine, and they should not be ignored in tobacco control efforts.

The findings that (a) tobacco smoking rates were considerably lower among women than among men whereas (b) chewing tobacco rates were less disparate may reflect a greater cultural acceptance of, and less stigma associated with, women's chewing (rather than smoking) tobacco (Reddy & Gupta, 2004). Because of this, and even though we made considerable efforts to earn patients' trust in order to promote candid reporting, we cannot rule out the possibility that some women may have underreported their smoking behavior.

Fifth, comparison of tobacco use rates among psychiatric patients in India to those reported for psychiatric patients in the west suggests that the smoking problem in India has not yet reached the same level. In the west, one-half to two-thirds of all psychiatric patients smoke (Vanable et al., 2003). It is difficult to interpret these cross-cultural variations, because they probably reflect many differences in culture, income, distribution, and availability of tobacco

products. For example, unlike the west, in India there is a strong family system, even for mentally ill individuals. The restriction imposed on smoking by the family may account for the lower rates of tobacco use. The much lower incomes for patients in this study may also limit their ability to afford commercially-prepared tobacco products.

Sixth, we found that 65% of the patients who reported current use were dependent on nicotine. To our knowledge, this is the first report of nicotine dependence among psychiatric patients in India, and reveals that the use of tobacco products among psychiatric patients is frequently associated with dependence. Given the lack of data on nicotine dependence in India, we cannot compare our results with general population.

Seventh, logistic regression analyses investigating the relationship between tobacco use and psychiatric characteristics indicated that tobacco use was associated with bipolar disorder. Although studies in the U. S. general population have documented a strong link between smoking and major depression (Breslau, 1995; Glassman & Covey, 1996), studies using psychiatric samples tend to find the highest prevalence of smoking among patients with schizophrenia (e.g., Venable et al., 2003). Within patient samples, smoking has been suggested to be related to the presence of psychotic symptoms in both bipolar disorder (Corvin et al., 2001) and schizophrenia (Beratis, Katrivanou, & Gourzis, 2001). Some have even suggested that increased smoking in the mentally ill may have a biological etiology, citing findings that genetic linkage related to nicotinic receptor were common in both schizophrenia and bipolar disorders (e.g., Leonard et al., 2001). Continued research is necessary to understand further the diagnostic correlates of smoking among psychiatric patients.

Eighth, as expected, tobacco use and nicotine dependence were associated with markers of other substance use. Thus, higher scores on the AUDIT and DAST were associated with use and dependence, as was betel nut use. These findings corroborate previous reports regarding the co-morbidity of substance use (e.g., Glassman et al., 1990; Venable et al., 2003). The association between betel nut and tobacco use was also expected, because a common practice is to add tobacco to betel nut and to chew both.

Ninth, exploratory analyses investigating the relationship between tobacco use and sociodemographic characteristics revealed two profiles of smokers: the poorer, married, less well-educated *beedi* smoker from a rural background working as a casual laborer, and the less poor, educated, unmarried cigarette smoker from an urban background in professional or other occupation. These findings corroborate results from studies of the general population (Subramanian et al., 2004; Venkatanarayan et al., 1996). These two profiles may reflect, at least in part, the economic cost of using these two types of tobacco products; that is, at the time this study was conducted, the average cost of 20 beedis was 4.50 rupees whereas the cost of 20 cigarettes ranged from 30 to 60 rupees. Thus, the cost of cigarettes was 6 to 13 times that of *beedis*. The much higher cost of cigarettes may help to explain why beedi smoking is more common (than tobacco smoking) among poorer, rural, and less educated patients.

These findings need to be interpreted mindful of the strengths and limitations of this study. One limitation was the (ethically necessary) exclusion of patients due to severe psychiatric instability or early discharge from the hospital. Such patients may be expected to be even more vulnerable to tobacco use, and their omission from the sample may mean that the prevalence rates reported herein actually underestimate the prevalence of tobacco use and dependence. A second limitation of our study was the absence of a control group (i.e., general population comparison condition) within our study; this required that we use a reference sample, provided by Subramanian et al. (2004), to permit comparisons with the general Indian population.

Strengths of our study include our large sample of male and female patients; the screening of consecutive admissions, thereby minimizing any self-selection bias; the use of measures with

established reliability and validity for assessment of tobacco use and other substance use; the assessment of tobacco use in multiple forms; and the assessment of nicotine dependence as well as use. The assessment of dependence related to *beedi* smoking is particularly novel and important because, compared to commercially-prepared cigarettes, *beedis* produce an equivalent or higher amount toxic compounds such as tar and hydrogen cyanide (Malson, Sims, Murty, & Pickworth, 2001).

Future research might continue our assessment of tobacco use in both smoking and smokeless forms, and further our efforts to assess dependence among users of smokeless tobacco and *beedis*. Exploration of tobacco use and dependence among different diagnostic groups is warranted to understand both the possible mechanisms of dependence, especially as these may relate to the neurobiology of the mental disorder. Research on smoking cessation and prevention strategies is also warranted.

Author Notes

This research was supported by grants R01-MH54929 and K02-MH01582 to Michael P. Carey. We gratefully acknowledge the patients for their participation and the therapists and administrators at the National Institute for Mental Health and Neurosciences for their enthusiasm and support. We also express our gratitude to the Health Improvement Project team.

References

- Beratis S, Katrivanou A, Gourzis P. Factors affecting smoking in schizophrenia. *Comprehensive Psychiatry* 2001;42:393–402. [PubMed: 11559866]
- Boucher BJ, Mannan N. Metabolic effects of the consumption of areca catechu. *Addiction Biology* 2002;7:103–110. [PubMed: 11900629]
- Breslau N. Psychiatric comorbidity of smoking and nicotine dependence. *Behavior Genetics* 1995;25:95–101. [PubMed: 7733862]
- Corvin A, O'Mahony E, O'Regan M, Comerford C, O'Connell R, Craddock N, Gill M. Cigarette smoking and psychotic symptoms in bipolar affective disorder. *British Journal of Psychiatry* 2001;179:35–38. [PubMed: 11435266]
- Farrell M, Howes S, Bebbington P, Brugha T, Jenkins R, Lewis G, Marsden J, Taylor C, Meltzer H. Nicotine, alcohol and drug dependence and psychiatric comorbidity: Results of a national household survey. *British Journal of Psychiatry* 2001;179:432–437. [PubMed: 11689401]
- Glassman A, Covey L. Smoking and affective disorder. *American Journal of Health Behavior* 1996;20:279–285.
- Glassman AH, Helzer JE, Covey LS, Cottler LB, Stetner F, Tipp JE, Johnson J. Smoking, smoking cessation, and major depression. *Journal of American Medical Association* 1990;264:1546–1549.
- Gupta, PC.; Hamner, JE. Tobacco habits in India. In: Bhonsle, RB.; Murti, PR.; Gupta, PC., editors. *Control of tobacco related cancers and other diseases. International Symposium, 1990. Bombay: Oxford University; 1992. p. 25-46.*
- Gupta PC, Warnakulasuriya S. Global epidemiology of areca nut usage. *Addiction Biology* 2002;7:77–83. [PubMed: 11900626]
- Heatherton TF, Kozlowski LT, Frecker RC, Fagerström KO. The Fagerström test for nicotine dependence: a revision of the Fagerström Tolerance Questionnaire. *British Journal of Addiction* 1991;86:1119–1127. [PubMed: 1932883]
- Lasser K, Boyd JW, Woolhandler S, Himmelstein DU, McCormick D, Bor DH. Smoking and mental illness: A population-based prevalence study. *Journal of American Medical Association* 2000;284:2606–2610.
- Leonard S, Adler L, Benhammou K, Berger R, Breese C, Drebing C, Gault J, Lee M, Logel J, Olincy A, Ross R, Stevens K, Sullivan B, Vianzon R, Virnich D, Waldo M, Walton K, Freedman R. Smoking and mental illness. *Pharmacology, Biochemistry and Behavior* 2001;70:561–570.

- Malson J, Sims K, Murty R, Pickworth W. Comparison of the nicotine content of tobacco used in bidis and conventional cigarettes. *Tobacco Control* 2001;10:181–183. [PubMed: 11387541]
- Murray C, Lopez A. Alternative projections of mortality and disability by cause 1990–2020: Global Burden of Disease Study. *Lancet* 1997;349:1498–1504. [PubMed: 9167458]
- Reddy, S.; Gupta, PC., editors. Report on tobacco control in India. New Delhi: Indian Ministry of Health and Family Welfare; 2004.
- Saunders JB, Aasland OG, Babor TF, De La Fuente JR, Grant M. Development of the Alcohol Use Disorders Screening Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption II. *Addiction* 1993;88:791–804. [PubMed: 8329970]
- Skinner HA. The Drug Abuse Screening Test. *Addictive Behaviors* 1982;7:363–371. [PubMed: 7183189]
- Srinivasan TN, Thara R. Smoking in schizophrenia—All is not biological. *Schizophrenia Research* 2002;56:67–74. [PubMed: 12084421]
- Subramanian SV, Nandy S, Kelly M, Gordon D, Smith GD. Patterns and distribution of tobacco consumption in India: Cross sectional multilevel evidence from the 1998–9 national family health survey. *British Medical Journal* 2004;328:801–806. [PubMed: 15070637]
- Vanable PA, Carey MP, Carey KB, Maisto SA. Smoking among psychiatric outpatients: Relationship to substance use, diagnosis, and illness severity. *Psychology of Addictive Behaviors* 2003;17:259–265. [PubMed: 14640821]
- Venkatanarayan KM, Chadda SL, Hanson RL, Tandon R, Shekawat S, Fernandez RJ, Gopinath N. Prevalence and pattern of smoking in Delhi: Cross-sectional study. *British Medical Journal* 1996;312:1576–1579. [PubMed: 8664667]
- World Health Organization. Tobacco or Health: A Global Status Report. Geneva: WHO; 1997.

Table 1

Type of Tobacco Use

Type of Tobacco Use	N (%) (N = 988)	Men (n = 593)	Women (n = 395)
Any form of tobacco	351 (36%)	316 (53%)	35 (9%)
<i>Beedis</i> only	87 (9%)	86 (15%)	1 (<1%)
Cigarettes only	40 (4%)	40 (7%)	0
Chewing tobacco only	88 (9%)	55 (9%)	33 (8%)
<i>Beedis</i> and cigarettes	73 (7%)	72 (12%)	1 (<1%)
<i>Beedis</i> and chewing tobacco	19 (2%)	19 (3%)	0
Cigarettes and chewing tobacco	5 (1%)	5 (1%)	0
All three types	39 (4%)	39 (7%)	0

Table 2

Logistic Regression Analyses for Correlates of Tobacco Use and Nicotine Dependence

Variable	%	Tobacco Use	%	Nicotine Dependence
<i>Gender</i>				
Female	9	1.00 (Reference)	7	1.00 (Reference)
Male	53	14.91 (9.46, 23.48) ***	34	7.15 (4.48, 11.40) ***
<i>Age</i>				
18 – 28	29	1.00 (Reference)	16	1.00 (Reference)
29 – 38	40	1.93 (1.31, 2.83) **	27	2.12(1.42, 3.17) ***
39 – 48	44	2.11 (1.28, 3.50) **	32	2.48 (1.51, 4.08) ***
48+	44	2.30 (1.20, 4.40) *	35	3.53 (1.88, 6.62) ***
<i>Education</i>				
<High School	41	1.00 (Reference)	30	1.00 (Reference)
High School	38	.68 (.40, 1.17)	25	.70 (.42, 1.19)
College	31	.47 (.27, .83) *	19	.51 (.29, .90) *
<i>Psychiatric Disorder</i>				
Schizophrenia	33	1.00 (Reference)	23	1.00 (Reference)
Bipolar	46	1.55 (1.05, 2.29) *	29	1.11 (.75, 1.65)
Depression	29	.83 (.50, 1.38)	17	.64 (.37, 1.11)
Others	28	.76 (.45, 1.28)	18	.74 (.42, 1.29)
<i>Betel Chewing</i>				
Non-chewers	28	1.00 (Reference)	17	1.00 (Reference)
Chewers	60	4.08 (2.74, 6.07) ***	41	2.75 (1.89, 4.00) ***
<i>AUDIT Score</i>				
Low risk (< 8)	31	1.00 (Reference)	20	1.00 (Reference)
High risk (≥ 8)	88	5.74 (2.79, 11.81) ***	61	2.56 (1.52, 4.31) ***
<i>DAST Score</i>				
Low risk (< 3)	34	1.00 (Reference)	22	1.00 (Reference)
High risk (≥ 3)	76	4.16 (1.45, 11.89) **	55	2.65 (1.15, 6.08) *

¹ Percentage indicates the proportion of participants within each stratification reporting current use of tobacco.

² Percentage indicates the proportion of participants within each stratification with nicotine dependence.

AUDIT = Alcohol Use Disorder Identification Test; DAST = Drug Abuse Screening Test.

*
 $p < .05$

**
 $p < .01$

 $p < .001$