Association between Smoking and Depression among University Students in Bangladesh

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ABSTRACT

Background: Smoking has some terrible consequences on human health, and it has become a major public health concern around the globe. Currently one of the leading preventable causes of premature death and disability in the world is smoking. Depression is a serious problem for young people leads to suicide. Therefore, this study aimed to find out the association between smoking and depression.

Materials and Methods: This cross-sectional study was conducted at two universities in Dhaka, Bangladesh among 401 students aged 18-26 years. Centre for Epidemiologic Studies Depression scale (CES_D) was used for the evaluation of depression status of the respondents. Statistical analysis was performed to see the association between outcome and predictors by using SPSS version 22 software package.

Result: Among total students, 301 students lived in nuclear families, and 84.0% of the student's monthly family income was above 20,000 takas. Although 78.1% were smokers among depressed respondents, there was no significant association between smoking and depression. Significant associations were also not found in the subgroups of males, females, those aged 18-23 years and those aged 24-26 years.

Conclusion: There may be heterogeneity in the association between smoking and depression among different culture, different society, different stage of life, etc. Since the association between smoking and depression is an important public health issue, the heterogeneity should be examined by large scale studies.

Keywords: smoking, depression, university students, stress, Bangladesh

INTRODUCTION

Smoking has some terrible consequences on human health and it becomes a major public health concern around the world.[1] Currently, one of the leading preventable causes of premature death and disability in the world is smoking.[2] Based on the latest estimation, ten percent of the causes of cardiovascular disease (CVD) are due to smoking.[3] Almost 5 million people die every year from tobacco related diseases and it will be

doubled by the year 2020.[4]Smoking habit is raising among university students in both developing and developed countries.[5] A report of WHO Department of Mental Health and Substance Abuse defined the depression as "Depression is a common mental disorder that presents with depressed mood, loss of interest or pleasure, decreased energy, feelings of guilt or low self-worth, disturbed sleep or appetite, and poor concentration".[6] World Health Organization (WHO) refers adolescence as the period in human growth and development from the ages 10 to 19 as the peak age of depression.[7] Due to genetic predisposition to a positive parental or family history and chronic illnesses such as diabetes, asthma and heart disease, young people could become depressed. During puberty hormonal changes can lead depression. Nicotine stimulates the release of the chemical dopamine in the brain. Nicotine causes changes to neurotransmitter activity in the brain, leading to increased risk of depression. Youth tobacco use is a raising problem in Bangladesh. More than 100,000 people die in Bangladesh in each year from diseases caused by consumption of tobacco. [8] In Bangladesh, about 20 million people use tobacco in several different methods with five million women in share. [4] Smoking prevalence among male is 48.3%, among female is 20.9%. [4] Depression leads younger part of the society to start smoking or drug addiction. [9] Global Adult Tobacco Survey, Bangladesh report 2009 found that the peak age of depression was 15 years or above which accounted for 23.0%. [7] Bangladesh voluntarily participates in the FCTC (Framework Convention on Tobacco Control) on 16th June, 2003, there has been few advances in tobacco control policy, mostly the Smoking and Tobacco Product Usage (Control) Act, 2005. The national agency for tobacco control in Bangladesh has an objective of tobacco prevention, but there is still a long road ahead to reach the set of strong, comprehensive policies which basically recommended by the World Health Organization. The studies conducted in Nepal, Pakistan and India found that 78%, 39% and 97.6% of university students were smokers. [10] A study in Bangladesh showed that 21.2% of university students have smoking habit and it is increasing in a risky manner due to over anxiety and tension, feeling of maturity, symbol of manliness and it can help one to forget the unhappy family environment.[10] Anxiety and depression were remarkably higher in current cigarette smokers than non-smokers and former smokers. [11] Many studies approved that there was an association between major depression and smoking.[12] However, to my knowledge, there were no studies in Bangladesh to examine the association between smoking and depression among the youth. This study aimed to examine the association between smoking and depression among university students in Bangladesh, adjusting for the factors associated with depression by multivariate analysis.

MATERIALS AND METHODS

Study design

This cross-sectional study was conducted at two universities (Dhaka University and United International University) in Dhaka, Bangladesh from June to September, 2016. The subjects were students aged 18-26 years; 306 students from Dhaka University and 95 students from United International University. Purposive sampling was used for the selection of universities and respondents. The students who did not agree the participation were excluded.

Data Collection

Self-administered anonymous questionnaire was used for data collection after acquiring informed consent from each student. The questionnaire was prepared with the help of opinion of relevant expert and literature review. It was translated into Bengali. Researcher provided the questionnaires to the students. The questionnaire was pre-tested among 30 students. After the pre-test, the questionnaire was modified for appropriate context and lingual meaning. The questionnaire was again retested to finalize the questionnaire to adjust internal consistency and construct validity and reliability of the questionnaire. The questionnaire included three parts: 1) socio demographic status of students, 2) information related to smoking (tobacco), 3) information related to depression. Smokers were defined as those who had tried or experimented with cigarette smoking, even a few puffs and who had smoked a cigarette in past thirty days. The 20-items self-report version of the Centre for Epidemiologic Studies Depression scale (CES-D) was used for the evaluation of depression status of the respondents.[13] The scores ranged from 0 to 60. The cutoff score for clinical depression in adult according to American Psychological Association (16 or greater) [13] was adopted in this study.

Statistical analysis

Collected data was checked, rechecked, edited, coded and recoded for quality management. Percentage, mean, median, mode, range and standard deviation (SD) were calculated for descriptive purposes. A chi-square test was used to examine the significance of associations. A logistic regression model was applied for the estimation of odds ratio (OR) and 95% confidence interval (CI), using SPSS version 22 software package. Subgroup analysis was also done in gender and age subgroups for the associations between smoking and depression. Age was divided into two groups; 18- 23 year and above, and 24-26 years. P-value less than 0.05 was regarded to be significant

RESULTS

Table 1: Socio-demographic features of university students

Socio-demographic features	Female N=90		Male N=311		Total N=401	
	No.	%	No.	%	No.	%
Age group						
18-20 years	10	(11.1)	15	(4.8)	25	(6.2)
21-23 years	50	(55.6)	138	(44.4)	188	(46.9)
24-26 years	30	(33.3)	158	(50.8)	188	(46.9)
Religion						
Muslim	74	(82.2)	242	(77.8)	316	(78.8)
Hindu	9	(10.1)	49	(15.8)	58	(14.5)
Buddhist	4	(4.4)	11	(3.5)	15	(3.7)
Christian	3	(3.3)	9	(2.9)	12	(3.0)
Educational status						
Bachelor	63	(70.0)	225	(72.3)	288	(71.8)
Masters	17	(18.9)	63	(20.3)	80	(20.0)
Others	10	(11.1)	23	(7.4)	33	(8.2)
Type of family						
Nuclear family	68	(75.6)	233	(74.9)	301	(75.1)
Joint family	22	(24.4)	76	(24.5)	98	(24.4)
Three generation family	0	(0.0)	2	(0.6)	2	(0.5)
Family income (monthly)						
≤20,000 taka*	12	(13.3)	52	(16.7)	64	(16.0)
>20,000 taka	78	(86.7)	259	(83.3)	337	(84.0)

Socio-demographic features	Female N=90		Male N=311		Total N=401	
	No.	**%**	**No.**	**%**	**No.**	**%**
Parents alive						
No	13	(14.4)	30	(9.6)	43	(10.7)
Yes	77	(85.6)	281	(90.4)	358	(89.3)
Father's education						
Illiterate	2	(2.2)	4	(1.2)	6	(1.5)
1-5 class	3	(3.3)	17	(5.5)	20	(5.0)
6-10 class	3	(3.3)	21	(6.8)	24	(6.0)
S.S.C [*]	10	(11.2)	22	(7.1)	32	(8.0)
H.S.C [**]	33	(36.7)	67	(21.5)	100	(24.9)
Graduation	37	(41.1)	170	(54.7)	207	(51.6)
Others	2	(2.2)	10	(3.2)	12	(3.0)
Mother's education						
Illiterate	7	(7.8)	20	(6.4)	27	(6.7)
1-5 class	9	(10.0)	31	(10.0)	40	(10.0)
6-10 class	5	(5.6)	36	(11.6)	41	(10.3)
S.S.C [*]	21	(23.3)	50	(16.0)	71	(17.8)
H.S.C [**]	22	(24.4)	80	(25.7)	102	(25.4)
Graduation	24	(26.7)	91	(29.3)	115	(28.7)
Others	2	(2.2)	3	(1.0)	5	(1.1)

*S.S.C= Secondary School Certificate, **H.S.C= Higher Secondary Certificate

Socio-demographic features	Female N=90		Male N=311		Total N=401	
	No.	**%**	**No.**	**%**	**No.**	**%**
Father's occupation						
Service	27	(30.1)	114	(36.7)	141	(35.2)
Business	58	(64.4)	165	(53.1)	223	(55.6)
Agriculture	1	(1.1)	18	(5.8)	19	(4.7)

Others	4	(4.4)	14	(4.4)	18	(4.5)
Mother's Occupation						
Service	25	(27.8)	50	(16.1)	75	(18.8)
Business	2	(2.2)	5	(1.6)	7	(1.7)
Home maker/ House wife	62	(68.9)	250	(80.4)	312	(77.8)
Others	1	(1.1)	6	(1.9)	7	(1.7)

*1 taka= 0.013 USD

The respondents were 18 to 26 years age group, with an average 23.19 ± 1.73 years. Among all of the respondents, 311 were male and remaining 90 were female (Table 1). Mainly Muslims 78.8% and mostly living in nuclear family 75.1% consisting of at least 3 members, while 24.4% came from joint family with highest 27 members. 84.0% of the student's monthly family income was above 20,000 takas. Most of the respondents' fathers were well educated; 24.9% for those with higher secondary certificate and 51.6% for those graduated from a university. On the other hand, the corresponding education of their mothers were 25.4% and 28.7%, respectively. Most of their fathers (55.6%) were doing business and 35.2 % were service holder. Most of their mothers (77.8%) were home makers. The study found that 77.3% of the respondents were depressed.

Table 2: Distribution of factors according to depression status among the university students

Factors	Non-depressed N=91		Depressed N=310		Total N=401		p-value
	No.	**%**	**No.**	**%**	**No.**	**%**	
Age group							
18-20 years	6	(6.6)	19	(6.1)	25	(6.2)	0.274
21-23 years	36	(39.6)	152	(49.0)	188	(46.9)	
24-26 years	49	(53.8)	139	(44.9)	188	(46.9)	
Educational status							
Bachelor	53	(58.2)	235	(75.8)	288	(71.8)	0.004
Masters	26	(28.6)	54	(17.4)	80	(20.0)	
Others	12	(13.2)	21	(6.8)	33	(8.2)	
Type of family							
Nuclear family	73	(80.2)	228	(73.6)	301	(75.1)	0.239
Joint family	17	(18.7)	81	(26.1)	98	(24.4)	
Three generation family	1	(1.1)	1	(0.3)	2	(0.5)	

Smoking status							
Non-smoker	22	(24.2)	68	(21.9)	90	(22.4)	0.669
Smoker	69	(75.8)	242	(78.1)	311	(77.6)	
Influencing factor for smoking							
Friends		72	(79.1)	244	(78.7)	316	(78.8)	0.732
Family		4	(4.4)	20	(6.5)	24	(6.0)	
Others		15	(16.5)	46	(14.8)	61	(15.2)	

Factors	Non-depressed N=91		Depressed N=310		Total N=401		p-value
	No.	**%**	**No.**	**%**	**No.**	**%**	
Parents smoking status							
No	53	(58.2)	190	(61.3)	243	(60.6)	0.627
Yes	38	(41.8)	120	(38.7)	158	(39.4)	
Best friend smoking status							
No	25	(27.5)	100	(32.3)	125	(31.2)	0.441
Yes	66	(72.5)	210	(67.7)	276	(68.8)	
Community stress or problem							
No	41	(45.1)	143	(46.3)	184	(46.0)	0.905
Yes	50	(54.9)	166	(53.7)	216	(54.0)	
Anyone smoke regularly at home							
No	28	(30.8)	96	(31.0)	124	(30.9)	1.00
Yes	63	(69.2)	214	(69.0)	277	(69.1)	
Experienced stressful life event in last year							
No	73	(80.2)	118	(38.1)	191	(47.6)	<0.001
Yes	18	(19.8)	192	(61.9)	210	(52.4)	
Familial disharmony							
No	72	(79.1)	259	(83.5)	331	(82.5)	0.347
Yes	19	(20.9)	51	(16.5)	70	(17.5)	

Table 2 shows distribution of the factors according to depression status among the university students. Among the depressed students, 49.0% were at the age between 21 year and 23 year. The majority of the respondents (75.8%) studied in bachelor degree. Although 78.1% of the depressed students were smoker, the association between depression and smoking was not significant (p=0.669). The study showed that 39.4% of the parents were smokers. History of community stress had 54.0% of depressed respondents. Among depressed respondents, 69.0% respondents lived together with family members who were regular smokers. It found that 61.9% respondents experienced stressful life event in last year among depressed respondents. Best friends smoking status also was found high and it accounted for 67.7% and the smoking habit of majority of the respondents (78.8%) were influenced by their friend, followed by watching others to smoke (15.2%), and their family member (6.0%).

Table 3: Odds ratio (OR) and 95% confidence interval (CI) of depression for significant factors as well as smoking starting age (N=401)

Variables	Unadjusted		
	OR*	**95 % CI****	**p-value**
Smoking starting age			
≤15 years			
>15 years	0.66	(0.40-1.06)	0.087
Anyone smoke regularly at home			
No			
Yes	0.99	(0.59-1.64)	0.971
Father alive			
No			
Yes	3.15	(1.63-6.05)	<0.001
Step parents			
No			
Yes	0.28	(0.08-0.99)	0.049
Experienced stressful life event in last year			
No			
Yes	3.24	(1.95-5.38)	<0.001
Violence at home			
No			
Yes	6.59	(3.75-11.60)	<0.001

Table 3 shows ORs and 95% CIs of smoking and significant factors for depression. The students whose father was alive were 3.15 times more likely to be depressed. The respondents who experienced stressful life event in

last year were 3.24 times more likely to be depressed and 6.59 times more depressed those who faced violence at home.

Table 4: Odds ratio (OR) and 95% confidence interval (CI) of smoking for depression relative to non-smoking

Variables	Unadjusted			Adjusted*		
	OR	**95 % CI**	**p-value**	**OR**	**95 % CI**	**p-value**
All student	1.13	(0.65-1.97)	0.653	1.18	(0.59-2.33)	0.642
Female	1.36	(0.51-3.61)	0.535	0.19	(0.03-1.14)	0.070
Male	0.98	(0.49-1.94)	0.956	0.98	(0.43-2.26)	0.962
≤23 years	1.31	(0.61-2.79)	0.485	1.08	(0.42-2.79)	0.861
>23 years	1.01	(0.45-2.28)	0.968	0.60	(0.20-1.84)	0.379

* adjusted for age, sex, smoking status, residence, father alive, mother alive, monthly income, parent's smoker, best friend smoker, violence in home, stressful life event, long physical illness, familial disharmony, broken family, step parents, victim violence, community stress, anyone smoke at home regularly, starting age of smoking.

Table 4 presents OR and 95% CI of depression for smoking relative to non-smoking among all subjects and subgroups of gender and age. All of the OR were not significant.

DISCUSSION

Our study findings did not reveal that the depression significantly predicted smoking onset and progression. However, it identified that depression became a remarkable problem among young generation. It also found that the associated factors for depression. Fathers alive, step parents, stressful life events and domestic violence were significantly associated with depression. It indicates that the respondents whose father's alive were more depressed. It may be due to father who is the leader of the household has higher expectation for children and they may make their children stressful by urging to get higher grades. Step parents were brought sad and depression for them also. The respondents who experienced stressful life event in last year become more depressed. Violence at home was also the reason of depression. A study conducted in public schools of northern Virginia showed that current smoker students had the highest odds ratio for depression than former and nonsmokers.[14] A study of Bangladesh, which was conducted to find the socio-demographic factors related to smoking among rural adolescent, found that the depression was significantly associated with smoking, even after adjusting for socioeconomic and cultural factors.[3] The other four studies also revealed the evidence for a bi-directional relationship between adolescent depression and smoking.[14-17] Our study found that amongst all respondents, 77.6% were smokers and 39.4% of the respondent's parents were smokers. A study done in Bangladesh, which showed that the starting time of smoking of children was associated with parent's smoking.[18] This finding also consistent with another study that was conducted at rural Bangladesh.[19] Self- efficacy was identified as the single most significant predictor of smoking.[20] Amongst all the reasons for smoking, study conducted in Bangladesh determined that initiation of smoking due to peer pressure followed by curiosity, for relieving anxiety and tension, feeling of maturity, symbol of manliness, lower level of self-efficacy and unhappy family environment. [19] Several studies showed that smoking was significantly associated with age, sex, educational level, residence, religion, family size, occupation, parental literacy, parental and siblings smoking status. [19,21-26] Peer smoking is a crucial factor for starting smoking. Our study also found that 78.8% of the respondents were influenced about smoking by their friends. This finding is in line with a study conducted on tobacco consumption among the college students of University of Delhi, India in 2010. [27] Similar findings were found in another study, which revealed stronger association between smoking and friend's smoking status. [28] To our knowledge, this was the first study to examine the

association between cigarette smoking and depression among the university students in Bangladesh. As like as other studies, our study had some limitations which may have affected the quality of the study. It was a cross sectional study, so we cannot determine causality. The study place was selected purposively due to time limitation and it was an urban-based study. Therefore, the study findings do not reflect the situation of the whole country. Friend selection, parent's supervision, environment of home, school, college and university all those play important role to stop smoking. We suggest establishing the universities with environment free of smoking and to start stress management program to reduce stress and relive the need of smoking. A chapter on smoking and its adverse effects on health should be added in current curriculum. Hospitals and social organization should participate to raise awareness among the people. Most of the students believe that they can stop smoking easily. [20,29] Stress and depression will also be reduced and the mood will be changed to normal state by discontinuing smoking because nicotine is a source of stress and depression. Cessation of smoking may be more challenging for those who experiencing psychiatric illness like schizophrenia or mania because smoking is more prevalent among those patients. [30-32] Therefore, the family, teachers and friends should not only encourage but also support the students to quit smoking. Smoking leads to a wide range of health hazards like lung cancer and COPD (chronic obstructive pulmonary disease). Although smoking trend declines a little, it is still difficult to reduce smoking more because of some culture and socio-economic factors. Raising taxation, bans on tobacco advertisement, promotion and sponsorship should also be enforced for prevention of smoking.

REFERENCES

1. Park S, June KJ. The importance of smoking definitions for the study of adolescent smoking behavior. J Korean Acad Nurs, 2006; 36: 612-620.
2. Lasser K, Boyd JW, Woolhandler S, Himmelstein DU, McCormick D, Bor DH. Smoking and mental illness: a population-based prevalence study. JAMA, 2000; 284: 2606-2610.
3. Khan FI, Afrin S, Huq ME, Zaman S, Rahman MR. Socio demographic factors related to smoking among rural adolescent. Delta Med Coll J, 2014; 2: 58–63.
4. WHO Global Youth Tobacco Survey (GYTS) and Global School Personnel Survey (GSPS) 2007 in Bangladesh. pp.2-3, 2008, World Health Organization Regional Office for South-East Asia, New Delhi.
5. Wechsler H, Rigotti NA, Gledhill-Hoyt J, Lee H. Increased levels of cigarette use among college students: a cause for national concern. JAMA, 1998; 280: 1673-1678.
6. WHO Department of Mental Health and Substance Abuse. Depression a global public health concern report of WHO Department of Mental Health and Substance Abuse. pp. 6-8, 2013, WHO, Geneva.
7. Billah SMB, Khan FI . Depression among urban adolescent students of some selected schools. Faridpur Med Coll J, 2014; 9: 73-75.
8. Campaign for tobacco free kids, Bangladesh Tobacco Burden Facts, 2004. Available at: http://global.tobaccofreekids.org/files/pdfs/en/.
9. Glied S, Pine DS. Consequences and correlates of adolescent depression. Arch Pediatr Adolesc Med, 2002; 156: 1009-1014.
10. Huq S, Hossain SM, Zahid M, Haque SMT, Chowdhury TG. Prevalence and determinants of smoking in some selected private university students of Dhaka city. Updat Dent Coll J, 2015; 5: 40-46.
11. Tselebis A, Papaleftheris E, Balis E, Theotoka I, Ilias I. Smoking related to anxiety and depression in Greek medical staff. Psychol Rep, 2003; 92: 529-532.
12. Breslau N, Peterson EL, Schultz LR, Chilcoat HD, Andreski P. Major depression and stages of smoking. A longitudinal investigation. Arch Gen Psychiatry, 1998; 55: 161-166.
13. Radloff LS. The CES-D Scale: A self-report depression scale for research in the general population. Appl Psychol Meas. 1977; 3: 385-401.
14. Audrian-McGovern J, Rodriguez D, Kassel JD. Adolescent smoking and depression: evidence for self-medication and peer smoking mediation. Addiction, 2009; 104: 1743-1756.
15. Brown RA, Lewinsohn PM, Seeley JR, Wagner EF. Cigarette smoking, major depression, and other psychiatric disorders among adolescents. J Am Acad Child Adolesc Psychiatry, 1996; 35: 1602-1610.
16. Wang MQ, Fitzugh EC, Turner L, Fu Q, Westerfield RC. Association of depressive symptoms and school adolescents' smoking: a cross-lagged analysis. Psychol Rep, 1996; 79: 127–130.

17. Windle M, Windle RC. Depressive symptoms and cigarette smoking among middle adolescents: prospective associations and intrapersonal and interpersonal influences. J Consult Clin Psychol, 2001; 69: 215–226.

18. Flora MS, Taylor CN, Rahman M, Akter SFU. Influence of parental smoking on smoking habits of Bangladeshi Adult population in rural and urban areas. Am Int J Contem Res, 2012; 2: 221-227.

19. Tarafdar MMA, Nahar S, Rahman MM, Hussain SMA, Zaki M. Prevalence and determinants of smoking among the college students in selected district of Bangladesh. Bangladesh Med J, 2009; 38: 3-8.

20. Von AD, Ebert S, Nqamvitroj A, Park N, Kang DH. Factors related to cigarette smoking initiation and use among college students. Tob Induce Dis, 2005; 3: 27-40.

21. Rahman MM, Karim MJ, Ahmad SA, Suhaili MR, Norashikin S, Ahmad W. Prevalence and determinants of smoking behaviour among secondary school teachers in Bangladesh. Int J Public Health Res, 2011; 26: 25-32.

22. Choudhury K, Hanifi SMA, Mahmood SS, Bhuiya A. Sociodemographic characteristics of tobacco consumers in a rural area of Bangladesh. J Health Popul Nutr, 2007; 25: 456-464.

23. Djibuti M, Gotsadze G, Mataradze G, Zoidze A. Influence of household demographic and socio-economic factors on household expenditure on tobacco in six New Independent States. BMC Public Health, 2007; 7: 222.

24. Siziya S, Ntata PR, Rudatsikira E, Makupe CM, Umar E, Muula AS. Sex differences in prevalence rates and predictors of cigarette smoking among in-school adolescents in Kilimanjaro, Tanzania. Tanzan Health Res Bull, 2007; 9: 190-195.

25. Sreeramareddy CT, Kishore P, Paudel J, Menezes RG. Prevalence and correlates of tobacco use amongst junior collegiates in twin cities of western Nepal: a cross-sectional, questionnaire-based survey. BMC Public Health, 2008; 8: 97.

26. Yang T, Li F, Yang X, Wu Z, Feng X, Wang Y et al. Smoking patterns and sociodemographic factors associated with tobacco use among Chinese rural male residents: a descriptive analysis. BMC Public Health, 2008; 8: 248.

27. Kumar R, Alka S, Khushwah MA, Prakash S, Vijayan VK. A study of tobacco consumption among college students of university of Delhi, India. Indian J Prev Soc Med, 2010; 41: 198-202.

28. Whalen CK, Jamner LD, Henker B, Delfino RJ. Smoking and moods in adolescents with depressive and aggressive dispositions: evidence from surveys and electronic diaries. Health Psychol, 2001; 20: 99-111.

29. Martinelli AM. An explanatory model of variables influencing health promotion behaviors in smoking and nonsmoking college students. Public Health Nurs, 1999; 16: 263-269.

30. Addington J, el-Guebaly N, Campbell W, Hodgins DC, Addington D. Smoking cessation treatment for patients with schizophrenia. Am J Psychiatry, 1998; 155: 974-976.

31. Hughes JR, Hatsukami DK, Mitchell JE, Dahlgren LA. Prevalence of smoking among psychiatric outpatients. Am J Psychiatry, 1986; 143: 993-997.

32. De Leon J, Dadvand M, Canuso C, White AO, Stanilla JK, Simpson GM. Schizophrenia and smoking: an epidemiological survey in a state hospital. Am J Psychiatry, 1995; 152: 453-455.