Original Research Article

Prevalence and factors affecting tobacco use among urban adolescents in Bhilai city, central India

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ABSTRACT

Background: Most tobacco users initiate their smoking habit quite young, upto 10 yrs of age. The physiological and psychological changes in this phase of life with an inquisitiveness to become autonomous enhance their vulnerability for addiction, tobacco use and dependency. its use during adolescence are likely to continue the use into adulthood and contribute to the 90 per cent of premature deaths among tobacco users. In this context the prevalence, patterns and correlates of tobacco use are studied among adolescent of urban slums of Bhilai city, Chhattisgarh India.
Methods: Total 172 adolescents within the age group of 10-19 yrs, across 30 slums of Bhilai city are taken by cluster random sampling. They have been administered a self-administered questionnaire incorporating standardized instruments.
Results: Of the 172 study respondents, the overall lifetime prevalence of tobacco use is 25 per cent (18% boys and 7% girls). Among users category the prevalence of tobacco use increased from 2.3 per cent at 10-14 yrs to 58.2 per cent at 18-19 yr. The mean age of onset of tobacco use was 14.8±3.1 yr. The prevalence is higher among subjects belong to lower socio-economic status and those with part-time jobs. Tobacco users had significantly higher rates of use of alcohol (90%) than tobacco non users (7.8%). They are having any form of stress in family (55% vs. 31.5%), more severe psychological distress (65 vs. 25.6%) and a sense of hopelessness (40 vs. 19%).
Conclusions: The prevalence of tobacco use in adolescents reported in this study is relatively higher than those reported from other Indian States. However, it correlates with multiple socio-demographic and familial predicting factors suggesting a need to promote health and holistic interventions to prevent adolescent tobacco use.

Keywords: Addiction, Adolescent, Global youth tobacco survey, Health promotion

INTRODUCTION

In the era of substance abuse the most commonly abused drug in the world is unanimously tobacco. Adolescence and early adulthood i.e., in the age group 10 to 19 yrs and 15-24 yrs respectively is the most vulnerable phases of life for initiation of tobacco use.[1] The World Bank has reported that nearly 82,000–99,000 children and adolescents all over the world begin smoking every day.[2] In the year 2010 another research by National Institute

On Drug Abuse US, it was found that nearly 60 percent of new smokers (who initiated smoking with a month) were under the age of 18.[3]

The physiological and psychological changes in this phase of life with an inquisitiveness to become autonomous enhance their vulnerability for addiction, tobacco use. As per the 1994 U.S. Surgeon General's report, those who use tobacco products at an early age are more addicted to it and are the worse quitters. Early users

are also less ignorant about the effects, making them easier prey for the tobacco addiction and dependency.[4]

Globally among all smokers, in more than two third (88%) initiation to smoking occurs before the age of 18 yr. Among every three young smokers, only one will quit and one of the remaining smokers will die of tobacco-related causes. Monitoring the future study revealed that 38 per cent of American school students of both genders were regularly smoking by 12th grade.[5,6]

In India, adolescents constitute 19.6 percent of the total population as per Census 2011 survey, the most significant decadal survey of India.[7] The Global Youth Tobacco Survey (GYTS) (2000-2004), the first Indian survey on large scale on tobacco use among adolescents, reported the prevalence of ever use of tobacco in any form to be 25.1 per cent, with cigarette smoking being 17.5 per cent and current use of smokeless tobacco (SMT) to be 14.6 per cent in the age group of 13-15 yrs. On an average five million children under the age of 15 are current tobacco users. Further it (GYTS) revealed that between 2006 and 2009, about 14 per cent (13.7% in 2006 and 14.6% in 2009) of students aged 13-15 yrs were reported using tobacco. Easy access and availability of tobacco are the most direct influencing factors which has a direct impact on consumption levels in this age group. This survey in 2009, high lightened that nearly 15 per cent of children (19 per cent of boys and over 8 per cent of girls) in India as young as 13-15 yrs used some form of tobacco; another 15.5 per cent in the same age group who had never smoked before were likely to begin smoking the following year.[8,9]

Besides this, the 2010 Global Adult Tobacco Survey (GATS) report showed that nearly 10 per cent of children in India in the 15-17 age group consumed tobacco in some form.[10] According to an August 2015 paper published in the journal Global Health Promotion, there are nearly 4.4 million children in India in the 15-17 age groups who use tobacco daily. Two school based surveys from Kerala, a Southern state of India has reported prevalence of 8% and 9.8 per cent, respectively in students between age group 13 to 17 year.[11,12]

In various studies conducted in India, the mean age of initiation to tobacco use is found to be between 8 and 15 years of age.[13-15] Across studies worldwide, using different standardized instruments of measurement on current smoking status, smoking has been found to increase with age. The prevalence of smoking tobacco products increases in all countries, from around 5% (five per cent) at 11 yrs to 10-25% (upto twenty five percent) at 15 yrs.[15,16] Most national studies in India on gender predominance of tobacco use reported a male predominance (10-30% vs. 1-3%) in contrast to most western studies and a few Indian studies which have reported a female predominance or equal prevalence.[14,15,17-20]

Besides availability and access many other characteristics have been shown to influence tobacco use at an early age BPL (below poverty line) families, lower educational status and living in problem families have been found to predict smoking in adolescents.[17] Familial factors such as high levels of connectedness, regular monitoring by guardians and punishment by close members were protective against smoking.[15,19-21]

Many studies and systematic reviews shown that, Nicotine use has been correlated not only with addiction, dependence but with many adolescent behavioural problem like risky sexual habits, aggression, alcohol and illicit drug use.[22-25] Higher rates of anxiety, mood disorders and suicidal tendency are seen in adolescent smokers in comparison to non-smokers. Another Indian study reported a positive correlation between sexual risk behavior and nicotine use.[22]

These high figures on tobacco consumption by minors (less than 18 yrs) are definitely a gross underestimate than the real scenario. By virtue of mostly being school-based designs, these surveys failed to take into account the most vulnerable population of children who are outside the schooling system and who are probably the earliest and most extensive users of tobacco. In studies regarding tobacco use in India, there is little information available on the psychosocial correlates of tobacco use among adolescents in the community. The present study is undertaken to determine the prevalence of tobacco use among adolescents of urban slum in the age 10-19 years and to evaluate the pattern of use and factors affecting their addiction status.

METHODS

This cross-sectional epidemiological survey is conducted from January 2017 to December 2017 in urban slums of Bhilai City Chattisgarh State. Each designated urban slum in Bhilai city (as per Census 2011) is being taken as one cluster. Total 30 clusters are being taken for sampling by PPS (probability proportionate to size) method. In each of the cluster (urban slum/municipality ward) one lane is selected by simple random sampling method. All the adolescents (10 to 19 yrs) from that particular lane those who have given consent or have shown willingness to be a part of the study are being considered. The sample size (N) is calculated by taking prevalence of tobacco use among adolescent as 10% with 95 per cent confidence interval with a five per cent error. Non response rate is being taken as 20%.

A pilot study was conducted in one slum (not included in the data analyzed) to test for accuracy of translation and validity. The questionnaire initially prepared in English was translated into Hindi (the official communication language) and then back translated to check for accuracy.

Socio-demographic profile (age/sex/area of residence/ economic indicators/ religion/ academic performance) is

assessed using a checklist. For assessing socio-economic status, subjects are asked to indicate whether their family belonged to the BPL or APL. No formal instruments were used for the assessment of socio-demographic profile and socio-economic status.

Tobacco and substance use

The alcohol, smoking and substance involvement screening test (ASSIST) developed by the WHO is being used to assess the use of alcohol, tobacco and other drugs in respondents.[18] Tobacco use assessed in the questionnaire refers to 'lifetime use' (defined as having smoked/used smoked form of tobacco ever in their lifetime) and 'current use' (defined as having smoked/used smoked form of tobacco in the last three month). The ASSIST provides information about the pattern of tobacco use in the past three months; craving; need to cut down; the level of others' concern about the person's tobacco use and problems related to use. An individual response is converted to a standardized score and it is possible to calculate the tobacco involvement score by adding together the standardized scores of each of the questions. Three groups of people could be distinguished based on tobacco involvement score: those with tobacco involvement score of 0-3: abstainers or low risk users (means they may not be using or using tobacco occasionally, with no likely harm now or in the future if they continue the same pattern); those with tobacco involvement score of 4-26: indicates hazardous use (means the individual is of moderate risk of harm from their current pattern of use); and tobacco involvement score 27+: indicates dependence (means a dependent pattern of use on tobacco with serious problems in multiple areas of life).[18] Use of alcohol is also calculated in life time user cases.

Psychological distress

Kessler's psychological distress scale (K10): psychological distress was assessed using Kessler's psychological distress scale (K10) a screening tool for non-specific psychological distress.[26] This tool has been validated to screen common mental disorders in developing country settings including India. It consists of ten questions to elicit the frequency of depressive and anxiety symptoms over the past month on a Likert scale. Based on the total scores, psychological distress can be categorized into mild, moderate and severe.[27]

Statistical analysis

Statistical package for social studies (SPSS) version 16 is used for the analysis. Life time prevalence of tobacco use and the pattern of use is determined. The socio-demographic variables are compared between the tobacco and non-tobacco user groups using Chi-square tests. Academic performance and self-reported prevalence of psychological distress are compared between the tobacco and non-tobacco groups using binary logistic regression analysis.

RESULTS

A total of 172 out of 180 (calculated sample size, N) have given their written or Verbal consent for this study with a response rate of 95.5%. Of the questionnaires analyzed, 92 (53.4%) are boys and 80 (46.6%) are girls with a mean age of 14.8±3.1 yrs within a range of 10-19 yrs.

Table 1: Prevalence and patterns of tobacco use among adolescents.

	Number of adolescents	Tobacco users (%)
Prevalence of tobacco use (among life time users)		
Boys	92	31 (18)
Girls	80	12 (7)
Total	172	43 (25)
Prevalence of tobacco use by age (in years)		
10-14	54	1 (2.3)
15-17	72	17 (39.5)
18 & 19	46	25 (58.2)
Pattern of tobacco use in last three months (current users)		
Not used in last three month		152 (88.3)
1 or 2 times used		1 (0.5)
Monthly		2 (1.2)
Weekly		3 (1.7)
Daily		14 (8.3)
Severity of tobacco use (current users)		
Low risk		2 (10)
Moderate risk		4 (20)
High risk		14 (70)

The prevalence and pattern of tobacco usage among urban adolescents are depicted in Table 1 below. A total of 43 (25%) adolescents reported lifetime use of tobacco, of whom 31 (18%) were boys and 12 (7%) are girls. Hence among boys 31 out of 92 (33.6%) and in girls 12 out of 80 (15%) are life time tobacco users. There is increasing use of tobacco among boys user group with the proportion of boys with lifetime tobacco use increasing from 2.3 percent in age category 10-14 yrs to 58 per cent at 18-19 yrs. This trend is not seen in girls category in which maximum use of tobacco is seen in 15 to 17 years. Current use of tobacco is seen in 20 adolescents (11.6 per cent). Daily use of tobacco product is reported in 8.3 per cent of the total adolescents. Among respondents who reported current tobacco use (20), the frequency and severity of tobacco use (indicated by collective ASSIST scores) showed 10 per cent of users were at low risk and 70 per cent of users had hazardous level of use. Daily use (8.3%) of tobacco is mostly reported among boys. The mean age of onset of tobacco use was 14.8±3.1 yrs (Table 1).

The socio-demographic variables are shown in Table 2. Lower socio-economic status (p<0.05), school or college

dropout (p=0.01), and having a part time job (p<0.05) were significantly correlated with lifetime tobacco use.

There is no significant correlation of smoking status of adolescents with religion.

Table 2: Comparison of various socio demographic factors between current tobacco users and non users using Chi square test with necessary correction.

	Life time tobacco users	Non users	Chi square value	P value
Socio economic category				
BPL	14	132	3.9	0.04
APL	6	20		0.04
Financial dependency on family				
Ever employed/earned	15	159	6.41	0.01
Never earned	5	13		0.01
Religion				
Hindu	13	112	1.2	>0.05
Muslim	5	26		>0.05
Jain	1	10		
Others	1	4		
Educational status				
Currently in school/college	6	123	24.4	<0.01
Dropped from school	14	29		<0.01

Table 3: The bivariate analysis between various psychological co relates with tobacco user.

	Life time tobacco users (20) (%)	Non users (152) (%)	OR (95% CI) (%)
Alcohol life time use	18 (90)	12 (7.8)	12.3 (12-13.1)
Any stress in family	11 (55)	48 (31.5)	3.2 (2.6-3.4)
Feeling depressed	13 (65)	39 (25.6)	2.8 (1.8-3.4)
Felling hopelessness	8 (40)	29 (19)	4.5 (3.9-5.1)

The above table describes the life time alcohol use and psychological correlates between tobacco user and non-users. In the bivariate analysis, use of tobacco is highly predictive for use of alcohol. Further, study subjects who used tobacco has significantly higher odds of feeling depressed and hopelessness.

DISCUSSION

The overall prevalence of lifetime tobacco use in our study among adolescents of age group 10-19 yrs is 25 per cent, with 18 per cent in boys and 7 per cent in girls. The current prevalence is found to be 11.6% collectively in both the gender. The prevalence found in our study is higher than the rates of the nationwide survey conducted in 2009 which reported prevalence of 9.5 per cent and a study conducted in Kerala in 2011 showing prevalence of tobacco use as 9.8 per cent.[9,11] Further, the prevalence reported is in match with the findings from studies from Western countries which showed varying prevalence between 20 and 67 per cent.[17,18] Various economic, social and cultural characteristics and tobacco policies could account for the wide range of variation in prevalence rates of tobacco use across different States/countries. Smoking in public places is banned in Chhattisgarh and there is a ban on the sale of tobacco products around

educational institutions following implementation of the cigarettes and other tobacco products (prohibition of advertisement and regulation of trade and commerce, production supply and distribution) Act, 2003 (COTPA).[28] However there is plenty of non-licensed shop selling tobacco products in urban slums in the study area. The high prevalence of tobacco use reported in our study could also be due to the high school dropout adolescents in urban slum. Hence easy availability and access to these addictive products at an early age could be the other factors influencing higher prevalence of tobacco use.

The age category comparative prevalence rates of our study is approximately equal than the other studies, the increasing prevalence with age has been reported in multiple studies from India and other countries.[1,5,6,8,9] There is reported male gender predominance in smoking behavior than females in our study. Most studies from India have reported the same male predominance suggesting that existing social norms against girls tobacco use, especially smoking, continues to be strong.[1,13] In couple of studies from Goa and North-Eastern states have reported almost equal prevalence across both the gender, reflecting the gender distribution as par with the studies from Western countries.[10,16,19,20]

The found prevalence rates of tobacco use is relatively lower than many other studies, 70 per cent of adolescent users in our sample are hazardous users as assessed by the ASSIST tobacco involvement scores. Daily use of tobacco is seen in 8.3 per cent of users and current use is 12 per cent. These findings are in support with another study from Kerala, India which shows that 68 per cent adolescent among smokers as hazardous user.[29] The higher proportion of users in hazardous use category and current use in adolescence could be owing to highly addictive action of tobacco.[30]

The mean age of onset of tobacco use of 14.8 yr in this study is comparable to another study from Kerala which reported an age of onset of around 13 year.[15] Many other Natioanl studies, from various States reporting higher prevalence of tobacco use, have observed a younger age of onset upto 10 yr or less, which is also similar to international studies with higher prevalence among early adolescents.[1,9,6,16] Catch 'em young' seems to be the unsaid slogan of tobacco companies and their proxies.

Tobacco use is seen to be higher among adolescents belonging to the lower socio-economic status families similar to findings from previous studies.[6,8,9] Adolescents ever employed in any kind of job have significantly increased risk of tobacco use. A higher proportion of study subjects working part time belonged to the lower socio-economic class, thus having extra income. This paves the way towards greater access to available tobacco products which could have increased the risk of tobacco and substance use.[14] This factor could have contributed additively to already reported risk factors in lower socio-economic families like larger family size, less effective supervision and lower parental education.[1,9] The timing of data collection is morning and forenoon hence most of adolescents are found in slum at that time are school drop outs and part time workers which may contribute to increased prevalence in these category. Subjects who used tobacco in our study had a significantly higher risk of using alcohol supporting to prior literature that use of one substance increases the risk of use of other substances.[31]

Students with tobacco use have higher psychological distress and hopelessness. Though there are few National studies taking these factors in to account, previous studies from other countries have found that adolescents who smoke have higher rates of anxiety and mood disorders than non-smokers and higher rates of smoking have been found in the group with family distress in comparison to people without familial distress.[32] Many studies have reported that Smoking has also been correlated with suicidal ideation and suicidal attempts.[24] This can be correlated with the psychological fact that tobacco use may be used as forms of 'self-medication' to manage distress, hopelessness and suicide.[33]

While the Ministry of Women and Child Development's initiative to disincentives the sale of tobacco products to children through stiff penalty is commendable, the real challenge will be in its enforcement. Unlike in the developed countries where cigarettes are sold in licensed shops and outlets, "over 76 per cent sale of tobacco products in India is restricted to unlicensed small shops and kiosks found in every street corner". Policing them will be a huge challenge.

The present study has its own limitations. First, this study did not include exclusively school students who tend to have lower risk for using tobacco and other drugs thus got a higher prevalence among adolescents. Second, the use of different forms of tobacco is not assessed separately. Third, temporality could not be established neither the incidence due to cross-sectional nature of the design. Finally, many factors which are known to influence adolescent tobacco use including peer pressure and parental tobacco use were not assessed. Finally this study was cross-sectional in nature, having a small sample size making generalization of the finding difficult.

In conclusion, the overall current prevalence of tobacco use in our study is 11.8 per cent which is higher in comparison to findings from previous studies across other regions of India. The association of tobacco use with alcohol use, psychological distress and hopelessness is observed among tobacco using adolescents from urban slums of Chhattisgarh. Taking the higher hazardous score and dependency of tobacco in adolescent, there is a need to further restrict availability and accessibility of these products in urban slums which constitute the largest group of socially disadvantageous population.

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