

## RESEARCH ARTICLE

# Predictors of Cigarette Smoking among Young Adults in Mangalore, India

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### Abstract

**Background:** The tobacco epidemic is a heralding health menace, particularly among college students. Tobacco usage among young can have an especially devastating effect as they can be exposed for longer periods. Data to estimate the prevalence of tobacco use in young adults will be a valuable addition to the existing resources. **Materials and Methods:** An analytical cross-sectional study was therefore carried out in Mangalore city using a pre-tested, self-administered questionnaire adapted from the Global Youth Tobacco Survey (GYTS) with a representative sample of 720 students aged 18-20 years selected from degree colleges by multi-stage random sampling. **Results:** Prevalence of 'ever users' and 'current users' of smoking were 20.4% and 11.4%, respectively. The mean age at initiation of cigarette smoking was 16 years and the majority (31 %) smoked in public places. Interestingly, 84% of them knew about the harmful effects of cigarette smoking. About one half of smokers had some or most of their friends smoking. Multivariate analysis revealed gender (OR=8.585; CI=3.26-22.5), pocket money (OR=4.165; CI=1.76-9.82) and peer's smoking habit (OR= 5.15; CI=2.21-11.9) have higher odds as correlates of tobacco usage among college students. **Conclusions:** It is of prime importance to highlight the role of prevention of smoking initiation rather than subsequently trying to stop the habit. Comprehensive interventions embracing family, friends and social milieu are needed to reduce tobacco use among students in India.

**Keywords:** Cigarette smoking - prevalence - young adults - correlates - India - GYTS

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### Introduction

Tobacco usage has been acknowledged as a major risk factor leading to several health conditions. Tobacco epidemic is presumed to kill 6 million people annually (WHO, 2011). Taking up this habit at an earlier age and rising smoking prevalence rates have been reported among adolescents and young adults (Sinha, 2002). Earlier the age of initiation, longer the period of exposure to smoking urges earliest need for protecting this vulnerable group (Sinha et al., 2006; Reddy and Arora, 2005). Literature states peer pressure; parental tobacco habits and pocket money are the triggering factor for initiating this habit. (Mohan et al., 2005).

Though tobacco is the prime causal factor in major diseases, its usage among youth is troublesome (Jindal et al., 2005). Information concerning tobacco use among young adults is lacking for most developing countries. Hence the present study was carried out to determine the prevalence and correlates of tobacco use of young adults in Mangalore.

### Materials and Methods

An analytical cross sectional study was done using a

self-administered questionnaire among 18 - 20 year old students attending degree colleges in Mangalore. The list of degree colleges was obtained from the Mangalore University. A target sample of 720 was derived using the formula " $n = N (Z\alpha)^2 \times 0.25 / d^2 (N-1) + (Z\alpha)^2 \times 0.25$ " (95% Confidence Interval; + 5 precision level). Multistage sampling technique was applied to select the study subjects from the population. Students who were unwilling to sign the informed consent form and absent to the college on that particular day were excluded from the study.

#### *Instrument and Method of Administration*

A pre-tested, self-administered questionnaire designed by WHO Global Youth Tobacco Survey (GYTS) (World Health Organisation, 2011) was used (English as well as in local vernacular language) to collect data from the target population.

The GYTS questionnaire is a self-administered, school based instrument consisting of a "core" and "optional" set of questions that can be modified according to the needs and priorities of individual countries. Various domains in the core questionnaire assess prevalence of tobacco use, age of initiation, exposure to tobacco advertising, perceptions and attitudes on behavioral norms with regard to tobacco use among young people, media and

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advertising, legislation, economics, school curriculum, and environmental tobacco smoke (Global Youth Tobacco Survey Collaborative Group, 2002).

The participants were assembled in a class room and rationale behind the study was explained. Each student was given 15-20 minutes for completing the questionnaire and discrepancy if arose was clarified by the first investigator. Absence of the professor/staff encouraged the students to respond without reporting bias.

*Ethics*

Institutional ethics committee approved the study protocol. Consent form was obtained from student before they answered the questionnaire.

*Data Management and Statistical Analysis*

The data was coded and analyzed using the SPSS version 11.5. The level of statistical significance was kept at  $p < 0.05$ . Rates, percentages and descriptive statistics were calculated. Chi square test and binary logistic regression was used to interpret the results. Dependant variable was 'ever use' of cigarette smoking. Univariate analysis using simple logistic regression was then carried out with different predictor variables. Variables showing significant associations were then entered into a multivariable analysis using multiple logistic regression. Odds ratios (OR), 95% confidence intervals (95%CI) and p-values of independent variables were calculated.

**Results**

A total of 720 students from a government and a private college were invited to participate in the survey out of which 363(50.4%) were males and 357(49.6%) were females.

*Prevalence and age of initiation of tobacco use*

Ever tobacco users in the form of smoking were found to be 20.4% among males, whereas in females, none had ever tried experimenting with smoking. Nearly all of the smokers (75.6%) initiated smoking at 16 years or later. (Table 1)

*Smoking pattern and access to tobacco products*

About 14.9 % stated to have smoked on all 30 days and half of them smoked less than a cigarette per day. Majority (85%) of them bought cigarettes from store/ shop/ street vendor and two third did not have preference for any usual brand. On an average, for every month 99.8 % got pocket money less than 100 rupees and majority of them smoked in public places (Table 2)

*Attitude towards tobacco smoking*

About 1.9% reported that they will definitely smoke cigarette if their friends offer them a cigarette. More than two third of the target population reported that they will not definitely smoke within next one year. The attitude of study participants towards quitting cigarette smoking revealed that 36.9 % felt that it is definitely not difficult to quit. Captivatingly 42% of the study participants felt that cigarette smoking boys will have more friends whereas

20.7 % felt that cigarette smoking girls will have more friends.

Almost 20 % of subjects stated that smokers will feel more comfortable in social gatherings and 32.5 % felt there is no difference between smokers and non - smokers in this regard. Among the study participants 9.2 % felt smoking cigarettes makes boys more attractive whereas only 7 % of the participants felt that smoking cigarettes makes girls look more attractive.

Two third of the targets felt smoking is definitely detrimental and 11.1% of the participants were unaware of the harmful effects of second hand smoking. On an encouraging note, majority (89.3%) supported banning smoking in the public place, more so among females (91.9%).

The dwindling sequence of reasons why smokers tried to quit smoking was to improve their health, save money, family and friends didn't like it. Regarding advertisements only 32.4% have noticed a lot of anti-smoking media messages whereas majority (70.2%) of the participants had seen a lot of actors smoking on-screen. During the precedent one year, only 31.5 % of the participants have been explained about the ill effects of smoking in their curriculum.

*Correlates of tobacco use*

Independent variables (Table 3) that best predicted students being ever smokers through multiple logistic regression analysis were; male gender (OR=8.5; CI -3.264-22.581), pocket money (OR=4.167; CI-1.767-9.825) and having smoker friends [some of the friends smoke (OR=5.1; CI - 2.218 - 11.96); most of the friends smoke (OR=4.3; CI -1.534 - 12.05)] (Table 4).

**Discussion**

Various measures to dissuade tobacco use were followed in developing countries, yet their usage is substantially increasing and occupies second position as a risk factor for several preventable causes of death in the world (Saddichha et al., 2010).

**Table 1. Age of Initiation of Cigarette Habit among the Study Participants**

Age of initiation	Frequency (%)
7 years or younger	1 (1.4%)
10-11 years	1 (1.4%)
12-13 years	4 (5.4%)
14-15 years	12 (16.2%)
16 years or older	56 (75.6%)

$X^2 = 66.41; p = 0.000$

**Table 2. Distribution of Study Subjects According to their Place of Smoking**

	Frequency (%)
At home	12(16.2%)
At school/ At work	5(6.8%)
At friend's house	10(13.5%)
At social events	3(4.1%)
In public places	23(31%)
Others	21(28.4%)

**Table 3. Univariate Analysis of Factors Associated with Smoking**

Characteristics	Odds ratio /S.E	95.0% C.I. for EXP(B)	P value
Gender			
Male	18.026(.469)	7.192-45.184	0.000
Distribution of study subjects according to their pocket money in the past 30 days			
Less than 100 Rupees*	5.162(0.336)	2.671-9.979	0.000*
100-500 Rupees*	8.135(0.411)	3.637-18.197	0.000*
500-1000 Rupees	16.238(0.372)	7.836-33.649	0.000*
Distribution of study subjects according to their place of smoking in the past 30 days			
Never smoked cigarettes	12.53	4.056-38.709	0.000*
At school	65.158	5.660-750.16	0.999
At Friends house	16.289	1.415-187.54	0.000*
Distribution of study participants based on "whether it is difficult to quit , once someone has started smoking"			
Definitely not	2.941(0.342)	1.506-5.744	0.002*
Probably not	1.162(0.332)	.607-2.227	0.65
Probably yes	.920(0.319)	.492-1.720	0.795
Distribution of study subjects according to the behavior of smokers in social gatherings			
More comfortable	0.305	1.466-4.845	0.001*
Less comfortable	0.304	0.487-1.604	0.684
Distribution of study subjects according to "whether their friends smoke cigarettes"			
None of them	4.462(0.348)	2.257-8.824	0.000*
Some of them	18.308(0.392)	8.496-39.452	0.000*
Most of them	12.935(0.479)	5.057-33.085	0.000*
Distribution of study subjects based on their opinion "whether cigarette smoking is harmful to health"			
Definitely not	7.059(0.883)	1.251-39.841	0.027*
Probably not	9.290(0.798)	1.945-44.370	0.005*
Probably yes	2.642(1.750)	0.626-11.145	0.186
Distribution of study subjects according to their opinion about a cigarette smoking woman.			
Lacks confidence	0.292(0.376)	0.140-0.609	0.000*
Stupid	0.303(0.318)	0.162-0.565	0.001*
Loser	0.62790.369)	0.304-1.292	0.000*
Successful	0.519(1.096)	0.061-4.450	0.206
Intelligent	3.636(2.3000)	0.686-19.286	0.55
Distribution of study subjects according to "whether they feel that it is safe to smoke for only a year or two"			
Definitely not	3.111(0.325)	1.645-5.885	0.000*
Probably not	1.694(0.346)	0.860-3.333	0.127
Probably yes	3.182(0.326)	1.681-6.023	0.000*
Distribution of study subjects according to whether smoke from other people is harmful.			
Definitely not	2.107(0.343)	1.075-4.129	0.030*
Probably not	8.686(0.501)	3.254-23.188	0.000*
Probably yes	1.623(0.313)	0.879-2.997	0.121
Distribution of study subjects according to their opinion regarding banning cigarette smoking in public places.			
Yes	1.67	1.109-2.516	0.014
Distribution of study subjects according to "whether they have received help to stop smoking"			
Program or professional	131.564(0.484)	50.953-339.70	0.000*
Friend	131.564(0.613)	39.560-437.53	0.000*
Family member	137.045(0.571)	44.764-419.56	0.000*
Program/ professional /from friends and family members	61.670(0.573)	20.048-189.70	0.000*

\*Statistically significant

**Table 4. Multivariate Analysis of Factors Associated with Smoking**

Characteristics	Odds ratio	95.0% C.I. for EXP(B)	P value
Gender			
Female	1		
Male	8.585	3.264 – 22.581	0.000*
Distribution of study subjects according to their pocket money in the past 30 days			
Less than 100 rupees	3.546	1.768 – 7.113	0.000*
500-1000Rupees	4.167	1.767- 9.825	0.001*
Distribution of study subjects according to "whether their friends smoke cigarettes"			
None of them	1		
Some of them	5.155	2.218 – 11.96	0.000*
Most of them	4.3	1.534 – 12.05	0.006*

\*Statistically significant; 1 - Reference category

Tobacco usage among young, heralds a devastating effect as they can be exposed for longer periods. Inspiration from peer group, the lure of popularity, and easy availability of tobacco in different forms makes teenagers easy prey. The mainstream of ever users experimented with tobacco before the age of 18 years (Aggarwal et al., 2012).

A GYTS survey done among 13-15 year olds, estimated that smoking increased in Eastern India from 12.7% in 2006 to 7.3% in 2003, while other tobacco use remained nearly stationary in these years. The increasing use of tobacco is not just limited to adolescents but is also being seen in adults. Another survey done by the National Family Health Survey (NFHS) III (2005-06) reported a tobacco use of 62% and 12% among adult men and women respectively (Saddichha et al., 2010).

As reported by Saddichha S et al data predicting the prevalence of tobacco use in young adults, between the populations studied by GYTS and NFHS III, will be a valuable addition to the existing resources (Saddichha et al., 2010). This will also help in creating a more accurate picture of the tobacco epidemic in India which ignited up the aim of this study.

In this study, "Ever smoker" and "Current smoker" was defined as one who had not smoked tobacco in the past 30 days preceding the survey but had tried even once or twice in the past and those who had smoked tobacco product on one or more days in the preceding month of the survey respectively (Al-Mulla et al., 2008).

In the present study, the prevalence of ever smokers and current smokers were 20.4 % and 11.4% respectively. The percent of current smokers in this study was closer to the study done among Thailand students where the prevalence was 11.2% (McKnight-Eily et al., 2010) whereas lesser compared to studies done in different population groups (Kumari et al., 2008; Kosevska et al., 2009; Ravishankar et al., 2009; Mehrotra et al., 2010; Van Minh et al., 2011; Palipudi et al., 2012; Deitz et al., 2013; Kabir et al., 2013; Pradhan et al., 2013; Srivastava et al., 2013)

A robust risk factor for long term disease and dependency of smoking in adulthood is early age of initiating smoking (Ravishankar et al., 2009). The mean age of initiating smoking in the present study was 16.5 years akin to the study done by Aggarwal et al., 2012. Studies reported by Sirichotiratana N, Bhojani UM and Kosevska E revealed lesser age of initiation (below 10 years) of smoking (Sirichotiratana et al., 2008; Bhojani et al., 2009; Kosevska et al., 2009). Hence, targeting age groups below 20 years to prevent their first puffs of smoking seems to be a doable method of primordial prevention.

Majority of smokers in this study also smoked in public places akin to the studies reported (Sirichotiratana et al., 2008; Pradhan et al., 2013). This highlights although legislation regarding ban of smoking in public places are existing they are not strictly enforced in many places.

Multivariate analysis revealed male gender, pocket money, closest friend smoking are the strong determinants for smoking in the present study. Consensus findings were seen in the studies reported earlier (Mohan et al., 2005;

Ramakrishna et al., 2005; Ertas 2007; Siziya et al., 2008; Christophi et al., 2009; Rudatsikira et al., 2009; McKnight-Eily et al., 2010; Binu et al., 2010; Palipudi et al., 2012; Dietz et al., 2013; Mahabee Gittens et al., 2013; Kabir et al., 2013 and Pradhan et al., 2013)

Higher odds for smoking among males reported in the present study was concurrent with various studies (Rudatsikira et al., 2009; Palipudi et al., 2012; Kabir et al., 2013; Dietz et al., 2013; Mahabee et al., 2013 and Pradhan et al., 2013) and synonymous with studies previously conducted in South-Asian countries like Bhutan (18.3% in males, 6.3% in females), Pakistan (12.4% in males, 7.5% in females) and Maldives (8.5% in males, 3.4% in females) (Kabir et al., 2013). No prevalence of smoking among females could be due to reflective conservative social structure of the country leading to under-reporting of the actual situation.

A positive correlation between pocket money and smoking in the current study had been reported earlier (Mohan et al., 2005; Ramakrishna et al., 2005; Siziya et al., 2007-2008 and Christophi et al., 2009). Hence having disposable cash have greater influence on adolescents and young adults in their purchasing power of cigarettes.

In the present study 48.7% had a closest friend smoking and peer smoking habit was a major determinant of tobacco smoking (OR=5.15; CI-2.21-11.9) as reported earlier (Mathur et al., 2008; Rachiotis et al., 2008; Siziya et al., 2008; Sreeramareddy et al., 2008). Studies have shown that those who had best friend as smoker were more prone to be smokers themselves (Ertas et al., 2007; Siziya et al., 2008; Rudatsikira et al., 2009; Knight Eily et al., 2010 and Muttappallymyalil et al., 2012). The datum that peers have critical influence over one's smoking emphasizes use of peer education as a viable platform for altering the perception of smoking and to get rid of the habit. In the battle of youth against smoking, reducing peer influence have greater part to play.

On a positive note majority of the smokers in this study population (84%) were conscious about the harmful effects of tobacco and this was higher than 51 % to 81% as reported in previous studies (Bhojani et al., 2009; Mukherjee et al., 2012; Gupta et al., 2014).

Interestingly, significantly higher percentage (89.3 %) was in favor of banning smoking in public place. This was higher than a Macedonian study (86.4%) done in college students and school based study (80%) in Indian population. In contrast to the present study, 91% of the students in Thailand favored banning of smoking in public places (Sirichotiratana et al., 2008; Kosevska et al., 2009; Aggarwal et al., 2012). The limitations of the present study was it was based on self-reports. Adolescents may not have reported truthfully their own history of smoking either due recall bias or intentionally. Certain social norms might result in under reporting (unacceptability of female smoking habit). Current smoking status in the present study was not verified by biochemical methods. Only in-college students were recruited and hence not generalizable to all young adults as truant adolescents are likely to be engaged in unhealthy lifestyle.

To conclude, prevalence and predictors of smoking will provide further indicators for drafting expedient

targeted- public health interventions. In light of this present study male gender, pocket money and peer smoking habit were found to be compelling correlates of tobacco usage. Hence a comprehensive program to prevent young adults from experimenting with tobacco should involve not only the students themselves but amalgamated approach comprising of their home, school, colleges and social milieu for implementing the preventive strategies.

Recommendations: *i*). Peer targeting anti-tobacco campaign suitable for individual country needs should be drafted; *ii*). Increasing taxation on cigarettes, though it has double edged effects, at least in young adults it may prevent initiation of smoking; *iii*). Legislation following ban of smoking should be made stringent by imposing penalties; *iv*). Tobacco usage among celebrities in mass media should be downcast as they play an important in influencing the personality formation especially in adolescents and young adults; *v*). As alcohol is strong predictors for smoking, including it in the core questionnaire of GYTS can be considered.

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