



Socio-demographic and socioeconomic differences in tobacco use prevalence among Indian youth[☆]

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ABSTRACT

The study aims to assess the association between socio-demographic factors such as age, gender, area of residence, father's education, and standard of living and the likelihood of tobacco use in adolescence.

We conducted secondary data analysis on a large scale cross-sectional study comprising of 1386 adolescents, living in regions representative of three different socioeconomic positions in New Delhi.

Data was collected through clinical oral examination and interviewer-administered questionnaire.

Multiple logistic regression analysis with an unadjusted model for assessing the association between the respective explanatory variable and ever tobacco use. Sequential models were adjusted for confounders as well as the other explanatory variables.

The number of tobacco users was 185 (13%). Gender wise tobacco use shows significant ($P = 0.001$) difference between girls vs. boys; the girls are about 40% less likely to use tobacco than boys (OR = 0.58, 95% CI = 0.42–0.80). Among socio-economic classes, residents of resettlement colonies were twice as likely to use tobacco as middle/upper middle class residents (OR = 2.26, 95% CI = 1.45–3.53). Adolescents with fathers educated up to the primary or secondary levels were almost twice likely to have used tobacco than those with fathers educated till graduation or above (OR = 2.08 95% CI = 1.30–3.34 vs. OR = 2.24, 95% CI = 1.43–3.51, respectively). Significant ($P = 0.001$) difference in tobacco use among adolescents was also observed based on their standard of living.

A significant association exists in terms of area of residence, father's education, and standard of living.

Key messages

Our study shows a clear social gradient in terms of the area of residence, father's education, and standard of living for tobacco use among adolescents. The results of this study can be instrumental in directing appropriate strategies in developing effective intervention approaches under National Tobacco Control Programme (NTCP), National Adolescents Health Programme (NAHP) and National Programme for Prevention and Control of Cancers, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) especially to address tobacco use among adolescents from lower socio-economic groups.

1. Introduction

Preventing deaths associated with tobacco use is a global priority. Smoking has been the cause of one in ten deaths worldwide, consequently killing more than 6 million people and nearly 150 million disability-adjusted life-years in 2015 (Britton, 2017). Smoking is associated with the risk of death from many diseases such as cancer, ischemic heart disease, chronic obstructive pulmonary disease (COPD), and stroke being the most common ones (Eriksen et al., 2015). Adolescents have also been reported to be the most vulnerable population for the initiation of tobacco use. Approximately 90% of the adult

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smokers initiating the habit during adolescence (Veeranki et al., 2015). Nearly one adolescent, in the age group of 13 to 15 years have smoked tobacco in the form of cigarettes out of which almost half of them reported initiating of tobacco use before the age of ten (Sinha et al., 2006).

The Global Youth Tobacco Survey (GYTS) has reported the use of tobacco products as 14.6% for the Indian youth (Ministry of Health and Family Welfare, 2009). There is a paucity of Indian studies looking at prevalence and determinants of tobacco use among youth, especially among the poor and vulnerable.

This study aims to assess the association between socio-demographic factors such as age, gender, area of residence, father's education, and standard of living and the likelihood of tobacco use in adolescence.

2. Methods

2.1. Study sample

We performed a secondary analysis on the data collected through a cross sectional study comprising of 1386 adolescents residing in the three areas representative of contrasting socioeconomic positions (middle/upper middle class communities, resettlement colonies, and urban slums) in the National Capital Territory of Delhi. The inclusion criteria were a) colonies must be within a radius of 25 km. from our research office, b) both slum and resettlement colony are inhabited together as a cluster, c) have more than 500 households in both the components of the cluster, and d) have a known non-governmental organization working in the community which is willing to participate in the research. Fourteen colonies and slums were found to be eligible. Demographic data from 2 blocks in each of these slums and resettlement colonies were collected. This enabled assessment of variation in their population features. All slums and resettlement colonies were found to be comparable demographically (in terms of ethnicity, religion, language, number of households, population per block, and school going/non-school going children per family). Urban slums, resettlement colonies are colonies which are created by removing a group of households from the congested slums of city core or an encroachment in public places and are slightly better off economically than urban slums (Kundu and Basu, 1999). Private schools having English as the medium of education and charging higher fees ('English Medium Schools') were identified to segregate adolescents from the middle/upper middle class communities. Multi-stage random sampling technique was used to select the study sample. Four slums and resettlement colonies were selected from the fourteen identified colonies and four English medium private schools were randomly selected from a list of forty eight eligible schools. The calculated sample size was increased by a factor of 25% to account for potential non-response, and then by a factor of 1.3% to account for the effect of clustering. A detailed methodology of the study has been described elsewhere (Mathur et al., 2016).

2.2. Data collection

Data was collected using an interviewer-administered questionnaire. The question asked to the respondent about tobacco use was "Have you ever smoked Tobacco? (at least one cigarette, bidi, cigar or pipe)". The answer for the above question was recorded as "yes" or "no". The questionnaire was used to record information pertaining to the participants' socioeconomic position, material resources, neighbourhood social capital, level of available social support that an adolescent receives generally (Henderson et al., 1980) and prevalence of health related behaviours like alcohol use, diet, dental visit, oral hygiene practices, and involvement in violent activity. It included previously validated questions and scales. These were further evaluated for reliability and validity in the local context during a pilot study.

Standard of living was recorded in our study using the NFHS (National Family Health Survey) standard of living index (Vyas and Kumaranayake, 2006). This index was first developed in 2000 and assessed the availability of basic material things required for living by an individual.

3. Statistical analysis

The explanatory variables included sex, area of residence, father's education, and standard of living. Frequency distributions of the explanatory and outcome variables were assessed by descriptive statistics. Multiple logistic regression analysis was carried out with an unadjusted model for assessing the association between the respective explanatory variable and ever tobacco use. Different covariates namely, Age, Area of Residence, Gender, Fathers Education, and Standard of Living were sequentially adjusted in the subsequent models. Stata/SE 13.1 for Windows (32-bit) (StataCorp LP, College Station, TX) was used for data analysis.

4. Results

Out of the sample studied ($n = 1386$), 736 (53%) were boys and 650 (47%) were girls. Overall, 460 (33%) adolescents belonged to the middle and upper middle class group, 462 (33%) were from resettlement communities and 464 (34%) from urban slums. In terms of father's education, fathers of 503 adolescents (40%) were educated up to the primary level, 394 (31%) were educated up to the secondary level, and remaining 373 (29%) had graduate education or above. As for standard of living, 14 (1%) had a high standard of living, 174 (13%) had a medium standard of living, and 1198 (86%) had a low standard of living. As for tobacco use, 1201 (87%) had never used tobacco in any form, while 185 (13%) had used tobacco in one of its forms (Tables 1 and 2).

While the differences in tobacco use among the age groups studied, was not statistically significant ($P = 0.86$), there was a statistically significant ($P = 0.001$) difference in tobacco use according to gender, the girls are about 40% less likely to use tobacco than boys. (OR = 0.58, 95% CI = 0.43–0.80; Table 3).

Residents of resettlement communities were twice as likely to have used tobacco as residents of middle/upper middle class communities (OR = 2.26, 95% CI = 1.45–3.53) and residents of urban slums were thrice as likely to have used tobacco as residents of middle/upper middle class communities (OR = 3.04, 95% CI = 1.98–4.67), with adjustments for gender, age, father's education, and standard of living not affecting these odds considerably (Table 3).

There was also a statistically significant ($P = 0.001$) difference in

Table 1
Characteristics of the study population.

Characteristics	Total ($n = 1386$)
1. Age (in years); Mean (SD)	13 (1)
2. Female n (%)	650 (47)
3. Father's education n (%)	
Graduation and greater	373 (29)
Primary to Secondary	394 (31)
Up to Primary School	503 (40)
4. Area of residence n (%)	
Middle/Upper-middle class communities	460 (33)
Resettlement communities	462 (33)
Slums	464 (34)
5. Standard of living n (%)	
Low	1198 (86)
Medium	174 (13)
High	14 (1)
6. Tobacco use n (%)	
Non-user	1201 (87)
User	185 (13)

Table 2
Distribution of the tobacco users/non-users on age, sex, father's education, area of residence, and standard of living (n = 1386).

Tobacco use		
Characteristics	Never used n (%)	Used n (%)
1. Age		
12 years	333 (88)	46 (12)
13 years	318 (86)	52 (14)
14 years	247 (86)	40 (14)
15 years	303(87)	47(13)
2. Sex		
Boys	617 (84)	119 (16)
Girls	584 (90)	66 (10)
3. Area of residence		
Middle/Upper-middle class communities	428 (93)	32 (7)
Resettlement communities	395 (85)	67 (15)
Slums	378 (81)	86 (19)
4. Father's education		
Graduation and above	344 (92)	29 (8)
Primary–Secondary school	35 (85)	59 (15)
Up to primary school	423 (84)	80 (16)
5. Standard of living		
High	8 (57)	6 (43)
Medium	144 (83)	30 (17)
Low	1049 (88)	149 (12)

tobacco use among adolescents according to their fathers' education. Adolescents with fathers educated up to the secondary or primary levels were almost twice as likely to have used tobacco than those with fathers educated up to the graduation level or above (OR = 2.08, 95% CI = 1.30–3.34; OR = 2.24, 95% CI = 1.43–3.51, respectively). Adjustments for gender, age, area of residence, and standard of living did not have considerable effects on the odds ratio (Table 3).

Moreover, a statistically significant (P = 0.001) difference in tobacco use among adolescents was also observed according to their standard of living. Adolescents having a medium standard of living were about 70% less likely to have used tobacco than those having a low standard of living (OR = 0.27, 95% CI = 0.09–0.85). Adolescents having a high standard of living were about 80% less likely to have used tobacco than those having a low standard of living (OR = 0.17, 95% CI = 0.05–0.51). Adjustments for gender, age, area of residence, and father's education did not have considerable effects on these odds (Table 3).

Table 3
Association between standard of living, sex, age, area of residence, father's education and tobacco use.

Association of tobacco use [OR (95% CI)]						
Sociodemographic variables	Model 1 (Unadjusted)	Model 2 (Adjusted for sex)	Model 3 (Adjusted for age)	Model 3 (Adjusted for area of residence)	Model 4 (Adjusted for father's education)	Model 5 (Adjusted for standard for living)
Sex (Boys = 1)	0.58 (0.43–0.80)		0.59 (0.43–0.81)	0.57 (0.41–0.79)	0.58 (0.41–0.81)	0.57 (0.41–0.79)
Standard of living (High = 1)						
Medium	0.2 (0.09–0.85)	0.26 (0.08–0.82)	0.27 (0.09–0.86)	0.29 (0.09–0.92)	0.37 (0.10–1.36)	
Low	0.18 (0.06–0.55)	0.17 (0.05–0.51)	0.18 (0.06–0.55)	0.31 (0.10–0.93)	0.29 (0.08–0.1.01)	
Father's education (Graduation and above = 1)						
Primary–Secondary school	2.08 (1.30–3.34)	2.12 (1.32–3.40)	2.20 (1.37–3.54)	1.33 (0.76–2.34)		1.99 (1.24–3.20)
Up to primary school	2.24 (1.43–3.51)	2.29 (1.46–3.59)	2.37 (1.50–3.74)	1.17 (0.63–2.17)		2.10 (1.26–3.20)
Area of residence (Middle/Upper-middle class communities = 1)						
Resettlement communities	2.26 (1.45–3.53)	2.28 (1.46–3.56)	2.40 (1.53–3.76)		2.50 (1.41–4.45)	2.23 (1.43–3.48)
Slums	3.04 (1.98–4.67)	3.09 (2.01–4.75)	3.23 (2.09–4.99)		3.24 (1.73–6.05)	2.78 (1.75–4.39)

5. Discussion

Our study shows a clear social gradient, in terms of the area of residence, father's education, and standard of living for tobacco use among adolescents. The use of smoked tobacco is more prevalent among males, which is universally acknowledged. Multiple studies have reported a strong gender gap in the use of tobacco products, with male students being more susceptible to initiate the use of both cigarette and non-cigarette tobacco products (Chatterjee et al., 2016; Santos and Cruz, 2016). In male ever-smokers, the literature suggests no differences in the average smoking initiation age for education, self-reported social class and geographical regions, while in female ever-smokers, there was a significant difference in terms of education and geographical regions (Koprivnikar and Korošec, 2015).

Considering fathers' education, adolescents with fathers educated up to the primary or secondary levels have a significant association with tobacco use. Significant difference was also observed in tobacco use among adolescents, according to their standard of living. Age has also been identified as a significant correlate of smoking status in many studies. In the 2009 GYTS survey, when compared with the preceding one in 2006, the prevalence of smokeless tobacco among girls was twice as that of smoking tobacco and the proportion of students who initiated bidi smoking before 10 years of age was significantly higher in boys (Gajalakshmi and Kanimozhi, 2010). In terms of socioeconomic classes, residents of resettlement colonies were more likely to use tobacco as middle/upper middle class residents. Similarly, adolescents smoking prevalence rates were also reported to be the highest among low- SES in Latin American countries (Kuipers et al., 2015). Older age, males, not residing with the family, low parental educational level, socioeconomic status, and low academic achievement is significantly associated with substance and tobacco use (Park and Kim, 2015).

6. Strength and limitations

The study has benefited from a large sample size and achieving a high response rate (86.6%). The scales and questions were adopted from internationally validated questionnaires and then were subsequently tested and validated among Indian adolescents. The study has observed the following limitations: (1) Potential under-reporting of the status of tobacco use; (2) Concealment of the correct information, in particular by the females; and (3) A mismatch between the study-population and population of Delhi.

7. Conclusion

The increasing problem of tobacco use among vulnerable adolescent population groups has become a major public health threat for India. People from low socio-economic group are more likely to use tobacco and are more likely to develop tobacco-related diseases. The results thus obtained maybe instrumental in directing the various campaigns and programs against tobacco use to the most vulnerable groups. Developing effective intervention approaches under National Tobacco Control Programme, National Adolescent Health Program and National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke to address higher tobacco use among adolescents from lower socio-economic group will assist further in preventing NCDs in India and globally too.

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Conflict of interest

We declare no conflicting interest.

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