International Journal of Community Medicine and Public Health
Kedar A et al. Int J Community Med Public Health. 2017 Jun;4(6):1912-1917
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20172148

Original Research Article

Tobacco use and its determinants among 13-15 year old adolescents of two central government schools of New Delhi district

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Received: 25 March 2017
Revised: 10 April 2017
Accepted: 13 April 2017

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ABSTRACT

Background: The burden of Non Communicable Diseases (NCDs) is on the rise globally as well as in India. Tobacco use is one of the important behavioural risk factors which can be recognized and modified at a young age. Objectives: To assess tobacco use among school going adolescents and to determine the factors affecting this NCD risk factor.
Methods: The study was conducted among adolescents aged 13 years to 15 years studying in class eighth to tenth from two central government schools of New Delhi district. Self-administered questionnaires were used to collect data from students and their parents. Data gathered from 438 students was analyzed using SPSS version 20.
Results: 30 participants were found to ever use tobacco, and 25 were current users. Majority (17) ever tobacco users started using tobacco at 11 years or less. Tobacco use among family members, friends was found to be an important predictor for, ever and current tobacco use. Film actors were an important source of inspiration for tobacco use followed by family members and friends. Health education at school had a strong protective effect especially for current tobacco use.
Conclusions: A decreasing age of initiation for tobacco use and a strong influence of family members were found. Greater emphasis on health education activities at school may help to decrease tobacco use among children. School based interventions involving families of students may help in controlling this behavioural risk factor.

Keywords: Tobacco, Adolescence, Non-communicable diseases, School

INTRODUCTION

Non communicable diseases (NCDs) are on the rise globally. NCDs are reaching epidemic proportions in India. Primary and primordial prevention are the cornerstone to curtail this epidemic. Tobacco use is one of the behavioral NCD risk factors which if recognized early and modified, can prevent and reduce the burden of NCDs. Smoking is estimated to cause about 71% of all lung cancer deaths, 42% of chronic respiratory disease and nearly 10% of cardiovascular diseases (CVDs).[1] Smoking is also an important risk factor for communicable diseases such as tuberculosis and lower respiratory infections.[2] According to WHO report on Global Tobacco Epidemic 2013, prevalence of smoked tobacco use among 13 to 15 years is 14.6% and that of smokeless tobacco is 9.0 %.[3]

Adolescence is a stage of growing up filled with curiosity and experimentation. Any habits or attitudes developed in this stage may continue into adulthood. Hence it is essential to assess harmful habits such as tobacco use and to identify the factors influencing them, in order to control this harmful risk taking behavior among adolescents.

This study was done with the objective of studying NCDs risk factors in school going adolescents. This paper discusses a part of the study findings focusing on tobacco use among school going adolescents.

METHODS

The study was conducted at New Delhi district and permission for conducting the study was granted for the same. The study was conducted from July 2015 to September 2015. There were three central government schools in this district. One school was randomly selected by lottery method for pretesting and study was conducted at the other two schools. Operational definitions were made and data related to behavioural risk factors was collected using a pretested questionnaire based on WHO STEPS questionnaire.[4] The study population was 13 to 15 years old children studying in two central government schools of New Delhi district. Informed consent with a questionnaire was sent to the parents. The students were administered the questionnaire after the parents' and their consent.

As there was variability in prevalence of NCD risk factors in other studies, hence the sample size was calculated using 95% confidence level, 5% error and prevalence of 50%. Thus the sample size came out to be 384. Taking into consideration a 10% non-response rate, the total sample size came out to be 424 approximately. 2 sections each were randomly selected from class 8th, 9th and 10th at both the schools and students in the age group 13 to 15 years were invited to participate in the study. A total of 465 students from both the schools were invited to participate in the study. Since 9 parents did not give consent for their ward's participation, data was collected from 456 students. 18 students attempted less than 50% questions in the questionnaire and thus were excluded during data analysis. Hence analysis was done of the data gathered from 438 students.

The following operational definitions were used for the study.

1. *Ever tobacco user:* use of smoking/smokeless tobacco at least once in the past.
2. *Current tobacco use:* use of smoking/smokeless tobacco at least once in the past one month.
3. *Current alcohol use:* consumption of alcohol at least once in the past one month.
4. *Adequate physical activity at school:* physical activity on 3 or more days at school

Data was entered in excel spread sheet with double checking for errors. SPSS version 20 was used to analyze the data. Association of tobacco use with other factors was analyzed using Chi Square test (Fischer`s Exact test where applicable) and the strength of association was derived using Binary logistic regression.

RESULTS

The age of the study participants ranged from 13 years to 15 years. The number of males in the study population was 243 (55.47%) which was a little more than 195 (44.52%) females. Majority 380 (86.75%) of the students belonged to the upper middle section of the society according to the Kuppuswami classification.[5]

Ever tobacco use

Out of the 438 study participants, 30 (6.8%) acknowledged ever using tobacco. More number of ever tobacco users were males than females (χ^2= 8.84, p= 0.00). More number of students in the age group of 13 years to 14 years reported ever tobacco use as compared to 15 years. The number of study participants who stated to be both ever smokers and ever chewers was 3. The association between the habit of smoking and chewing tobacco was found to be statistically significant in this study population (χ^2= 9.84, p=0.00).

Current tobacco use

Among the study participants, 25 (5.70%) students reported using tobacco in the past 30 days. Among these, 12 were current chewers and 14 were current smokers. Concurrent use of smoking and smokeless form of tobacco was reported by only 1 student. Current tobacco use was also more common among boys than girls (χ^2=4.17, p=0.03).

Age of initiation

Age of initiation of tobacco use was reported as 11 years or less by 17 (56.67%) ever tobacco users. Among these, 4 (13.33%) reported their age of initiation of tobacco use as 7 years or younger.

Knowledge

Majority (93.38%) study participants considered the habit of smoking to be bad for health. 92.50% students were aware of at least one disease caused by tobacco use. 70.80% of students acknowledged being taught about the harmful effects of smoking at school.

Quit tobacco use

Out of 25 current tobacco users, 12 (48%) had tried to quit tobacco use and 13 had never tried to quit tobacco use. Among all tobacco users, 10 had received an advice to quit tobacco.

Tobacco use among family and friends

Ever tobacco use was stated to be present among family members of 83 (18.95%) study participants and among friends of 35 (8%) study participants. More number of

ever tobacco users than the non-tobacco users stated a positive history of habit of smoking among family members (χ^2= 9.29, p= 0.00) and friends (χ^2= 36.02, p= 0.00).

Table 1: Various sources of inspiration for tobacco use among study participants.

Source of inspiration to smoke tobacco	Ever tobacco user	Current tobacco user	Never tobacco user
Family member	5	5	5
Friends	10	7	8
Film actors	11	10	11
Television actors	0	0	13

*multiple responses.

Table 2: Factors associated with ever tobacco use and it`s determinants.

Factors	Ever use of tobacco (smoke cigarette/bidi and/or chew tobacco)					
	Frequency	Chi square	P value	Odds ratio	CI (95%)	P value
Gender		5.97	0.02			
Boys	23			2.08	0.63-6.85	0.23
Girls	7			1.00		
Was taught about smoking being bad for health in health education class at school		11.72	0.00			
Yes	13			0.36	0.13-0.94	0.08*
No	17			1.00		
Use of tobacco (smoking/smokeless) among family members		9.29	0.00			
Yes	12			8.08	2.39-27.39	0.00***
No	18			1.00		
Use of tobacco (smoking/smokeless) among friends		36.02	0.00			
Yes	11			10.09	2.86-35.77	0.00***
No	19			1.00		
Family member inspires to smoke		40.23	0.00			
Yes	6			4.54	0.70-29.34	0.11
No	24			1.00		
Friends inspire to smoke		69.79	0.00			
Yes	10			9.94	2.33-42.44	0.00***
No	20			1.00		
Film actors inspire to smoke		67.59	0.00			
Yes	11			28.87	7.10-117.35	0.00***
No	19			1.00		
Adequate activity at school		9.51				
Yes	25		0.00	1.00		
No	5			2.85	1.02-7.94	0.09*
Current alcohol use		26.36	0.00			
Yes	5			1.24	0.18-8.52	0.83
No	25			1.00		
Felt stressed at school		12.94	0.00			
Yes	7			1.18	0.24-5.89	0.84
No	23			1.00		

*significant at 90% confidence interval. **significant at 95% confidence interval. ***significant at 99% confidence interval.

Availability of tobacco products

Among the ever tobacco users, 17 (56.67%) stated that they purchased bidis /cigarettes or chewing form of tobacco from various vendors (near the school, near their home or elsewhere). 12 (40%) ever tobacco users stated that their friends got tobacco for them. This suggests a poor implementation of Cigarettes and Other Tobacco Products Act (COTPA 2003).

Inspiration to use tobacco

As summarized in Table 1, adolescents felt inspired to smoke when they saw either their family members, friends, film actors or television actors smoke tobacco. Statistically significant sources of inspiration to smoke tobacco were family members, friends and film actors for the ever and current tobacco users.

Table 3: Factors associated with and /or determining current tobacco use.

Factors	Current use of tobacco (smoke cigarette/bidi and/or chew tobacco)					
	Frequency	Chi square	P value	Odds ratio	CI (95%)	P value
Gender		4.62	0.03			
Boys	19			1.96	0.59-6.59	0.28
Girls	6			1.00		
Was taught about smoking being bad for health in health education class at school		15.50	0.00			
Yes	9			0.25	0.08-0.81	0.02**
No	16			1.00		
Use of tobacco (smoking/smokeless) among family members		7.65	0.01			
Yes	10			8.38	2.37-29.67	0.00***
No	15			1.00		
Use of tobacco (smoking/smokeless) among friends		14.44	0.00			
Yes	7			4.48	1.08-18.53	0.04**
No	18			1.000		
Family member inspires to smoke		33.12	0.00			
Yes	5			2.19	0.32-15.08	0.43
No	20			1.00		
Friends inspire to smoke		38.40	0.00			
Yes	7			4.18	1.13-15.49	0.07*
No	18			1.00		
Film actors inspire to smoke		67.99	0.00			
Yes	10			24.66	5.85-103.91	0.00***
No	15			1.00		
Adequate activity at school		10.77	0.00			
Yes	5			1.00		
No	20			4.15	1.01-17.12	0.05**
Current alcohol use		33.12	0.00			
Yes	5			3.04	0.52-17.74	0.22
No	20			1.00		
Felt stressed at school		11.55	0.00			
Yes	6			1.00		
No	19			0.93	0.21-4.23	0.93

*significant at 90% confidence interval, **significant at 95% confidence interval, ***significant at 99% confidence interval.

Among the ever tobacco users, the source of inspiration to smoke tobacco was family members in 5 (χ^2= 40.23, p=0.00); friends in 10 (χ^2= 60.79, p=0.00) and film actors in 11 (χ^2= 67.59, p=0.00). Among the current tobacco users, the source of inspiration to smoke tobacco was family members in 5 (χ^2= 33.12, p=0.00); friends in 7 (χ^2= 38.40, p=0.00) and film actors in 10 (χ^2= 67.99, p=0.00).

Determinants of ever tobacco use and current tobacco use

As summarized in Table 2 and 3, ever and current tobacco use was more among boys than among girls indicating a higher risk taking behavior among boys. However as compared to other determinants, gender was not a statistically significant determinant for tobacco use.

Ever and current tobacco users had greater odds of not being taught about harmful effects of tobacco use at school. Hence health education classes at school were an important determinant with a protective effect.

The odds of tobacco use among a family member were similar for the ever tobacco users and current tobacco users. However the odds of tobacco use among friends were two times more for ever tobacco users than the same for current tobacco users.

A statistically significant association was found between sources of inspiration derived from friends, family members or film actors to use tobacco and ever or current use of tobacco. The odds of being inspired by film actors to smoke were highest among both ever tobacco users and current tobacco users. Those who were inspired by film actors to smoke tobacco were 28 times more likely to ever use tobacco and 24 times more likely to currently use tobacco.

Lifestyle related risk factors, inactivity at school, stress at school and current alcohol use showed a statistically significant association with ever and current tobacco use. Inactivity at school was a significant predictor for current tobacco use but a weak predictor of ever tobacco use. Feeling of stress at school and current alcohol use was not found to be a predictor of ever or current tobacco use. Other NCD risk factors related to dietary habits and physical activity was not found to affect ever use or current use of tobacco.

DISCUSSION

The prevalence of ever tobacco users (6.8%) in the present study was found to be a little lower than that found in GYTS Delhi 2005 (10%).[6] Current tobacco use (5.7%) in the present study was comparable to that found in GYTS Delhi (4.5%).[6]

In the present study the current tobacco use among adolescents was more among boys (7.5%) as compared to GYTS Delhi (5%).[6] Current tobacco use among girls was 3% in this study population which was similar to GYTS Delhi.[6] The boys were more prone to ever/current use of tobacco as observed in other Indian studies.[7-9] The increased risk taking behavior among boys may be attributable to the greater freedom given to boys in Indian society and the influence of other male role models in their lives.

An alarming decrease in age of initiation of tobacco use was seen in the current study which was also observed in other similar studies from India.[7,8,10] The shift in the health risk behaviors from adolescence to childhood stage is making children vulnerable to NCDs at a younger age.

Ever and current tobacco use was seen to be strongly associated with tobacco use among family members. Similar association was found in Indian studies and studies done in other countries.[7-12] Use of tobacco among family members was found to be a strong predictor for tobacco use among students with an odds ratio of 8 in the present study. A study from Sweden done to determine predictors of any tobacco use among adolescents showed an odds ratio of 1.15 for father currently smoking, odds ratio of 2.29 for mother currently smoking and an odds ratio of 3.03 for any other family member currently smoking.[11]

Friends using tobacco had a strong influence on the adolescents to ever use tobacco. A friend was more likely to inspire ever use of tobacco compared to a family member. Similar findings were observed in a study conducted in Greece where odds of a friend smoking were 10 among adolescent smokers.[12] This emphasizes the fact that amongst adolescents there is a strong influence of their peers for experimenting with tobacco use and hence ever use of tobacco.

Though the influence of friends was more evident for ever tobacco use but for current use of tobacco, tobacco use in the family was a better predictor. Similar findings were observed in other studies.[11,13] This fact highlights the strong bond and influence of family on children in the Indian society. Parental smoking was found to have a strong influence on current tobacco use among adolescents in studies from other countries too.[12-13]

Adolescents drew inspiration to smoke from friends, family members and film actors. Among these, film actors had the strongest influence on the study population, inspiring them to use tobacco. This finding is corroborated by other studies which have also shown that adolescents were more likely to ever use tobacco if their favourite movie stars smoked on screen.[12-14]

Majority (93.38%) of our study population reported smoking as being harmful to health hence were aware of the consequences of smoking. Similar results were seen in other studies in India.[15] However the same in GYTS Delhi was less than 26%.[6] Few other studies also reported low levels of knowledge in their study population.[7]

GYTS studies showed that the percentage of students who reported that they were taught about the dangers of smoking during the school year significantly increased from 52.3% in 2003 and 54.4% in 2006 to 63.3% in 2009.[16] In the present study, 70.8% of students acknowledged being taught about the harmful effects of smoking at school. Health education classes at school had a protective effect on ever and current tobacco users with the effect being greater for current tobacco users.

A higher number of current tobacco users (64%) were able to purchase tobacco products from vendors in the current study as compared to GYTS Delhi which reported it as 40%.[6] The present study findings were consistent with other studies from India which show that 80% students freely purchased tobacco products from shops located near their school and home, some students found from their own homes and few borrowed from friends or relatives.[17] Though under COTPA 2003, sale of tobacco products to minors (under 18 years) is prohibited, yet these studies point to the fact that the implementation of this act is not done stringently and minors are able to purchase tobacco products easily from vendors.

Current alcohol use also had a strong association with tobacco use however they were not very strong predictors

of tobacco use when compared to other factors in the study population. But in Sograwal et al study the odds of students consuming alcohol was 5 in those who smoked tobacco and 3 in those who chewed tobacco.[7]

Among lifestyle related risk factors inactivity at school showed a strong association with tobacco use however they were weak predictors as compared to other factors. Similar observation was found in Sograwal et al study.[7] However most other studies such as Spyratos et al study and other studies showed a protective effect of participation in sports activity with an odds ratio of 0.59.[12]

CONCLUSION

The use of tobacco was not alarmingly high among the study population, however this could just be the tip of the iceberg as underreporting and over reporting cannot be ruled out in the present study. The current study points towards a decreasing age of initiation of tobacco ,strong influence of family ,friends and film actors and a poor implementation of COTPA in India. It also brings forth the importance of school in bringing about a positive change in the behavior of students through proper health education. Involvement of parents and students in workshops or health `melas` at school and home based activities for students may lead to a decreased tobacco use among family members and hence a decreased tobacco use among adolescents.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Kedar A, Gupta S, Singh KJ. Tobacco use and its determinants among 13-15 year old adolescents of two central government schools of New Delhi district. Int J Community Med Public Health 2017;4:1912-7.