Prevalence and Determinants of Tobacco Use among School Going Adolescents in a Hilly District of Himalayan Region in India

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Abstract: Tobacco use in India is characterized by a high prevalence of smoking and smokeless tobacco use, with dual use also contributing a noticeable proportion. This abuse which is the cause of several respiratory diseases generally starts in adolescence and tracks across the life course. In this context a cross-sectional study was carried out among school going adolescents in district Kullu in north India. The purpose of this study was to assess the prevalence of tobacco habits among school children and to determine the association of socio demographic and other risk factors with tobacco abuse among the study subjects.   Multi stage cluster random design and PPS sampling methodology was adopted. A sample of 3000 students both from rural and urban areas studying in 20 government and private senior secondary schools was selected. Collected data was analyzed using Epi-info version 7). Among the study participants 505(17.6%) had used tobacco in any form at least once in their lifetime. There were 254(8.9%) current users and 93(3.2%) regularly consumed tobacco. Smoked form of tobacco was the more frequent form of usage. There were 147 participants who had tried both forms of tobacco once in their lifetime, while similar figures for current and regular users were 62 and 10 participants respectively. Curiosity (51.4%) and need to get relax (35%) were the most common reasons for initiating the tobacco products. On univariate analysis, the strongest association of prevalence of tobacco use was with those participants whose friends were also involved in tobacco consumption followed by male students and those with a history of tobacco abuse in the family. Our research lends support to the need for intervention on restricting adolescents from taking up this habit. Parents who smoke should quit this habit, which will not only restore their own health, but also protect their children. There is necessity to bring positive behavioural changes through adoption of comprehensive awareness programs on harmful effects of smoking among adolescent school going children.
Keywords: Adolescent, Tobacco use, positive behavioural changes

INTRODUCTION

The extent of worldwide Tobacco abuse is estimated at 1.3 billion. Worldwide, cigarette smoking is the most widespread form of drug dependence and a leading cause of preventable death, resulting in an estimated 3 million deaths annually. This has resulted in tobacco use attributing up to 11.93% deaths [1, 2].

The World Health Organization estimates that 70% of premature deaths among adults are due to behavioural patterns that emerge in adolescence, including smoking, violence, and sexual behaviour [3].The tobacco situation in India is unique because of a vast spectrum of tobacco products available for smoking as well as smokeless use. Smoking of cigarette particularly beedis and chewing tobacco (smokeless use) is an age-old practice in India [4]. There is no established national epidemiological data collection system in India. However country specific data from Global burden of disease study 2010 shows that Tobacco attributes to 10.14% of all deaths in the country [5].

Compared with individuals initiating tobacco abuse in adulthood, adolescent onset individuals have shown to have "accelerated dependency courses with shorter time from first exposure to dependence for these substances. Infect the age of initiation into misuse is progressively falling [6]. It is seen that smoking and drinking become symbols of maturity and independence, among the young people. For them, the use of tobacco provides an opportunity for taking part in a behaviour that defies established social norms [7].

Various factors influence tobacco use among adolescent students. Addiction to tobacco products and other substance of abuse among family members and peer groups, family conflicts, poor school performance, truancy and school dropouts has been found to be associated with smoking at an early age [8].

The present cross-sectional study was undertaken to determine the prevalence and age at initiation of tobacco smoking or tobacco chewing among school children in Kullu in north India. The specific objectives were (i) to assess the prevalence of tobacco habits among school children, (ii) to determine the association of socio demographic and other risk factors with tobacco abuse among the study subjects.

METHODOLOGY
Sample size
A cross-sectional study was conducted among school going adolescents of Kullu district, Himachal Pradesh. The study was conducted during the period from September 2015 to October 2016. We do not have data on prevalence of substance abuse in the study area .However based on similar studies conducted elsewhere in the country we assumed a prevalence of 25%. With normal deviate (z) =1.96 at 0.05 level of significance , allowable error of 10% of Prevalence and Confidence level of 95% , we arrived at the sample size of 1188.In order to compensate for design defect, the required sample was multiplied by 2. For student non response/absenteeism the sample size was a further increase by 20%. Thus, the final arrived sample size was 3000.

Sampling technique
Multistage cluster sampling was used to draw a representative sample of students from grades 7th to 12th of the schools .Out of the four blocks in Kullu district, one block was chosen for the purpose of the study by Simple Random Sampling. In the next stage from 45 senior secondary schools (from both rural and urban areas and government and private schools) in Kullu block, 20 schools were chosen by probability proportionate to size sampling. 150 students from each school were selected. Individual classes of the selected school were selected by Simple random sampling method.

Data collection
We used the WHO-recommended methodology for student drug use surveys. This study was conducted using the locally adapted WHO model core questionnaire[9]on substance abuse. The questionnaire was translated and retranslated to Hindi and English language for self-administration. The questionnaire included information about demographic characteristics, history of tobacco use and age at first use for tobacco.

DATA ANALYSIS
Collected data was analyzed using Epi-info software version 7 (Centre for Disease Control, Atlanta). Possible predictors of adolescent smoking behaviours' were identified by univariate analysis.

Ethical aspects
Formal approval was obtained from the Principals of the selected schools. Informed written consent was obtained from all the study participants and their parents/guardians. The institutional ethical committee of Indira Gandhi medical college approved the protocol. It was an anonymous self-administered questionnaire. No information pertaining to the name of the participants or the name of the school was collected. The respective teachers were requested to stay away during the exercise. After completion; questionnaires were collected simultaneously from all students in a box kept in the class

Operational definitions
- Ever user was one who has smoked once in his/her lifetime.
- Current cigarette smoker was defined as a student who had smoked cigarettes on one or more days in the preceding month (30 days) of the survey.
- Regular smoker was one who smoked daily.

RESULTS
The study sample consists of 2864 adolescents of which 1424 (49.7%) were males and 1440 (50.3%) were females. The mean age of the study population was 15.51 years (standard deviation [SD] =1.61 years).Majority of the students were from rural background (69.3%) and studying in government schools (79.5%).[Table no.1]

Table‒1: Socio demographic profile of respondents

Socio demographic profile		N=2864 (%)
Age	13-15yrs	1393(48.6)
	16-19 yrs	1471(51.4)
Gender	Male	1424 (49.7)
	Female	1440 (50.3)
Type of School	Government	2276(79.5)
	Private	588(20.5)
Area of School	Urban	878(30.7)
	Rural	1986(69.3)
Education level of Father	Post graduate	261(9.1)
	Graduate	464(16.2)
	High School	1257(43.9)
	Primary education	477(16.7)
	Don't know	405(14.1)
Education level of Mother	Post graduate	132(4.6)
	Graduate	338(11.8)
	High School	994(34.7)
	Primary education	906(31.6)
	Don't know	494(17.2)
Type of family	Joint	996(34.8)
	Nuclear	1868(65.2)
Current place of stay	With parents	2530(88.3)
	Away from parents	334(11.7)
Time spent with parents	Quality time spent	2387(83.3)
	Quality time not spent	477(16.7)

Among the study participants 505(17.6%) had used tobacco in any form at least once in their lifetime. There were 254(8.9%) current users and 93(3.2%) regularly consumed tobacco. Smoked form of tobacco was the more frequent form of usage. [Table 2]

Table‒2: Prevalence of different type of tobacco abuse among study participants (N=2864).

	TOTAL N=2864(%)	MALE N = 1424(%)	FEMALE N = 1440(%)
Ever tobacco users			
Smokers	471(16.4)	353(24.8)	118(8.2)
Smokeless users	181(6.3)	141(9.9)	40(2.8)
Any one	505(17.6)	372(26.1)	133(9.2)
Current users			
Smokers	236(8.2)	186(13.1)	50(3.5)
Smokeless users	80(2.7)	70(4.9)	10(0.7)
Any one	254(8.9)	199(14)	55(3.8)
Regular(daily) users			
Smokers	85(3.0)	81(5.7)	4(0.3)
Smokeless users	18(0.6)	17(1.2)	1(0.07)
Any one	93(3.2)	89(6.3)	4(0.3)

There were 147 participants who had tried both forms of tobacco once in their lifetime, while similar figures for current and regular users were 62 and 10 participants respectively. Curiosity (51.4%) and need to get relax (35%) were the most common reasons for initiating the tobacco products. [Table.3.]

Table-3: Reasons for initiating substance abuse(n=785)

Reasons*	N(%)	95% CI
Peer pressure	262(33.3)	30.1to 36.7
Curiosity	**404(51.4)**	47.9 to 54.9
To relax/ get a high	275(35.0)	31.7 to 38.4
Copy favourite actor	60(7.6)	6.0 to 9.7
Its fashionable/cool	208(26.5)	23.5 to 29.7
Others	24(3.2)	2.2 to 4.6

*Participants could mark up to two options

Nearly 85% of the participants felt it was unhealthy to smoke occasionally while 90.2% believed that regular consumption of tobacco was harmful for health. [Table.4]

Table-4: Health risk perception of study participants (N=2864)

Pattern	Great risk	Some risk	No risk	Don't know
Smoke occasionally	1594(55.7)	839(29.3)	70(2.4)	361(12.6)
Smoke regularly	2155(75.3)	429(15.0)	44(1.5)	236(8.2)

Almost one third (33.8%) of the participants had access to cigarettes/bidis while a quarter (25.4%) could procure SLT (smokeless tobacco) products. [Table.5]

Table-5: Ease of availability of procuring various substances (N=2864)

Substance	Impossible N(%)	Difficult N(%)	Easy N(%)	Don't know N(%)
Smoked tobacco	695(24.3)	416(14.5)	**555(19.4)**	1198(41.8)
Smokeless tobacco	847(29.6)	370(12.9)	358(12.5)	1289(45)

On univariate analysis, the strongest association of prevalence of tobacoo use was with those participants whose friends were also involved in tobacco consumption followed by male students and those with a history of tobacco abuse in the family. Participants staying away from their family, of older age group, and having higher educated fathers and residing in urban areas were also more likely to consume the tobacco products. [Table. 6]

Table-6: Association of socio demographic variables with substance abuse

Variable		Tobacco Abusers		Chi square	p value*	UOR (95%CI)
		Present (n)	Absent (n)			
Age group	16-19 yr	304	1167	18.73	**0.000**	1.54
	13-15yr	201	1192			[1.27-1.88]
Gender	Male	372	1052	139.43	**0.000**	3.47
	Female	133	1307			[2.80-4.30]
Type of school	Private	114	474	1.42	0.23	1.16
	Government	391	1885			[0.91-1.46]
Area of school	Urban	176	702	4.84	0.03	1.26
	Rural	329	1657			[1.03-1.55]
Father's education Status**	High education	159	566	11.27	**0.000**	1.46
	Low education	280	1454			[1.17-1.81]
Mothers education status**	High education	93	377	1.76	0.18	1.2
	Low education	324	1576			[0.93-1.55]
Type of family	nuclear	338	1530	0.70	0.40	1.1
	Joint	167	829			[0.89-1.34]
Current place of stay	Away	95	239	29.59	**0.000**	2.05
	With parents	410	2120			[1.58-2.67]
Abuse in friends	Yes	415	984	270.97	**0.000**	6.44
	No	90	1375			[5.06-8.21]
Abuse in family	Yes	363	1273	53.8	**0.000**	2.18
	No	142	1086			[1.77-2.69]

*p <0.05 taken as significant ** some participants not aware of their parents education status, hence left out

DISCUSSION

Studies across the globe have reported that tobacco abuse is a widespread among adolescents. It is dependent on multiple factors that have been explored in detail in developed countries but in developing countries like India, this problem has not received enough attention so far. The present study has brought out certain important aspects related to this problem. The overall tobacco (smoked) use in the present study was 16.5% .Current and regular usage was 8.2% and 3% respectively. For smokeless form of tobacco the corresponding figures were 6.3%, 2.8% and 0.6% for lifetime, current and regular users respectively.

In their study in Delhi, Sharma *et al*. [10] found that overall 16% of the study children had at least once experimented with cigarette or bidi smoking in their lifetime. The prevalence of current smoking was 7.1%. This is similar to the findings of our study. At the national level, the prevalence in this study is higher than national average of 6.4% [11] and state prevalence of 4% [12].

Low prevalence was also seen by Narain *et al*.[13] in their study. Any kind of tobacco use was found in 11.2% students; 8.8% were 'ever smokers and 4.6% were ever tobacco chewers. Similar. Low prevalence was also reported in a study among school going adolescents in Indore [24] while very high prevalence observed by Baba *et al*.[14] (22.5%) in Kashmir, Saxena *et al*.[15] in Dehradun (38%) and Quadri *et al*.[16] in Haryana(35.6%).This wide variation in usage rate could be attributed partly because of absence of a uniform methodology, target population and also could be because of varied socio cultural settings in different parts of India,

Studies on smokeless tobacco (SLT) by GYTS2007 [17] in SEAR countries revealed a prevalence of 5.9% in Bangladesh to 23.2% in Bhutan. India reported a prevalence of 9% abuse similar to findings by Kapil *et al*.[18] The mean age of initiation for smoked and SLT was 14.1±1.80 years and 14.2±1.67 respectively. The mean age of initiation was comparable to those reported by other authors[19] while it was slightly lower (13 years) in the ESPAD [24] survey and in the study by Narain *et al*. [13]. Tobacco use was found to be significantly more among male students as compared to female students (26.1% and 9.2%% respectively) as also reported by Juyal *et al*.[21] in Dehradun (45.8% and 7.3% respectively) among others studies[10,18].

Prevalence of substance abuse was found maximum in the students who were living away from their homes. Only 16.2%of the students living with their parents were found to be consuming tobacco; while 28.4% of students living away from their parents were using the mentioned substances. This difference can be very well explained on the basis of the fact that while living at their homes the students are within the supervision and care of their parents, hence substance use in this population is limited as compared to those who are living away from the homes

Parents and friends behaviour and habits has a strong influence on the impressionable minds of adolescents. This was also highlighted in this study which revealed that presence of tobacco abuse in the family was a significant predictor of alcohol abuse by the study participants. This finding in our study is consistent with the results of majority of the studies [10, 12, 20]. Similarly, friend's habit of tobacco consumption or peer pressure was the strongest influence for adolescent boys and girls to take up this habit. Similar habit pattern has also been reported among school going students in India [10, 20, 21]. This emphasises the importance of parents serving as role models and keeping a strict vigil on the type of friends their wards socialise with.

Most of the fathers of tobacco users were highly educated. Higher education in this part of the world usually implies higher income family which in turn suggests that children of these families are financially well off and fall into the trap of tobacco consumption. This finding though was in contrast to what was observed by other authors [22].

The most responded reasons cited for tobacco use by adolescents in this study were curiosity, to relax and peer pressure. Studies have found out that curiosity to use tobacco and drugs during adolescence is very common [25]. It is seen as part of growing up with friends or being part of the gang to "fit in". This may explain why adolescents try these substances despite a majority having the knowledge of its harmful use.

RECOMMENDATIONS

The study highlights that adolescent males were more likely to indulge in substance abuse. Therefore, concerted efforts should be directed towards targeting the students in their early adolescence. The legislative actions by the government like COTPA, ban on sale of alcohol to minors, smokeless tobacco products need further scaling up so as to prevent the adolescents from abusing them.

The study thus emphasizes the need to evolve, both at school and societal level, effective interventions and strategies to combat this menace. Schools are ideal sites for efforts towards prevention of substance abuse among adolescents. It is recommended that schools should formulate a locally adaptable substance abuse policy. The parents, siblings and all other stake holders (Government departments, NGOs) need to be engaged

through regular parent teacher workshops. This school education policy needs to include Health education about substance use and its adverse effects, Provision for training and staff development and availing services of trained psychologist/counsellors in schools.

The problem of adolescent tobacco consumption therefore can be handled adequately only if a variety of strategies are developed that works for the welfare of both the society and the tobacco dependent school children.

Funding

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