ORIGINAL ARTICLE

Smoking practices and nicotine dependence among adolescents in Pakistan

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Abstract

Objective: To find out the smoking prevalence and associated factors among in-school and out-of-school adolescents and their nicotine dependence.

Method: The cross-sectional study was conducted from April to June 2008 comprising 1014 adolescents aged 12-18 years residing in two rural districts of Sindh and Punjab. Trained interviewers collected information from the adolescents regarding age, ethnicity, religion, occupation and education of parents, smoking behaviour, smoking history of family/friend, type of family system, number of siblings and place of residence. Statistical package Epi-Info version 6 was used to enter the data and analysis was performed by using SPSS version 12.

Results: Overall smoking prevalence among the 1014 adolescents was 15.2%, with significant gender stratification (7.9% among girls versus 20.2% among boys). Of these, 50% were moderately nicotine dependent. However, the prevalence among in-school adolescents (14.6%) was not significantly different from out-of-school adolescents (16.1%). The factors associated with adolescents' smoking were father's illiteracy (adjusted odds ratio [OR]= 8.2), friend's smoking (adjusted OR=6.8), father's smoking (adjusted OR=5.4) and nuclear family setup (adjusted OR=3.6). When explored for the first place of smoking, friends' home was mentioned by majority of adolescents boys and girls.

Conclusion: Although there was a significant difference found between the prevalence of smoking among adolescent males and females, but any difference among in-school and out-of-school adolescents smoking prevalence could not be established.

Keywords: Adolescents, Smoking, Nicotine dependence, In-school, Out-of-school. (JPMA 63: 1260; 2013)

Introduction

Adolescence is a critical period in the lifetime of an individual. The World Health Organisation (WHO) defines the age range for adolescence as 10-19 years that roughly corresponds to their pubertal age and the development of secondary sexual characteristics.[1] It is this phase of transition to adulthood when an individual undergoes extensive physical, emotional, psychological and social development. As per the Social Learning Theory, individuals learn new behaviours from observation, modelling, and imitation of their role models[2] and are most vulnerable to even adopt unhealthy social habits such as smoking.

Statistics show that there are an estimated 1.1 billion smokers worldwide.[3] Out of these, 150 million are adolescents.[4,5] The situation is equally gloomy for developed and developing countries as half of the 100000 young new smokers belong to Asia.[6] Pakistan is no different from other Asian countries and studies have revealed that nearly 15% Pakistani college students indulge in smoking[7,8] with nearly 1200 youths starting smoking every day.[9] There seems to be a strong need to identify the factors that influence such rampant ill-health practices. The smoking habits of parents and family members have been identified as risk factors for adolescents' smoking.[10-12] However, there are evidences which support a stronger relationship between adolescents' smoking and the smoking among their close friends.[10,11] Other risk factors identified by studies from United States include poor relationship with parents, lack of confidence and self-esteem, poor academic performance, psychological distress, depression and lack of social and religious responsibility.[12]

Deviance may also sprout from a lack of supervision and restrictions as well as easy access to tobacco.[2] In such cases, if left unchecked, it could lead to heavy smoking in adulthood and can form grounds for dependency, a foremost hurdle for quitting the habit. Studies conducted in Africa have shown that adolescents are at the risk of becoming nicotine-dependent soon after they start smoking.[13,14] Although increasing priority is being given to discourage smoking, very limited data is available about local influences, perceptions and practices in low-income countries. Pakistan, the 10th largest tobacco-producing country, demands more attention towards exploring the adolescents' perceptions and practices for

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smoking.. Also to date, no study has examined adolescent nicotine dependence in Pakistan.

The aim of the present study was to find out the smoking prevalence and associated factors among in-school and out-of-school adolescents aged 12-18 years and their nicotine-dependence in two rural districts of Pakistan.

Subjuects and Methods

The cross-sectional study was conducted from April to June 2008 and comprised girls and boys aged 12-18 years residing in low socio-economic areas in two rural districts of Sindh and Punjab. The adolescents were categorised into two groups i.e. out-of-school and in-school. The adolescents selected from rural Sindh were out-of-school and those from rural Punjab were in-school. Two local NGOs working in the selected communities for several years facilitated the selection of respondents.

The selection of districts was made to have a representation of rural Sindh and rural Punjab. There was an ethnic mix of people residing in these districts. Socio-economically, the population belonged to the middle and lower classes. Ethical approval for the study was obtained from the Aga Khan University's Ethical Review Committee (ERC). In addition, a written permission was obtained from the District Coordinator Office in Sindh to conduct survey. In Punjab, permission was taken from the District Education Officer. The study received written approval from the administrators of all the selected schools prior to data collection and it was decided that the results will not be reported for individual institutions. Additionally, permission was taken from parents of the respondents as well.

The union councils (UCs) were selected in the two districts. The study was conducted in three UCs in Punjab and two UCs in Sindh.

In Punjab, there were a total of 9 primary and 5 high schools with 1324 and 532 students respectively. A multistage cluster sampling design was used based on school type (primary or secondary). The first stage sampling frame contained 3 sampling units with stratification of schools on the basis of their types (primary/secondary). Depending on enrollment size, every 10th student was selected from the students registering a random starting point. Of those present on the day of the visit, 625 students were selected with a probability proportional to enrollment size of each school.

The sample size was calculated as a minimum of 590 and 400 in-school and out-of-school adolescents respectively, using Epi Info 2000 statistical software, with an error of 1% and with a confidence interval of 95%. For this reason, it was decided to set the sample size as 625 in-school and 435 out-of-school adolescents. The selected adolescents were initially explained the purpose of the study and also assured that the responses will be kept confidential.

A total of 8 trained interviewers, 4 in each districts, completed the survey. Male and female data collectors interviewed male and female adolescents respectively to encourage frank responses. The information was collected for smoking behaviour, age, ethnicity, religion, occupation and education of parents, smoking history of family/friends, type of family system, number of siblings and place of residence. Smoking behaviour of the student was assessed by asking whether the individual had smoked in his/her life or not, age and particular reason for initiation of smoking and frequency of smoking. The outcome variable, smoking status (smoker or non-smoker) was assessed based on 30-day prevalence of cigarette smoking (that is whether one had smoked a cigarette in the preceding 30 days). For smokers, current frequency of smoking was further categorised as daily, weekly, monthly and occasional smoker. Descriptive statistics included mean (± standard deviation) for continuous and frequencies and proportions for categorical variables. To identify factors associated with smoking among adolescent, associations between outcome variable (smoker and non-smoker) and independent variable were sought. Crude odds ratio (OR) and their 95% confidence interval (CI) were calculated by univariate logistic regression analysis. Variables with $P \leq 0.05$ were selected for multivariate analysis. To assess the independent effect of individual factors and control potential confounders, multiple logistic regression analysis was used and adjusted OR (AOR) with their 95% CIs were computed.

To measure nicotine dependence, the Fagerstrom Test was used.[15] Six items were included in the questionnaire and responses were scored, ranging from '0' to '10', with a '0' indicating no dependence and '10' being the most dependent. The questions assessed the number of cigarettes typically smoked, smoking when sick, difficulty refraining from smoking in forbidden places, the time between waking up in the morning and smoking the first cigarette, smoking more frequently during the first hours of the morning, and the cigarette a respondent would hate to give up

Table-1: Univariate analysis of factors associated with adolescents smoking.

Variable	n	Nonsmoker (%)	Smoker (%)	OR	95% CI
Gender					
Female	416	92.2	7.9	1	
Male	598	79.8	20.2	2.9	(1.5-3.4)
Educational status					
In school	611	85.3	14.7	1	(0.3-1)
Out of school	403	83.9	16.1	1.1	
Mother's Literacy Status					
Literate	392	62.6	37.4	1	
Illiterate	622	37.4	62.6	2.18	(1.4-3.6)
Father's Literacy Status					
Literate	739	68.2	25.8	1	
Illiterate	275	31.8	74.2	6.1	(3.9-10.2)
Family Type					
Extended	698	56.6	31.6	1	
Nuclear	316	43.4	68.4	2.8	(0.6-2.4)
Father smokes					
Yes	405	46.0	67.6	2.4	(1.2-4.0)
No	609	54.0	32.4	1	
Siblings/other family members Smoke					
Yes	389	52.0	68.4	1.9	(1.2-2.8)
No	625	48.0	31.6	1	
Friends Smoke					
Yes	310	36.4	69.5	3.9	(9.6-19.8)
No	704	63.6	30.5	1	

the most ("the first one in the morning" or "all the others"). The test has been used with adolescents and young adults and has demonstrated acceptable psychometric properties.[16]

Statistical package Epi-Info version 6 was used to enter the data, and analysis was performed by using SPSS version 12.

Results

Of the 1060 who were initially approached, 28 (2.6%) respondents refused to participate after giving consent, while 18 (1.7%) did not give consent. The response rate, as such, was 95.6% (n=1014). Of the 1014 respondents who completed the interviews, 416 (41.1%) were females and 598 (58.9%) were males. The mean age was 14.7±1.9 and 14.6±1.8 for girls and boys respectively. A total of 403 (39.7%) out-of-school and 611 (60.2%) in-school children completed the survey. There was significant difference in literacy status of parents of adolescents in the two sites. Nearly 72% of the mothers and 38% of the fathers of adolescents in rural Sindh were illiterate. In rural Punjab, 48% of mothers and 19% of fathers of the adolescents were illiterate. Majority (70%) of the fathers of adolescents in rural Sindh had completed education till grade 10. However, nearly one-third of the fathers in rural Punjab had completed education till grade 14. Majority of the parents of adolescents in both sites were in stable marital relationships, with 3.0% in rural Sindh and 5% in rural Punjab being divorced. Additionally, 12% of the fathers of adolescents in rural Punjab were staying out of city or country because of their jobs.

Table-2: Multivariate analysis of factors associated with adolescents smoking.

Variable	Adjusted OR	95% CI
Gender		
Female	1	
Male	4.6	(3.4-5.2)
Father's Literacy Status		
Literate	1	
Illiterate	8.2	(3.9-10.2)
Family Type		
Extended	1	
Nuclear	3.2	(1.6-4.4)
Father smokes		
Yes	5.4	(3.2-7.0)
No	1	
Friends Smoke		
Yes	6.8	(4.6-8.8)
No	1	

Overall, 26.2 % of the adolescents reported smoking at

Table3: Nicotine dependence among adolescent smokers.

Nicotine Dependence	Very Low Dependence		Low Dependence		Medium Dependence		High Dependence		Very High	
Dependence Score	(score 0-2)		(Score 3-4)		(Score 5)		(Score 6-7)		(Score 6-7)	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
n (%)	17 (14.1)	12 (36.6)	28 (23.2)	17 (51.5)	45 (37.1)	4 (12.4)	20 (16.6)	0 -	11 (9.0)	0 -

some point in life. In all 316 (76%) of the female adolescents and 315 (52.6%) of the male adolescents had never tried smoking. More girls in rural Sindh reported smoking than those in rural Punjab. The smoking prevalence was 15.2% with 121 boys and 33 girls being current smokers. The prevalence of smoking among in-school adolescents was less 90 (14.7%) compared to out-of-school adolescents 65/403(16.1%). However, the difference was insignificant (Table-1).

Overall, the prevalence of smoking among girls was 33/416(7.9%) and among boys was 121/598(20.2%) which was statistically significant ($p < 0.05$). The average number of cigarettes smoked/day was 9.5±6.2. The difference between girls and boys was statistically significant and was 4.1±1.6 and 11.0±6.2 for girls and boys respectively. The mean age for starting smoking was 14.2±2.3 years among girls and 13.0±1.8 years among boys.

The chief motivating reasons identified for starting smoking among both boys and girls were peer pressure, out of curiosity and for enjoyment. Less commonly mentioned was smoking as a stress reliever.

When explored for the first place of smoking, friends' home was mentioned by 130/154 (84.6%) of adolescents of both genders. The other reported places were in markets, shops and farms for boys, and wedding ceremonies and shopping places by girls. Both girls and boys smokers mentioned the media as the main source for getting information about various brands of cigarettes.

Four other variables ($p < 0.05$) were chosen to test for their relationship with smoking practices of adolescents: family setup, fathers' literacy, fathers' smoking and smoking of friends. Ranking in order of decreasing strengths of association, they were: father's illiteracy (AOR= 8.2), friend's smoking (AOR=6.8), father's smoking (AOR=5.4) and family type-nuclear (AOR=3.6) (Table-2).

Of the 121 boys and 33 girls who reported to be current smokers (smoking during the last month), 45 (37.1%) boys moderately nicotine dependent and 4 (12.1%) girls were moderately nicotine dependant and 20 (16.6%) males were highly dependant. The dependence was much higher among the male adolescents than the female adolescents (Table-3).

Discussion

The findings of the current study are consistent with the previous local[5-8] and global[9] studies, suggesting that the use of tobacco was prevalent in both the areas with nearly a quarter of adolescents reporting to have ever smoked. This was in line with previously reported local data of adolescent smoking prevalence of 23%.[5]

Compared to the in-school adolescents smokers, the out-of-school adolescent smokers were not significantly more. This was contrary to our expected findings that schooling (particularly primary and secondary level) has positive influence on an adolescent's social behaviours. Where this holds true, it is also important to consider that in rural Punjab, where adolescents were aware of the adverse effects of smoking; with increased level of education comes increased access to media sources which, as established by other studies,[17-19] has a strong contributory impact on moulding social activities.

In contrast to the in-school and out-of-school adolescent smokers, there was substantial difference seen in terms of gender. Among the boys, every 1 in 5 smoked, but it was as low as 1 in 13 among the girls. Another striking finding was the variation in the number of cigarettes smoked per day by girls and boys. This was not surprising since the social and environmental factors for boys were different and more conducive to smoking.[10,17] The social determinant for boys was predominantly the liberal family atmosphere and, therefore, increased access to tobacco and its products, compared to the girls. Most of the girls stay engaged in household chores with very little outdoor access, and it is only obvious that being less exposed, they are less prone to adopt it. This is further reinforced by strict adult supervision that is faced by girls more often than boys do.

The chief factors responsible for initiating and persisting smoking among adolescents were identified and

analysed. The In-school adolescents cited bad company, lack of supervision by adults, stress, and failure in love and education as their major motivations; as opposed to the out-of-school adolescents, where the key reasons mentioned were enjoyment, thrill, friends' recommendations, mimicking adults and addiction. These differing stimuli are mostly dictated by the overall upbringing of the youth in both the study groups, their relative exposure to social practices, and their perception of their environment. Our findings substantiate some of the previously identified risk factors for smoking and nicotine dependence among adolescents in previous studies.[13,14,20]

Another factor of association was the impact of parental literacy status on adolescents' smoking and nicotine dependence. We found paternal illiteracy to be far more significant in moulding adolescents', specially boys', smoking behaviours compared to the maternal literacy status. This was a remarkable outcome as no local study has established this link before. This may be because of father's pivotal role in supervising adolescent's social habits.

Also, the adolescents whose father, siblings and other family members and, most importantly, friends were smokers were more likely to be smokers. A study conducted in Portugal found that prevalence of smoking among adolescents had a strong association with smoking practice of mothers (OR = 1.88), siblings (OR = 1.96) or friends (OR = 1.75). Another study suggested that delinquent behaviour was more common among adolescents who had poor parental monitoring and deviant peer group than adolescents with non-delinquent behaviour. This emphasises the potent influence that the social circle plays on determining adolescent behaviour.[10-12,21-24]

Nicotine dependence as an after-effect of smoking habit was also evaluated by the study. Due to the lesser number of cigarettes smoked per day among the girls, it can be inferred that their nicotine dependence would also be low. This is consistent with our finding where boys showed high nicotine dependence whereas none of the girls was found to be in this category. Previous studies evaluating addiction and nicotine dependence clearly stated an increase in craving due to nicotine dependence among sporadic, monthly, weekly and daily smokers. They also found that although withdrawal symptoms were most common among weekly smokers, monthly smokers were not completely free of withdrawal effects. The symptoms of withdrawal, for instance low mood, were more common among females if they smoked equal number of cigarettes each day as male adolescent smokers.[13,14]

The current study had its limitations. Firstly, it could not adequately control the type of schooling that the rural Punjab adolescents received. This was in terms of the standard of those schools, the maximum classes attended by the participants and their annual attendance. Secondly, the figures for smoking stated for girls could be an underestimate because of the taboo linked to it and we could not confirm it from independent source. Thirdly, we did not explore the factors that kept the other adolescents away from smoking, and the incentives for those who decided to quit smoking. Lastly, parent literacy was taken as a qualitative variable rather than a quantitative variable.

Conclusion

Smoking practices and nicotine dependence among in-school and out-of-school adolescents is influenced by multiple variables amongst which gender, father's and friend's smoking and literacy status of the father are the leading ones.

Recommendation

The identified areas must be worked upon by healthcare providers and policymakers in formulating adolescent's awareness and education programmes. Furthermore, social support systems for adolescents should be developed in schools and communities to direct adolescents towards constructive and productive social habits and positive common goals.

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