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PREVALENCE AND DETERMINANTS OF TOBACCO, ALCOHOL AND DRUG USE AMONG ADOLESCENT HIGH SCHOOL STUDENTS IN AN URBAN AREA OF KOTTAYAM DISTRICT, KERALA

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HOW TO CITE THIS ARTICLE:

Geethadevi M, Elsheba Mathew, Manjula V. D, Sobha A, Anita Bhaskar, Bindu Vasudevan, Ajith R. "Prevalence and Determinants of Tobacco, Alcohol and Drug Use among Adolescent High School Students in an Urban Area of Kottayam District, Kerala". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 36, August 18; Page: 9456-9464, DOI: 10.14260/jemds/2014/3220

ABSTRACT: BACKGROUND: Multiple health risk behaviors like smoking, use of tobacco products, alcohol and drug use tend to co-occur among adolescents and pose a threat to their health and wellbeing today or tomorrow. Appropriate timely intervention can prevent or change these risk behaviors. Objectives: To estimate the prevalence of tobacco, alcohol and drug use among adolescent high school students and to explore the associated factors. **METHODOLOGY:** This cross sectional study was carried out in 975 adolescents from randomly selected Government, Aided and Unaided high schools of Kottayam Municipal area proportionate to sampling frame using WHO designed Global School based Health survey (GSHS) questionnaire. Prevalence of risk behaviors related to tobacco, alcohol and drug use were expressed as individual percentages. Chi-square analyses were performed to determine the association between concurrent health risk behaviors (no risk, one or more risk –dependent variable) and factors like socio- demographic background, peer and parental factors (independent variables) using Epi-Info version 3.4.3. Binary logistic regression analysis was performed with SPSS 16.0 **RESULTS:** A total of 975 respondents, 501(51.47%) boys and 474(48.6%) girls were included in the study. Majority (82%) reported no risk behaviors while 18% involved in one or more risk behaviors related to tobacco, alcohol and drug use. The protective factors were other students behavior being helpful(OR- 0.45, 95%CI-0.32- 0.64), Parental understanding (OR-0.41, 95%CI-0.29-0.59), Parental checking(OR-0.68, 95%CI-0.47-0.90) while logistic regression yielded low educational status of father(OR- 1.919, 95%CI- 1.117- 3.298), alcoholic father(OR-3.863, 95%CI- 2.404-6.209) and close friends habit of smoking(OR-4.707, 95% CI-2.724-8.134) as risk factors. **CONCLUSION:** Tobacco, alcohol and drug use among adolescents are significantly associated with socio-demographic factors, peer and parental behaviors. This highlights the need for action at family, school and community level to prevent risk behaviors.

KEYWORDS: Adolescents, Prevalence, Determinants, Tobacco, alcohol and drug use, Urban Kerala.

INTRODUCTION: Adolescents defined by the United Nations as those between the ages of 10 and 19 are estimated to be 1.2 billion in the world today.¹ The experiences and choices of adolescence contribute to their healthy living in future. Unfortunately many of the lifestyle choices adopted may pose a threat to their health and well-being and limit their potential for achieving responsible adulthood. Behaviors often established in adolescents such as using tobacco, alcohol and drugs accounted for 2/3rd of premature death and one third of total disease burden in adults.²

Smoking, alcoholism and drug use among adolescents are indeed social evils which are on alarming rise Globally.³ Global Youth Tobacco Survey (GYTS) results in India revealed that 22% of boys and 10.3% of girls were current users of tobacco, 18.5% boys and 8.4% girls were current users of smokeless tobacco with 10.5% of boys and 4.4% of girls being current smokers.⁴

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In India alone, nearly one in ten adolescents in the age group 13-15 years have ever smoked cigarettes and almost half of these initiate tobacco use before 10 years of age.⁵ The epidemiological research model on the causal association of smoking and lung cancer has highlighted the importance of focusing on primary prevention in adolescents for successful cancer control.⁶

Alcohol use may directly increase the risk of organic diseases, accidents and suicides. Even though diseases may manifest in adulthood, these risky behaviours usually begin during adolescence. But most of these risk behaviours are potentially preventable ones. The risk behaviours also depend on family background, parental and peer factors.⁷

Kottayam is the first district in Kerala declared as having 100% literacy, but there is a lack of published data about prevalence and determinants of tobacco, alcohol and drug use among adolescents.

In a democratic society school stands next to home in influencing health of children. School is the best place to get adolescents where they explore different health risk behaviours when they are involved with peer groups and out of control from parents. Clearly this is a crucial time to find out the magnitude of such risky behaviours which is essential for planning suitable interventions and translate it into everlasting good health for adolescents.

Hence this cross sectional study was done to estimate the prevalence of risk behaviours like using tobacco, alcohol, and drug among adolescent high school students and to find out the determinants of such behaviours which is particularly important in contributing to prevention of risk behaviours and reducing morbidity and mortality due to non-communicable diseases.

MATERIALS AND METHODS: A cross sectional analytical study was carried out at selected high schools belonging to Govt. Aided and Unaided sectors in Kottayam municipal area. Details of high schools in the study area and their student strength were taken from District Education Office. Schools were divided into three strata – Government, Private Aided and Unaided.

There were three high schools under Govt. Sector, 14 under Aided and one under Un-Aided sector and all students of 8th, 9th and 10th standards admitted during the academic year 2012-2013 in Govt. Aided and Unaided schools in the study area constituted the sampling frame. The total student strength was 6918 which included 295 students (4%) in Government sector, 6440(93%) in Aided and 183(3%) in Unaided sector.

Based on previous studies^{8,9} prevalence was taken as 9%, and allowing a difference of 2%, the sample size calculated was 786. Considering a non- response rate of 20%, the ultimate sample size planned was 943. From the sampling frame of 6918 students, the investigator selected the study sample, based on probability proportionate to size (PPS) sampling technique.

Initially the number of students in 8th, 9th and 10th grades from each sector to be selected were determined based on probability proportionate to size. Then one school was selected at random in each sector and finally from the selected school, one class was selected from 8th, 9th & 10th grades. In the selected class all the students were included. If the required number was not sufficient in the first school surveyed, the next school was selected at random.

The process was repeated till the required sample size was obtained. The final study sample consisted of 975 adolescent high school students including 39 students (4%) from Government sector (one school), 907(93%) from Aided (three schools) and 29(3%) from unaided sector (one school).

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The study was conducted over a period of one year from August 2012 to August 2013. Data collection was carried out using a self-administered questionnaire which included respondent's socio-demographic details and health risk behaviors related to use of tobacco, alcohol and drugs. Questions related to tobacco, alcohol and drug use were adapted from Global school based student Health Survey Questionnaire (GSHS).¹⁰ The questionnaire was pretested among adolescent students in a different setting and necessary corrections and modification were made to make it more understandable.

Ethical committee approval was obtained from the institution and the study was conducted after obtaining written permission from District Education Officer and Headmasters/Head mistresses of the selected schools. Informed and written consent was obtained from parents on a printed consent form distributed a day prior to filling the questionnaire.

The date of visit to the selected school was informed to the Headmaster/headmistress. On the day of administering questionnaire, children were addressed by their teachers followed by the researcher. The purpose of research was explained to them. Consent form was collected and questionnaires were distributed with a clear explanation of what was expected and doubts were cleared immediately. The participants were assured of the anonymity and confidentiality of the information.

Collected data were entered into MS Windows Excel. Analysis was performed using Epi-Info version 3.4.3 and SPSS 16. Prevalence of risk behaviors related to tobacco, alcohol and drug use were expressed as individual percentages. It was also analysed as concurrent health risks considering current smoking, current alcohol, current use of tobacco products and drugs ever tried together. Accordingly subjects were classified as having none and one or more risk behaviors.

Chi-square analyses were performed to determine the association between concurrent health risk behaviors (no risk, one or more risk –dependent variable) and factors like socio- demographic background, peer and parental factors (independent variables). Socio-economic status of the study subject was assessed using Modified Kuppaswamy's socioeconomic status scale.

A p value of <0.05 was considered statistically significant. Strength of association was found out by Odds Ratio with 95% confidence Interval. The independent variables were entered into a comprehensive logistic regression model (enter method) that simultaneously considered the socio demographic parental and peer factors using SPSS 16 statistical software.

RESULTS: A total of 975 adolescents including 501 males (51%) and 474 females (48%) from selected high schools belonging to three sectors Govt. (4%), Aided (93%) and Un-Aided (3%) were included in the study. 32% (309) were studying in class VIII, 33% (321) in class IX and 35% (345) in class X. 53% of study sample belong to Hindu religion, 39% Christians and 8% Muslims.

50.67% of students reported that their mother's educational status was plus two or above where as 32% of students' fathers were educated up to PDC or above. 78% of study subjects belong to middle class family while 22% belong to lower class. 84% were nuclear families and the rest joint families (16%). (Table: 1)

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Socio-demographic variables		Number	Percentage
Gender	Male	501	51.4%
	Female	474	48.6%
Sector	Govt.	39	4%
	Aided	907	93%
	Un-Aided	29	3%
Class	VIII	309	31.69%
	IX	321	32.92%
	X	345	35.39%
Socio-Economic Status	Upper	3	0.3%
	Upper Middle	173	17.74%
	Lower Middle	584	59.9%
	Upper Lower	212	21.74%
	Lower	3	0.31%
Type of Family	Nuclear	819	84%
	Joint	156	16%

Table 1: Socio-demographic variables of the study subjects

Among the study group 158 adolescents (16%) reported that they had ever tried cigarettes/ beedies, 19.% including 33% of males and 4% of females had ever tried alcohol, 2.87% of study subjects including 3.79% of males and 1.9% of females had ever tried drugs. 11% smoked cigarettes, 11% of adolescents significantly more males (20%) than females (1%) consumed alcohol, 8% of students used tobacco products other than smoking, one or more days during the previous 30 days preceding the survey. 11% of study subjects had taken one or more drinks on days they consumed alcohol. (Table -2)

Risk behaviours	Gender		Total -975 No. (%)
	Boys No. (%)	Girls No. (%)	
Ever tried smoking	144(28.74%)	14(2.95%)	158 (16.21%)
Ever tried alcohol	167(33.33%)	20(4.22%)	187(19.18%)
Ever tried drugs	19(3.79%)	9(1.9%)	28(2.87%)
Current smokers (smoked cigarettes/ beedies one or more days during the previous 30 days)	102(20.36%)	4(0.84%)	106(10.87%)
Current users of tobacco products (used tobacco products one or more days during the previous 30 days)	73(14.57)	5(1.05)	78(8%)
Current alcoholic (consumed alcohol one or more days during the previous 30 days)	100(19.96%)	5(1.05%)	105(10.77%)

Table 2: Prevalence of Risk behaviours related to tobacco, alcohol and drug use among study subjects

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Concurrent risk behaviors were analysed related to substance use which included current smoking, current use of tobacco products, current alcohol use and drugs ever tried. Accordingly 18% of study subjects were involved in one or more risk behaviors related to substance use. (Table 3)

	Gender		Total No (%)
	No. Male (%)	No. Female (%)	
No risk	347(69.26%)	454(95.78%)	801 (82.15%)
1-2 risk	91(18.116%)	19(4.01%)	110(11.29%)
3 or more risks	63(12.58%)	1(0.21%)	64(6.56%)
Total	501 (100)	474 (100)	975 (100)

Table 3: Distribution of students according to concurrent risk behaviours related to Tobacco, alcohol and drug use (N=975)

Determinants of Risk behaviors related to Tobacco, Alcohol and Drug Use: The risk factors that have emerged as significant in univariate analysis were low educational status of father($p=0.002$, OR-2.03, 95% CI 1.29-3.1), low socioeconomic status($p=0.01$, OR-1.8, 95% CI 1.1-3.06), exposure to passive smoking($p=0.0002$, OR-2.18, 95%CI- 1.43-3.3), smoking parents($p=0.001$, OR- 2.08, CI 1.49-2.91), use of tobacco products by parent ($p=0.001$ OR- 2.49, 95% CI- 1.76-3.52), alcoholic parents($p=0.001$, OR-5.82, 95%CI-1.76-3.52), close friend's habit of using tobacco($p=0.001$, OR-5.86, 95% CI- 4.07-8.43), close friends habit of smoking ($p=0.001$, OR-8.6, 95%CI, 5.91-12.54). (Table:4)

The present study also identified some protective factors as other students behavior being kind and helpful ($p=0.0002$, OR-0.45, 95%CI-0.32-0.64), parental understanding ($p=0.0001$, OR-0.41, 95%CI-0.29-0.59), parental checking of children and personal belongings ($p=0.03$, OR-0.68, 95%CI-0.47-0.99), Parental checking to see homework was done($p=0.01$, OR-0.66, 95%CI-0.47-0.93). Factors that did not have significant association were type of family, mother's educational status and occupational status of father and mother. (Table 4)

In the Binary logistic regression analysis, low educational status of father ($p=0.018$, OR=1.919, 95% CI- 1.117-3.298), close friend's smoking status ($p=0.0001$, OR=4.707, 95% CI-2.724-8.134), and alcoholic status of parent ($p=0.001$, OR=3.863, 95%CI-2.404-6.209), remained as significant risk factors for involvement in one or more risk behaviors by the study group. (Table 4)

Factors	Group	Number	OR	95% CI	P value	Adjusted Odds Ratio (CI)
Educational status of fathers	Low	112	2.03	1.29-3.1	0.002	1.919 (1.117-3.298)
	High	867				
Socio Economic Status	Upper & Upper middle	176				
	Lower middle	584				
	Lower	215	1.86	1.1-3.06	0.01	
Type of family	Joint	160				
	Nuclear	815			0.9	
Passive Smoking	Yes	687	2.18	1.43-3.3	0.0002	
	No	288				
Smoking status of parents	Smokers	421	2.08	1.49-2.91	0.001	
	Non-smokers	554				

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Close friends habit of smoking	Yes	251	8.6	5.91-12.54	0.001	4.707(2.78-8.13)
	No	724				
Use of tobacco products by close friends	Yes	258	5.86	4.07-8.43	0.001	
	No	717				
Alcoholic father	Yes	497	5.82	3.79-9	0.001	3.863(2.4-6.2)
	No	478				
Use of tobacco products by parents	Yes	346	2.49	1.76-3.52	0.001	
	No	629				
Other students behavior being kind and helpful	Yes	534	0.45	0.32-0.64	0.0002	
	No	441				
Parental habit of checking their children to see home work was done	Most of the time/always	618	0.66	0.47-0.93	0.01	
	Never/rarely	357				
Parental understanding	Most of the time/always	555	0.41	0.29-0.59	0.0001	
	Never/rarely	420				
Parental habit of checking personal belongings	Most of the time/always	335	0.68	0.47-0.99	0.03	
	Never	645				

Table 4: Determinants of risk behaviours related to tobacco, alcohol and drug use

DISCUSSION: The present study revealed 174 adolescents (18%) significantly more males (154, 31%) than females (20, 4.21%) were involved in one or more concurrent risk behaviors. The prevalence of current smoking was 10.87% which included 20.36% of boys and 0.84% of girls which is higher than the Global Youth Tobacco survey (GYTS) results in India Which revealed that 10.5% of boys were current smokers.⁴ A higher prevalence for substance use (43%, 70%) was reported among adolescents in urban slums of Sambalpur and Bangalore respectively by different researchers.^{11, 12} But Sinha reported a prevalence of 19% for smoking among school children in Bihar.¹³

Our study revealed significantly more boys than girls were involved in single or concurrent risk behaviors related to substance use which is consistent with findings from other studies conducted in South East Asia.^{14,15} Tobacco use can be considered as part of risk taking behavior that is more prevalent among males.

Smoking by males but not females may be an accepted behavior in many Asian cultures. Globally also far fewer women (9%) than men (40%) use tobacco.¹⁶ However the rising trends of tobacco use among girls should not be ignored. Continuing modernization is likely to narrow the gender differences in substance use and likely to result in high prevalence of substance use among teen girls in Asian countries. Higher prevalence of substance use among adolescents is dangerous since the habit often continues into adulthood.

Among the study subjects who had ever tried smoking, 84.81% (134/158) tried tobacco at the age of 10 or more and the rest 15.19% tried smoking at less than 10 years of age. The mean age of initiating tobacco smoking in our study was 12.58 years (SD-2.21) which is consistent with other studies from Dharan, Noida and Kerala where the mean age of onset was 13.79, 12.4 and 13.2 years respectively.^{17,18,9} Early and middle adolescents are more vulnerable to initiate tobacco use which should be highlighted as target group for early intervention to reduce uptake of this habit.

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The risk behavior of substance use also depend on socio demographic peer and parental factors. Among the social factors, low educational status of father emerged as significant in this study($\chi^2=16.32$, OR-2.03, 95%CI-1.29-3.1). Similar finding was reported by a study among male students in Karachi, Pakistan where those students with fathers having no formal education were more likely to smoke.¹⁹ NFHS III reported that tobacco use showed a clear and continual decrease with increasing levels of education.²⁰ This may be due to the fact that education may make the individual more aware of ill effects of risky behaviors.

More over educated fathers usually talk freely with their children regarding ill effects of substance use. Lower socio economic status was associated with higher prevalence of smoking among male and female adolescents.²¹ In our study also lower socioeconomic status was evolved as a significant risk factor. NFHS III also reported that there was clear decrease in tobacco use with increasing wealth quintile.²⁰

Parental smoking is an important source of vulnerability to smoking initiation among adolescents. The present study revealed that the risk behavior related to substance use were more frequent among adolescents whose parents were also smokers. Similar finding was reported by Singh. G et al,⁸ Saravana Kumar et al²² and Madankumar et al.²³

Alcoholism among parents are strongly related to usage of alcohol and tobacco products among adolescents.³ Alcoholic father emerged as a significant risk factor in this study as evidenced by the high Odds Ratio. Similar finding was reported by Chopra et al.²⁴ From this study it is clear that substance abuse among the family members will influence the adolescents resulting in increasing social evils like smoking, use of tobacco products, alcohol and drugs among adolescents. There is a need for intervention that address parental tobacco use and alcoholism to mitigate the risk for substance use among adolescents.

Peer habits also influence adolescents to engage in risky behaviors as shown by other researchers.^{19,23} Similar finding was noticed in our study also as risk behaviors were more frequent among adolescents whose close friends were smokers.

Our study could find out protective factors which prevent the students from engaging in health risk behavior such as other students' behavior being kind and helpful, parental understanding, parental checking of personal belongings, checking free time activity. Being received Health education on ill effects of substance use was another protective factor. The point to be highlighted is adolescent who perceive themselves as accepted by their parents and close friends are less likely to engage in health risk behaviors.

CONCLUSION: Our study revealed the frequency of single and concurrent risk behaviors related to Tobacco, alcohol and drug use and it's social, parental and peer determinants among adolescent high school students in an urban area of Kerala. This provides a pointer to the rising pattern of risky behaviors and highlights the need for health education and preventive steps against usage of tobacco and alcohol among adolescents, their friends and family members which in turn lead to prevention of use of these harmful substances by adolescents.

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Date of Submission: 04/08/2014.
Date of Peer Review: 05/08/2014.
Date of Acceptance: 11/08/2014.
Date of Publishing: 18/08/2014.