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Prevalence of Substance use and its Associated Risk factors among Adolescents in an Urban Area –A Cross Sectional Study.

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ABSTRACT

Substance use among adolescents has life-threatening consequences in future and also a challenge for policy makers to reduce this burden. This work outlines several important issues related to substance use among adolescents. (1) prevalence of substance uses among adolescents; (2) the presence risk factors associated with substance use. (3) current preventive interventions for adolescent population. A cross-sectional study was carried out in the urban field practice area of a private medical college with use of a semi structured questionnaire and sample size collected was 350. Majority of study population were male (76%) and mean age was 14.6 ± 2.8 years .Prevalence of substance use among adolescents was found to be 22.29% .Maximum were addicted to alcohol (66.6%) followed by Gutkha (44.8%), paan (30.7%), gudakhu (29.4%), cigarette(21.8%), cocaine(2.5%), heroine (1.28%) and bidi (1.28%).Addiction was found more in school dropouts , nuclear family ,broken family and problem family background and adolescents from upper lower socio economic status. This challenge of substance use among adolescents requires consistent and unremitting attention in order to execute effective prevention programs with continuous re-evaluation of the situation.

Keywords: Adolescents, substance use, Risk factors.

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INTRODUCTION

Adolescence is a unique phase of life characterized by rapid physical growth, emotional maturation, cognitive development, and social transition. According to the World Health Organization (WHO), adolescents are individuals between the ages of 10 and 19 years. This period is often considered a bridge between childhood and adulthood, during which individuals acquire habits, behaviors, and lifestyles that may persist throughout their lives. While adolescence is generally associated with good health, it is also a critical stage during which risky behaviors may emerge. Among these behaviors, specifically substance use has become a major public health concern across the world. Substance use among adolescents includes the consumption of alcohol, tobacco, smokeless tobacco products, illicit drugs, and other psychoactive substances. Adolescents are particularly vulnerable to experimenting with substances because of peer pressure, curiosity, emotional instability, academic stress, family conflicts, and exposure to unfavorable social environments. Early initiation of substance use is associated with multiple adverse health outcomes, including dependence, mental illness, poor academic performance, delinquency, risky sexual behavior, violence, and long-term chronic diseases. Substance use not only affects the health of the individual adolescent but also places a significant burden on families, communities, healthcare systems, and national productivity. It has been reported around 5.6% people in the age of 15-26 years using drugs at least once (1). Globally, substance use among adolescents has emerged as a major challenge for public health authorities and policymakers. The World Drug Report and several international studies indicate that millions of adolescents worldwide use alcohol, tobacco, and other substances before reaching adulthood. Early exposure to addictive substances significantly increases the risk of substance dependence later in life. Studies have demonstrated that individuals who begin smoking or consuming alcohol before the age of 18 years are more likely to develop addiction and long-term behavioral problems compared to those who initiate substance use in adulthood. Early substance use increases the likelihood of future physical, mental, and social health problems (2). One of the adverse outcomes of adolescent substance use is the increased risk of addiction in those who start smoking, drinking, and taking drugs before they are of 18 years. Moreover, most individuals with substance use disorders begin using substances when they are young (3). Substance use during adolescence can lead to serious health consequences. Tobacco use is associated with respiratory diseases, cardiovascular disorders, and various cancers. Alcohol consumption may lead to liver diseases, impaired judgment, accidents, and mental health disorders. Illicit drug use can cause neurological damage, psychiatric illness, social isolation, and criminal involvement. Moreover, adolescents using substances are more likely to engage in unsafe

sexual practices and violent behavior. Substance use disorders amongst adolescents have long-term adverse health effects but can be mitigated with efficient treatment (4). Adolescent substance users suffer risks and consequences on the psychological, sociocultural, or behavioral levels that may manifest physiologically (5,6). Despite the growing burden of substance use among adolescents, awareness regarding the problem and the implementation of preventive interventions remain inadequate in many regions. Effective prevention strategies require early identification of high-risk adolescents, community awareness programs, school-based interventions, counselling services, and family support systems. Understanding the prevalence and associated risk factors of substance use among adolescents is therefore essential for planning evidence-based public health interventions.

With this background, the present study was conducted in the urban field practice area of a private medical college in Odisha to estimate the prevalence of substance use among adolescents, identify the associated risk factors, and understand the need for preventive interventions in this vulnerable population. So, the current study was done with the following objectives -(1) To estimate the prevalence of substance use among adolescents; (2) To identify the risk factors associated with substance use and (3) current preventive interventions for adolescent population.

MATERIALS AND METHOD

This study was conducted at the Urban field practice area of a private medical college and Hospital, Odisha for a period of 5 months. All the adolescents within the age group of 10-19 years (WHO) who were residing in the field practice area of the medical college at least for 1 year were included in our study. As per a study in West Bengal, the prevalence rate of substance abuse in adolescents had been found to be 31.25%(7) and considering that we calculate our sample size by applying the formula, $n=z^2pq/d^2$ which was around 350.The adolescent population in the field practice area of private medical college was found to be 3190.Simple random sampling method was followed to draw 350 samples out of a total of 3190 adolescents by using the random number table method . All the study subjects were contacted by house to house visit with the help of our field staff and then after taking the informed consent and those below 12 years of age, parent's consents were taken and then they were interviewed and examined using the pretested questionnaire. Data were collected using a pretested semi-structured questionnaire. The questionnaire included information regarding sociodemographic profile, educational status, type of family, socioeconomic status, personal habits related to substance use, family background and family-related problems, types of substances consumed. Confidentiality and privacy were maintained throughout the study.

Study Variables are -Dependent Variable are Substance use among adolescents and Independent Variables are age, gender, religion, educational status, type of family, socio-economic status, etc.

Operational Definition-Substance use was defined as the use of alcohol, tobacco products, smokeless tobacco, or illicit drugs by the adolescent during the study period.

Data Analysis-The collected data were entered and analysed using Epi Info software. Descriptive statistics such as percentages and proportions were used to summarize the findings. Chi-square test was applied to assess the association between substance use and demographic variables. A p-value less than 0.05 was considered statistically significant.

RESULTS

Table-1 describes the socio-demographic profile of study population. Out of 350 sample size, 76% (266) were males and 24% (84) were females. Maximum (41.1%) were in the age of 16-19 years, were Hindu (92.3%) and from nuclear family 237(67.7%). Around 121(34.57%) adolescents were school drop-outs. Maximum study subjects belonged to upper lower socio-economic status 217(62%).

Table 1: Socio-demographic profile of the study population (n = 350)

Variables	Male	Female	Total
Age (Years)			
10-13	65 (24.4%)	46(54.7%)	111(31.7%)
13-16	75 (28.2%)	20 (23.8%)	95(27.1%)
16-19	126 (47.3%)	18(21.4%)	144(41.1%)
Religion			
Hindu	248(93.2%)	75(89.2%)	323 (92.3%)
Muslim	12 (4.5%)	5 (5.9%)	17 (4.9%)
Others	6(2.2%)	4 (4.8%)	10 (2.9%)
Type of Family			
Nuclear family	171(64.2%)	66 (78.5%)	237 (67.7%)
Joint family	18 (6.7%)	8 (9.5%)	26 (7.4%)
3 generation family	77 (28.9%)	10 (11.9%)	87 (24.8%)
Education			
Primary	52 (19.5%)	55 (65.4%)	107 (30.57%)
Middle school	67 (25.1%)	22 (26.1%)	89 (25.43%)
High school	14 (5.2%)	2 (2.4%)	16 (4.57%)
Intermediate& above	17 (6.4%)	0 (0%)	17 (4.86%)
Not continued (Drop out)	116 (43.6%)	5 (5.9%)	121 (34.57%)
Socioeconomic status			
Upper	0	0	0
Upper middle	0	0	0
Lower middle	7(2.6%)	8(9.5%)	15(4.29%)
Upper lower	170 (63.9%)	47(56%)	217(62%)
Lower	89(33.5%)	29(34.5%)	118(33.7%)
Total	**266 (76%)**	**84(24%)**	**350(100%)**

Table 2: Distribution of study subjects as per the presence of substance use among them (n= 350)

Substance Use	Male	Female	Total
Present	57(16.3%)	21(6%)	**78(22.3%)**
Absent	209(59.7%)	63(18%)	272(77.7%)
Total	266(76%)	84(24%)	350(100%)

Table 2 shows, out of 350 adolescents, 78 (22.3%) adolescents have the habit of substance use. Among them substance use was 57 (16.3%) in male and 21(6%) in female.

Table 3: Distribution of different types of substance use among adolescents in our study-(n=78)

Type of substance use	Male-57 (%)	Female-21 (%)	Total-78 (%)
Alcohol	51 (89)	1 (4.7)	52(66.6)
Gutkha	24 (42.1)	11 (14.1)	35(44.8)
Paan	16 (28)	8 (38)	24(30.7)
Gudakhu	16 (28)	7 (33.3)	23(29.4)
Cigarette	17 (29.9)	0	17(21.8)
Cocaine	2 (3.5)	0	2(2,5)
Bidi	1(1.7)	0	1(1.3)
Ganja	1 (1.7)	0	1(1.3)
Heroin	1 (1.7)	0	1(1.3)

Table 3 explains maximum adolescents were addicted to alcohol 52(66.6%) followed by Gutkha 35(44.8%), Paan 24(30.7%), Gudakhu 23(29.4%), Cigarette 17(21.8%), Cocaine 2(2.5%), Heroin 1(1.3%).

Table 4: Association of demographic variables with substance use among study subjects.

Demographic Variables		Substance use		Total (%)	Chi-square(X2), d f, P (S/NS)
		Yes (%)	No (%)		
Age (years)	10-13	18(23.0)	93(34.2)	111 (31.7%)	X^2=4.46, df=2, P=0.108 NS
	13-16	27(34.6)	68 (25)	95 (27.1%)	
	16-19	33(42.3)	111(40.8)	144(41.1%)	
	Total	**78 (100)**	**272 (100)**	**350 (100)**	
Sex	Male	57(73.0)	209(76.8)	266 (76%)	X^2=0.49, df=1, P=0.47 NS
	Female	21(26.9)	63(23.1)	84 (24%)	
	Total	78	272	350	
Religion	Hindu	75 (96.1)	248(91.1)	323 (92.3%)	X^2 =2.12 ,df =2 , P=0.34 NS
	Muslim	2 (2.5)	15(5.5)	17 (4.9%)	
	Others	1 (1.3)	9(3.3)	10 (2.9%)	
	Total	78	272	350	
Education	Primary	10 (12.8)	97(35.6)	107(30.57%)	X^2 =87.59 ,df =4 ,P=0.001 , S
	Middle school	3 (3.8)	86(31.6)	89(25.43%)	
	High school	1 (1.3)	15(5.5)	16 (4.57%)	
	Intermediate & above	2 (2.5)	15(5.5)	17 (4.86%)	
	Drop out	62 (79.5)	59(21.7))	121(34.57%)	
	Total	78	272	350	
Type of	Nuclear	46(58.97)	191(70.2)	237 (67.7%)	X^2 =7.32. df=2, P=0.2

Family	Joint	11 (14.1)	15(5.5)	26 (7.4%)	S
	3 generation	21 (26.9)	66(24.2)	87(24.8%)	
	Total	78	272	350	
Broken	Yes	41(52.56)	23(8.4)	64 (18.2%)	X^2 =78.9, df =1,
Family	No	37 (47.4)	249(91.5)	286 (81.7%)	P =0.001, S
	Total	78	272	350	
Problem	Yes	38 (48.7)	86 (31.6)	124 (35.4%)	X^2 =7.78, df =1, P=0.005,
Family	No	40 (51.3)	186(68.4)	226 (64.6%)	S
	Total	78 (100)	272 (100)	350 (100%)	

df -degree of freedom**, S**-Significant, **NS**-Not Significant

Table-4 represents maximum study participants with substance users were between 16-19 year age 33 (42.3%) ,belongs to male 57(73%) and from Hindu religion 75 (96.1%),but there is no significant association found between substance users with these 3 variables(age ,sex, religion),P>0.05.But there is significant association found between substance users with their educational qualification(school drop outs were more addicted 62(79.5%)),from nuclear families 46 (58.97% , from broken families 41(52.56%) and problem families 38(48.71%) (P<0.05).

DISCUSSION

The present study included a total of 350 adolescents residing in the urban field practice area of a private medical college in Odisha. Among the study participants, the majority (41.1%) belonged to the age group of 16–19 years, followed by 31.7% in the age group of 10–13 years and 27.1% in the age group of 13–16 years. Adolescence is considered a vulnerable period characterized by physical, emotional, and psychological transitions, making individuals more susceptible to risky behaviors including substance use. Similar observations regarding age distribution have been reported in earlier studies. However, a study conducted by Reddy AP et al. among adolescents and street children in Andhra Pradesh observed that the majority of participants (46.6%) were in the age group of 11–14 years, followed by 15–18 years (38.8%) and 7–10 years (14.6%) (8).

The difference in age distribution between the studies may be attributed to differences in study settings, sociocultural factors, and sampling methods. The mean age of participants in the present study was 14.6 ± 2.8 years, which is comparable to the findings of Daniel LT et al., where the mean age was reported as 15 ± 2.3 years which is similar to our study (9). This similarity indicates that substance use behaviors commonly emerge during mid to late adolescence, a stage often associated with increased peer influence, emotional instability, experimentation, and exposure to social pressures.

In the current study, male adolescents constituted the majority of participants (76%), which is consistent with findings from a study conducted among school children in Jaipur where 71%

of participants were males (10). The predominance of males in substance use studies may reflect greater social freedom, outdoor exposure, and higher likelihood of engaging in risk-taking behaviors among boys in Indian society. Cultural norms often permit boys more autonomy compared to girls, thereby increasing their exposure to peer groups and environments associated with substance use.

Most adolescents in the present study belonged to the Hindu religion (92.3%), which reflects the demographic composition of the study area. Similar findings were observed in studies conducted in Mumbai and Dehradun. A study among street children in Mumbai reported that 66.3% of participants were Hindus (11), while another study conducted in Dehradun observed that 90.1% of participants belonged to the Hindu religion (12). The higher proportion of Hindu participants in these studies may primarily be due to the regional population distribution rather than any direct association between religion and substance use behavior.

Educational status plays an important role in shaping adolescent behavior and lifestyle. In the present study, 34.29% of adolescents were school dropouts. This finding is slightly lower than that observed in a study conducted in urban slums of Mumbai, where 44.2% of adolescents were school dropouts (11). School dropout adolescents are particularly vulnerable to substance use because they are more likely to experience unemployment, poor supervision, low self-esteem, and association with antisocial peer groups. Education acts as a protective factor by increasing awareness, promoting discipline, and providing opportunities for social engagement.

Regarding family structure, the majority of adolescents in the current study belonged to nuclear families (67.7%). Similar findings were reported by Baba TA et al., where 52.4% of participants belonged to nuclear families (13). The increasing prevalence of nuclear families in urban areas may reduce the availability of emotional support and supervision traditionally provided by extended family members in joint family systems. Adolescents from nuclear families may therefore experience greater emotional isolation and less monitoring of their activities.

The majority of study participants belonged to the upper lower socioeconomic class (62%). Similar findings were observed in a study conducted by Kokiwar PR et al., where 38.5% of participants belonged to the upper lower class followed by 37.7% from the upper middle class (14). Low socioeconomic conditions may contribute to substance use through factors such as financial stress, overcrowding, poor educational opportunities, family conflicts, and lack of recreational facilities.

About 35.4% of adolescents belonged to problem families and 18.3% belonged to broken families. However, a study conducted by Sarangi et al. reported that 53% of adolescents belonged to problem families, which was much higher than the findings of the present study (15). Adolescents from broken and problem families often experience emotional distress, neglect, lack of parental supervision, domestic violence, and poor communication within the family. Such unfavorable family environments may increase the likelihood of adolescents seeking comfort or escape through substance use.

The prevalence of substance use in the current study was found to be 22.29%, indicating that nearly one out of every five adolescents was engaged in substance use. This prevalence was lower than the prevalence reported by Sarangi L et al., where substance use among adolescents was observed to be 43.4% (15). Variations in prevalence may be due to differences in study population, geographic setting, accessibility of substances, and sociocultural practices. Alcohol was identified as the most commonly used substance use (66.6%) among adolescents in the present study, This was followed by gutkha (44.8%), paan (30.7%), gudakhu (29.4%), and cigarette smoking (21.8%). Similar findings have been reported in various Indian studies, although the pattern of substance use varies regionally. In a study conducted by Kokiwar PR et al., tobacco and alcohol were the most commonly used substances, with prevalence reported as 12.9% (14). The high prevalence of alcohol use among adolescents is particularly concerning because early initiation of alcohol consumption is associated with long-term addiction, poor academic performance, accidents, violence, and mental health problems. Similarly, smokeless tobacco products such as gutkha, paan, and gudakhu are inexpensive, easily available, and socially accepted in many communities, thereby increasing their use among adolescents. In the present study, no statistically significant association was observed between substance use and variables such as age, sex, and religion ($P > 0.05$). However, statistically significant associations were found between substance use and educational status, family type, broken family status, and problem family background ($P < 0.05$). These findings suggest that social and family-related factors play a more important role in adolescent substance use than demographic characteristics alone. Similar observations were reported by Daniel LT et al., where educational status and family type showed significant association with substance abuse among adolescents (9). Overall, the findings of the present study emphasize that adolescent substance use is a multifactorial problem influenced by educational, familial, social, and socioeconomic determinants. Effective prevention strategies should therefore focus on strengthening family relationships, promoting school retention, increasing awareness regarding harmful effects of substance use, and implementing community-based interventions targeting adolescents and their families.

CONCLUSION

In our study prevalence of substance use among adolescents was found to be 22.29%. Maximum adolescents were addicted to alcohol (66.6%) followed by Gutkha (44.8%), Paan (30%), Gudakhu (29.4%), Cigarette (21.8%), Cocaine (2.56%), Bidi, Ganja, Heroin (1.28%). Statistically significant association was observed between substance use and educational qualification, type of family and family back ground (problem family and broken family) of study subjects (P<0,05). So proper IEC (Information, Education and Communication) activities must be carried out to create awareness about harmful effects of substance use among adolescent population.

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