Perceptions, Risky Behaviour and Harmful Practices Associated with Adolescent Substance Use in Gwagwalada, Abuja, Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

Article Information

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ABSTRACT

Background: Adolescence is associated with high-risk behaviour, experimentation with substance use and testing boundaries, putting adolescents at increased risk for exploitation, harmful practices, health challenges and getting into trouble. The perceived effect of a substance on an adolescent can determine its use. This study aimed to identify the perceptions adolescents have towards substance use, the risky behaviour and harmful practices associated with substance use and determine the accessibility of substances among adolescents in Gwagwalada Area Council, Abuja Federal Capital Territory.
Study Design: This was a cross-sectional, descriptive study carried out among secondary school adolescents.
Place and Duration: The study was carried out in Gwagwalada Area Council, Abuja, Nigeria from May to July 2015.
Methodology: A questionnaire-based study using a multi-stage random sampling method to select the students.

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Results: A total of 1,196 adolescents' questionnaires were analysed comprising of 555 (46.4%) males and 641(53.6%) females. There was a high perception of harm from the use of cigarette, alcohol and Indian hemp among the adolescents and was statistically significant for cigarette use at P= <.001 OR= .104 CI .0371 – .343 and alcohol use at P= 0.01 OR= 9.75 CI 2.971-27.497. The perceived ease of access to licit substances was much higher than that for the illicit substances with the relationship between perceived availability and substance use being statistically significant for all eight substances assessed. Substance use was also found to be associated with adolescent risky behaviour and harmful practices.
Conclusion: More awareness needs to be created on the harmful physical, social and mental effects of substance use while stricter rules and regulations should be enforced to ensure restricted access of substances to adolescents.

1. INTRODUCTION

Adolescence is a critical period in development. It is associated with high-risk behaviour, experimentation with substance use and testing boundaries which also puts them at risk for sexual exploitation [1,2]. The attitudes and beliefs of an adolescent, play a role in substance use behaviour. Substance use usually starts with alcohol and tobacco which are the "gateway" drugs. Adolescents' perception of the risk involved in substance use determines his or her usage [3]. When a substance is not perceived negatively or when its use is perceived as normal behaviour to an adolescent and his peers, then that substance will most likely be used by that adolescent and his peers [3] meaning youths who perceive high risk of harm from substance use are less likely to use drugs than youths who have a perception of low risk of harm from that drug.

The same study also reported that the percentages of adolescents who reported substance use in the past month was generally lower among those who perceived great risk from using substances than among those who did not perceive great risk [3]. Among six South American countries: Chile, Ecuador, Argentina, Peru, Uruguay and Bolivia surveyed, Chile, which had the highest proportion of school adolescents assigning low or no risk to frequent smoking also reported the highest prevalence for current smoking use (38.1%) [3].

These behaviours and practices are harmful to the individual and/ or others. Many premature deaths among adults have been attributed to behaviours initiated during adolescence [4]. Risky behaviour, substance use and addiction are leading causes of preventable deaths and disabilities in the United States [5].

The perceived prevalence of drug – related deaths in Africa was reported to be between 3.8% and 12.5% in people between the ages of 15 to 64 year olds [6]. Some examples of risky behaviours include fighting, violent behaviour, cultism, road traffic accidents from driving under the influence of drugs, stealing to enable them buy drugs, engaging in unsafe sex and even prostitution which can result in sexually transmitted diseases like HIV, Hepatitis B and C, and unwanted pregnancies in the females. Intravenous drug use is also a high risk for infections especially infective endocarditis.

A study [7] reported that smoking in the past 30 days and lifetime marijuana use was strongly associated with all the sexual risk behaviors examined. Unprotected sex occurred in 37.95%, 21.26% and 19.07% of adolescents who reported having used alcohol ≥3 days in the past 30 days, binge drinking (1 – 2 days in the past 30 days) and lifetime cocaine use, respectively. Almost half (48.39%) of adolescents who reported drinking alcohol > 3 days in the past 30 days had had multiple sexual partners in the past 3 months [7].

More recently, there has been an increase in the popularity of the so called "choking game" in the United States [8]. This is a potentially fatal game in which the carotid arteries are occluded to obstruct blood flow and oxygen to the brain in order for the person to experience a high or euphoria when the occlusion is released. This has led to several deaths in the United States of America. The practice of the "choking game" has been reported to be associated with substance use among both sexes [8].

Adolescent substance use places a heavy burden on the individual, family and community. For instance, it costs the American economy about $467.7 billion annually and places huge

burdens on the health care systems, family courts, criminal justice systems and social service systems [5].

Substance use is associated with chronic health diseases (for example smoking has been linked to cancers, respiratory diseases and heart diseases), substance use disorders, mental illnesses, and other medical conditions like sleeping, eating and vision disorders [5]. It is also associated with increased fatalities from intentional and unintentional injuries, homicides and suicides [8] as well as antisocial behaviour like violent crimes, broken relationships and cult activities [9,10].

Other consequences include poor academic performance, poor educational achievement and poor social functioning [5]. Early substance use can impede the ability for acquiring critical thinking skills, and also hinder learning of important cognitive strategies which are required for successful transition to adulthood [11].

Substance use during the adolescent age is critical because the regions of the brain responsible for decision making, judgment, control of impulse, memory and emotion are still developing. These addictive substances physically change the structure and function of the brain faster than they do in adults, thus interfering with proper development of the adolescent brain, impairing judgment, and increasing the risk for addiction [5].

This study aimed to identify the perceptions towards substance use, the risky behaviour and harmful practices associated with substance use and determine the accessibility of substances among adolescents in Gwagwalada Area Council, Abuja Federal Capital Territory.

2. SUBJECTS AND METHODS

Gwagwalada Area Council is a cosmopiltan town located in Abuja, the Federal Capital Territory. It hosts several government agencies such as a Teaching Hospital, Radio station, Customs, Immigration services and Federal Inland Revenue offices among others. The indigenous tribes are mainly Bassas and Gwaris known mainly for farming. There are however, people from other tribes and occupations.

This was a descriptive, cross-sectional, secondary school-based study that lasted three months from May to July, 2016.

Ethical approval from the FCT Health Research Ethics Committee and Health Research and Ethics Committee of the University of Abuja Teaching Hospital were obtained before starting the study. Approvals were also obtained from the FCT Administration Universal Basic Education Board, Secondary Schools Education Board and principals of the selected schools prior to commencement. The principles of research ethics were adhered to.

Adolescents aged 10 years to 17 years with caregiver signed informed consent forms and individual verbal assent, as well as adolescents aged 18 years with individually signed consent forms attending secondary schools in Gwagwalada were included in the study. Students absent from school or in the sickbay at the time of the study were excluded.

An initial sample size of 955 was calculated using a formula [12]. Twenty percent was then added for attrition and rounded up to the nearest whole number giving a sample size of 1,200. However, 1204 students were selected as fractions obtained while calculating for proportionate sampling were rounded up to the nearest whole number.

A multi – stage random sampling technique, in three stages was used to select the subjects. The schools were first stratified into urban and secondary school, then stratified into private and secondary and balloted for using proportionate sampling. One thousand, two hundred and four students from a sample frame of 10,093 were then selected from all classes and all arms also using proportionate sampling and a table of random numbers. Only co-educational schools were used.

The study instruments used was a modified version of the United Nations Office on Drug and Crime questionnaire for conducting surveys on drug abuse among students [6]. The questionnaire was pretested prior to use. It consisted of questions on substances used, perceived availability of substances, perceived harmful effects of substances, associated risky behaviour and harmful practices of substance use.

The pre-test and pilot studies were done using two groups each of 50 randomly selected students from a secondary school. These students were not included in the final study sample. The pre-test and pilot studies helped to determine the reliability and validity of the questionnaire, detect difficulties or ease of answering the questionnaire and assess the time

it would take to complete the questionnaire. The questionnaire was subsequently adjusted in accordance.

The questionnaire was self-administered after the selected students had been gathered in a hall or class. Teachers were present to help maintain law and order but were not permitted to see what any student was writing or discuss with any student. The participants were also not allowed to communicate with one another. Any question not understood by the students was explained by the researcher or research assistant that had been trained prior to the study. After completing the questionnaire, for anonymity, the students turned their questionnaires upside down, and then dropped them in a box at the back of the class.

Data analysis was done with SPSS version 20. Chi-square was used to determine association between perceived availability of substances, perceived the harmful effect of substances and substance use. $P < 0.05$ was regarded as statistically significant and confidence interval (CI) was calculated at 95%. Analysis of social class was based on the classification by Olusanya et al. [13] [Appendix I].

3. RESULTS

3.1 Socio-demographic Distribution

A total of 1,204 students were selected using proportionate sampling. Questionnaires were distributed to these students, of which 1,196 (99.3%) were analysed. The age range of the study subjects was 10 to 18 years with a mean age of 14.54 years with standard deviation (SD) of ± 2.28 years. The mean age for males was 14.87 years with SD ±2.45 years while for females; the mean age was 14.24 with SD ± 2.09 years. There were 555 (46.4%) males and 641 (53. 6%) females, giving a male to female ratio of 1:1.15.

Christians made up about three –quarters of the subjects (n=904; 75.6%) while about half of the respondents (650; 54.4%) were from the upper socioeconomic class. Ninety-seven (8.1%) could not be classified into the different social strata due to inadequately filled questionnaires. There were 1052 (88%) students from public schools and 144 (12%) from private schools. The disparity in the number of students from the two types of schools was due to the proportionate sampling method applied. The socio-demographic distribution characteristics of the students are shown in Table 1.

3.2 Perception of Harmful Effect of Substances and Substance Use

Table 2 shows the relationship between the perception of the harmful effects of substances and substance use among students. Out of 1,094 students who responded to the question related to perception of harmful effect of substances, 649 (54.3%), 403 (33.7%) and 42 (3.5%) students reported that smoking 5 sticks of

Table 1. Socio-demographic characteristics of the adolescents

Variables	Males No. (%)	Females No. (%)	Total No. (%)
Age (years)			
10 -13	173 (14.5)	234 (19.5)	407 (34.0)
14 – 16	240 (20.0)	308 (25.8)	548 (45.8)
17 - 18	142 (11.9)	99 (8.3)	241 (20.2)
Religion			
Christianity	410 (34.3)	494 (41.3)	904 (75.6)
Muslim	144 (12)	147 (12.3)	291 (24.3)
Traditional African	1 (100)	0 (0)	1 (0.1)
Social class			
Upper	305 (25.5)	345 (28.9)	650 (54.4)
Middle	119 (10)	143 (12)	262 (12)
Lower	91 (7.6)	96 (8)	187 (15.6)
Unclassified			97 (8.1)
Type of school			
Public	480 (40.1)	572 (47.8)	1052 (88)
Private	75 (6.3)	69 (5.8)	144 (12)

cigarette everyday was strongly harmful, harmful and not harmful respectively. Out of the 649 students who reported that smoking 5 sticks of cigarette everyday was strongly harmful, 8 (1.2%) of them had used tobacco at least once in their lifetime, of the 403 who said smoking was harmful, 10 (2.5%) had used tobacco while 42 who reported smoking 5 sticks everyday as not harmful, 6 (14.3%) had used tobacco. The relationship between smoking 5 sticks of cigarette a day and the perceived harmful effect was statistically significant (P= <0.001). Students who perceived this habit as harmful were less likely to use tobacco (OR= 0.104 CI 0.0371 – 0.343).

Seventy-one (6.6%), 583 (54.2%) and 421 (39.2%) students reported drinking 2 bottles of beer a day as not harmful, harmful and strongly harmful respectively. Seventeen (17; 23.9%), 105 (18%) and 52 (12.4%) of those who reported drinking 2 bottles of beer a day as not harmful, harmful and strongly harmful respectively had taken alcohol in their lifetime. The relationship between the perceived harmful effect of alcohol and lifetime use of alcohol was statistically significant (P= 0.01). Students who perceived harm from drinking 2 bottles of beer a day as harmful were more likely to use alcohol (OR= 9.75 CI 2.971-27.497).

One hundred and ninety-eight (16.6%), 501 (41.9%) and 371 (31%) subjects reported smoking Indian hemp once a month as not harmful, harmful and strongly harmful. Of these 3 (9.3%), 4 (0.8%) and 7 (1.9%) from the respective groups had used Indian hemp at least once in their lifetime. This difference was not statistically significant (P= 0.361).

3.3 Perceived Availability of Substances and Substance Use

Kolanut was the substance perceived to be the most easily available. Of the 523 students who reported that kolanut was easy to get, 354 (67.7%) had used kolanut at least once in their lifetime. Many of the students did not know how available alcohol (40%), sniffed and inhaled substances (42.4%) and tobacco (38.4%) were. Of these students, eighty-two (29.9%), 19 (18.8%) and 5 (4.8%) had used alcohol, sniffed and inhaled substances and tobacco respectively at least once in their lifetime.

Very few students reported that it would be easy to get the illicit substances: cannabis (n= 26; 2.5%), cocaine (n=34; 3.2%), hallucinogen (n= 38; 3.6%) and heroin (n= 27; 2.9%).

The relationship between perceived availability and substance use was significant for all eight substances: kolanut, alcohol, sniffed and inhaled substances, tobacco, cannabis, cocaine, hallucinogen and heroin. The perceived availability of substances and their use among students is depicted in Table 3.

3.4 Risky Behaviour and Harmful Practices and Licit Substance Use

Table 4 shows the association between risky behaviour and harmful practices and licit substance use. The relationship between users and non users of all licit substances were statistically significant for subjects having: quarrels or arguments, accidents or injuries, problems in relationships with parents, friends and teachers. The relationship between substance use and getting into scuffles or fights was significant for alcohol and sniffed and inhaled substances but not for tobacco use.

There were no statistically significant relationship seen between any of the four licit substances and engaging in sex that students later regretted.

3.5 Risky Behaviour and Harmful Practice and Illicit Substance Use

The association between risky behaviour and harmful practice and illicit substance use is shown in Table 5. The relationship between users and non users was statistically significant for cannabis use in subjects who had had an accident or injury (P = <0.001), problems in relationships with parents (P = <0.001) and teachers (0.004), performed poorly at school or work (P = 0.021), trouble with the police (P= 0.043) and engaged in unprotected sex (P= 0.001). For cocaine use, the relationship was significant for only "engaged in unprotected sex" (P = 0.001). The relationship was significant for heroin use and the variables; getting into scuffles or fights (P = 0.035), performed poorly at work (P = 0.001), trouble with police (P = 0.017), hospitalised or admitted to an emergency room (P = 0.010), engaged in sex regretted (<.001) and engaged in unprotected sex (P = < 0.001). There was no statistically significant relationship between Hallucinogen use and the variables tested for.

Table 2. Relationship between the perception of the harmful effects of substances and substance use among students in Gwagwalada

Habits	Not harmful n (%)	Harmful n (%)	Strongly harmful n (%)	Total n	X^2	P value	OR	CI
Smoking 5 sticks of cigarette a day NR	42 (3.5)	403 (33.7)	649 (54.3)	1,094 (91.5%) 102 (8.5%)	31.548	<0.001*	0.104	0.0371-0.343
Drinking 2 bottles of beer a day NR	71 (6.6)	583 (54.2)	421 (39.2)	1,075 (89.9%) 121 (10.12%)	9.143	0.01*	9.75	2.971 - 27.497
Smoking Indian hemp once a month NR	198 (16.6)	501 (41.9)	371 (31)	1,070 (89.5%) 126 (10.5%)	2.036	0.361		

*df = 1; *= P value < 0.05*
NR= Non response

Table 3. Relationship between perceived availability of substances and substance use among students

Substance		Easy to get n (%)	Difficult to get n (%)	I don't know n (%)	Total n (%)	X^2	P value
Kolanut	Non-users	169 (14.1)	127 (10.6)	184 (15.4)	480 (49.7)	138.73	<0.001*
	Users	354 (29.6)	54 (4.5)	77 (6.4)	485 (50.3)		
	NR				231 (19.3)		
	Total	**523 (54.2)**	**181 (15.1)**	**261 (21.8)**	**1,196 (100)**		
Alcohol	Non-users	192 (16.)	284 (23.8)	352 (29.4)	779 (65.1)	98.56	<0.001*
	Users	82 (6.9)	13 (1.1)	29 (2.4)	173 (14.5)		
	NR				244 (20.4)		
	Total	**274 (22.9)**	**297 (24.8)**	**381(31.9)**	**1,196 (100)**		
Sniffed/ inhaled substan-ces	Non-users	82 (6.9)	408 (34.1)	384 (32.1)	874 (73.1)	26.06	<0.001*
	Users	19 (1.6)	35 (2.9)	16 (1.3)	70 (5.6)		
	NR				252 (21.1)		
	Total	**101 (10.7)**	**443 (37)**	**400 (33.4)**	**1,196 (100)**		
Tobacco	Non-users	99 (9.4)	530 (50.1)	408 (38.6)	1,037 (98.1)	6.704	0.035*
	Users	5 (0.5)	11 (1)	4 (0.4)	20 (1.9)		
	NR				139 (11.6)		
	Total	**104 (9.8)**	**541 (51.2)**	**412 (39)**	**1,057(100)**		
Canabis	Non-users	20 (1.9)	378 (36)	438 (41.7)	1,036 (98.6)	70.55	<0.001*
	Users	6 (0.6)	5 (0.5)	4 (0.4)	15 (1.4)		

Substance		Easy to get n (%)	Difficult to get n (%)	I don't know n (%)	Total n (%)	X²	P value
	NR				145 (12.1)		
	Total	**26 (2.5)**	**383 (36.44)**	**442 (42.05)**	**1,051 (100)**		
Cocaine	Non-users	32 (3)	575 (54.5)	434 (41.1)	1,041 (98.67)	5.97	0.047*
	Users	2 (0.2)	8 (0.8)	4 (0.4)	14 (1.33)		
	NR				141 (11.8)		
	Total	**34 (3.2)**	**583 (55.3)**	**437(41.5)**	**1,055 (100)**		
Halluci-nogen	Non-users	36 (3.43)	535 (50.95)	468 (44.57)	1,039 (98.95)	7.00	0.032*
	Users	2 (0.19)	4 (0.38)	5 (0.47)	11 (1.05)		
	NR				146 (12.2)		
	Total	**38 (3.6)**	**539 (51.33)**	**473 (45.00)**	**1050 (100)**		
Heroin	Non-users	25 (2.7)	515 (55.1)	386 (41.3)	926 (99.14)	15.34	0.003*
	Users	2 (0.2)	5 (0.5)	1 (0.11)	8 (0.86)		
	NR				265 (22.2)		
	Total	**27(2.9)**	**520 (55.6)**	**387(41.4)**	**934(100)**		

*= P value <0.05
NR= Non response

Table 4. Relationship between risky behaviour and harmful practice and licit substance users

Behaviour	Alcohol			Sniffed and Inhaled			Tobacco		
	n (%)	X²	P value	n (%)	X²	P value	n (%)	X²	P value
Scuffle or fight	10 (.8)	23.448	<0.001*	6 (.5)	29.435	<0.001*	2 (.2)	1.40	0.497
Accident or injury	10 (.8)	14.322	0.001*	6 (.5)	21.633	<0.001*	6 (.5)	17.203	<0.001*
Problems in your relationship with parents	9 (.8)	14.227	0.001*	2 (.2)	10.926	0.04*	6 (.5)	22.957	<0.001*
Problems in your relationship with friends	9 (.8)	33.002	<0.001*	5 (.5)	8.838	0.012*	4 (.3)	8.875	0.012*
Problems in relationship with your teachers	9 (.8)	10.679	0.005*	3 (.3)	3.766	0.152	4 (.3)	11.638	0.003*
Performed poorly at school or work	7 (.6)	19.698	<0.001*	4 (.3)	9.239	0.010*	3 (.3)	8.567	0.014*
Trouble with police	6 (.5)	.168	0.919	5 (.5)	2.111	0.38	2 (.2)	2.255	0.324
Hospitalised or admitted to an emergency room	7 (.6)	9.529	0.009*	5 (.5)	4.748	0.093	4 (0.3)	12.218	0.002*
Engaged in sex you regretted	6 (.5)	.701	0.704	5 (.5)	2.239	0.326	4 (.3)	19.257	<0.001*
Engaged unprotected sex	4 (.3)	1.145	0.56	4 (.3)	1.505	0.471	2 (.2)	7.588	.023*

df= 2; *= P value < .05

Table 5. Relationship between risky behaviour and harmful practice and illicit substance users

Behaviour	Illicit Substance											
	Cannabis			Cocaine			Hallucinogen			Heroin		
	n	Fischer's exact	p value	n	Fischer's exact	p value	n	Fischer's exact	p value	n	Fischer's exact	p value
Scuffle or fight	2	3.052	0.163	1	1.098	0.520	1	1.085	0.621	2	5.228	0.061
Accident or injury	1	24.703	0.000*	1	0.563	0.796	1	0.942	0.559	1	3.981	0.129
Problems in your relationship with parents	7	25.860	0.000*	1	1.044	0.635	1	2.490	0.27	1	4.271	0.121
Problems in your relationship with friends	1	1.209	0.511	1	1.063	0.605	1	2.467	0.357	1	1.931	0.461
Problems in relationship with your teachers	2	7.143	0.023*	0	1.335	0.466	0	2.467	0.387	0	4.636	0.082
Performed poorly at school or work	1	7.211	0.026*	1	2.776	0.221	1	2.777	0.188	1	11.063	0.005*
Trouble with police	2	5.653	0.051*	1	2.368	0.282	1	4.685	0.124	1	7.524	0.028*
Hospitalised or admitted to an emergency room	2	7.710	0.013*	1	1.622	0.415	0	1.003	0.595	0	6.343	0.037*
Engaged in sex you regretted	2	9.402	0.010*	1	2.787	0.241	1	5.192	0.103	2	13.261	0.002*
Engaged in unprotected sex	1	9.848	0.006*	1	9.933	0.006*	1	3.325	0.212	1	14.629	0.001*

*= P value < .05

4. DISCUSSION

This study demonstrated a high perception of the harmful effects of substance use among the secondary school students of Gwagwalada Area Council. However, even though 96.16% and 93.83% perceived smoking 5 sticks of cigarette a day and drinking 2 bottles of beer a day respectively as harmful, it did not stop 1.7% and 14.6% of these students from using tobacco or alcohol respectively at least once in their lifetime. This suggests that only the perceived harmful effect of a substance is not enough to stop or discourage adolescent use. The perception in this study that the harmful effect from cigarette was high when compared with a study in the USA where only 64.3% and 33% reported perceived harm from light and intermittent smoking [14]. The study also reported that those with family members who smoked were less likely to associate harm with smoking [14]. The perception was also higher than in another study in the US with 64.2% of 24,658 adolescents perceiving that harm from smoking was dose-dependent [15]. In another study also in the USA, the perception of the harmful effect from tobacco ranged from 59.1% to 70.4% depending on the State [16].

Eighteen percent of students did not perceive that smoking Indian hemp once a month was harmful. With countries like the USA being more favourably disposed to the use of cannabis and the likelihood of this influence on Nigerian students, more effort needs to be put in place in creating awareness of the harmful effect of cannabis.

This study showed that perceived availability of substances and harmful effect of substance use was associated with substance use as in previous documented studies [3,17].

The adolescents reported that substance use among the secondary school students was associated with various risky behaviours and harmful practices such as getting into scuffles or fights, accidents or injuries, problems in relationships with parents, friends and teachers, poor performance at school or work, trouble with police, hospitalisation or admission to an emergency room, engaging in sex they regretted or in unprotected sex, similar to findings in another previous study [7].

Hospitalisations from substance use made up 1.25% of the total admissions in acute care in a study. Thirty- eight percent of these adolescents were dependent on alcohol or other drugs. This group also accumulated the highest hospital costs [18]. Oluwole et al. [19] in a study in Lagos State in Nigeria reported that adolescents who used substances were not deterred by police when a crime was committing by them. This could be one of the reasons why adolescent substance users may have trouble with police.

With regards to sex, a study reported that earlier sexual debut, multiple partners, lesser consistency in condom use and higher prevalence of HIV was found among adolescents who use substances compared with those who did not [20].

5. CONCLUSION

The perception of the harmful effect of substances was high. However, this did not stop the use. Substance use was also associated with harmful practices and behaviour among adolescents. This study assessed perceptions of harm, availability and risky behaviour from an individual and environmental point, other factors such as sociocultural, psychological and institutional factors can be considered. More awareness needs to be created on the harmful physical, social and mental effects of substances. Stricter rules and regulations should be enforced to ensure restricted access of substances to adolescents.

CONSENT

Adolescents aged 10 years to 17 years with caregiver signed informed consent forms and individual verbal assent, as well as adolescents aged 18 years with individually signed consent forms attending secondary schools in Gwagwalada were included in the study. Students absent from school or in the sickbay at the time of the study were excluded.

ETHICAL APPROVAL

Ethical approval from the FCT Health Research Ethics Committee and Health Research and Ethics Committee of the University of Abuja Teaching Hospital were obtained before starting the study. Approvals were also obtained from the FCT Administration Universal Basic Education Board, Secondary Schools Education Board and principals of the selected schools prior to commencement. The principles of research ethics were adhered to.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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