Journal of Public Health and Diseases
Volume 1(3), pages 31-48, December 2018
https://doi.org/10.31248/JPHD2018.007

Article Number: 862162CA1
http://www.integrityresjournals.org/journal/JPHD

Full Length Research

Psychotropic substance abuses and academic attainments of learners from randomly selected school environments and reviews of previous joint studies at KNUST in Ghana

Richard W. Tiimob[1], Gideon L. Tiimob[2], Isaac Baani[3], Paul Amihere-Ackah[3], Benjamin M. Tiimub[3,4*] and James. K. Assabil[5]

[1]Department of Public Health, School of Allied Health Sciences, University for Development Studies, P.O. Box TL1350 Tamale, Ghana.
[2]Department of Population Family and Reproductive Health, School of Public Health, University of Ghana, Legon.
[3]Department of Environmental Health and Sanitation Education, Faculty of Science & Environment Education-CAGRIC, University of Education, Winneba, P. O. Box 40, Asante Mampong, Ghana.
[4]Department of Environmental Engineering, Institute of Environmental Engineering, College of Environmental and Resource Sciences, Zhejiang University, Hangzhou 310058 - China.
[5]Department of Theoretical and Applied Biology, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

*Corresponding author. Email: benmakimit@yahoo.com; Tel: +233 244 50 10 55; 008618258871677.

Received 13th June, 2018; Accepted 11th July, 2018

ABSTRACT: Psychotropic effects of substance abuse on academic attainments was studied from a cross sectional descriptive survey from January to June, 2010 in Bosomtwi and Atwima Kwanwoma Districts. Entirely thirteen beneficiaries of School Health Education Programmes (SHEP) interventions between 5 to 10 years intervals, sub-divided into ten Junior High (JHS), and three public Senior High (SHS) were randomly selected based on learners' gender ratios using questionnaire and instructional guidelines approved by the school authorities for interview of 600 (258 females and 342 males) respondents. Majority (42 to 94%) were victims of coffee and alcohol abuse while 31% were implicated for marijuana, amphetamine, cocaine and heroin. About 56% resorted to drugs hoping to improve their academic performances with 11% consequently developing truant behaviors and abysmal achievements. Family members and friends often lured/provided money for 61% of learner's drug purchase while 96% were addicted averagely at 11.5 years old. Proportionately, 51% males were abusing drugs against 45% females. Likelihood ratio of abuse amongst genders cohorts were both asymptotically ($P<0.07$) and linearly ($P<0.4$) not significantly different. Substance abuse problems worsened in divorced marriages and single parent families where financial constraints and inadequate care compel learners to depend on drugs as probable solution to their depression and stress. The overall analysis revealed little improvement on learners' academic performances with increased drug use. Parent Teacher Associations need to strengthen the implementation of child care monitoring interventions in homes and schools to curtail rampant drug abuse problems through pilot School Health Education Programmes (SHEP).

Key words: Academic performance, Ashanti Region, Ghana, students, substance abuse.

INTRODUCTION

A drug that is used for any purpose other than that approved therapeutically or socially within a given culture

is drug abuse. It is also, the inappropriate and excessive use of drugs that may cause harm to the individual user and or to society in general (Simons et al., 2005; Nora and Volkow, 2014). The term, drug abuse has become almost synonymous with the abuse of psychotropic drugs, a chemical substance that can influence human consciousness (National Institute on Drug Abuse (NIDA), 2016). The problem has now assumed international proportions as it affects all human races with children becoming the most predominant (Asperheim, 2002; NIDA, 2016). The most commonly abused drugs are central nervous system stimulants, depressants, narcotics, hallucinogens and volatile substances with each of these drugs giving the abuser a desired feeling although the primary effects are irregular and temporary and may be accompanied by or replaced with undesired secondary effects (Asperheim, 2002; NIDA, 2016).

Numerous studies have documented correlations between substance use and suicide, depression, conduct disorder, school dropout, and poor scholastic attainment (Triplett and Payne, 2004; Nora and Volkow, 2016). In particular, both truancy and grade point average (GPA) have been found to be reliable correlates of adolescent substance use (Simons et al., 2005). In 2003, 45% of USA high school students reported drinking alcohol, 28% reported episodic “heavy drinking,” and 22% reported using marijuana during the past month. Additionally, 8.5% reported attempting suicide and 33% reported being in a physical fight during the past year (Kirby, 2006).

A critical challenge for prevention is to identify those youths at increased risk for substance abuse, addiction, and related problems, so that they can receive timely and appropriate assistance (Haynie and Osgood, 2005; Nora and Volkow, 2014). This is because adolescents tend to conceal problems such as substance use and suicidal thoughts, thus making it difficult to systematically identify those at increased risk. The school setting presents a unique opportunity for early identification and intervention, because it provides nearly universal access to children and youth. Nevertheless, school-based identification has been extraordinarily difficult to implement, due in part to the lack of appropriate screening mechanisms (Haynie and Osgood, 2005).

In the United States, substance has been blamed on the family as a unit (Bumpass and Lu, 2000). The family evokes a myriad of meanings and is made up of a variety of types. These range from the traditional notion of the nuclear family-comprising of a husband, wife, and their biological children-to an assortment of variations comprising of single parent, step-parent, and adopted parent households (Bumpass and Lu, 2000). As the composition of the family continues to change, there is one constant that remains: changes within the family have an impact upon youths living within them with regard to both the nature of parent-child relations and parent-child socialization.

Nora and Volkow (2016), showed that traditional families provide lower levels of involvement in family activities, thereby, raising youths with lower levels of educational attainment (NIDA, 2016), and have less access to social capital pertaining to child rearing than two parent families (Pong, 1997; Parcel and Dufur, 2001). Dittus and Jaccard (2000), Dorius et al, (2004) and Regenerus and Luchies, (2006) have shown that there is a relationship between family structure and the risky behaviours of youths and that it is largely related to the levels of closeness and attachment and levels of supervision and monitoring that occur along with changes in family structure. Nora and Volkow, (2014) reported that while the differences are small, adults with youths at home worried more with higher levels of anxiety than adults in homes where youths are not present. With women increasingly participating in the paid labour force, the issue of commitment to work and family becomes important.

Despite the debates over the nature, value, and importance of the family, there is substantial evidence that not only is marriage beneficial to both men and women, but also that all sorts of undesirable experiences and behavior are more common among youths whose parents experienced marital disruption (NIDA, 2015; Dishion et al., 2002; Dishion et al., 2003).

Additionally, youths from families with married parents live in much better economic environments compared to those from single parent families and youths in households with step-parents do not perform as well in school as those growing up with both biological parents (NIDA, 2016; Nora and Volkow, 2016).

Drug use among youths has been found to be lowest in mother-father families (Hoffman and Johnson, 1998). Thomas et al. (1996) earlier reported the highest rates of delinquency and substance abuse to be among White males in single mother households without the support of a nonresident father. Delinquency risk for males in step-families and single parent families is double that of those living with both parents (Dishion et al., 2002; Dishion et al., 2003; NIDA, 2015). Family structure has tended to focus on the changes that have occurred within the family over time but neglected issues that focus on the impact of changing family structures on the social issues of youth. Attention is also not given to tension within the family when comparing outcomes pertaining to risky behaviors of youths within different family types. This study investigated the role that family structure, -coming from a two parent household or a nontraditional family- and tension within the family and academic units play in levels of substance usage among a sample of youths in selected first and second cycle institutions in the Bosomtwi and Atwima Kwanwoma Districts of Ashanti Region. The study assessed the family structure, sources of drugs, gender and the different types of drugs available to the youth based on relevant cardinal objectives set to determine/identify:

1. prevalence, predisposing factors, awareness level, and distribution channels of substance use among pupils and students in the two districts.
2. level in the educational ladder that illicit drug use start, family link or background, whether or not the students are in single or both parent homes and the effect of substance use on their academic performances.
3. different psychotropic substances commonly used by pupils and students in the two districts

Basis and justification of the study

Renowned researchers stipulate that among adolescents with substance use disorders (SUD), co-occurring mental disorders are both common and serious (Harada, 2010a). In general, SUD adolescents with co-occurring disorders have more severe psychiatric symptoms, are more difficult to treat, incur greater costs, and have worse overall outcomes compared to those without a co-morbid dysfunction (Chen, 2003). Moreover, treatment effectiveness is contingent upon the non- targeted co-morbid condition despite the fact that treatment is provided for the principal SUD diagnosis (Harada, 2010b). Therefore, understanding the nature and degree of the relationship between SUD and co-occurring mental disorder alongside other psychotropic effects is one of the keys to developing more effective treatment and prevention programs for drug abuse in schools, communities and families (Chen, 2003; Harada, 2010a; Harada, 2010b). A huge lag phase exists in drug abuse data available online upon cross scan to determine how frequent the problem spins in Ghanaian institutions. Historical analysis of previous or current data transposed on the subject of substance abuse in Ghanaian basic/tertiary schools unveiled the long and past record of a study by Danquah (1979) at the University of Ghana, Legon with three years observation made from 1974-1977 on 462 Ghanaian university and secondary school students, aged 15 to 27, who had drug problems. Of the 462 cases only 8 (1.73%) were females. The results showed an increase in the number of reported drug cases from 1974 to 1977. The majority of the students had relatively high socio-economic background. Polydrug abuse in combination with alcohol was a popular trend apparently influenced by contact with western values. The report concluded that treatment including supportive therapy was found to be encouraging although not a total panacea to the problem. There is therefore, an urgent need to pool existing evidences of increasing substance abuse in academic institutions and its psychotropic effects on the learners' attainments. This article provides some subsequent information recently generated on the subject.

Limitations of the study

The study could not originally capture those who took a combination of two or more substances at the same time due limitation on the scope of the questionnaire designed for data collection even though some responses were tracked later during the dissemination of findings at separate symposia in few of school**.** The study further failed to indicate actual comparison in the level of abuse of the different psychotropic substances among the various schools, although, the learners were selected from different schools in the two districts for the study to purposively broaden the scope of the study more or less from a preliminary basis.

MATERIALS AND METHODS

The study area

The study was conducted in the Bosomtwi and Atwima Kwanwoma districts located in the central part of the Ashanti Region of Ghana. The two districts lie within latitude 6^{o} 24" North and 6^{o} 43" North and longitudes 1^{o} 15" West and 1^{o} 46" West, respectively and are bounded in the north by the Kumasi Metropolitan Assembly (KMA), Atwima Nwabiagya and Ejisu-Juaben districts, in the south by Amansie East and West districts and in the west by Atwima Nwabiagya district (Figure 1). The Bosomtwi and Atwima Kwanwoma districts together has a land size of 681,799 sq. km and forms about 2.81% of the total land size of the Ashanti Region. The population of the two districts is 146,028 with 50.3% being females and 49.7% males. The two districts are 90% rural. The Ashanti Region has a population of 3,612,950 with a growth rate of 2.5% per annum (Ghana Statistical Service, 2002). The two districts have 135 communities with Kuntanase as the administrative capital for Bosomtwi and Foase Atwima as the administrative capital for Atwima Kwanwoma district. Nearly 41% of the population in the two districts are within the 0 to14 year group, 55% in the 15 to 64 year group and 4% are above 65 years (Ghana Statistical Service, 2002). The main economic activities in the two districts include petty-trading, farming and cottage industry. The agricultural sector alone absorbs about 58% of the labour force while cottage industry, service and commerce taking 18%, 13% and 11%, respectively. The two districts general economies are therefore agrarian and rural with low commercial activities especially in the remote and smaller communities. The relatively high commercial activities are confined to the few larger communities particularly those along major roads and those close to Kumasi. There are no weekly or periodic markets in the two districts (Bosomtwi and Atwima Kwanwoma District Assembly Profile, 2006). The two Districts have 86 Kindergartens (KG's), 100 Primary Schools, 64 Junior High School (JHS) and three Senior High School (SHS). The teacher-pupil ratio is 1:30. In addition, there are three vocational and two

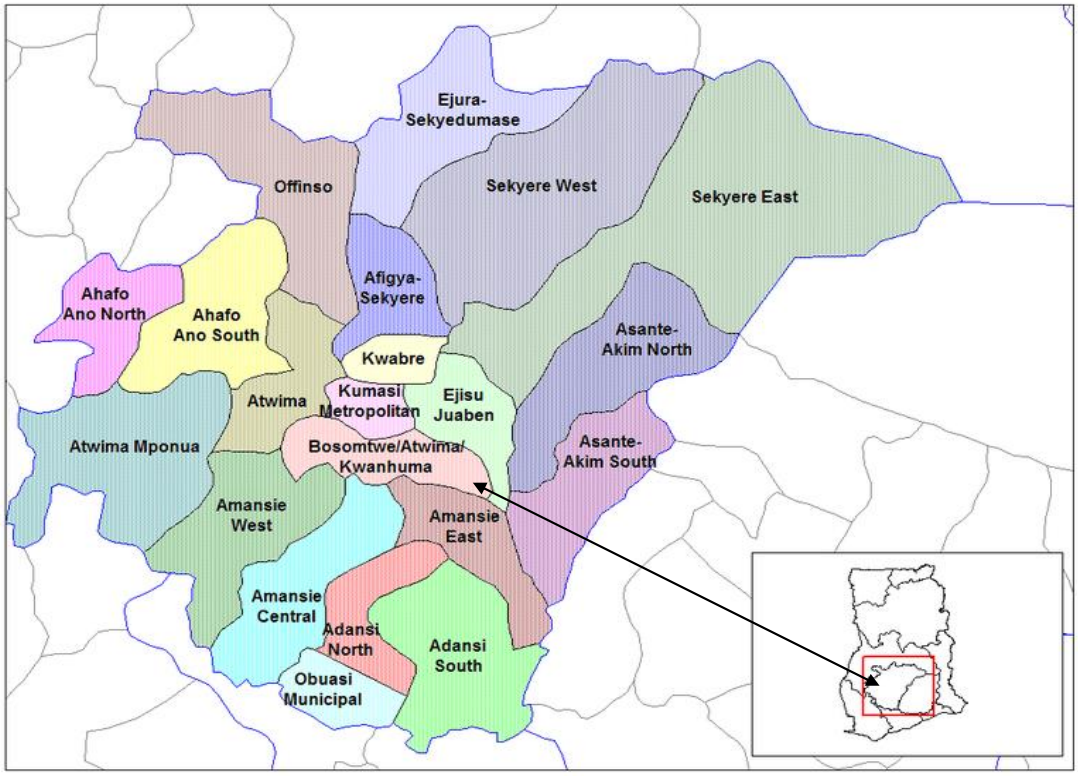

Figure 1. Map of Ghana with an arrow pointing to the Bosomtwe and Atwima Kwanwoma Districts in the Ashanti Region where the study was conducted. Source: Ghana Statistical Service (2002).

technical institutes, all in the Bosomtwe district. The two districts have 18 health facilities ranging from hospitals, health centres to clinics (9 of these are public, 7 mission health centres and 2 private clinics) (Bosomtwi Atwima Kwanwoma District Assembly Profile, 2006).

Study design and data collection

The study was a cross sectional descriptive survey carried out in January to June, 2010. The study areas, Bosomtwi and Atwima Kwanwoma districts, were zoned into three sections namely the Far East (Beposo and Abono), the Far West (Aburaso, Trabuom, Nweneso No.1 and Nweneso No.3) and Central (Esreso, Sawua and Jachie-Pramso) as shown in (Figure 1). Thirteen schools made up of ten Junior High Schools (JHS) and all the three public Senior High Schools (SHS) in the two Districts were chosen using the School Health Education Promotor's (SHEP) operational guidelines manuals which identify the distribution of public/private schools in the study areas from all the zones which had benefited from SHEP interventions between 5 to 10 years and were still benefitting from the time of this studies (Owusu et al., 2008; Owusu et al., 2009; Owusu and Bosumtwi-Sam, 2014) (Table 1). Based on gender and class within either the Junior High School or Senior High School, between forty and fifty students were randomly selected from each school (Table 1). Each of the selected female and male students was guided by instructions provided by the school authorities and aided by the questionnaire to complete questionnaires independently in all the 13 selected schools. They were also motivated with some incentives (pens, exercise books, pencils and erasers) (Owusu et al., 2009; Owusu and Bosumtwi-Sam, 2014) to ensure a high response rate. The questionnaires were administered by means of stratified random sampling based on the gender ratios of students as a basic guide in the selection process to 600 students made up of 258 females and 342 males (Table 1). The questionnaires were pretested and validated by allowing the head teachers to select 10% studying population in each of the schools to answer the questions on them. The responses were screened and analyzed and fine tunes by removing ambiguities and the mistakes while simplifying the difficult questions before the final surveys were conducted (Owusu et al., 2008; Owusu et al., 2009; Owusu and Bosumtwi-Sam, 2014).

Also, analysis was carried out on previous studies at the Kwame Nkrumah University of Science and Technology (Assabil, 2010) to determine the effect of increase in drug use on the academic performance of the students.

Table 1. Selected schools in each of the three zones and the number of students interviewed in the Bosomtwi and Atwima Kwanwoma districts.

School		Female	Male	Sub-total
Far East Zone				
SHS	Beposo Senior High School	18	32	50
JHS	Abono D/A	17	26	43
	Beposo D/A	15	30	45
Central Zone				
SHS	Jachie-Pramso Senior High School	17	36	53
JHS	Esreso D/A	17	27	44
	Jachie D/A	19	22	41
	Pramso D/A	17	28	45
	Sawua D/A	17	27	44
Far West Zone				
SHS	Afia Kobi Apem Girls Senior High Sch.	50	-	50
JHS	Nweneso No.1 D/A	19	27	46
	Nweneso No. 3 D/A	18	29	47
	Traboum Roman Catholic (R/C)	18	28	46
	Aburaso D/A	16	30	46
Total		258	342	600

Sampling technique

The technique of sampling was based on a 10% minimum representative sample drawn from the total population of students in the Far East, Far West and Central, distributed in the thirteen schools, Public Junior and Senior High Schools in the two districts. Six hundred (600) students were then randomly selected from the three zones based on the ethical considerations (Owusu et al., 2008; Owusu et al., 2009; Owusu and Bosumtwi-Sam, 2014) and recommendation of the school authorities (Table 1).

In each of the 13 schools, a class was randomly selected to represent a class learning stage from (JHS1 to JHS3 and SHS1 to SHS2) two (2) to four (4) learners were randomly selected according to the gender equity ratio representation of the class and each participating learner was given a serial/identity number clearly written on pieces of papers with the name of the student. The names of students were then picked at random from each class, folded and kept in a separate empty box. The content of each box was reshuffled. The name of any student picked at random was then recorded and transferred to stand-by separate empty boxes for the males and females respectively. The picking process was repeated until the required number of students per class was obtained from all the targeted representative learning stages from SHS one to three and JHS one to three from each school. The selected learners were then regrouped and made to seat in one class room to answer the questionnaires independently in all the 13 selected schools.

The structured questionnaires focused on pertinent issues relating to the use of some psychotropic substances such as caffeine, alcohol, marijuana, etc. Additionally, the questions were designed to probe reasons accounting for the use of the psychotropic substances, the age at first use and source of supply of the drugs (Appendix 1). The students were called, alerted by the school head teachers about the survey exercise and allowed to express their informed consent before filling the questionnaires. As part of ethical consideration (Owusu et al., 2008; Owusu et al., 2009), the Ghana Education Service District Offices in the Bosomtwi and Atwima Kwanwoma District Assemblies were contacted and permission was sought through the circuit supervisors in the various schools before the study was conducted (Owusu et al., 2008; Owusu et al., 2009; Owusu and Bosumtwi-Sam, 2014). The findings were presented to the SHEP coordinators in the form of final reports to be used to educate the pupils on the dangers of drug abuse and to caution them to refrain from abuse of psychotropic substances which hardy improved their academic attainments.

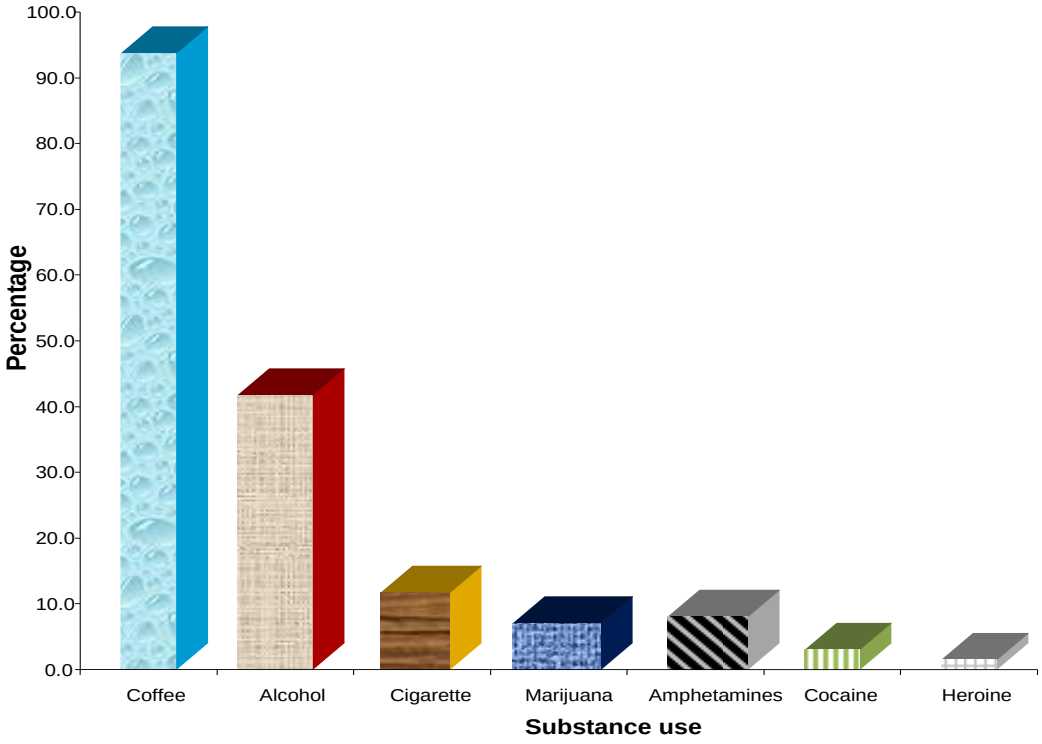

Figure 2. Percentage use of different psychotropic substances by students in the Bosomtwi and Atwima Kwanwoma Districts of Ashanti Region.

A follow up school health education promotion program was conducted at separate symposiums in purposively selected three schools that were represented by more than 50% of learners who actively took part in answering the questionnaires. The learners were noted and selected on the basis of answering the questionnaires properly from three schools with significantly larger population comprising of Jachie-Parmso Senior High school, Asreso-DA Junior High School and Afia Kobi Apem Girls Senior High Schools during the data collection process to track their responses on follow up actions. The students' responses were tracked from those who had experience in combined use of two or more substances to boost their learning by projection of their hands in the affirmative.

The collected data were cleaned and entered into Statistical Package for Social Scientists (SPSS, Chicago Version IL 22) and the results presented as tables and charts. Descriptive statistics was used for quantitative variables and chi squared for qualitative variables. P value of < 0.05 was considered statistical significance.

RESULTS

Psychotropic substances identified to be used by students

Socio-demographic characteristics of the students consisted of a total of 600 (258 females and 342 males) respondents between the ages of 11 and 20 years (Appendix 1). Out of the total 600 learners interviewed, 562 (93.6%) drink coffee whilst 250 (41.6%) drink alcohol. The percentage consumption was relatively low for all the other substances; cigarette (11.7%), marijuana (7.0%), amphetamine (8.0%), cocaine (3.0%) and heroine (1.5%) (Figure 2). However, about 31.2%, 30% and 32% respectively out of the total population from hand counts in the three schools indicated combined usage of cigarette, marijuana, amphetamine, cocaine and heroin during the dissemination of the findings at separate symposium held at random at Jachie-Parmso Senior High school, Asreso-DA Junior High School and Afia Kobi Apem Girls Senior High Schools on 5, 16 and 18, November, 2010.

Prevalence of substance use and introduction of psychotropic substances to students

Almost all the students (96.8%) were involved in the use of the psychotropic substances. The prevalence rate of substance use among students in the two districts was high (96.8%). Cross tabulation, chi-square tests and the symmetric measures on level of substance use are shown in Figure 3. Majority (63%) of the students acquired these substances from their homes (45%) and friends (18%).

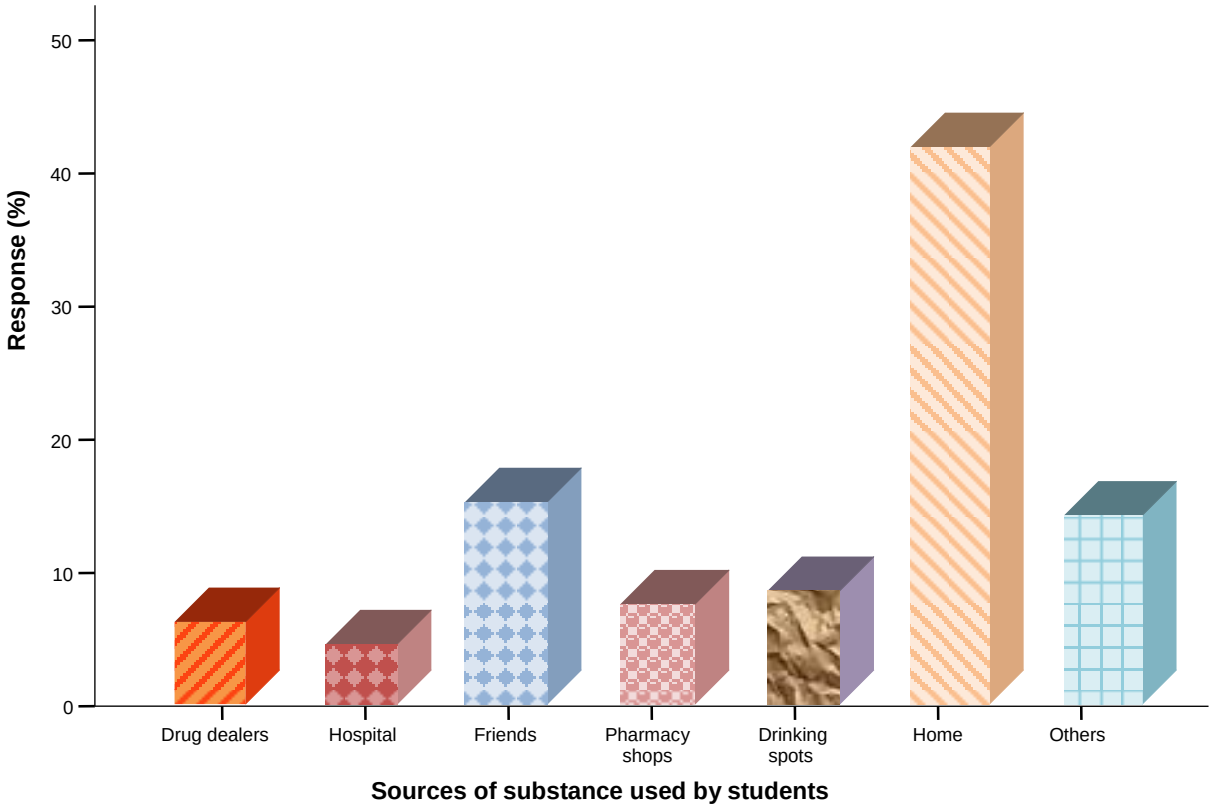

Figure 3. Sources of substance supply to student users in the Bosomtwi and Atwima Kwanwoma Districts of Ashanti Region.

Other sources of substance acquisition were from drug dealers (6.2%), hospitals (4.5%), pharmacy shops (7.5%), drinking bars (8.5%) and other unspecified sources (14.2%).

Effects of substance use on academic performance

The effects of substance use on the level of academic performance indicate that 55.8% of the students interviewed believe the use of these drugs have an effect on their academic performance. Majority (55.8%) of the pupils claimed that substance use had an influence on their academic performances. A relatively high number (47.7%) of the pupils claimed their academic performances were also enhanced (36.5%) or on the average (11.2%) as against a few (7.5%) whose performance were either low (4.0%) or the same (3.5%) following the use of these substances. Additionally, the chi-square tests on likelihood ratio and the linear-by-linear association of substance effect on the academic performance of pupils was asymptotically significant ($p<0.000$ based on normal approximations) and the symmetric measures of substance use on academic performance interval-by-interval Pearson's R and ordinal-by-ordinal Spearman Correlation on number of valid cases were also approximately significantly different ($p<0.000$ based on normal approximations) (Appendixes 3, 4)

Awareness level of the uses and effects of various psychotropic substances

Out of the 600 pupils, 562 (93.7%) drink coffee. Whereas 43.7% of the coffee users were fully aware of the health effects of abusing it, 27.3% were partially aware. Up to 42.0% of the pupils use alcohol. Additionally, 34.5% of them were fully aware and 17.0% partially aware of the effects of alcohol. About 12.0% of the pupils use cigarettes. Additionally, 26.5% out of the 600 pupils interviewed were fully aware of the effects of cigarette smoking and 17.5% partially aware. Similarly, about 39.9% of the pupils use marijuana of which 19.7% were fully aware and 14.2% partially aware of its health implication. About 14.3% of the pupils were fully aware of the health effects of amphetamines even though about 8.0% of them use it. About 3.0% of the pupils use cocaine of which 17.8% were fully aware of the health effects. Further, 1.5%

of the pupils use heroine out of which 12.8% were fully aware of the effects of heroine.

Predisposing factors influencing access to use of various psychotropic substances

The kind of family in which a pupil is nurtured was identified to be a major predisposing factor influencing the use of the various psychotropic substances**.** The cross tabulations of the family association in terms of whom each of the respondents stayed with, the chi-square test on likelihood ratios and linear-by linear association and symmetric measures were compared. The chi-square value ($p<0.59$), on likelihood ratio and linear-by-linear association of pupils who abused any of the substances identified in two parent families was insignificant compared to the chi-square value ($p<0.43$) in the single parent families (Appendixes 5, 6, 7). This implies that the pupils at an average age limit of 11.5 years in single parent families were more likely to use drugs compared to those living with both parents. However, majority (54.2%) of the pupils were staying with both parents.

Age and sex distribution of substance users against level substance use

The cross tabulation on the age distribution of substance use and the chi-square tests revealed that majority (95.5%) of the pupils who had access to psychotropic drugs were between the ages of 11 and 20 years and the likelihood ratios among the various age groups were described mathematically in terms of the limiting behaviors emanating from synergistic effects of increased or continuous drug abuse hereby referred as – "asymptotically" not significantly different ($p< 0.9$) (Paris and Kaminsky, 2001; Estrada and Kanwal, 2002; Miller, 2006; NIDA, 2016). The cross tabulation on the sex distribution of substance users, the chi-square tests and symmetric measures revealed that majority (51.8%) of the pupils who had access to the psychotropic drugs were males with females being 45%. The likelihood ratios among the various sexes were both asymptotically and linearly not significantly different ($p<0.07$ and $p<0.4$). Their symmetric measures were all asymptotically not significantly different interval by interval ($p<0.4$) and ordinal by ordinal ($p<0.4$) (Appendixes 8, 9, 10, 11).

The mode of introduction of psychotropic substance to pupil/student users and their sources of money for its purchase

Majority (60.7%) of the students were introduced to the psychotropic substances in hospitals (30%) during counseling sessions in instances that public health nurses interacted with them in the process of warning them on the dangers of drug abuse on occasional display of these drugs to enlighten learners who lacked knowledge about them during their school health education club sensitization. Incidentally, the recalcitrant learners later mounted their own efforts at acquiring these drugs willfully by themselves to experiment and abuse it. Exposure of learners through negligent parent addicts further attracted 30.7% of learners to abuse. Also, 18% of the learners abused drugs through conscious self-contacts (Figure 4). Majority (72.2%) of the students who purchased these substances had money from parental remittances (39.0%) and pocket money (33.2%) (Figure 4).

DISCUSSION

The frequencies and percentages of psychotropic substance use by students based on access revealed that majority of the students (79.7%) preferred using only coffee. However, majority in the range of (69.7 to 87.0%) did not opt to use most of the drugs (alcohol, cigarette, marijuana and amphetamines) inadvertently even if they had access to it. This study identified amphetamines, coffee, cigarette, cocaine, marijuana, alcohol, and heroine as the main psychotropic substances used most by students in the Bosomtwi and Atwima Kwanwoma Districts. Among the drugs, coffee (90%) and alcohol (45%) were the leading drugs abused. This compares with a study in the Upper West Region of Ghana which identified coffee and alcohol as the most common drugs abused by students in second cycle institutions in the region (Tettey, 1991). On average, 31.2% of the total respondents disclosed they were involved in the combined usage of cigarette, marijuana, amphetamine, cocaine and heroin. Longer time study done by Yangyouru (1987) on prevalence of drug use among the youth in Ghana ranked marijuana (65%), alcohol (40%) and cigarette (20%) among eight drugs predominantly abused. Knowledge of the use of drugs in the Bosomtwi and Atwima Kwanwoma districts was rather low and contradicted the trends shown by Yangyouru (1987). Additionally, research conducted in USA on substance abuse among students shows that 80% of high school kids have tried alcohol, with about 1.3% of people aged between 16 and 19 years falling victims of marijuana and amphetamine abuse whilst 4% of pupils, age 11 to 15 years have tried amphetamines in the UK. Furthermore, about 22% of the American youth are found to experiment with marijuana as teenagers (Crowley et al., 2007; Nora and Volkow, 2016). The use of cocaine and heroin appears not to be known by the students even though few of them who lived in the developed urban parts of the country had known these drugs. The total prevalence rate of substance use among students in the Bosomtwi and Atwima Kwanwoma Districts discovered in this survey is thus, very high (97.2%).

However, the effects of the substance use on level of

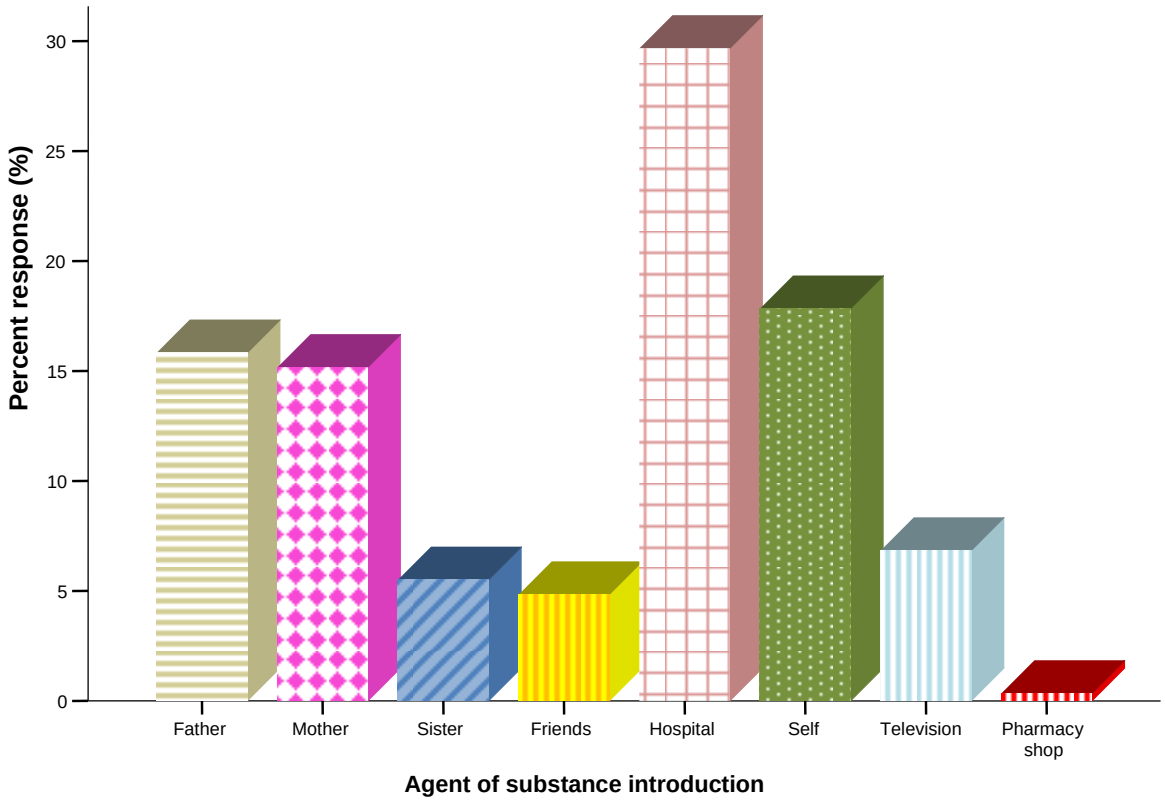

Figure 4. Percentage illustration of mode of introduction of psychotropic substances to student users in the two Districts of Ashanti Region.

academic performance with their cross tabulations, chi-square tests and symmetric measures of sex distribution of respondents against substance abuse from the raw data analysis using the questionnaire (Appendixes 1,11,12) proved that majority of the students used the substance because it probably had positive influence on their academic performances. Those students who participated in the survey claimed their academic performances improved (36.5%) or were on the average (11.2%) as against the few (7.5%) whose performances still remained low or even poorer when the victim students experimented with the drugs. The use of alcohol, tobacco, cigarette, and marijuana is common in many developed countries. Similar study on trends and prevalence of these drugs among Ontario students revealed that alcohol, marijuana and tobacco were reportedly the major drugs being abused (Reginald and Edward, 1990). Similar results were further obtained in studies conducted in Costa Rica and the Bahamas when comparing the students' attitude towards drugs (Reginald and Sandra, 1990). In all, coffee and alcohol were the most significantly abused drugs among the students. The high consumption of alcohol in particular among the youth has been found to be associated with juvenile delinquencies resulting in unplanned and unprotected activities such as sexual intercourse (NIDA, 2016). In a Swedish study involving 71 sexually active adolescents, 40% of young men and 60% young women reported they had been drunk at the time of first sexual intercourse. Additionally, studies on the effects of the use of hard drugs such as marijuana by students and peers in the USA as attempts to improve upon academic performances or deal with the struggles and trials of everyday life has rather reportedly caused truancy and increased the level of school drop outs (NIDA, 2015; Dishion et al., 2002; Dishion et al., 2003).

Numerous risk factors have been indicated in the initiation and maintenance of drug use. From this study for all the schools, the main reason for student's abuse of drugs was to enhance academic performance. Other reasons include need for courage to undertake an adventure, the influence of peer groups, for pleasure, curiosity and when sick (these were stated by those who use marijuana, coffee, cigarette and alcohol in particular). Studies conducted much earlier in some tertiary institutions in Ghana have indicated a number of risk factors which vary from place to place (Newcomb et al., 1986; Emmanuel et al., 1990). A historical study done in the University of Ghana Medical School in 1972 by Jayson

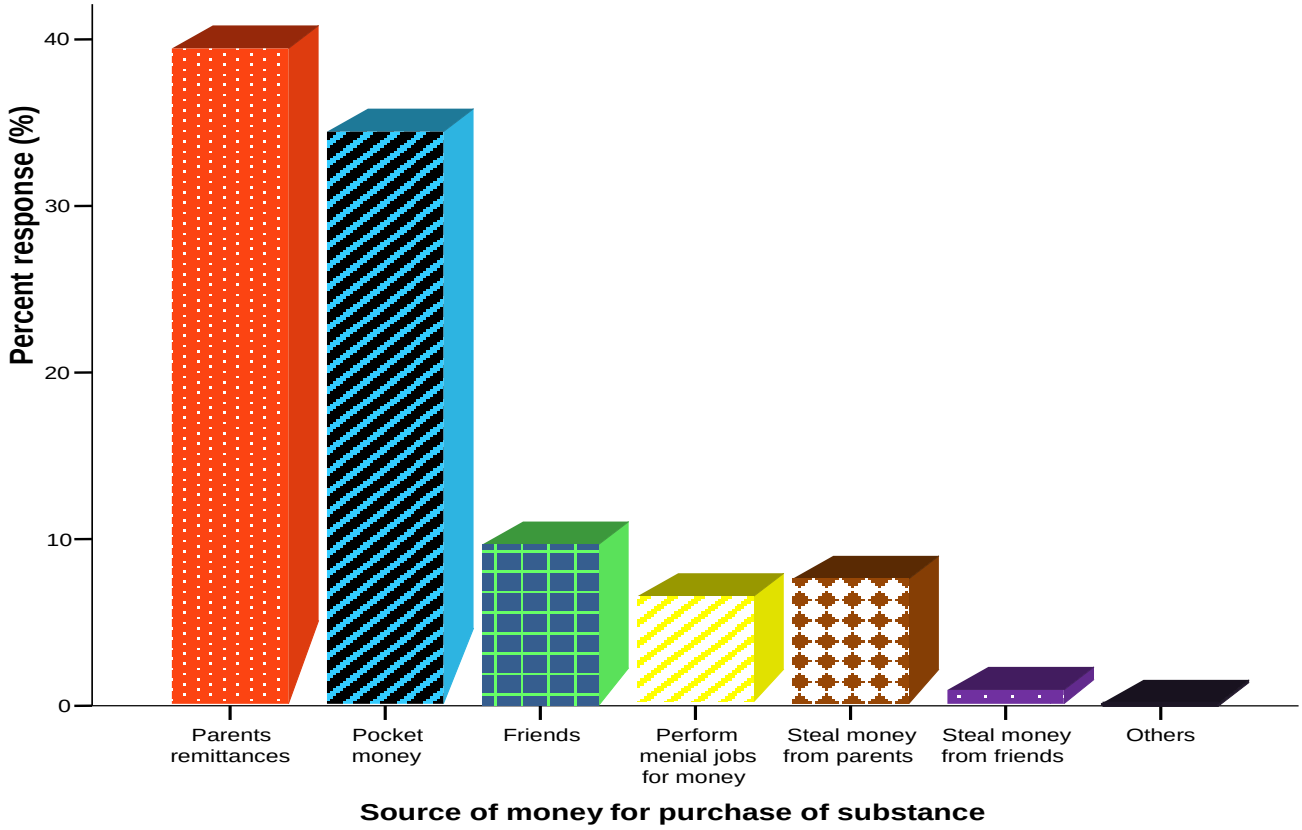

Figure 5. Source of money for purchase of the substances in the Bosomtwi and Atwima Kwanwoma District of Ashanti Region.

and Roger revealed that amphetamine, caffeine and marijuana were used for the specific purposes of aiding students in academic work. Reginald and Eduardo (1990) later found support for their hypothesis that youths use marijuana in particular, as a means to deal with their daily problems and to manage the negative effects such as depression and stress that accompany them. This is in conformity with this study in which the greater proportion of the students used the drugs to enhance their academic performance. The risk factors investigated in this study can be used as tools to help in solving the problems of drug menace.

Additional efforts made to identify the first time the students started using the drugs revealed that a greater proportion (95%) of them accessed abused the substances at their teen ages of between 11 and 20 years with likelihood ratios among the various age groups being asymptotically insignificant ($p<0.9$). Further, the greater proportion about 52% of the male students were found to abuse drugs at the adolescent age of less than 15 years but the female addicts accounted for about 45%. The differences in likelihood ratio of drug abuse among male and females were generally asymptotically insignificant ($p<0.07$) or linearly insignificant ($p<0.4$). It has been confirmed by studies in the US on stages of progression in drug involvement from adolescence to adulthood and further evidence from the gateway drugs that the average first use of any drug in USA is recently 11.5 years with male youths serving as the dominant group compared to their female counterparts (University of Michigan, 1998). This indicates that education and counseling on drug use should start at the primary level (Nora and Volkow, 2016; NIDA, 2016) and then, intensified at the Junior and Senior High School levels. Thus although 3 and 4 years old children would not be ready to learn the facts about alcohol or other drugs, they can begin to develop the decision-making and problem solving skills they would require later on. This affirms an earlier proposal towards educational guidance and counseling works, that, drug education should take place at all levels of education on the hazards of drug abuse (Kandel et al., 1992).

The student's responses show that majority (about 61%) of them were introduced to the substances by hospitals and parental contacts (Figure 4). On the contrarily, the data in Figure 5 shows that the main distribution channels (63%) of the substances rather comprise of the family and friends. The responses further confirm the fact that, personal contacts and probably other unknown point

sources could not be ruled out completely. In the USA for instance, there are legislative instruments to prevent teenagers from drug abuse. However, the family and friends have still been identified as the major sources of substance introduction to child abusers from a social learning perspective. Besides, the focus is directed toward intimate groups and the acquisition of values and certain beliefs that favor deviance and crime relating to drug abuse (Liguori et al., 1998; Nora and Volkow; 2016). Additionally, a greater proportion (72%) of responses show that the students' main source of money for the purchase of these drugs was through parents remittances which constituted their pocket money. This situation is rather aggravated in the families where parents are not permanently residing with their school going children but entrusts their children's welfare with relatives and keep providing the basic needs usually in terms of money. Similar cases have been detected where such students in associations with other peer groups engenders attitudes which favor frequent and more intense abuse of marijuana among the less protected youths (Liguori et al., 1998; Nora and Volkow, 2016).

The kind of family attachment was a major predisposing factor influencing the use of the various psychotropic substances**.** The cross tabulations on the family association in terms of whom each of the respondents lived with, the chi-square test on likelihood ratios and linear by linear association and symmetric measures further revealed that majority (54.2%) of the students lived with both parents as opposed to the few (40.33%) who were either lived with single parent (26.7%) or a relative (13.7%). However, the likelihood ratios, and linear-by-linear associations of student/family attachment as against the level of substance abuse were not asymptotically significant ($p<0.4$ and $p<0.2$). This could buttress the fact that students who even lived with their parents or relatives and are carefully monitored at home or school could still maneuver to acquire and abuse drugs through their personal efforts. Despite the debates over the nature, value, and importance of the family, there is substantial evidence that not only is marriage beneficial to both men and women, but also that all sorts of undesirable experiences and behavior related to drug abuse are more common among youths whose parents experience marital disruption (Dishion et al., 2002; Dishion et al., 2003; NIDA, 2015). Additionally, youths from families with married parents lived in much better economic environments compared to those from single parent families and youths in households with step-parents often do not perform well in school as those growing up with both biological parents (NIDA, 2016; Nora and Volkow, 2016). However, drug use among youths has long been found to be lowest in mother-father families (Hoffman et al., 1998). Thomas et al. (1996) report the highest rates of delinquency and substance abuse to be among White males in single mother households without the support of a non-resident father in the USA. Additionally, delinquency risk for males in step-families and single-parent families is double that of those living with both parents (Dishion et al., 2002; Dishion et al., 2003; NIDA, 2015).

Generally, the level of drug abuse was very high for coffee (93.7%), high for alcohol (50%) but low in the range of 1.5 to 39.9% for cigarette, marijuana, amphetamines and heroine in terms of preferences to these drugs and based on access and the various predisposing factors among the students. The psychotropic drugs most children use first are called "Gateway Drugs". This is because these children learn to accept and embrace the high feelings associated with its use (Kandel et al., 1992; Dishion et al., 2003; Nora and Volkow, 2016). It has been established that the preferential use of coffee and Gateway Drugs (alcohol, tobacco and marijuana and inhalants) is also a strong predictor for the future use of other drugs (Kandel et al., 1992, NIDA, 2016). In recent times the phenomenon of illicit use of drugs, especially, cocaine discussion on both the print and the electronic media attest to the seriousness of the drug menace (NIDA, 2016). However, the level of awareness of the effects was reported by the students to be high for both coffee (51%) and alcohol (71%) but appears to be low (24.8 to 44%) for cigarette, marijuana, amphetamines and heroine in their lumped responses from the various schools.

Conclusion

The study generally revealed that about 93.7% of students in Bosomtwi and Atwima Kwanwoma districts consume coffee apparently for increased concentration and to stay awake during examinations. About 42% of students in Bosomtwi and Atwima Kwanwoma districts consume alcohol apparently for mental alertness in class. The study revealed relatively low percentage of students who use other drugs such as cigarette, marijuana, amphetamines, cocaine and heroin. As much as 42% of the substance abusers had their point source supplies from home and 15% from friends. It was established that 51.8% of the drug abusers in the Bosomtwi and Atwima Kwanwoma districts public schools were males whiles 45% were females whose age distribution in the schools ranged from 11 to 20 years. The kind of family association was a major predisposing factor for learners drug use status because those who lived with single parents or separated parents consequently abused drugs due to poor, inadequate or unavailable parental care. The study generally revealed little improvement on academic performances in schools with increased drug use even though the extent of abuse has significantly increased for coffee and alcohol, and is most likely to involve the intensive use of cocaine, marijuana and heroin if appropriate measures are not adopted to curb current trends in the first and second cycle schools in the two districts.

Recommendations

1. School Management Committees (SMCs), Parent Teacher Associations (PTAs) and all stake holders in Education in the two districts need to be seriously involved in school management programs to assist in the implementation of anti-drug abuse campaigns through SHEP and other school club programmes.
2. Schools must occasionally organize lectures and symposia to highlight the negative effects of drug abuse, spelling out it devastating effects on the human body. Guidance and counseling departments in the second cycle institutions must set out their activities and counsel students to eschew drug abuse. Drug abuse should be treated as a topic in integrated science and Social studies at first and second cycle Institutions. It is recommended that the teaching of the topic should start at Basic level four (P.4) in the primary schools since 11 years old children experiment with drugs. Rewards must be made to schools whose students stayed clear of drugs. The faith based organizations must also lend its support to the effect. Preachers must incorporate in their sermons, hints on the dangers of drug abuse. The media, television, newspapers must all join the crusade against drug abuse. At home, teenagers must be made to go through proper socialization for a personality build up which could discourage them from taking drugs. Additionally, all forms of advertisements which tend to promote the use of drugs such as alcohol, marijuana etc. must be banned.
3. Juvenile deviance, peer pressure influence and drug abuse seminars and workshops should be organized in the beneficiary schools and communities with Parent Teacher Associations as the main target groups to address the problem of youth addiction to drugs among the vulnerable groups.
4. Further studies should be thoroughly structured and designed to assess the trend of psychotropic substance abuse and academic performances of students who depend on the combined use of two or more of these drugs so as to patch up the shortfalls of this study in future investigations.
5. Further studies should be conducted in these schools with detail and major improvement in the design of the questionnaire to specifically indicate the comparison in the actual level of abuse of the different psychotropic substances among the various schools and to establish a basis for selection of the students from different schools in the two districts for the study to improve the scope and quality of the study.

CONFLICT OF INTEREST

The authors declare that no conflict exist among themselves.

ACKNOWLEDGEMENT

The authors are grateful to God for the effort of the late Professor Thomas Kwadwo Djiang-Fordjor who left a legacy of intellectual wisdom with us by supervising this study towards the award of a Diploma in Education Certificate to Benjamin Makimilua Tiimub at the University of Education, Winneba. May his dear soul rest in perfect peace! We further acknowledge the joint works of Assabil James Kwesi at the Kwame Nkrumah University of Science and Technology for an MSc. Thesis in Environmental Science which constituted some aspects of the foundational data sources for our reviewed work in this authorship.

REFERENCES

Asperheim, M. K. (2002). Substance Abuse. Pharmacology an Introductory Text. *Journal of Southwest Tennessee Community College*, 7, 273-278.

Assabil, J. K. (2010). Abuse of psychotropic substances -a survey of some first and second cycle institutions in the Bosomtwi and Atwima-Kwanwoma Districts in Ashanti Region of Ghana. MS. Theses, College of Science, KNUST, 1-82. Available at http://hdl.handle.net/123456789/4651.

Ayerst, S. L. (1999). Depression and stress in street youth. *The Wall Street Journal*, 34, 52-94.

Bosomtwi Atwima-Kwanwoma District Assembly Profile (2001). National Centre for Social Research and the National Foundation for Educational Research. Ghana Book Publishers Association. 1, 1-5

Bumpass, L. L., & Lu, H. H. (2000). Trends in cohabitation and implications childrens' and adolescents' maladjustments. *American Journal of Population Studies*, 54, 29-41.

Chen, K. (2003). Epidemiology of Co-Occurring Substance Abuse and Psychiatric Disorders among Adolescents in the United States [A]: Report on the seventh national conference on drug dependence [2003]; 2003

Crowley, T. J., Macdonald, M. J., Whitmore. E. A., & Mikulich, S. K. (2007). Cannabis Dependence, Withdrawal, and Reinforcing Effects among Adolescents with Conduct Symptoms and Substance Use Disorders. Drug and Alcohol Dependence. Universit De Lyon, PhD Thesis, 114p.

Danquah, S. A. (1979). Drug abuse among Ghanaian students. *Psychopathologie Africaine*, 15(2), 201-211.

Dishion, T. J., Kavanagh, K., Schneiger, A., Nelson, S., & Kaufman, N. K. (2002). Preventing early adolescent substance use: A family-centered strategy for the public middle school. *Prevention Science*, 3(3), 191-201.

Dishion, T. J., Nelson, S. E., & Kavanagh, K. (2003). The family check-up with high-risk young adolescents: Preventing early-onset substance use by parent monitoring. *Behavior Therapy*, 34(4), 553-571.

Dittus, P. J., & Jaccard, J. (2000). Adolescents' perception of maternal disapproval sex: Relationship to sexual outcomes. *American Journal of Adolescent Health*, 26, 268-278.

Dorius, C. J., Bahr, S. J., Hoffman, J. P., & Harmon, E. E. (2004). Parenting practices as moderators in the relationship between peers and adolescents marijuana use. *American Journal of Marriage and the Family*, 66, 163-178.

Emmanuel, S. C., Ho, C. K., & Chen, A. J. (1990). Cigarette smoking among school Children in Singapore. *Singapore Medical Journal*, 31(3), 211-216.

Estrada, R., & Kanwal, R. P. (2002), A Distributional Approach to Asymptotics, Birkhäuser

Ghana Statistical Service (GSS 2002). Ghana Population Census. Summary Report on Final Report. March. Medial ties Co. Ltd.

Harada, T. (2010a). A new strategy for drug abuse treatment: The rationale and practice of the Matrix Model. *Japanese Journal of Alcohol Studies & Drug Dependence*, 45(6), 557-568.

Harada, T. (2010b). Evidence-based substance abuse treatment in penal institutions. *The Japanese Journal of Criminal Psychology*, 48(1), 51-64.

Haynie, D. L., & Osgood, D. W. (2005). Reconsidering peers and delinquency. How do peers matter? *American Journal of Social Forces*, 84, 1109-1130.

Hoffman, J. P., & Johnson, R. A. (1998). A national portrait of family structure and Adolescent substance use. *Journal of Marriage and the Family*, 60, 633-645.

Jayson, O., & Roger, A. L. (1972). Drug abuse Among Ghanaian Medical Students. Ghana Medical Journal, 11(3), 307.

Kandel, D. B., Yamaguchi, K., & Chen, K. (1992). Stages of Progression in Drug Involvement from Adolescence to Adulthood. Further Evidence for the Gateway Drug Theory. American Journal of Alcohol Studies, 45, 447-457.

Kirby, J. B. (2006). From single-parent families to step families: Is the transition associated with alcohol initiation? *American Journal of Family Issues*, 27, 685-711.

Liguori, A., Gatto, C. P., & Robinson, J. H. (1998). Effects of marijuana on equilibrium psychomotor performance and simulated driving. *Behavioral Pharmacology*, 9, 599-609.

Miller, P. D. (2006), Applied Asymptotic Analysis, American Mathematical Society.

National Institute on Drug Abuse (NIDA) (2016). Principles of Substance Abuse and Prevention for Early Childhood. A Research-Based Guide. Available at https://www.drugabuse.gov/publications/principles-substance-abuse-prevention-early-childhood/table-contents. Accessed March, 2016.

National Institute on Drug Abuse. (2015). Family Checkup: Positive Parenting Prevents Drug Abuse. Available at https://www.drugabuse.gov/family-checkup. Accessed August 2015.

Newcomb, M. D., Maddahain, E., & Bentler, M. P. (1986). Risk factors of drug use among adolescents, concurrent and longitudinal analyses. *American Journal of Public Health*, 76(5), 525-531.

Nora, D., & Volkow, M. D. (2014). Drugs, Brains, and Behaviour: The Science of Addiction.National Institute on Drug Abuse. Available at https://www.drugabuse.gov/publications/drugs-brains-behavior-science-addiction/preface. Accessed July, 2014

Nora, D., & Volkow, M. D. (2016). Marijuana, Facts Parents Need to Know. National Institute on Drug Abuse. Available at https://www.drugabuse.gov/publications/marijuana-facts-parents-need-to-know/letter-to-parents. Accessed June, 2016.

Owusu, A., & Bosumtwi-Sam, C. (2014). A Different Kind of Partnership: Ghana School-based Student Health Surveillance System (GSSHSS). Conference: 142nd APHA Annual Meeting and Exposition.

Owusu, A., O'Hara-Murdock, P., Bosumtwi-Sam, C., Campbell, K., Kann, L., & Riley, L. (2008). HIV/AIDS Risk Behaviors & Prevention Factors among Junior Secondary School Students in Ghana: Baseline Data from the 2007 Ghana GSHS.

Owusu, A., Weatherby, N., Bosumtwi-Sam, C., Revell, M., & Campbell, K. (2009). Evaluation of the School Sanitation and Hygiene Education (SSHE) Program in Ghana, West-Africa. Conference: 137st APHA Annual Meeting and Exposition.

Parcel, T. L., & Dufur, M. J. (2001). Capital at home and in the school: Effects on students' achievement. American Journal of Social Forces, 79, 88-912.

Paris, R. B., Kaminsky, D. (2001). Asymptotics and Mellin-Barnes Integrals. Cambridge University Press. 85, 8-9.

Pong, S. (1997). Family structure, school context, and eighth-grade maths and reading achievement. *American Journal of Marriage and Family*, 59, 734-178.

Regenerus, M. D., & Luchies, L. B. (2006). The parent-child relationship and opportunities for adolescents' first sex. *American Journal of Family Issues*, 27, 159-183.

Reginald, D. S., & Sandra, D. P. (1990). Comparison of alcohol, tobacco, and illicit drug use among Students and Delinquents in Bahama. *Bulletin of PAHO*, 24(1), 39-45.

Reginald, G. S., & Edward, M. A. (1990). Drug use in Ontario, Canada. *Bulletin of PAHO*, 24(1), 12-21.

Simons, R. L., Simons, L. G., & Wallace, L.E. (2005). *Families, delinquency and crime*. Oxford University press, USA. 1, 1-232.

Tettey, M. M. (1991). Drug abuse-A study of second cycle institutions in the Northern Region of Ghana. UNIVERSITAS (Kwame Nkruma University of Science and Technology). BSc. Theses (work not published).

Thomas, G., Farrel, M. P., & Barnes, G. M. (1996). The effects of single-mother families and nonresident fathers in delinquency and substance abuse in Black and White adolescents. *American Journal of Marriage and the Family*, 58, 884-894.

Triplett, R., & Payne, B. (2004). Problem solving as reinforcement in adolescent drug use: Implications for Theory and Policy. *American Journal of Criminal Justice*, 32, 617-630.

University of Michigan (1997). Drug use among American teens show signs of leveling after a long rise. News and Information Services. December 18, 1997.

Yangyouru, Y. (1987). The social correlates of psychotropic substance use by contemporary youth of Ghana. *UNIVERSITAS (University of Ghana)*, 9, 154-171.

Appendix 1

SURVEY INSTRUMENT ON SUBSTANCE USE INSTRUCTIONS:

SECTION A

Do not write your name on the sheet.
Fill in the spaces provide and just tick where necessary.

SECTION A 1

1. Age……
2. Sex: Male ☐ Female ☐
3. Name of School…….
4. Class/Form: ……...
5. (a) Occupation of mother (guardian):…….....
   (b) Occupation of father (guardian) ……..
6. Number of siblings in the family ……...
7. Whom do you stay with? Both parents: ☐ One of the parents: ☐
   A relative ☐

Appendix 1. Contd.

SECTION B

QUESTION ON SUBSTANCE USE

Knowledge of the use of substance (please tick)

	coffee	Alcohol	Cigarette	Marijuana	Amphetamine	Cocaine	Heroine
1. Ever heard of							
2. Know							
3. Ever used							
4. Never used							
5. Age at first use							
6. Still use							
7. Obtain from							
8. Awareness of effects							
9. Reasons for using							
10. Academic							
11. Who introduce you to the substance							
12. Where do you obtain the substance							
13. Source of money for substance?							

KNOWLEDGE OR AWARENESS LEVEL OF THE POSSIBLE EFFECTS OF SUBSTANCE USE

(Select the numbers of those applicable and put in the Table)

1. Awareness of effect of substance
   1. Fully aware
   2. Partially aware
   3. not aware
2. Reasons for using substance-
   1. It makes me feel good
   2. It “sharpens my brain”
   3. It gives me courage to act
   4. For relaxation
   5. Makes me feel high
   6. For energy
   7. Because of peer pressure
   8. Keeps me awake
   9. Other (specify)
   10. Has the use of the substance had any effect on your academic performance?
   Yes: ☐ No: ☐

b. If yes, what was your former exam position and your present exams position?
Better: ☐ Average: ☐ Lower: ☐ The same: ☐

11. Who introduced you to the substance?
1. Father 2. Mother 3. Brother 4. Sister 5. Friends 6. Hospitals 7. Self 8.Television
9. Pharmacy shops 10. House maid/Boy 11. Others (Specify)
12. Where do you obtain the substance?
1. Drug dealers 2. Hospital 3. Friends 4. Pharmacy shops 5. Drinking spots 6.Home
7. Others (Specify)
13. How do get money for the purchase of these substances?
1. Parents remittances 2. Pockets money 3. Friends 4. Perform menial jobs for money 5. Balance money from parents 6. Balance money from friends

Statistical Tables

Appendix 2. Cross tabulation of substance effect on academic performance.

Count

		has the use of the substance had anyeffecton your academic performance?			
		0	Yes	No	Total
SUBSTANCE USE	No response	2			2
	Positive	1	335	245	581
	Negative	17			17
Total		20	335	245	600

Appendix 3. Table of chi-square test on substance effect on academic performance.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	569.019[a]	4	.000
Likelihood Ratio	160.646	4	.000
Linear-by-Linear Association	75.743	1	.000
N of Valid Cases	600		

a. 4 cells (44.4%) have expected count less than 5. The minimum expected count is .07.

Appendix 4. Table of symmetric measures of substance use on academic performance.

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.356	.072	-9.304	.000[c]
Ordinal by Ordinal	Spearman Correlation	-.275	.057	-6.983	.000[c]
N of Valid Cases		600			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Appendix 5. Cross tabulation indicating whom the various respondents stay with.

Count

		whom do you stay with				
		Both parents	Single parent	A relative	Alone	Total
SUBSTANCE USE	No response	2				2
	Positive	325	160	82	14	581
	Negative	13	3	1		17
Total		340	163	83	14	600

Appendix 6. Table of chi-square tests on whom the various respondents stay with.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.578[a]	6	.599
Likelihood Ratio	5.897	6	.435
Linear-by-Linear Association	1.501	1	.221
N of Valid Cases	600		

a. 7 cells (58.3%) have expected count less than 5. The minimum expected count is .05.

Appendix 7. Table of symmetric measures on whom the various respondents stay with.

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.050	.032	-1.226	.221[c]
Ordinal by Ordinal	Spearman Correlation	-.051	.035	-1.244	.214[c]
N of Valid Cases		600			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Appendix 8. Cross tabulation of the age distribution of respondents against substance abuse.

Count

		Age group				
		11 - 15	16 - 20	21 - 25	26 - 30	Total
SUBSTANCE USE	No response	1	1			2
	Positive	301	272	7	1	581
	Negative	9	8			17
Total		311	281	7	1	600

Appendix 9. Table of chi-square tests on age distribution of respondents against substance abuse.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.272[a]	6	1.000
Likelihood Ratio	.525	6	.998
N of Valid Cases	600		

a. 7 cells (58.3%) have expected count less than 5. The minimum expected count is .00.

Appendix 10. Cross tabulation of sex distribution of respondents against substance abuse.

Count

		SUBSTANCE USE			
		No response	Positive	Negative	Total
sex	male		311	6	317
	female	2	270	11	283
Total		2	581	17	600

Appendix 11. Table of chi-square tests of sex distribution of respondents against substance abuse.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.452[a]	2	.108
Likelihood Ratio	5.233	2	.073
Linear-by-Linear Association	.797	1	.372
N of Valid Cases	600		

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is .94.

Appendix 12. Table of symmetric measures on sex distribution of respondents against substance abuse.

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.036	.041	.893	.372[c]
Ordinal by Ordinal	Spearman Correlation	.037	.041	.907	.365[c]
N of Valid Cases		600			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.