ORIGINAL ARTICLE

Substance abuse and sexual frequency among youths: implications for sexually-transmitted infections in Nigeria

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Abstract

Substance use is one of the key factors that predispose young people to sexually frequent behaviors. This study therefore investigates the implications of substance abuse and sexual frequency for sexually transmitted infections among Nigerian youths.

The study used quantitative data from the National HIV/AIDS and Reproductive Health Survey (NARHS Plus II, 2012). The data for the study were analyzed using three levels of statistical analysis while, two statistical techniques were used and five models were constructed to test the formulated hypotheses The study reveals that the estimate incidence of relative risk (IRR) of substance abuse on sexual frequency confirmed a positive significant effects for both adjusted and unadjusted data (Smoking cigarette, unadjusted OR=.19 P-value=.000, adjusted OR=.33 P-value=.000; consuming alcohol everyday unadjusted OR=1.07 P-value=.000, adjusted OR=1.40 P-value=.000). While a significant relationship between substance abuse, sexual frequency, and likelihood of contracting STIs was established in the study (P-value<.005). The study concludes that there is need for education on substance abuse among young people.

Keywords: Abuse, Sexual Frequency, STIs, Youth.

INTRODUCTION

In traditional African narrative, substance use by youths was never a practice in which socialization envisaged. Therefore, socialization did not provide for the containment of that moral issue. Trendy alternative lifestyles that African youth freely access online and on other electronic media have predisposed the current generation of youth to substance abuse. The law as a colonial heritage defines the act of substance abuse by youth as a status offence. While sex was traditionally held

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as a practice reserved primarily for procreation, its excitement-satisfying function was an imported value into Africa. Therefore, the implications of substance abuse and sexual frequency for sexually transmitted infections among Nigerian youths are extensive in the West just as they are among adolescents in Macau (1), and probably in Nigeria. In Nigeria, substance use is one of the key factors that predispose young people to sexually frequent behaviours. Therefore, substance use and sexual frequency have considerable economic and substantial public health implications for Nigeria. Moreover, in the West, studies have shown that a strong relationship exists between substance abuse and risky sexual behaviour among adolescents (2).

Sufficient western research evidence supports the likelihood that substance abuse may influence adolescent sexual behaviour (3). The associations between substance use and sexual behaviour are complicated, with empirical causal evidence for the relationships in both directions, and for mutual reasons of both behaviours, contingent on the environment and residents (4; 5; 6). Among youths, the extraordinary frequency of harmful substance use, thrill-seeking, and sensation-seeking actions causes difficulty in measuring the causal elements of frequently detected connotations between substances and sexual consequences (4; 7; 8). Among the likely negative outcomes of heavy substance consumption for sexual health among youths are those previously singled out in younger people, such as STIs, unwanted pregnancies, and lamented sexual involvements (9). In this article, our objective is to examine the role of substance abuse in sexual frequency and outcomes among Nigerian youths.

In the first study to examine the association between substance use and frequency of sexual intercourse in the United States at the population level, Eisen-

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berg (10) observed that substance use, specifically marijuana use is very widespread. But he added that its significant use and association with sexual frequency had not been considerably studied scientifically. To the extent that Nigeria uses an admixture of Western and traditional African values to socialize her youths and only a little research attention has been given to the impact of substance abuse and sexual frequency on STIs among Nigerian youths so socialized, this investigation cannot be more timely. Research studies conducted in the West indicate a strong relationship between substance abuse and risky sexual behaviour among young people (11). Whereas risky sexual behaviour emphases adverse health aspects, such as sexually transmitted diseases, relatively little research attention about the sexual misconduct of young people exist in Nigerian communities. The influence of peers on adolescents is significant. Research has indicated that it is inborn for humans to interact with compatible individuals (12, 13). However, empirical evidence supports the claim that a peer group exerts a substantial influence on decision making regarding sexual activities (14, 15).

Generally, empirical findings on the relationship between substance abuse and risky sexual behaviour are inconclusive. On the one hand, researchers stated that substance abuse leads to risky sexual behaviour owing to the disinhibition effect (11, 16), some researchers claimed that risky sexual behaviour leads to substance abuse (4) on the other. Studies on deviant behaviour in the area of substance abuse by young people have revealed that it is associated with having generous sexual sentiments or being sexually active (17, 18). Earlier studies have also indicated that substance abuse plays a role that positively correlates with involvement in risky sexual behaviour among younger people (19, 20, 21, 22, 23). Although numerous studies have socially observed the associations between substance use and sexual frequency in the course of adolescence, few of any degree has been conducted in Nigeria. In this connection, research is required to increase the understanding of the scientific community about what shapes sexual frequency, particularly the role of substance abuse, and their consequences to send critical signals to policymakers for necessary and effective interventions.

It is in this regard that the present study answers the following questions. (i). Does substance abuse influence sexual frequency among youth in Nigeria? (ii). Is there any relationship between substance abuse and the transmission of STIs in Nigeria? (iii). What is the relationship between substance abuse and the use of condoms among youth in Nigeria? (iv). Does substance abuse influence sexual risks among youth in Nigeria? The present study used the data collected from a large sample of Nigerian youths in 2012 to fill the gaps in youth substance abuse and sexual frequency. We, therefore, hypothesize that (i). Substance abuse might be the crucial factor triggering sexual frequency among youths in Nigeria. (ii). There is a significant relationship between substance abuse and STIs transmission and (iii). Substance abuse may likely influence sexual risks (having multiple partners, non-use of condoms during sexual intercourse, having concurrent partners, contacting STIs) youth in the study area.

MATERIALS AND METHODS

Study setting

The study used quantitative data from the National HIV/AIDS and Reproductive Health Survey (NARHS Plus II, 2012). The data were a nationally representative survey carried out in Nigeria to provide information on key HIV & AIDS and reproductive health knowledge and behaviour related issues. The survey was unique because it includes biological marker components (HIV testing) and was called NARHS Plus II. Data collection took place between September and December 2012. The 2012 NARHS Plus comprises two components: Behavioural survey and HIV Testing. In addition, the survey provided information on the situation of reproductive and sexual health in Nigeria, the variety of factors that influence reproductive and sexual health.

Sampling technique and sample size

Multi-stage cluster sampling method was used to select eligible persons with known probability. Stage 1 involved the selection of rural and urban localities. Stage 2 involved the selection of Enumeration Areas (EA) within the selected rural and urban localities.

Stage 3 involved the listing and selection of households while stage 4 involved selection of individual respondents for interview and testing. Overall, 35,520 households and 35,520 individual respondents were selected for final interview of which 32,190 households (91%) and 31,235 individuals (88%) were successfully interviewed; resulting in a 2.5% non-response rate. The sample population consists of 15,596 males and 15,639 females. The respondents were drawn from all females aged between 15 and 49 years and males aged 15 to 64 years living in regular households in Nigeria drawn from the updated master sample frame of rural and urban localities and Enumeration Areas developed and maintained by the National Population Commission (NPC) ((NARHS Plus II, 2012). A total of 24,152 of the individuals that responded to the interview (which represent 78%) were successfully tested for HIV. The data set for young never married within 15-24 years was used for the study. Those respondents who are currently consuming alcohol and cigarette or other substances such as cocaine, heroin, and marijuana were selected from the young never married data.

Variable measurement

Sexually transmitted infections were measured by whether the respondent is tested HIV Positive or not. This was re-coded to positive =1, negative =0. The sexual frequency was measured by the total number of times sex with sexual partner(s) occurred within the three months preceding the survey which is a count data. Risky sexual behaviour was also measured by having multiple partners (having multiple sexual partners yes =1, no=0) and non-use of condoms during sexual intercourse (use condom=0, non-use =1). The proximate variables identified were level of education of respondents, age, sex, religion, age at first intercourse, and away from home for more than one month. While the independent variable was substance abuse which was measured by currently smoking cigarettes was merged with smoking other things apart from cigarettes and consuming alcohol. The smoking cigarette was classified into smoking=1 not smoking =2 while drinking alcohol every day =1, others =2

DATA ANALYSIS

The data analysis employed Stata14.0 software. The data for the study were analyzed using three levels of statistical analysis, univariate to show the frequency distributions of the socio-demographic characteristics of the respondents', proximate variables and explanatory variables comparing substance users with non-users. The Bivariate analysis was used to show the differentials in the socio-economic characteristics of the respondents and the use of substance among young never married in the study area. For multivariate analysis, two statistical techniques were used and five models were constructed to test the formulated hypotheses. These models were also adjusted with proximate variables (see Table 1) Binary logistic regression was used to show the relationship between outcome variables which can be dichotomized (HIV test result and risky sexual behaviours i.e. non-use of condom during sex and having multiple sexual partners) and independent variable (substance abuse). While Poisson regression was used to estimate the incidence of relative risk (IRR) of substance abuse (smoking cigarettes and drinking alcohol every day) and sexual frequency (count data).

Ethical consideration

The authors obtained oral permission for the use of the data from National Agency for the Control of AIDS (NACA.) office in Abuja. The data was given to the Department of Demography and Social Statistics Federal University Oye-Ekiti for research purpose in July 2014 during our field trip visit to the organization. The confidentiality of study participant information was maintained throughout the analysis by not using any identifier related to the participants in the data collection. On ethical considerations, the absence of an IRB in my institutional affiliation may shock non-Africans. Nevertheless, it is the truth; the institution was established in 2012.

RESULTS

Table 2 reveals the selected characteristics of the respondents, from the study it was observed that majority of the respondents are between aged 20-24years while 71.73% were males. More than two-thirds of the respondents had secondary education at the same time 72.39% are non-Catholic Christians. Whereas forty-three percent of the respondents indicated that they had been away from home for more than one month in the last twelve months preceding the survey. The sexualbehaviour of the respondents depicts that 56.45% had sexual intercourse 12 months preceding the survey while 36% had two or more sexual partners. Regarding condom use, half of the respondents ever used condoms while 3.30% among those tested are HIV/AIDS positive. Among the sampled population, nearly 71% consumed alcohol every day while 10.07% are currently smoking cigarettes and other substances such as Cocaine, Heroin, and Marijuana.

Table 3 shows the percentage distribution of selected characteristics of the respondents and substance abuse, it is pertinent to note that males are the highest substance abusers (Drinking Alcohol everyday male 73.36% female 26.64% □2 P-value = .000, Smoking cigarette male 91.5%, female 8.49 □2 P-value =.000) in the study area same as those in aged 20-24years (consuming Alcohol everyday 20-24years 55.96% 15-19years 33.94% □2 P-value = .097, Smoking cigarette 20-24years 55.96% 15-19 years 33.94% □2 P-value = .006). The significant relationship was also established between religion, use of condoms, age at first sex, and smoking (□2 P-value <.001) while those who are away from home for more than one month have a significant likelihood of drinking alcohol every day (□2 P-value= .005).

The logistic regression of substance abuse and risky sexual behaviours in Table 4, pointed out the higher significant relationship between having multiple partners and substance abuse with the unadjusted data (P-value <.001). When the data was adjusted with the confound variables the significant effect of the smoking cigarette with having multiple partners was revalidated (adjusted data Smoking cigarette odds ratio 2.50, P-value <.001). In the same vein, a significant relationship was established between smoking and non-use of condoms in the study area even when the data was adjusted with confound variables (unadjusted data smoking 3.74 P-value <.001

adjusted data smoking 2.57 P-value <.001).

In model three, the poison regression validated the significant relationship between substance abuse and sexual frequency for both adjusted and unadjusted data in the study (P-value <.001) (Table 5). It is also noteworthy that the higher significant effect of drinking alcohol every day and sexual frequency was affirmed when compared with the reference category those who drink occasionally or seldom (unadjusted data odds ratio 1.07 P-value <.001, adjusted data odds ratio 1.40 P-value <.001).

The logistic regression of substance abuse, sexual frequency, and HIV in Table 6 shows a higher significant effect of consuming alcohol every day with the likelihood of having HIV in the study area. When the sexual frequency was added to the model, the significant impact of smoking and sexual frequency was reaffirmed with the likelihood of having HIV in the study area (P-value <.001). In the same context, when the data was adjusted with the confound variables, smoking was significant with the likelihood of having HIV (P-value <.001). While the higher significant effect of sexual frequency on the likelihood of having HIV was enacted in the study (adjusted data odds ratio 9.73 P-value <.001).

DISCUSSION

The study has reaffirmed the relationship between substance abuse, sexual frequency, and STIs in Nigeria. It was observed in the study that the majority of those who are involving in substance abuse had secondary education. Studies have established a significant association between formal educational attainment and range of individual health outcomes and risks such as drinking alcohol, smoking cigarette, and other substances (3, 4). Illicit substance abuse may hinder the opportunity for scholarship and other forms of financing higher education thereby constrained the abusers not to further their education beyond the secondary school level (33). Substance abuse may simply decrease academic performance, shifting individual resources from schooling to substance use, and lead to higher failure and increase drop-out rates. In a study in Nigeria among students and out of school youths in urban areas, a positive relationship was observed between substance abuse in the early stage of life and risk of early school dropout in addition to involvement in deviant adolescent behaviours (34). Similarly, the significant relationship established between age at first sexual intercourse and smoking among the respondents aligned with the previous researches (2,7).

A Survey conducted in the United States of America found out that more than five million adolescents have unprotected sex at an early age because of alcohol and drug use. Substance abuse normally acts as a gateway for risky behaviour such as having sexual intercourse at an early age. Since the purpose of drinking alcohol or smoking of cigarette and other substances among adolescents varies, some for sensation seeking and desire for hallucination especially in developed countries while in developing countries alcohol abuse is strongly seen as a means of tension relief and coping mechanisms to reduce emotional problems (35, 36). Risky behaviour can be exhibited under the influence of substance intoxication, in some instances alcohol is seen as a facilitator of sexual encounter and maleness, enhancer of sexual experience, and an excuse for irresponsible behaviour. A study conducted in eight countries on alcohol and sexual behaviour reports that respondents believed that alcohol facilitated or enhanced sexual intercourse, reduce fears connected to sex, provide extra power for sex, delayed orgasm, decreased sexual inhibition and help to build the courage to approach a possible sexual contact (37).

The significant association between substance abuse and risky sexual behaviour (having multiple sexual partners and non-use of condoms during sexual contacts) was also validated in the study. Substance abuse may increase the likelihood of youth engaging in risky sexual behaviour with the tendency of contracting STIs. A study in Ethiopia found out that more than two-thirds of the street children who are abusers of substances did not protect themselves during their last sexual intercourse despite the fact that they also have multiple partners (38). A similar study conducted in South Africa among the street youth pointed out that the need for economic sustenance led the youth to risk-taking such as inability to obtain condoms, having multiple sex partners, and

taking of drugs (39). Reasons for not using condoms among the street youth include; it decreases sexual pleasure and difficulty in using condoms during the heat period (38). In the same vein, a study in Ghana documented that smoking, Tawa use, tobacco use; drunkenness, marijuana use, and other drug use were all associated with sexual debut and number of sexual partners. It was also noted that substance abuse independently increases the chances of having multiple partners, those who use substances have 8 to 16 folds of chances of having multiple sex partners when compared with non-users (40). While among females transactional sex was a strong factor for having multiple sex partners and non-use of condoms during the sexual debut.

Furthermore, a study among the homeless youth in Ghana revealed that 54% of the sampled population had sold their body for food, money and even a place to sleep, with females more likely to engage in such behaviours than males. At the same time, age at first intercourse was positively related to having multiple sexual partners with low condoms use among adolescents using substances (41). On the other hand, it was reported that respondents who had a greater number of sexual encounters under the influence of alcohol were more likely to use condoms than others since drinking often takes place in settings where potential sexual partners are available (42). Study in India reveals that those youth with higher education are more risk averters in terms of condoms use than less-educated youth despite consuming alcohol before sex (43). In addition, the higher significant effect of drinking alcohol every day on sexual frequency observed in the study consolidated the earlier findings of substance abuse and sexual frequency (42, 11).

Study in America reported that those who drink alcohol regularly have the likelihood of having multiple sexual partners; this is to satisfy the increased sexual libido. It was also reported that the sexual frequency of the respondent under the influence of alcohol was positively associated with condoms use (44). An increase in the use of substances may likely increase the number of sexual encounters and as well as engaging in risky behaviour such as non-use of condoms and having multiple sexual partners. A study found marijuana use to be positively related to increased sexual frequency (45, 46). The complexity

of the impact of substance use on sexual activity was also noted in some literature (46, 47, 48) while the use of cocaine has been found to delay orgasm, enhance sexual pleasure, increase frequency of sex, and arousal. On the other hand it is also associated with erectile dysfunction, diminishes sexual desire, and hampers orgasm (47, 48). Nevertheless, the significant relationship between substance abuse, sexual frequency, and STIs is evident in this study. Studies have pointed out that less knowledgeable youth who consumed alcohol has a likelihood of contracting HIV and STDs (39). Alcohol consumption is not only an originator of risky sex but also as an outcome of it.

A cross-sectional analysis of alcohol and drug use during sexual activity and compliance with safe sex guidelines for AIDS showed that use of drugs or substances during sex, the number of drugs used during such activity, and the frequency of combining drugs and sex are all positively related with risky sexual activity for AIDS (49). The factors responsible for the interaction between alcohol use and sexual behaviour that posed risks for STI/HIV infection include the construction of manliness in terms of alcohol use; a denial and neglect of risk as a way of coping with life; the use of alcohol-serving venues as contact places for sexual encounters; the use of alcohol at/during (first) sexual encounters; and the promotion of alcohol use in pornographic material (37). Study in Ghana shows the vulnerability of youths to HIV/AIDS as a result of high levels of sexual risk behaviour (multiple sexual partners, involvement in survival sex, and irregular condoms use) in contexts of high alcohol and drug use (40). On the other hand, HIV risk behaviour among youth normally influenced by interpersonal processes such as peer group norms, perceived gender roles, lack of communication skills to negotiate condoms use, and their understanding of love, sex, and relationships. The positive influence of peer pressure on substance and drug use, likelihood to become sexually active at an early age, have more sexual partners and probability to practice unsafe sex with the implication of contracting HIV has been established (50,51).

Above all, the 2.9% prevalence rate of HIV/AIDS among the selected sample size is a confirmation that HIV/AIDS are more common among high-risk

groups such as the mobile population (truck drivers, migrant workers), commercial sex workers, among homosexuality, drug users, and prison inmates. Systematic planning is required not to move from a perceived problem to intervention. There is a need to reduce consumptions of substances including alcohol among youths in the study area through different interventions such as introduction of zero blood alcohol tolerance among adolescents in schools and young mobile workers especially drivers, this will also reduce road accidents. It is also necessary for a media campaign about health warnings associated with substance abuse through fear messages; this may reduce the consumption and risk of contracting HIV/AIDS.

LIMITATION OF THE STUDY

There are major limitations in this study. Firstly, the study used cross-sectional data which makes it impossible to demonstrate whether substance use has a direct, causal effect on risky sexual behaviour: Secondly, this study assesses only general substance use (Drinking Alcohol every day and smoking) and not the frequency of substance use with sex.

CONCLUSIONS

Intense patterns of substance use were some of the most powerful correlates of youth's engagement in frequent sexual activities. The study has reaffirmed the established relationship between substance abuse, sexual frequency, and sexually transmitted infections in the study area. The intricate relationship between substance use and sexual frequency requires further investigation in some culture-specific communities of Nigeria to determine the cultural elements that account for variation in the rate of STIs. Since it has been established that HIV/AIDS is being majorly transmitted through sexual intercourse especially among high-risk groups. Further research should examine other health challenges associated with young people's sexual frequency outside STIs.

INFORMATION

REFERENCES

1. Li, S.D., Zhang, X., Tang, W., & Xia, Y. Predictors and implications of synthetic drug use among adolescents in the gambling capital of China. SAGE Open 2017 .

2. Ritchwood, T., Ford, H., DeCoster, J., Sutton, M., & Lochman, J. Risky sexual behavior and substance use among adolescents: A meta-analysis. Child. Youth Serv. Rev. 2015 52, 74–88.

3. Graves, K.L. & Leigh, B.C. The relationship of substance use to sexual activity among young adults in the United States. Fam. Plan. Perspect. 1995, 27, 18–33.

4. Cooper, M. L. Alcohol use and risky sexual behavior among college students and youth: evaluating the evidence. J Stud Alcohol Suppl 2002:101–17 pmid: 12022716

5. Levitt, A. & Cooper, M. L. Daily Alcohol Use and Romantic Relationship Functioning: Evidence of Bidirectional, Gender-, and Context-Specific Effects. Pers Soc Psychol B 2010; 36:1706–22

6. Ramrakha, S., Paul, C., Bell, M. L., Dickson, N., Moffitt, T. E., & Caspi. The relationship

between multiple sex partners and anxiety, depression, and substance dependence disorders: a cohort study. Arch Sex Behav 2013; 42:863–72

7. Halpern Felsher, B. L., Millstein, S. G., Ellen, J. M. Relationship of alcohol use and risky sexual behavior: A review and analysis of findings. J Adolescent Health 1996; 19:331–36

8. Kiene, S. M., Barta, W. D., Tennen, H., & Armeli, S. (2009). Alcohol, helping young adults to have unprotected sex with casual partners: findings from a daily diary study of alcohol use and sexual behavior. J Adolesc Health 2009; 44:73–80 pmid: 19101461

9. Swartz, L. H., Sherman, C. A., Harvey, S. M., Blanchard, J., Vawter, F., & Gau, J. Midlife women online: evaluation of an internet-based program to prevent unintended pregnancy & STIs. Journal of women & aging 2011; 23:342–59

10. Eisenberg, M. (2017). Regular marijuana use linked to more sex, study finds. Retrieved on July 11, 2019, from https://bit.ly/3hP74Rx

11. Ritchwood, T.; Ford, H.; DeCoster, J.; Sutton, M.; & Lochman, J. Risky sexual behavior and substance use among adolescents: A meta-analysis. Child. Youth Serv. Rev. 2015, 52, 74–88.

12. Brown, B.B.. Adolescents' relationship with peer. In Handbook of Adolescent Psychology, 2nd ed.; Lerner, R.M., Steinberg, L., Eds.; John Wiley Sons: Hoboken, NJ, USA, 2004 363–394. 7

13. Rose, R.J. How do adolescents select their friends? A behavior-genetic perspective. In Paths to Successful Development: Personality and the Life Course; Pulkkinen, L., Caspi, A., Eds.; Cambridge University Press: Cambridge, UK, 2002 p. 106–125. 7

14. Khan, M.R.; Berger, A.T.; Wells, B.E.& Cleland, C.M. Longitudinal associations between adolescent alcohol use and adulthood sexual risk behavior and sexually transmitted infection in the United States: Assessment of differences by race. Am. J. Public Health, 2012; 102, 867–876.

15. Whitbeck, L.B.; Yoder, K.A.; Hoyt, D.R. & Conger, R.D. Early adolescent sexual activity: A developmental study. J. Marriage Fam. 1999; 61, 934–946.

16. Perkins, D.F.; Luster, T.; Villarruel, F.A. & Small, S. An ecological, risk-factor examination of adolescents' sexual activity in three ethnic groups. J. Marriage Fam. 1998; 60, 660–673.

17. Baskin-Sommers, A. & Sommers, I. The co-occurrence of substance use and high-risk behaviors. J. Adolesc. Health, 2006; 38, 609–611.

18. Leigh, B.C. & Stall, R. Substance use and risky sexual behavior for exposure to HIV: Issues in methodology, interpretation, and prevention. Am. Psychol. 1993; 48, 1035–1045.

19. Santelli, J.S.; Robin, L.; Brener, N.D. & Lowry, R. Timing of alcohol and other drug use and sexual risk behaviors among unmarried adolescents and young adults. Fam. Plan. Perspect. 2001; 33, 200–205.

20. Tapert, S.F.; Aarons, G.; Sedlar, G. & Brown, S. Adolescent substance use and sexual risk-taking behavior. J. Adolesc. Health, 2001; 28, 181–9.

21. Turchik, J.A.; Garske, J.P.; Probst, D.R. & Irvin, C.R. Personality, sexuality, and substance use as predictors of sexual risk taking in college students. J. Sex Res. 2010; 47, 411–419.

22. Clarke, R. V. and Cornish, D. B. (1985). Modelling offender' decisions: a framework for research and policy. Crime and Justice. 1985; 6, 147-185

23. Hedstrom, P., & Stern, C. Rational choice and sociology. In L. Blume & S. Durlauf (Eds.), The New Palgrave dictionary of economics. Basingstoke: 2008 Palgrave Macmillan.

24. Crenshaw, M. How terrorists think: What psychology can contribute to understanding terrorism. In L. Howard (Ed.), Terrorism: Roots, impact, responses.1992 New York: Praeger.

25. Sandler, T., and Lapan. H. E. The calculus of dissent: An analysis of terrorists' choice of targets. Synthese, 1988; 76, 245-261.

26. Wilson, M. A. Toward a model of terrorist behavior in hostage-taking incidents. Journal of Conflict Resolution, 2000; 44, 403-324.

27. Cohen, L.E., &Felson, M. Social change and crime rate trends: A routine activity approach. American Sociological Review, 1979; 44, 588 - 608.

28. Felson, M., & Cohen, L. E. (1980). Human ecology and crime: A routine activity approach. Human Ecology, 1980; 8(4), 389–405.

29. Gottfredson, M. R., & Hirschi, T. A. A general theory of crime. Stanford, CA: 1990 Stanford University Press.

30. Cullen, F.T., Agnew, R. & Wilcox, P. Criminological Theory: Past to Present (5th Ed.). New York: 2014, Oxford University Press.

31. Register CA, Williams DR & Grimes PW Adolescent Drug Use and Educational Attainment Education. Economics 2001 9:(1)

32. Abot, I Substance use among students & out of school youth in Urban Area of Nigeria World Health Organization (2005).

33. Li X, Stanton, B, Cottrell, L, Burns, J, Pack, R & Kaljee, L. Patterns of initiation of sex and drug-related activities among urban low income African-American Adolescents. Journal of Adolescent Health. 2001; 28(1).

34. Madhavika B. Nayak, Racheal A. Korcha and ivek Benagal. Alcohol use, mental health and HIV related risk behaviour among adult men in Karnataka. AIDS and Behaviour. 2010: 14.Supplement 1.

35. World Health Organization Alcohol Use and Sexual Risk Behaviour: A Cross-Cultural Study In Eight Countries 2005, Geneva

36. Habtamu D, Adamu A. Assessment of sexual and reproductive health status of street children in Addis Ababa. J Sex Transm Dis, 2013:1–20.

37. Robinson, T., Thompson, T. and Bain, B. Sexual risk-taking behavior and HIV knowledge of Kingston's street boys. Journal of HIV / AIDS Prevention and Education for Adolescents and Children, 2001 4(2-3):127-47.

38. David Doku. Substance use and risky sexual behaviours among sexually experienced Ghanaian youth BMC Public Health . 2012, 12:571 https://bit.ly/3AjdY8d

39. Oppong Asante waku, Meyer-Weitz Anna a & Petersen Inge. Substance use and risky sexual behaviours among street connected children and youth in Accra, Ghana. Substance Abuse Treatment, Prevention, and Policy 2014, 9:45 https://bit.ly/3Gpu4AW.

40. Graves Karen L and. Leigh Barbara C. The Relationship of Substance Use to Sexual Activity Among Young Adults in the United States. Family Planning Perspectives. 1995: 27(1)

41. Singh S. K & Das Arup (2011) Interface of Alcohol And Risky Sexual Behaviour Among Adolescents and youth in Low Income Slums of Mumbai, India. The Journal of Family Welfare 2011: 57(2)

42. Leigh BC. The relationship of substance use during sex to high-risk sexual behavior. Journal of Sex Research. 1990;27:199–213

43. Sun, A. J., & Eisenberg, M. L. Association between marijuana use and sexual frequency in the United States: A population-based study. The Journal of Sexual Medicine, 2017: 14(11), 1342–1347. https://bit.ly/2APes6v

44. Probs, C., Manthey, J., Martinez, A., & Rehm, J. Alcohol use disorder severity and reported reasons not to seek treatment: A

cross-sectional study in European primary care practices. Substance Abuse Treatment, Prevention, and Policy, 2015: 10, 1–10. https :// doi.org/10.1186/s13011-015-0028-z.

45. Nicholson, K. L., & Balster, R. L. GHB: A new and novel drug of abuse. Drug and Alcohol Dependence, 2001 63, 1–22. https://doi.org/10.1016/S0376-8716(00)00191-5

46. Stall R, McKusick L, Wiley J, Coates TJ, & Ostrow DG. Alcohol and drug use during sexual activity and compliance with safe sex guidelines for AIDS: the AIDS Behavioral Research Project. 1986 Health Educ Q.;13(4):359-71.

47. Swartzendruber A, Sales J, Brown J, DiClemente R, Rose E. patterns of recent alcohol and marijuana use as predictors of condom use, pregnancy and sexually transmitted infections during 18-months of follow-up among African-American female adolescents. Sex Transm Infect. 2013;89(Suppl 1):A148–A148.

48. Substance use and other risk factors for unprotected sex: results from an event-based study of homeless youth.Tucker JS, Ryan GW, Golinelli D, Ewing B, Wenzel SL, Kennedy DP, Green HD Jr, Zhou A AIDS Behav. 2012 Aug; 16(6):1699-7

Table 1. Variables used in the substance abuse models.

	Model 1 Having Multiple Partnership	Model 2 Condom use	Model 3 Sexual Frequency	Model 4 STIs (HIV Test Result)
Dependent Variable	Yes= 1 No=0	None- use of Condom = 1 Use condom= 0	Sexual Frequency (Count data)	Positive=1 Negative=0
Independent variables	Drinking Alcohol Drinking Everyday =1 Others =0 Smoking Cigarette and other substance Smoking=1 Not smoking=0	Drinking Alcohol Drinking Everyday =1 Others =0 Smoking Cigarette and other substance Smoking=1 Not smoking=0	Drinking Alcohol Drinking Everyday =1 Others =0 Smoking Cigarette and other substance Smoking=1 Not smoking=0	Drinking Alcohol Drinking Everyday =1 Others =0 Smoking Cigarette and other substance Smoking=1 Not smoking=0
Statistical techniques	Binary Logistics	Binary Logistics	Poisson Regression	Binary Logistics

Explanatory variables: Age of respondents - Age at first sex – Sex – Mobility - Level of Education - Exposure to mass media – Religion.

Table 2. Percentage Distribution of Selected Characteristics of the Respondents.

Variables	Frequency	Percentage
Age of individual		
15-19years	461	43.74
20-24years	593	56.26
Total	1054	100
Sex		
Male	756	71.73
Female	298	28.27
Total	1054	100
Highest Level of Education		
Qur'anic only	9	.90
Primary	108	10.33
Secondary	739	74.12
Higher	141	14.14
Total	1054	100
Religion		
Islam	107	10.15
Non-Catholic Christian	656	72.39
Catholic	270	25.62
Traditional	9	. 85
No religion	12	1.15
Total	1054	100
Away from your home for more than one month		
Yes	455	43.21
No	599	56.79
Total	1054	100
Had sex in the last 12 months Preceding the survey		
Yes	595	56.45
No	8	.76
Non-Response	451	42.79
Total	1054	100
*HIV Test Result		
Negative	851	96.70
Positive	29	3.30
Total	880	100
*Sex partner(s) in the last 12 months	951	100
0	16	2.67
1	367	63.94
2 or more	216	36.06
Total	599	100
Age at First Intercourse		
0-14years	98	9.32
15-19 years	456	43.39
20 & above	80	7.61
Don't know	417	39.68
Total	1054	100
Drinking Alcohol		
Drinking Alcohol Every day	747	70.87
Others	307	29.13
Total	1054	100
Smoking Cigarette or other substances		
Yes	186	10.07
No	948	89.93
Total	1054	100

*Excluding non-Response Category. Source: Computed by the authors from NARSH Plus II 2012.

Table 3. Percentage Distribution of Selected Characteristics of the Respondents and Substance Abuse.

Variables	Drinking Alcohol Everyday N = 747		Smoking Cigarette and other substances N=186	
	%	X² P-value	%	X² P-value
Age of individual				.006
15-19years	33.04	0.097	31.13	
20-24years	55.96		68.87	
Total	100		100	
Sex		.006		.000
Male	73.36		91.51	
Female	26.64		8.49	
Total	100		100	
Highest Level of Education		.095		
Qur'anic only	.86		0	.138
Primary	10.60		15.46	
Secondary	74.64		65.95	
Higher	13.90		18.56	
Total	100		100	
Religion		.037		
Islam	11.24		11.32	.000
Non-Catholic Christian	61.58		58.49	
Catholic	24.36		22,64	
Traditional	1.20		1.89	
No religion	1.60		5.86	
Total	100		100	
Away from your home for more than one month		.005		0.821
Yes	41.29		44.34	
No	58.71		55.66	
Total	100		100	
Use Condom		.425		.000
Yes	52.21		77.55	
No	47.49		22.45	
Total	100		100	
Age at First Intercourse		.454		.000
0-14years	9.80		16.04	
15-19 years	42.55		47.17	
20 & above	6.88		9.43	
Don't know	40.47		27.36	
Total			100	

Source: Computed by the authors from NARSH Plus II 2012.

Table 4. Logistic regression of substance abuse and risky sexual behavior.

Variables	Having Multiple Sexual Partner				Non-Use of Condom			
	Unadjusted		Adjusted		Unadjusted		Adjusted	
	Odds Ratio	CI @ 95%	Odds Ratio	CI @ 95%	Odds Ratio	CI @ 95%	Odds Ratio	CI @ 95%
Smoking cigarette or other substances								
Yes	2.60**	1.64-4.15	2.50**	1.51-4.15	3.74**	2.27-6.25	2.57**	1.30-5.07
No	RC							
Drinking Alcohol								
Drinking everyday	1.49**	1.00-2.23	1.42	.92- 2.15	1.05	.80-1.40	1.20	.81-1.76
Others	RC	1.00	RC	1.00	RC	1.00	RC	1.00
Age of individual								
15-19years			RC	1.00			RC	1.00
20-24years			1.80	1.16-2.29			1.67*	1.12-2.43
Sex								
Male			RC	1.00			RC	1.00
Female			.45**	.78-.67			.75	.57-1.12
Highest Level of Education								
Qur'anic only			RC				RC	
Primary			.56	.26-1.24			.28**	.12-.62
Secondary			.93	.56-1.55			.401**	.22-.75
Higher			.81	.34-1.95			.92	.38-2.25
Religion								
Islam			RC	1.00			RC	1.00
Non-Catholic Christian			.79	.34-1.54			.85	.38-1.94
Catholic			.74	.30-1.82			.76	.32-1.82
Traditional			.60	.08-4.78			.56	.042-3.45
No religion			.24	.03-1.07				
Away from your home for more than one month								
Yes			RC	1.00			RC	1.00
No			1.03	.73-1.57			.74	.59-1.07
Age at First Intercourse								
0-14years			RC	1.00			RC	1.00
15-19 years			.80	.47-1.37			1.04	.61-1.75
20 & above			.35*	.17-.84			.67	.35-1.41

Note *P-value < .001 **P-value < .005 CI= Confidence Interval.
Source: Computed by the authors from NARSH Plus II 2012.