

Alcohol Use among In-School Adolescents in a Municipality in Ghana

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Abstract

Background: Alcohol use among adolescents can result in many health issues and is linked to future health and economic problems, motor vehicle crash involvement and interpersonal violence. This study aimed to determine the prevalence of alcohol use among in-school adolescents and factors associated with its use in a Municipality in Ghana.

Methods: A school-based cross-sectional survey was conducted among 700 students. A stratified random sampling method was applied to select the participants. Structured questionnaires were administered to collect information on demographic characteristics, students' behaviors, family, peer, school factors and engagement in economic activities. Univariate, bivariate and multivariate analysis were applied to determine prevalence and risk factors of alcohol use

Results: The prevalence of lifetime alcohol use was 39% while current users were 27.6%. The odds of taking alcohol were highest among sexually active adolescent compared to those who were not sexually active (AOR=2.96, 95% CI: 1.56, 5.61, $p=0.001$). Adolescents who used other substances such as cigarette smoking (AOR=7.16 95% CI: 3.90, 13.17, $p<0.0001$) and marijuana (AOR=3.57, 95% CI: 1.38, 9.26, $p=0.009$) had increased odds of using alcohol.

Conclusion: Interventions aimed at addressing adolescents' alcohol use may help address the use of other substances.

Keywords: Alcohol, Adolescents, High School, Prevalence, Risk factors, Ghana

Background

Alcohol is a serious public health problem. Globally, harmful use of alcohol resulted in the death of more than 3 million people in 2016 (WHO, 2018). Alcohol contributes nearly to 5% of deaths and among men, estimated 2.3 million deaths were attributable to alcohol while women experienced 0.7 million deaths as a result of alcohol consumption in 2016 (WHO,2018). Annually, 320,000 young people aged 15–29 years die from alcohol-related causes resulting in 9% of all deaths in that age group globally (WHO, 2012). In a study carried out in Australia and Portugal, 19.2% of adolescents reported consuming one or more drinks in the previous three months and 50% of adolescents reported having experimented with alcohol respectively (Hodder RK, 2011) (Fraga S, 2011). A study of high school students in Dire Dawa in Ethiopia showed the prevalence of life time and current alcohol drinking as 34.2% and 19.6% respectively (Negussie, 2012). A study conducted in South Africa showed a prevalence of adolescent alcohol use as high as 10.6% (Morojele NK1, 2018). Studies conducted in Ghana by Ministry of health among adolescents and Adu-Mireku et al in selected senior high schools in 2000 and 2003 showed lifetime alcohol prevalence to be 25.3% and 25.1% respectively (World Health Organization , 2000) (Adu-Mireku S, 2000). Early onset of drinking increases the likelihood of alcohol-related injuries, motor vehicle crash involvement and unprotected intercourse among others (American Congress of Obstetricians and Gynecologists committee , 2008) and is one of the most important predictors of future health, socio-cultural and economic problems (Strauch ES, 2009). In order to protect adolescents from exposure to alcoholic advertisement from the media, Food and Drugs Authority in collaboration with Consumers Association implemented a policy to ban advertisement on alcoholic beverages in the media from 6 am to 8 pm with effect from January 2018 (FDA, Consumer Protection and Other Stakeholders Report 2018, , 2018)

Factors identified as associated with alcohol use among adolescents include socio-demographic factors, parental factors, peer factors and individual factors. Good parental involvement and communication is important in reducing risky behaviours (Babalola S, 2005) (Biddlecom A, 2009) whilst parental alcohol use and favourable attitudes about alcohol intake increase the risk of initiation and the intensity of later adolescent alcohol use (Tildesley E.A., 2008) (Kandel, D.B., & Andrews, K. Processes of adolescent socialization by parents and peers., 1987). Peers remain one of the greatest influences in initiating alcohol use among adolescent and studies conducted in Ghana showed that over 60% of students were introduced to substance use by peers (Dogbe, 2003). Other socio-demographic and individual factors such as age of initiation of alcohol, male's preponderance in alcohol intake and involvement in economic activities have been reported as factors associated with alcohol intake (Malta DC, 2010) (Malta DC M. M., 2011) (Cooper, 2002)

Yilo Krobo Municipality located in Eastern Region of Ghana has a population of 97,466 with adolescents constituting 19% of the population (Ghana Health Service, 2017). There has been reported cases of alcohol use and abuse among in-school adolescent in the Municipality during various stakeholders' meetings. However, there is lack of data to determine the magnitude of alcohol use among adolescents and its associated risk factors. Thus, the present study aimed to describe the prevalence of alcohol use among in-school adolescents in Yilo Krobo Municipality, and to identify the factors associated with alcohol use among this population. Additionally, alcohol abuse among the youth is a global problem and this study will help in understanding adolescent alcohol use and the findings will be used to design interventions to address alcohol use and abuse among in-school adolescents and also add to the existing knowledge on adolescent alcohol use.

Methods

A school based cross-sectional analytic study was carried out in a Municipality located in the Eastern Region of Ghana and has population of 97,466 with adolescent population of 18,519 (Ghana Health Service, 2017) on 16th February to 20th March 2017. The main economic activities are formal sector jobs, farming and petty trading. This study site was selected based on its high teenage pregnancy of 15.7% compared to the national figure of 11.8% (Ghana Health Service, 2017) during the same period and numerous reports from various stakeholders alleging to use of substances among adolescents.

Adolescents aged 12 to 19 years from high schools in the Municipality took part in the study. A sample size of 700 was used for the study using the equation below from open epi

$$N = \frac{DEFF * p(1-p)}{[d^2 / Z^2_{1-a/2} * (N-1) + p * (1-p)]}$$
 level of confidence (Z) of 1.96 for a 95% confidence interval, estimated prevalence of substance use (p) of 15% from literature [16], a design effect (DEFF) of 3.5, a margin of error (d) of 5% to give 686 and considering a non-response rate of 2%, a sample size of 700 was arrived at. In order to ensure validity, a stratified random sampling method was employed to select the students. A list of all high schools, both Junior and Senior high schools in the Municipality was obtained from Ghana Education Service. A stratified sampling method was used. A sample frame of the schools was made grouping urban and rural schools. Proportionate number of schools were selected from the urban and rural schools according to size. This yielded a total of 14 schools from both the urban and rural schools. In the schools, register of students were used to conduct systematic random sampling to select students onto the study and the number of students selected in each school was proportionate to size of enrollment in the school. A total of 700 students were selected and enrolled onto the study. The issues of sexes were not the focused of the study but rather to ensure equal probability of every students being selected onto the study.

Structured questionnaire was used to collect quantitative data. The questionnaire was designed by formulating questions to answer the aim of the study. To ensure validity and reliability, this questionnaire was pre-tested in selected schools in a neighboring district with similar characteristics to the study site by the teams to identify errors during the questionnaire administration after which the errors and problems detected in its administration

were corrected. Twenty paramedical staff with three supervisors were intensively trained for two days on the questionnaire administration, research ethics and data entry to ensure quality in data collection process. They were then divided into teams comprising of two members to form ten teams. The teams with their supervisors were then deployed to the selected schools after a letter and information sheets on the study had been sent to the schools seeking permission to conduct the study.

Ethical clearance for the study was provided by the Ghana Health Service Ethics Review Committee (GHS-ERC: 2/11/16).

In the schools, consent forms were given to the students above 18 years which contained details of the study for them to read and sign before questionnaires were administered to them. For participants below 18 years, consent was obtained from legal parents through writing to explain the study and requesting for their endorsement of the consent forms days prior to the study. The parents with questions called the research team for clarification. This was followed by endorsement of an assent form by these under-aged participants before questionnaire administration. The data collection took a period of five days to complete. The questionnaires were self-administered in the schools and the trained teams supported the students in the questionnaire administration. The outcome variable was alcohol use and exposure variables included socio demographic characteristics, parental factors, peer factors and behavioral factors. The questionnaire contained closed ended questions with options for students to choose from. Socio-demographic factors assessed included the age of the participant, sex, place of stay (whether in the district of study or from outside the district), grade or level and religion. The parental factors included in this study were level of parent's formal education, parent's and relatives' drinking status, marital status and ability to discuss with parents, issues on substance abuse among other subjects. In addition, the perception and some behaviors of participants to alcohol were assessed. For all these variables, participants self-reported based on the structured questionnaire provided for them.

The school authorities were contacted and they gave the data collectors convenient time to administer the tool during school hours after obtaining written informed consent and assent from participants. To ensure data quality, the data was edited and mistakes rectified on the field by trained supervisors. The data entry was computer designed and had checks to ensure quality during entry. Also, data were doubly entered to minimize errors. All responses to questionnaires were safely stored on computers protected by password in the office of the principal investigator. Only project staff had access to answered questionnaires.

The data was entered, processed and cleaned using SPSS version 21 and analyzed in both SPSS and Stata 13MP.

Statistical analysis

Each question was assigned a code for the purpose of data cleaning, entry and analysis. Completed questions were verified before entry and cleaning in the Statistical Package for Social Services (SPSS) version 24 and then exported and analyzed using Stata 13MP. The variables assessed were categorized and presented using their frequencies and percentages and then shown in tables in the results section.

Participants were classified into those who had never drunk alcohol and those who had ever drunk alcohol. This was based on the response to the main question determining the outcome variable as, 'Have you ever drunk alcohol? (Drkalc)?' with responses No '0' (Never drunk) and Yes '1' (Ever drunk). Other questions were also asked to find out who introduced the participant to drinking, number of drinking days in lifetime and the age of having first drink. The findings of these were presented using their frequencies and percentages.

In determining the factors associated with alcohol use among in-school children, first the Chi-square test of independence was used. This was used to test the associations between the independent variables, socio-demographic, personal and peer factors and parental and adolescent risky behaviors and the outcome, that is those who had ever taken alcohol. The Chi square figure is reported with its corresponding p-value (significant at $p < 0.05$).

Logistic regression models were used to determine the factors that influenced alcohol use controlling for confounders. Main confounders identified in the model were the age, sex and current grade of the respondent. The logistic regression analysis was used to identify the perception and peer factors, parental factors and adolescent risky behaviours that is associated with alcohol use among in-school adolescent controlling for their age, sex and grade. The associated adjusted Odds Ratio (AOR) were reported with their 95% Confidence intervals (CI) and p-values (significant at $p < 0.05$).

Results

Socio-demographic characteristics of the study participants

A total of 700 students participated in the study and the age range of participants were 12 to 19 years. The mean age was 15 years. Participants who were 14 years and below formed 32.7% (229), those between 15 years to 17 years were 53% (371) and those who were 18 years and above were 14.3% (100) (Table 1)

Table 2 shows that, of the 699 adolescents responding, 275 (39.3%) had ever drunk alcohol. Out of those who had ever taken alcohol, 85.1% had alcohol in less than 10 days with 48.7% being introduced to alcohol by their friends.

From the study results, sex ($\chi^2=10.194$, $p=0.001$) and educational status of mother ($\chi^2=6.4694$, $p=0.039$) were background characteristics of adolescents that were associated with alcohol use among in-school adolescents.

The Table 3 also shows that personal and peer perceptions that were independently associated with alcohol use among in-school adolescents were not needing permission from parents to go out ($\chi^2=6.7788$, $p=0.009$), friends' opinion about sex and drugs being important ($\chi^2=6.9668$, $p=0.008$), having friends who drink alcohol ($\chi^2=73.821$, $p < 0.0001$) and having neighbours who drink ($\chi^2=6.5779$, $p=0.010$).

The study showed that sexual behaviors such as having sexual intercourse ($\chi^2=61.3151$, $p < 0.0001$), multiple sexual partners ($\chi^2=7.6613$, $p=0.0056$) and having forced sex ($\chi^2=16.228$, $p < 0.0001$) were associated with alcohol use among in-school adolescents. Also, other behaviours such as cigarette smoking ($\chi^2=97.5228$, $p < 0.0001$), marijuana use ($\chi^2=39.4013$, $p < 0.0001$), getting involved with commercial activities ($\chi^2=17.2899$, $p < 0.0001$) and school absenteeism ($\chi^2=5.1575$, $p=0.023$) were associated with adolescent alcohol use (Table 5).

In-school adolescents who viewed their friends' opinions about sex and drugs as important had a 1.61 (95% CI: 1.06, 2.43, $p=0.026$) odds of taking alcohol to those who did not. Also, adolescents who having friends who drunk alcohol had a 4.28 (95% CI: 2.89, 6.34) odds of taking alcohol compared to those who did not have friends who drunk alcohol.

Logistics regression of personal perception and peer factors influencing alcohol intake controlling for confounders such as age, sex and grade among adolescent is shown in the tables below.

Among parental factors, the study showed that parents who drink alcohol (AOR=1.85.54, 95% CI: 01.28, 2.67, $p=0.001$) and relatives who drink alcohol (AOR=1.56, 95% CI: 1.11, 2.20, $p=0.011$) are associated with alcohol use among in school adolescents after controlling for age, sex and grade of respondents.

From Table 6, after controlling for age, sex and grade of respondents, adolescent who have had sex had a 2.96 (95% CI: 1.56, 5.61) odds of taking alcohol compared to those who had never had sex and this was significant at $p=0.001$. Other adolescent risky behaviors associated with alcohol use were cigarette smoking (OR=7.16 95% CI: 3.90, 13.17, $p < 0.0001$), marijuana use (OR=3.57, 95% CI: 1.38, 9.26, $p=0.009$) and engagement in commercial activities (OR=1.56, 95% CI: 1.10, 2.22, $p=0.012$). The relationship between adolescent risky behaviours and alcohol use among in-school adolescents is shown in Table 6.

Discussion

In our study, the prevalence of lifetime alcohol use among adolescents and current users were 39.3% and 21.3% respectively. The study showed that 48.7% of adolescents were introduced to alcohol by their peers and as much as 60.4% started taking alcohol when they were 14 years and younger. The reported prevalence has implications for the future health and economic development of these adolescents as alcohol dependence lead to diseases such as liver cirrhosis, cancer and others. Alcohol dependence in adolescents lead to poor academic performance and school drop-outs (Strauch ES, 2009). A systematic review and meta-analysis of substance use among adolescents in sub-Saharan Africa estimated proportion of alcohol use among adolescents in sub-Saharan Africa was 32.77%. Southern Africa had the highest prevalence of alcohol use among the adolescents at 40.82%, followed by East Africa at 34.25% and Central Africa at 29.09%, respectively. West Africa had the lowest prevalence of alcohol use among the adolescents at 28.21%. (Amoo E O, 2018)

The prevalence of alcohol found in this study is higher than studies in Dire Dawa which showed lifetime and current users as 34.2% and 19.6% respectively respectively (Hodder RK, 2011) as well as that of all the Africa sub Regions found in the meta-analysis with the exception of Southern Africa (Amoo E O, 2018). Other studies conducted in Ghana also show lower prevalence than what is reported in this study (World Health Organization, 2000) (Adu-Mireku S, 2000). The high prevalence in this study indicates changing trends of adolescent risky behaviors over the years which may be attributed to increased exposure through the media, telecommunication and other avenues (Media, 2010). Peers remain the greatest influence in initiating alcohol intake among adolescents as 48.7% mentioned that they were introduced to alcohol by friends. This finding is consistent with other studies in Ghana that showed that over 60% of students were introduced to substance use by peers (Dogbe, 2003).

Although alcohol is the only psychotropic drug accepted and even encouraged by some society and allows early contact even before 11 years of age (Malta DC, 2010) (Malta DC M. M., 2011), the early onset of drinking as shown in this study is one of the most important predictors of future health and economic problems (Dogbe, 2003). Concerning the severity of alcohol intake, 4.3% of respondents are alcohol dependent and takes alcohol daily which is consistent with a study conducted in the United States that showed alcohol dependence of 4.6% (WHO, 2017).

The initial bivariate analysis with respect to background and perceptions showed that low educational status of mothers, importance attached to friends' opinion on drinking, friends and neighbours who take alcohol and not needing permission from parents before going out were associated with adolescent intake of alcohol. Good parental communication with their adolescents as well as needing permission from parents before going out were found to be protective against alcohol use. A systematic review of parent-based programs to reduce alcohol consumption among adolescents found that good parent-child communication, parents' restrictive attitude and parental monitoring are important protective factors for risky drinking behaviours among adolescents (Hughes, 1992). However, after adjusting for confounders (age, sex and grade) in the logistics regression model, friends drinking alcohol (AOR -1.61, p=0.026), parents who drink alcohol (AOR-1.85, p=0.001), relatives drinking alcohol (AOR-1.56, p=0.011) and neighbours who drink alcohol (AOR- 4.28, p<0.0001) were significantly associated with adolescents' intake of alcohol. Our findings are in line with other studies in different countries that [13,23,26,27,29] showed that parents, peers and neighbours alcohol use is associated with adolescents' alcohol use. This reiterate the fact that adolescents' alcohol use is a socially conditioned behavior and the social environment in which adolescents live contribute both positively and negatively to whether they will use or misuse alcohol.

Considering adolescent risky behaviours and alcohol use, the bivariate analysis showed multiple sexual partners, ever forced to have sex, use of other substances such as cigarette and marijuana as well as involvement in commercial activities to be associated with alcohol use. The logistic regression after adjusting for confounders identified having had sex (AOR-2.96, p=.001), using cigarette (AOR-7.16, p<0.0001), marijuana (AOR-3.57, p=0.009) and involvement in commercial activities (AOR-1.56, p=0.012) to be associated with alcohol use. The identified relationship between alcohol and having sex may be due to the disinhibitory effect of

alcohol which makes people prone to indulge in risky sexual behaviors. A study conducted by Cooper in 2002 indicated that underage alcohol use has been associated with risky sexual behavior (unwanted, unintended and unprotected sexual activity) and multiple sex partners (Cooper, 2002). Such behavior increases the risk of unplanned pregnancy and sexually transmitted infection. Moreover, young people who drink alcohol are more likely to carry out or be the victim of physical or sexual assault (Amy Young, 2008).

The study revealed that 49% of adolescents are engaged in commercial or economic activities such as trading and these adolescents had increased odd of using alcohol. Trading in goods result in income generation by these adolescents who do not have the skills to manage these funds and coupled with peer influences can easily purchase alcoholic beverages. In a study by Larrymore in Ghana (McCarthy-Bohan., 2015), showed that alcoholic beverage can be purchased with an amount less than 11 cedis per outing which is equivalent to less than two dollars and an adolescent who is trading can earn more money. Additionally, there are numerous drinking spots that sell alcohol to people of all ages making it easily accessible to adolescents. Involvement in economic activities also take these adolescents out of the classroom leading to poor academic performance.

This study found a strong association between alcohol use and cigarette smoking as well as the use of marijuana and this is consistent with a study conducted in National household Survey on drug abuse which found that 60% of first-time marijuana users had used both alcohol and cigarettes (The UHSDA Report (SMA 02—3711). Rockville, MD, 2003). Alcohol, marijuana and cigarette are all substances that can be abused by adolescents and it is not surprising that abuse of one can lead to the abuse of the other by the same person. What cannot be determined was the timing of that relationship and which of the substances led to the use of the other, that is which of them had a “gateway effect.” It can, however, be concluded that the use of alcohol is significantly linked to the use of cigarette and marijuana.

The strength of the study includes the importance of the selected topic and study population, that is alcohol use among adolescents which has health, social and economic implications on these adolescents. Limitations of the study are that since this study touches very sensitive and very personal issues, social desirability responding cannot be ruled out, however respondents were assured of confidentiality to assist in addressing this limitation. Also, the nature of the study, that is the cross sectional makes it impossible to draw inferences about the direction of relationship between the dependent and independent variables.

Conclusion

The prevalence of alcohol intake among in-school adolescents in Yilo Krobo Municipality is higher than what has been reported in some studies conducted in Ghana. The use of alcohol is associated with the use of substances such as cigarette and marijuana, there is therefore the need to implement school-based programs to address substance abuse among in-school adolescents, that is combined substance use intervention. There is the need for engagement of social scientists and policy makers to develop and implement strategic interventions and policies to reduce easy access

to alcohol by adolescents while strengthening peer counselling at school is desirable. There is the need for further studies to determine which of these substances had a gateway effect.

Abbreviations

AOR: Adjusted odds ratio; SPSS: Statistical package for social sciences; SHS: Senior high school; JHS: Junior high school; In-school adolescents: adolescents who are still attending school

Authors contribution

Dr. Akosua A. Owusu-Sarpong (AOS) and Dr. Frank Baiden (FB) were

involved in the conception of ideas and developing methodologies, AOS and Mr. Kwame Agbeshie (KA) were involved in data collection, analysis and report writing. All authors read and approved the final manuscript.

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Table 1. Background Characteristics of respondents

Background characteristics	Frequency (n=699)	Percent
Age		
≤14 years	229	32.8
>14 years	470	67.2
Sex		
Female	365	52.2
Male	334	47.8
Place of stay		
Within Yilo Krobo	488	69.8
Outside Yilo Krobo	211	30.2
Grade		
JHS	346	49.5
SHS	353	50.5
Tribe		
Ga-Dangme	467	66.8
Akan	99	14.2
Ewe	85	12.2
Others not specified	48	6.9
Educational status of father		
Never been to school	46	6.6

Ever been to school	653	93.4
Educational status of mother		
Never been to school	54	7.7
Ever been to school	557	79.7
Don't know	88	12.6
Marital status of parents		
Don't know	29	4.2
Married	405	57.9
Divorced	88	12.6
Single	81	11.6
Co-habiting	96	13.7
Religion		
Christian	667	95.4
Islam	22	3.2
Traditional	6	0.9
None	4	0.6

JHS – Junior High School, SHS – Senior High School

Table 2. Prevalence of alcohol intake among in school adolescents

Prevalence of alcohol among in school adolescents	Frequency	Percent
Alcohol status (n=699)		
Ever drunk alcohol	275	39.3
Never drunk alcohol	424	60.7
Drunk alcohol within the past 90 days (current use)		
Yes	149	21.3
No	550	78.7
Days of having alcohol intake (n=275)		
< 10 days	234	85.1
≥10 days	41	14.9
Introduced to alcohol by (n=275)		
Friends	134	48.7
Relatives and Neighbours	41	14.9
Not indicated	100	36.4
Age at first alcohol drink (n=275)		
≤14 years	166	60.4
>14 years	109	39.6
In the past 90 days, how many days have you had at least one drink		
1 to 80 days	263	95.7
80 to 90 days	12	4.3

Table 3 Association between Adolescents Factors and Alcohol Intake

Background data	Alcohol Status of in-school adolescents			χ^2	P-value
	Ever drunk (n=275)	Never drunk (424)	Total (n=699)		
	n (%)	n (%)	n (%)		

Age				2.772	0.096
≤14 years	80 (29.1)	149 (35.1)	229 (32.8)		
>14 years	195 (70.9)	275 (64.9)	470 (67.2)		
Sex				10.194	0.001*
Female	123 (44.7)	242 (57.1)	365 (52.2)		
Male	152 (55.3)	182 (42.9)	334 (47.8)		
Grade				0.899	0.343
Junior High School	130 (42.3)	216 (50.9)	346 (49.5)		
Senior High School	145 (52.7)	208 (49.1)	353 (50.5)		
Father's Educational status				1.637	0.201
Never been to school	14 (5.1)	32 (7.6)	46 (6.58)		
Ever been to school	261 (94.9)	392 (92.4)	653 (93.4)		
Mother's Educational status				6.469	0.039*
Never been to school	18 (6.5)	36 (8.5)	54 (7.7)		
Ever been to school	232 (84.4)	325 (76.7)	557 (79.7)		
Don't know	25 (9.1)	63 (14.9)	88 (12.6)		
Marital Status of parents				8.268	0.082
Married	145 (52.7)	260 (61.3)	405 (57.9)		
Divorced	45 (16.4)	43 (10.1)	88 (12.6)		
Single	35 (12.7)	46 (10.9)	81 (11.6)		
Cohabiting	40 (14.6)	56 (13.2)	96 (13.7)		
Don't know	10 (3.6)	19 (4.5)	29 (4.2)		
Peer and Personal Perceptions					
I find taking alcohol wrong	180 (65.5)	279 (65.8)	459 (65.7)	0.0089	0.925
Friends find taking alcohol wrong	154 (56.0)	262 (61.8)	416 (59.5)	2.3228	0.127
Talk to parents on substance use	137 (49.8)	220 (52.0)	357 (51.2)	0.3203	0.571
Not needing permission from parents to go out	223 (81.1)	374 (88.2)	597 (85.4)	6.7788	0.009*
Importance of friends' opinion	67 (24.4)	69 (16.3)	136 (19.5)	6.9668	0.008*
I have friends who drink alcohol	144 (41.5)	55 (13.0)	169 (24.2)	73.821	<0.0001*
Neighbours who drink alcohol	128 (46.6)	156 (36.8)	284 (40.6)	6.5779	0.010*
Ever had sexual intercourse (n=699)				61.3151	<0.0001*
Yes	142 (51.6)	97 (22.9)	239 (34.2)		
No	133 (48.4)	327 (77.1)	460 (65.8)		
Age at first sexual intercourse (n=239)				2.993	0.0836
≤14 years	73 (51.4)	38 (39.2)	111 (46.4)		
>14 years	69 (48.6)	59 (60.8)	128 (53.6)		
Sexual partners (n=239)				7.6613	0.0056*
One sexual partner	76 (53.5)	70 (72.2)	146 (61.1)		
>1 sexual partner	66 (46.5)	27 (27.8)	93 (38.9)		
Ever been forced to have sex (n=699)				16.2228	<0.0001*
Yes	49 (17.8)	33 (7.8)	82 (11.7)		
No	226 (82.2)	391 (92.2)	617 (88.3)		
Drug use and other behaviours (n=699)					
Tried Smoking				97.5228	<0.0001*
Yes	84 (30.5)	16 (3.8)	100 (14.3)		
No	191 (69.5)	408 (96.2)	599 (85.7)		
Marijuana				39.4013	<0.0001*
Ever used	37 (13.5)	7 (1.7)	44 (6.3)		
Never used	238 (86.5)	417 (98.3)	655 (93.7)		
Involved in commercial activities (Trading)				17.2899	<0.0001*
Yes	161 (58.5)	180 (42.5)	341 (48.8)		

No	114 (41.5)	244 (57.5)	358 (51.2)		
Absent from school				5.1575	0.023*
Never absented	125 (45.5)	230 (54.3)	355 (50.8)		
Ever absented	150 (54.5)	194 (45.7)	344 (49.2)		

Table 4. Perception and peer factors influencing alcohol intake among in school adolescents in Yilo Krobo, Ghana

Personal and peer perceptions	UOR (95% CI)	P value	AOR (95% CI)	P value
<i>I find taking alcohol wrong</i>				
No	<i>Ref</i>		<i>Ref</i>	
Yes	0.98 (0.72, 1.36)	0.925	1.29 (0.85, 1.95)	0.229
<i>My friends find taking alcohol and other substances wrong</i>				
No	<i>Ref</i>		<i>Ref</i>	
Yes	0.79 (0.58, 1.07)	0.128	0.69 (0.46, 1.02)	0.064
<i>I am able to discuss substance use with parents</i>				
No	<i>Ref</i>		<i>Ref</i>	
Yes	0.91 (0.68, 1.24)	0.571	0.95 (0.68, 1.3)	0.753
<i>I need permission from parents to go out</i>				
No	<i>Ref</i>		<i>Ref</i>	
Yes	0.57 (0.38, 0.87)	0.01	0.76 (0.48, 1.21)	0.244
<i>My friends' opinions about sex and drugs is important to me</i>				
No	<i>Ref</i>		<i>Ref</i>	
Yes	1.66 (1.14, 2.42)	0.009	1.61 (1.06, 2.43)	0.026*
<i>I have friends who drink alcohol</i>				
No	<i>Ref</i>		<i>Ref</i>	
Yes	4.75 (3.28, 6.89)	<0.0001	4.28 (2.89, 6.34)	<0.0001*
<i>I have neighbours who drink alcohol</i>				
No	<i>Ref</i>		<i>Ref</i>	
Yes	1.50 (1.10, 2.04)	0.01	1.09 (0.77, 1.53)	0.641
<i>Age of respondents</i>				
≤14 years	<i>Ref</i>		<i>Ref</i>	
>14 years	1.32 (0.95, 1.83)	0.096	1.22 (0.79, 1.89)	0.372
<i>Sex of respondents</i>				
Female	<i>Ref</i>		<i>Ref</i>	
Male	1.64 (1.21, 2.23)	0.001	1.34 (0.96, 1.86)	0.086
<i>Current grade of respondent</i>				
JHS	<i>Ref</i>		<i>Ref</i>	
SHS	1.16 (0.85, 1.57)	0.343	0.96 (0.63, 1.46)	0.851

Adjusting for Age, Sex and Grade of student.

*UOR - Unadjusted Odds Ratio, AOR – Adjusted Odds Ratio, 95% CI – 95% Confidence Interval, JHS – Junior High School, SHS – Senior High School, Ref – Reference Category, P-value – Probability value, *= $p < 0.05$.*

After adjusting for potential confounders, having friends and neighbours who drink alcohol is associated with adolescents' alcohol intake.

Table 5. Parental factors influencing alcohol intake among in school adolescents in Yilo Krobo Municipality in Ghana

Parental factors	UOR (95% CI)	P value	AOR (95% CI)	P value
Father's education status				
Never been to school	<i>Ref</i>		<i>Ref</i>	
Ever been to school	1.52 (0.80, 2.91)	0.204	1.46 (0.73, 2.93)	0.285
Mother's education status				
Never been to school	<i>Ref</i>		<i>Ref</i>	
Ever been to school	1.43 (0.79, 2.58)	0.237	1.49 (0.79, 2.83)	0.221
Don't know	0.79 (0.38, 1.65)	0.536	0.87 (0.40, 1.90)	0.728
Marital status of parents				
Don't know	<i>Ref</i>		<i>Ref</i>	
Married	1.06 (0.48, 2.34)	0.886	1.13 (0.49, 2.60)	0.771
Divorced	1.99 (0.83, 4.75)	0.123	2.01 (0.80, 5.03)	0.136
Single	1.45 (0.60, 3.50)	0.413	1.54 (0.61, 3.88)	0.357
Co-habiting	1.36 (0.57, 3.23)	0.49	1.38 (0.55, 3.42)	0.494
Parents drink alcohol				
No	<i>Ref</i>		<i>Ref</i>	
Yes	2.17 (1.54, 3.06)	<0.0001	1.85 (1.28, 2.67)	0.001*
Relatives drink alcohol				
No	<i>Ref</i>		<i>Ref</i>	
Yes	2.00 (1.45, 2.76)	<0.0001	1.56 (1.11, 2.20)	0.011*
Age of respondents				
≤14 years	<i>Ref</i>		<i>Ref</i>	
>14 years	1.32 (0.95, 1.83)	0.096	1.20 (0.78, 1.85)	0.399
Sex of respondent				
Female	<i>Ref</i>		<i>Ref</i>	
Male	1.64 (1.21, 2.23)	0.001	1.62 (1.18, 2.24)	0.003*
Current grade of respondent				
JHS	<i>Ref</i>		<i>Ref</i>	
SHS	1.16 (0.85, 1.57)	0.343	1.01 (0.67, 1.50)	0.974

Adjusting for Age, Sex and Grade of student.

UOR - Unadjusted Odds Ratio, AOR – Adjusted Odds Ratio, 95% CI – 95% Confidence Interval, JHS – Junior High School, SHS – Senior High School, Ref – Reference Category, P-value – Probability value, *=p<0.05

Table 6. Adolescent Risky behaviors influencing Alcohol intake among in school adolescent in Yilo Krobo, Ghana

Behaviour	UOR (95% CI)	P-value	AOR (95% CI)	P-value
Had Sexual intercourse				
Never had sex	<i>Ref</i>		<i>Ref</i>	
Ever had sex	3.60 (2.59, 4.99)	<0.0001	2.96 (1.56, 5.61)	0.001*
Age at first sex				
Never sexual intercourse	<i>Ref</i>		<i>Ref</i>	
≤14 years	4.72 (3.04, 7.34)	<0.0001	1.71 (0.93, 3.14)	0.082

>14 years	2.88 (1.92, 4.30)	<0.0001	-	
Number of sexual partners				
Never had sexual intercourse	<i>Ref</i>		<i>Ref</i>	
One sexual partner	2.67 (1.82, 3.91)	<0.0001	0.55 (0.30, 1.02)	0.057
>1 sexual partner	6.01 (3.68, 9.82)	<0.0001	-	
Ever had forced sex				
No	<i>Ref</i>		<i>Ref</i>	
Yes	2.57 (1.60, 4.11)	<0.0001	1.08 (0.58, 1.99)	0.81
Absent self from school				
Never absented	<i>Ref</i>		<i>Ref</i>	
Ever absented	1.42 (1.05, 1.93)	0.023	1.14 (0.80, 1.63)	0.461
Tried cigarette smoking				
No	<i>Ref</i>		<i>Ref</i>	
Yes	11.22 (6.40, 19.66)	<0.0001	7.16 (3.90, 13.17)	<0.0001*
Marijuana				
Never used	<i>Ref</i>		<i>Ref</i>	
Ever used	9.26 (4.07, 21.10)	<0.0001	3.57 (1.38, 9.26)	0.009*
Commercial activities				
Not engaged in any	<i>Ref</i>		<i>Ref</i>	
Engaged in commercial acts	1.91 (1.40, 2.60)	<0.0001	1.56 (1.10, 2.22)	0.012*
Age of respondents				
<=14 years	<i>Ref</i>		<i>Ref</i>	
>14 years	1.32 (0.95, 1.83)	0.096	1.09 (0.67, 1.77)	0.731
Sex of respondents				
Female	<i>Ref</i>		<i>Ref</i>	
Male	1.64 (1.21, 2.23)	0.001	1.31 (0.92, 1.87)	0.129
Current Grade of respondents				
JHS	<i>Ref</i>		<i>Ref</i>	
SHS	1.16 (0.86, 1.57)	0.343	1.28 (0.82, 2.00)	0.273

Adjusting for Age, Sex and Grade of student.

UOR - Unadjusted Odds Ratio, AOR – Adjusted Odds Ratio, 95% CI – 95% Confidence Interval, JHS – Junior High School, SHS – Senior High School, Ref – Reference Category, P-value – Probability value, *=p<0.05.