



Alcohol use by school-going adolescents in Ghana: Prevalence and correlates

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ABSTRACT

This study investigated the risk factors that are associated with alcohol use among a nationally representative sample of school-going adolescents in Ghana. The 2012 version of the Ghanaian Global School-based Student Health Survey on adolescents aged 11–19 years old ($N = 1984$) was used. Logistic regression was employed to study the relationship between alcohol use variables and socio-demographic characteristic, mental health problems, psychosocial variables and parental involvement. The prevalence of alcohol use behaviours were 6.8%, 11.1% and 12.6% for alcohol problem, lifetime drunkenness and current alcohol use respectively. Loneliness, suicidal ideation and suicidal attempts were found to independently increase the odds of alcohol use behaviours (current alcohol use, lifetime drunkenness and alcohol problems) among adolescents. Similarly behavioural problems such as truancy, current smoking of cigarette, being bullied, being physically attacked, being involved in a physical fight were found to independently increase the odds of alcohol use behaviours (current alcohol use, lifetime drunkenness and alcohol problems). Having close friends was protective of current alcohol use but not for drunkenness and alcohol problems. These results underline the need for the development of school-based health interventions for early identification of adolescents who may be at-risk for alcohol-related problems.

1. Introduction

Globally, 10–19 year olds are highly susceptible to various mental health disorders and about half of the adult mental health disorders begin in adolescence, but go undetected and untreated (WHO, 2014a). The developmental changes from childhood to adolescence are accompanied by physical and psychological challenges (e.g. engagement in risky behaviours including substance use, self-harm and having unprotected sex) that increases their vulnerability to poor physical and mental health outcomes.

Alcohol consumption poses a major public health issue as it affects several domains of adolescents' health and wellbeing. This is mainly due to the fact that adolescence as a stage of development is fraught with experimentations of several risky behaviours (Kaess et al., 2013; Kugbey, Ayanore, Amu, Asante, & Adam, 2018; Oshodi, Aina, & Onajole, 2010). The role of alcohol use and its resultant effect on other mental health problems in adulthood are well documented (McKenzie, Jorm, Romaniuk, Olsson, & Patton, 2011; Moss, Chen, & Yi, 2014; WHO, 2014a). These negative consequences of alcohol use and misuse among adolescents cut across societies but prevalence rates differ (WHO, 2014a).

Studies have reported varied rates of alcohol problems among

adolescents. Within sub-Saharan Africa, existing studies on alcohol consumption in school-going adolescents suggests that heavy episodic drinking is higher among adolescents than adults (WHO, 2014a). Thus, a substantial number of these adolescents consumed alcohol. In a study conducted among secondary schools students in Nigeria, it was reported that 13% currently use alcohol and 26% had ever consumed alcohol (Fatoye, Fatoye, Oyebanji, & Ogunro, 2006). Other studies have reported similar pattern in current alcohol use such as 18% in Uganda (Rudatsikira, Muula, Siziya, & Twa-Twa, 2007) 12.7%–25% in Ghana (Adu-Mireku, 2003; Doku, Koivusilta, & Rimpelä, 2012), 34% in Rwanda (Kanyoni, Gishoma, & Ndahindwa, 2015), 35.5% in Tanzania (Francis et al., 2015) and 39.4% in South Africa (Reddy et al., 2010). These high prevalence rates of alcohol use among school-going adolescents in the sub-region is a huge public health problem, which needs urgent attention from researchers and policy makers.

Previous studies on alcohol consumption indicated that gender was the most significant factor for lifetime drunkenness among adolescents and that, boys do engage in alcohol related behaviours more often than girls (Howell, Leyro, Hogan, Buckner, & Zvolensky, 2010; Peltzer, Pengpid, & Tepirou, 2016; Pengpid & Peltzer, 2012; Reddy, Resnicow, Omardien, & Kambaran, 2007; 2010; Swahn, Palmier, Benegas-Segarra, & Sinson, 2013; Woolf-King & Maisto, 2011). Studies have also found

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that adolescents aged 18 years and above when compared with younger teens, were more likely to have experienced alcohol use and drunkenness in the past 30 days (Peltzer et al., 2016; Pengpid & Peltzer, 2012; Swahn et al., 2013). It has also been established that parental factors play a significant role in adolescents' alcohol use (Ryan, Jorm, & Lubman, 2010; Strunin et al., 2015). For instance, Ryan et al. (2010) found that parental disapproval of adolescents' drinking, parental involvement, monitoring, support, and poor parent–child relationship were related to adolescents' early alcohol abuse. Also, Nash, McQueen, and Bray (2005) found that adolescents who engaged in alcohol-related behaviours had peers who also abused alcohol. Socio-economic factors have also been found in the extant literature to have influenced alcohol problems among adolescents (Doku et al., 2012; Kristjansson, Sigfusdottir, & Allegrante, 2013; Liu, Keyes, & Li, 2014).

Studies have found several mental health-related factors playing a significant role in alcohol use and misuse among adolescents. Some of these factors include anxiety (Buckner et al., 2008; Gilles, Turk, & Fresco, 2006; Savage et al., 2016) and loneliness (Page, Dennis, Lindsay, & Merrill, 2011; Qualter et al., 2013; Stickley, Koyanagi, Kuposov, Schwab-Stone, & Ruchkin, 2014). Cigarette use is also implicated in alcohol use and misuse among adolescents (Carney, Myers, Louw, Lombard, & Flisher, 2013; Reddy et al., 2010). It is evident that students who are suicidal are more likely to abuse alcohol than those who are not (Page & West, 2011; Peltzer et al., 2016; Randall, Doku, Wilson, & Peltzer, 2014; Wilson, Wilson, Viswanathan & Bovet, 2012), and that truant school-going adolescents are more likely to report recurrent alcohol-related problems (Carney et al., 2013; Goldberg-Looney, Sánchez-SanSegundo, Ferrer-Cascales, Albaladejo-Blazquez, & Perrin, 2016; Holtes et al., 2015; Mounteney, Haugland, & Skutle, 2010). In addition, interpersonal level risk factors found within the school environment to be associated with alcohol use are being bullied, involved in a physical fight and being physically attacked (Fite et al., 2016; Kelly et al., 2015; Peleg-Oren, Cardenas, Comerford, & Galea, 2012; Peltzer et al., 2016; Salas-Wright, Hernandez, Maynard, B., Saltzman, L., & Vaughn, 2014).

There are concerns that the proliferation of advertisement of alcoholic beverages in Ghana may have adverse effect on individual's mental health by attracting adolescents and young adults to its usage even though the legal age for alcohol use in Ghana is 18 years (Adu-Mireku, 2003; Asante, O., Meyer-Weitz, & Petersen, 2014). Factors related to alcohol use and misuse among school-going adolescents especially in Ghana have not been fully examined. Previous studies have focused on the prevalence rates of alcohol use as well as the role of both parental involvement and socio-economic status on alcohol use (Asiseh, Owusu, & Quaicoe, 2017; Doku et al., 2012). For example, Doku et al. (2012) reported elevated levels of alcohol use and further indicated that alcohol use among school-going adolescents was associated with higher material affluence. Similarly in their examination of the relationship between family dynamics and student engagement in consumption of alcohol, Asiseh et al. (2017) revealed that parental consumption of alcohol increased the odds of the adolescent alcohol use irrespective of gender. What was missing in these studies was mental health and interpersonal level risk factors for alcohol use among school-going adolescents. Furthermore, determinants of adolescents alcohol use as reported in developed Western countries may not necessarily apply to high school students within the Ghanaian context.

The above literature shows that despite the reported high prevalence of problem alcohol use and misuse, we are not fairly well informed about the factors associated with problems alcohol use among school-going adolescents in Ghana. The aim of this study is to examine the prevalence of problem alcohol use and to explore the determinants among a representative sample of school-going adolescents in Ghana. The main research questions examined are: (1) what is the prevalence of problem alcohol use among school-going adolescents (2) what factors are associated with problem alcohol use among school-going adolescents. The findings of this study could inform interventions that

could target high school students who may be at risk for alcohol use and abuse.

2. Methods

2.1. Design and sample

Data for this study was obtained from the Ghana Global School-based Student Health Survey (GSHS) conducted in 2012 (WHO, 2014b). This survey was conducted through the partnership among the World Health Organization (WHO), Disease Control and Prevention (CDC), Middle Tennessee State University and the Ghana Education Service (GES). The data was collected using a cross-sectional survey design among WHO countries which were interested in examining the behavioral risk factors and protective factors in several domains of functioning among adolescents in schools. Data collection was done by the use of close-ended structured questionnaires administered to the students. Details of the systematic steps involved in the data collection among the students can be found on the WHO website (WHO, 2014c) for further information. Participants for this study were sampled from selected senior high schools (SHS) in all the 10 administrative regions of Ghana. A two-stage cluster sampling design was used to select 25 senior high schools to represent all the 10 regions in Ghana. The selection of schools at the first stage of the sampling was based on a probability proportional to the size of enrollment. At the second stage, a random sampling technique was used to select the classes in each school. This allowed every student to have an equal chance of being selected for study. A numerical weighting was applied to each student record to enable generalization of results to the eligible population. A total of 1984 students participated in the study. This sample included 1065 (53.7%) males, 908 (45.7%) females and 11 (0.6%) missing data. The majority of the students, 1062 (53.5%) were aged 18 years or older. Students aged 14 years and below, 15 years, 16 years and 17 years constitute 50 (2.5%), 180 (9.1%), 245 (12.4%) and 440 (22.3%) of the sample respectively. The students were relatively equally split across the four senior high school grade levels. Two-thirds of those surveyed were boarding students.

2.2. Measures

2.2.1. Dependent variables

Three main outcome measures were extracted from the data, namely, current alcohol use, lifetime drunkenness, problem drinking. In this study, each of these three outcome variables was measured with a single self-report item. For example, the item, "Number of drinks past 30 days" was used to measure current alcohol use and the responses for this question were 0 days, 1–2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days and all 30 days. This item was recoded as *no day* (0) and *1 or more days* (1). The item, "Times drunk during life" was used to measure drunkenness and the responses for this question were 0 times, 1–2 times, 3–9 times and 10 or more times. This item was recoded as *0 times* (0) and *1 or more times* (1). The item "Number of troubles as result of drinking" was used to measure problem drinking and the responses for this question were 0 times, 1–2 times, 3–9 times and 10 or more times. This item was recoded as *0 times* (0) and *1 or more times* (1) for the statistical analysis.

2.2.2. Independent variables

A set of predictor variables including socio-demographic characteristics of the participants, psychological, socio-environmental factors, and parental involvement were used to determine their predictive effects on the three outcome variables (alcohol use, lifetime drunkenness and problem drinking). The details of the questions used, the variable names and the coding used for the statistical analysis are presented in Table 1.

Table 1
Independent variables derivation from survey data.

Variable	Survey question	Coding
Age	How old are you?	11–18 years (coded categorically)
Sex	What is your sex	(1) Male (0) Female
Anxiety	During the past 12 months, how often have you been so worried about something that you could not sleep at night?	(1) Most of the times/always (0) Never/rarely/sometimes
Loneliness	During the past 12 months, how often have you felt lonely?	(1) Most of the times/always (0) Never/rarely/sometimes
Suicidal Ideation	During the past 12 months, did you ever seriously consider attempting suicide?	(1) Yes (0) No
Suicidal plan	During the past 12 months, did you make a plan about how you would attempt suicide?	(1) Yes (0) No
Suicidal Attempt	1+ times attempt suicide 12 months.	(1) Yes (0) No
Truancy	During the past 30 days, how many days did you miss classes or school without permission?	(0) 0-2 times (1) 3 or more times
Bullied	During the past 30 days, how many days were you bullied?	(0) 0 times (1) 1 or more times
Attacked	During the past 12 months, how many times were you physically attack?	(0) 0 times (1) 1 or more times
In a fight	During the past 12 months, how many times were you in a physical fight?	(0) 0 times (1) 1 or more times
Close friends	How many close friends do you have?	(0) 0 friends (1) 1 or more close friend
Smoking	During the past 30 days, how many days did you smoke cigarette?	(0) 0 times (1) 1 or more times
Parental homework checking	During the past 30 days, how often did your parents or guardians check to see if your homework was done?	(1) Most of the times/always (0) Never/rarely/sometimes
Parental understanding	During the past 30 days, how often did your parents or guardians understand your problems and worries?	(1) Most of the times/always (0) Never/rarely/sometimes
Parental knowledge of activity	During the past 30 days, how often did your parents or guardians really know what you were doing you're your free time?	(1) Most of the times/always (0)Never/rarely/sometimes
Parental intrusion of privacy	During the past 30 days, how often did your parents or guardians go through your things without your approval?	(1) Most of the times/always (0)Never/rarely/sometimes

2.3. Ethical statements

The Ghana Global School-based Student Health Survey (GSHS) questionnaire used in the data collection in 2012 was piloted to ensure adequate comprehension of the survey items. The Ghana Education Service's (GES) policies on ethics regarding the use of students in survey studies were adhered to in the data collection. Official written permissions were obtained from Ghana Education Service (GES), the selected schools, and classroom teachers. Written informed consent and parental consent were obtained from students and parents respectively.

2.4. Statistical analyses

Sample weights were used in all analyses so results are generalizable to the population, and further to reduce bias on differing pattern of non-response. All variables were re-coded on dichotomous scale in this study as in other existing GSHS studies (e.g., Kugbey et al., 2018; Opong Asante, Kugbey, Osafo, Quarshie, & Sarfo, 2017). The primary analyses were performed in two steps to determine factors most strongly associated with alcohol use behaviours (current use, drunkenness and alcohol problem) in adolescents. First, bivariate analyses using the Chi-square (χ^2) test was used to examine possible associations between the independent variables and alcohol use behaviours (current use, drunkenness and alcohol problem). Variables that demonstrated significant differences between those who reported any of the indices of alcohol use behaviours (current use, drunkenness and alcohol problem) and those who did not were entered into logistic regression models at the second step. In the second step, binominal logistic regression analyses were conducted to examine the impact of the various risk and protective factors on alcohol use behaviours (current use, drunkenness

and alcohol problem). Demographic variables (age and sex) were included in all logistic regression models. The results from the regression analyses are presented as odds ratio (OR) and 95% confidence interval (CI). Statistical significance was defined as two-tailed *p*-value < 0.05 in all analyses. The Statistical Package for the Social Sciences (SPSS) version 23.0 was used to conduct data analyses.

3. Results

3.1. Prevalence of health risk behaviours

The prevalence of alcohol use behaviours were 6.8%, 11.1% and 12.6% for alcohol problem, lifetime drunkenness and current alcohol use respectively. A total of 317(16.0%) of the participants reported feelings of anxiety during the past 12 months prior to the study and 367(18.4%) reported feelings of loneliness within the same time frame. The prevalence of suicidal behaviours was 18.2% for suicidal ideation, 22.5% for suicidal plan and 22.2% for suicide attempt. About 43.8%, 37.5% and 28.2% of the participants reported to have been bullied, physically attacked and involved in a physical fight on once or more occasions respectively. Over a third of the participants (32.1%) were truant over the past 30 days and 3.6% smoked cigarette within the same time frame.

3.2. Relationship between alcohol use and associated factors

The association between alcohol use and other associated factors are presented in Table 2. Gender was not related to alcohol use. Age was associated with only current alcohol use but not with alcohol problem and drunkenness. A closer observation showed that current alcohol use

Table 2
Association of risks and protective factors with alcohol use among Ghanaian adolescents.

Variables	Sample	Current alcohol use		Drunkenness		Alcohol problem	
	100%	n(%)	<i>p</i>	n(%)	<i>P</i>	n(%)	<i>p</i>
<i>Demographic</i>							
<i>Age</i>			.027		.577		.350
≤ 14years	50(2.5%)	3(1.3%)		4(1.9%)		2(1.6%)	
15years	180(9.1%)	11(4.7%)		18(8.5%)		7(5.6%)	
16years	245(12.4%)	25(10.7%)		21(9.9%)		13(10.4%)	
17years	440(22.3%)	54(23.1%)		46(21.7%)		33(26.4%)	
≥ 18years	1062(53.7%)	141(60.3%)		123(58.0%)		70(56.0%)	
Sex (Male)	1062(53.7%)	134(57.3%)	.324	125(59.2%)	.118	77(62.1%)	.058
<i>Mental health problems</i>							
Anxiety	317(16.0%)	48(20.5%)	.022	43(20.3%)	.059	28(22.4%)	.038
Loneliness	364(18.4%)	69(29.4%)	<.001	59(27.8%)	<.001	26(21.0%)	.419
Suicidal ideation	360(18.2%)	65(28.1%)	<.001	55(26.1%)	<.001	31(25.2%)	.013
Suicidal plan	438(22.5%)	69(31.1%)	.001	59(28.8%)	.010	38(32.5%)	.002
Suicidal attempt	438(22.2%)	73(31.6%)	<.001	64(30.3%)	.001	52(41.9%)	<.001
<i>Psychosocial variables</i>							
Truancy	629(32.1%)	124(53.7%)	<.001	109(52.4%)	<.001	72(58.5%)	<.001
Bullied	806(43.8%)	129(58.6%)	<.001	111(56.3%)	<.001	71(62.3%)	<.001
Attacked	737(37.5%)	127(55.5%)	<.001	99(47.4%)	.001	72(59.5%)	<.001
In a fight	558(28.2%)	103(44.0%)	<.001	76(35.7%)	.005	68(54.8%)	<.001
Close friends	278(14.1%)	18(7.8%)	.006	27(12.9%)	.554	16(13.1%)	.764
Smoked cigarette	71(3.6%)	38(16.6%)	<.001	32(5.5%)	<.001	26(21.5%)	<.001
<i>Parental involvement</i>							
Parental homework checking	830(42.3%)	87(37.3%)	.124	76(36.2%)	.046	39(31.7%)	.016
Parental understanding	867(44.6%)	95(41.5%)	.330	72(35.3%)	.003	52(42.3%)	.518
Parental knowledge of activity	781(40.2%)	74(32.3%)	.010	65(31.7%)	.009	42(34.4%)	.152
Parental intrusion of privacy	1074(54.8%)	125(53.9%)	.662	116(55.5%)	.884	64(52.0%)	.468

increases with age. Suicide ideation, suicide plan and suicide attempt were independently related to all alcohol-related behaviours (i.e. current alcohol use, drunkenness and alcohol problem). Loneliness was related to current alcohol use and drunkenness but with alcohol problem. Anxiety was found to be related to current alcohol use and alcohol problem but the relationship with drunkenness only approached statistical significance ($p = 0.059$).

Interpersonal risk factors such as truancy, being bullied, physically attacked, involved in a physical fight and smoking of cigarette were independently associated with all the indices of alcohol use (i.e. current alcohol use, drunkenness and alcohol problem having). A higher number of close friends was only associated with current alcohol use. Parenting homework checking was associated with drunkenness and alcohol problem whilst parental knowledge of adolescent activities was found to be related to current alcohol use and drunkenness. Parental understanding of adolescents was only associated with drunkenness

3.3. Predictors of alcohol use

The result of the logistic regression analysis are presented in Table 3. Anxiety increases the odds of both current alcohol use and alcohol problem but these effects no longer exist after controlling for other variables in the study. Loneliness increases the odds of both current alcohol use and drunkenness even when other factors are controlled. Suicidal ideation increases the odds of current alcohol use, drunkenness and alcohol problem but the odds remained significant for only current alcohol use, after adjusting for other variables. Suicidal ideation, suicide plan and suicide attempt independently increased the odds of current alcohol use, drunkenness and alcohol problem but the odds were not significant after adjusting for other factors. However, moderation analyses showed that gender moderates the relationship between current alcohol use and suicidal ideation ($p = 0.02$), and the association between suicide attempt and drunkenness ($p = 0.03$).

Truancy was found to be a risk factor for all the domains of alcohol use (i.e. current alcohol use, drunkenness and alcohol problem). Being bullied increases the odds of current alcohol use and drunkenness but not alcohol problem after adjusting for other factors. After controlling

for other factors, being involved in physical fight increases the odds of both current alcohol use and alcohol problem. Being physically attacked increases the odds of current alcohol use. Cigarette smoking increases the odds of current alcohol use, drunkenness and alcohol problem. Increasing number of friends remained a protective factor for only current alcohol use. After adjusting for other variables, none of the parental involvement variables was associated with current alcohol use, drunkenness and alcohol problem.

4. Discussion

This study was conducted to determine the prevalence and factors related to alcohol use among school-going adolescents in Ghana. We found prevalence rates of 12.6%, 11.1% and 6.8% for current alcohol use, lifetime drunkenness and alcohol problem respectively. These prevalence rates as reported in this study are within the ranges of what has been described in previous studies conducted in African countries such as Nigeria (Fatoye et al., 2006) and Ghana (Adu-Mireku, 2003) but lower than the prevalence rates reported in Uganda (Rudatsikira et al., 2007), Rwanda (Kanyoni et al., 2015), South Africa (Reddy et al., 2010) and Tanzania (Francis et al., 2015). The reported prevalent rates of alcohol use in this study are lower than the 63.2% and 35% of lifetime drunkenness and past month alcohol use respectively found among school going adolescents in the United States (Cheng, Chandra, Alcover, & Anthony, 2016; Haberstick et al., 2014). These varying prevalent rates of alcohol use may reflect in part due to the economic and cultural settings within which these studies were conducted (Ter Bogt, Schmid, Nic Gabhainn, Fotiou, & Vollebergh, 2006). The prevalence rates for current alcohol use and lifetime drunkenness are within the rates reported in a large study conducted in Ghana where 17.5% of the sample reported to consume alcoholic beverages (Ghana Statistical Service [GSS], 2008). This relatively high prevalent rate of alcohol use as found in this study among school-going population supports the claim by the WHO that elevated prevalence of alcohol use and misuse in low and middle-income countries (LMIC) including Ghana may be due to increasing rate of alcohol sale (WHO, 2014a). Perhaps, it is plausible that proliferation of aggressive radio and television advertisement of

Table 3
Logistic regression for predictors of current alcohol use, drunkenness and alcohol problem among adolescents.

Variables	Current alcohol use OR (95%CI)	AOR(95%CI) ^a	Drunkenness OR (95%CI)	AOR(95%CI) ^a	Alcohol problem OR (95%CI)	AOR (95%CI) ^a
<i>Demographics</i>						
Age in years						
≤ 14–17	Ref	Ref	Ref	Ref	Ref	Ref
18 years and above	1.37(1.04–1.81)*	1.21(0.86–1.70)	1.23(0.92–1.65)	1.12(0.79–1.58)	1.14(0.79–1.64)	1.00(0.63–1.59)
Sex (Male)	.87(0.66–1.15)	.91(0.65–1.28)	.79(0.59–1.06)	.88(0.62–1.24)	.70(0.48–1.01)	.74(0.47–1.18)
<i>Mental health problems</i>						
Anxiety	1.50(1.06–2.12)*	.82(0.51–1.32)	1.41(0.99–2.03)	.92(0.57–1.48)	1.59(1.02–1.47)*	1.07(0.58–1.96)
Loneliness	2.06(1.51–2.80)***	2.24(1.52–3.31)***	1.83(1.33–2.54)***	1.72(1.16–2.57)**	1.20(0.77–1.89)	1.03(0.58–1.82)
Suicidal ideation	1.95(1.43–2.68)***	1.67(1.01–2.77)*	1.80(1.29–2.51)**	1.28(0.76–2.16)	1.95(1.43–2.68)***	.76(0.38–1.50)
Suicidal plan	1.68(1.23–2.29)**	1.04(0.63–1.71)	1.53(1.11–2.11)**	1.07(0.64–1.78)	1.87(1.25–2.80)**	.78(0.40–1.51)
Suicidal attempt	1.83(1.35–2.47)***	.64(0.37–1.09)	1.70(1.24–2.34)**	.86(0.50–1.48)	3.06(2.10–4.46)***	2.03(1.04–3.96)*
<i>Psychosocial variables</i>						
Truancy	2.88(2.18–3.81)***	2.35(1.66–3.31)***	2.71(2.03–3.63)***	2.18(1.54–3.09)***	3.49(2.40–5.07)***	3.11(1.96–4.92)***
Bullied	2.04(1.53–2.72)***	1.51(1.06–2.14)*	1.78(1.32–2.40)***	1.45(1.01–2.07)*	2.35(1.59–3.47)***	1.59(0.98–2.56)
Attacked	2.38(1.80–3.15)***	2.00(1.41–2.84)***	1.62(1.22–2.17)**	1.10(0.77–1.59)	2.80(1.92–4.07)***	1.52(0.94–2.44)
In a fight	2.27(1.72–3.01)***	1.50(1.05–2.15)*	1.53(1.13–2.07)**	1.09(0.74–1.60)	3.65(2.52–5.28)***	2.13(1.32–3.42)**
Close friends	.50(0.31–0.83)**	.52(0.28–0.96)*	.88(0.57–1.35)	.75(0.44–1.30)	.92(0.54–1.58)	1.45(0.76–2.77)
Smoked cigarette	10.89(6.56–18.06)***	5.19(2.56–10.53)***	10.94(6.44–18.60)***	6.23(3.06–12.69)***	13.87(7.97–24.13)***	3.60(1.63–7.95)**
<i>Parental involvement</i>						
Parental homework checking	.80(0.60–1.06)	.94(0.64–1.36)	.74(0.55–0.99)*	.95(0.65–1.39)	.62(0.42–0.92)*	.76(0.46–1.27)
Parental understanding	.87(0.66–1.15)	1.20(0.83–1.72)	.64(0.47–0.86)**	.81(0.56–1.18)	.89(0.61–1.28)	1.53(0.94–1.49)
Parental knowledge of activity	.68(0.51–0.91)*	.74(0.50–1.09)	.66(0.49–0.90)**	.75(0.50–1.12)	.76(0.51–1.11)	.86(0.51–1.45)
Parental intrusion of privacy	.94(0.71–1.24)	1.25(0.88–1.77)	1.02(0.77–1.36)	1.12(0.78–1.60)	.87(0.61–1.26)	1.16(0.73–1.86)

OR = unadjusted odds ratio.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

^a AOR = adjusted odds ratio for all factors which appear in table; CI = confidence interval.

alcoholic beverages in both English and local languages in Ghana may have influence the prevalence rates of alcohol use in this current study.

Contrary to other findings (e.g. Doku et al., 2012; Howell et al., 2010; Peltzer et al., 2016; Reddy et al., 2007; 2010; Swahn et al., 2013; Woolf-King & Maisto, 2011), age and gender did not have any significant effect on alcohol use behaviours (current alcohol use, drunkenness and alcohol problems) in this study. Although these findings are surprising, it is plausible that social desirability could have played a key role as participants may have provided desirable responses to items on drug and substance use because conservative Ghanaian society does not expect young school going adolescents to engage in health risk behaviours such as alcohol use (Owusu, 2008).

In this study, mental health-related factors (i.e. anxiety and suicidal behaviour) were found to be risk factors for alcohol use among school going adolescents. Similar findings were reported in previous studies (e.g. Buckner et al., 2008; Gilles et al., 2006; Peltzer et al., 2016; Randall et al., 2014; Savage et al., 2016; Wilson et al., 2012). Unlike other studies (Buckner et al., 2008; Gilles et al., 2006; Savage et al., 2016), anxiety which is characterised by feelings of worry or fear was not related to alcohol use. It may be that the operationalization of anxiety was not sufficiently done to capture the somatic experience of anxiety, or that feelings of anxiety alone was not enough to warrant a possible relationship with alcohol use. The association between anxiety and current alcohol use should be interpreted cautiously as gender has been shown to moderate this relationship (Dawson, Grant, & Ruan, 2005; Geisner, Larimer, & Neighbors, 2004). The association between suicidal behaviour and alcohol use has been established (Peltzer et al., 2016; Randall et al., 2014; Savage et al., 2016; WHO, 2014a). Alcohol abuse triggers suicidal acts due to increased impulsivity and impairment of cognitive functions (Pompili et al., 2010). It is thus plausible that alcohol or other intoxicating substances act either as means for accomplishing suicidal behaviours or to get the courage to fulfil one's plans or to reduce pain, consciousness, or fear (Kizza, Hjelmeland, Kinyanda, & Knizek, 2012; Pompili et al., 2010).

In this study, loneliness was found to be associated with current alcohol use and drunkenness but not alcohol problem, a confirmation of

what has been reported elsewhere (Qualter et al., 2013; Stickley et al., 2014). Loneliness has indeed been recognized as an essential risk factor in all the stages of alcoholism (Hawkey & Cacioppo, 2010; McKay, Konowalczyk, Andretta, & Cole, 2017) and studies conducted in developed countries have demonstrated that lonely individuals are more vulnerable to alcohol related problems (Page et al., 2011; Qualter et al., 2013). However, the lack of significant association between loneliness and alcohol-related problems was not surprising as loneliness in itself may not result in alcohol-related problems. Thus, the association could be mediated by alcohol use which may probably lead to negative psychosocial consequences. Perhaps school-going adolescents may respond to feelings of loneliness by undertaking other pleasing activities to help reduce or cope with the agonizing feelings associated with loneliness. This may explain why lonely adolescents are more likely to engage in health compromising behaviours including alcohol and illicit drug use (Page et al., 2011; Stickley et al., 2014). As reported by previous studies that having more friends was protective of alcohol use (e.g. Nash et al., 2005; Peltzer et al., 2016), our study also showed that the odds of alcohol abuse (particularly current alcohol use) reduces with higher number of close friends. Friendship is a key social relationship channel for adolescents, providing motivational context for learning new social skills and receiving feedback. Thus, in that regard, extensive friendship network should translate into positive developmental outcomes for adolescents. The observed linkage between alcohol abuse and feeling of loneliness and having fewer close friends confirms the claim that social neglect and the lack of social relationships with individuals as in the literature on children and adolescent substance abuse and misuse behaviour needs to be critically looked at again (Laursen & Hartl, 2013).

Our results further showed that cigarette use was independently related to all the three indices of alcohol-related problems (i.e. current alcohol use, drunkenness and problem alcohol. This confirms previous studies which have reported alcohol use and misuse as risk factors to other health compromising damaging behaviours, including the uses of tobacco and marijuana (e.g. Carney et al., 2013; Reddy et al., 2010). Unsurprisingly, as a developmental stage characterised by experimentation of risky behaviours, this finding may elucidate their

vulnerability to engage in concurrent health compromising behaviours (Sumter, Bokhorst, Steinberg, & Westenberg, 2009). The combination of such harmful health behaviours affirms the theory of problem behaviour (Jessor & Jessor, 1997). In this study, it is uncertain as to whether participants smoke cigarettes because they were under the influence of alcohol or vice versa or a possible “third factor” that facilitates cigarette smoking. Globally, alcohol use is widely acknowledged to interfere with rational behaviours (Asante et al., 2014), thus making individuals vulnerable to several health risky behaviours.

Truancy was also found as a significant risk factor for all the three indices of alcohol behaviour in this study. Unsurprisingly, many studies have shown that students who reported higher levels of truancy were likely to report frequent drinking, drunkenness and alcohol-related problems (Carney et al., 2013; Goldberg-Looney et al., 2016; Holtes et al., 2015; Mounteney et al., 2010). The finding that adolescents being bullied, physically attacked and involved in physical fight were associated with significantly greater odds of alcohol use aligned with previous research that have found such interpersonal level risk factors to be associated with alcohol use in school going adolescents (e.g. Fite et al., 2016; Kelly et al., 2015; Peltzer et al., 2016; Salas-Wright et al., 2014).

4.1. Strengths and limitations of the study

This is one of the first primary studies to have used a large data to examine adolescents' alcohol use with a nationally representative sample and advances our knowledge of risks and protective factors related to alcohol use, drunkenness and alcohol problem among senior high school students in Ghana, but some limitations should be noted. The GSHS study provides a cross-sectional database, thus, we could not predict causality between the predictors and alcohol use related behaviours. Secondly, mental health questions such as anxiety (worried), loneliness and alcohol related behaviours were measured with a single question as in all GSHS. Finally, we suspect the presence of social desirability response to some of the items which might also explain potentially, the low levels of alcohol use in this sample. Nevertheless, this study is one of the first cross-sectional study to have used a nationally representative data to explore the role of mental health and interpersonal factors to be associated with alcohol use, variables that hitherto have infrequently been studied among school going adolescents in Ghana.

5. Conclusion

This study was conducted to assess the prevalence and factors associated with alcohol use among adolescents in senior high schools in Ghana. Although the prevalence rates for alcohol problem was low, the rates for current alcohol use and lifetime drunkenness were quite relatively high. Loneliness, suicidal ideation and suicidal attempts were found to independently increase the odds of alcohol use behaviours (current alcohol use, drunkenness and alcohol problems) among adolescents. Similarly, psychosocial problems such as truancy, current smoking of cigarette, being bullied, being physically attacked, being involved in a physical fight were found to independently increase the odds of alcohol use behaviours (current alcohol use, drunkenness and alcohol problems). Having close friends was protective of current alcohol use but not for drunkenness and alcohol problems. These findings underscore the need for the development of school-based health interventions for early identification of adolescents at-risk for alcohol related problems.

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Declaration of interest

The named authors have no conflicts of interest to declare.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.mhp.2019.01.009](https://doi.org/10.1016/j.mhp.2019.01.009).

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