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Prevalence and Predictors of Substance Use Among Senior High School Students: An Institution-Based Cross-Sectional Study in Ghana

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Abstract: Introduction: Substance use among senior high school students in Ghana has been on the increase. While various studies have investigated the topic, studies that examine the issue in high schools in coastal Ghana are scarce. Also, the relationship between the use of the three most common substances—alcohol, cigarette, and marijuana—is essentially an open question. This study examines the prevalence of substance use among senior high school students in a coast population in Ghana. Methods: An institution-based cross-sectional study was conducted among 405 senior high school students. Data was collected using a self-administered, structured questionnaire via a multistage sampling process. The data was entered, cleaned, coded, and analyzed using SPSS. Pearson Chi-square test was used to determine the association between the independent and dependent variables, and a multiple logistic regression established the strength of the explanatory variables in predicting the outcomes. Associations were significant at $p < 0.05$. Results: The lifetime prevalence and current prevalence of alcohol consumption were 64.8% and 26.8%, respectively. The lifetime and current prevalence of cigarette smoking were 12.2%, respectively. Regarding marijuana use, the lifetime prevalence was 9.1%, and the current prevalence was 6.3%. Household head (s) [AOR=3.53, 95% CI=1.24, 10.03] and lifetime cigarette smoking predicted alcohol consumption [AOR=5.72, 95% CI=1.50, 21.76]. Religion [AOR=7.19, 95% CI=1.21, 42.58], lifetime alcohol consumption [AOR=5.73, 95% CI=1.51, 21.83], and lifetime marijuana use predicted cigarette smoking [AOR=23.95, 95% CI=8.00, 71.66]. School residency status [AOR=0.15, 95% CI=0.05, 0.47], religion [AOR=6.99, 95% CI=1.07, 45.84], home residency [AOR=12.61, 95% CI=3.07, 51.88], and lifetime cigarette smoking [AOR=25.07, 95% CI=8.00, 78.60] predicted marijuana use. Conclusion: A substantial proportion of the students engage in underage drinking and smoking. The use of marijuana, an illicit substance, is notable. Policymakers should act proactively to prevent an impending public health and legal crisis among senior high school students.

Keywords: Substance Use, High School, Prevalence, Predictors, Ghana

1. Introduction

Substances, chemical matters with the ability to affect the brain and influence mood, thinking, and behavior, could be used for various reasons—medical therapy, recreation, medical experiments, and manufacturing and production [1]. However, some others tend to misuse substances. In other words, substances, by themselves, are not dangerous, it is only when they are misused that these substances tend to be dangerous [2, 3]. One category of persons who tend to misuse substances is senior high school students [4, 5]. These students, typically in their adolescence, tend to experiment with substance use due to various reasons or influencing factors [6].

Substance use tends to have negative effects on senior high school students [7]. The effects of substance use could

manifest in both the physical and mental health of the students [8]. It leads to decreased academic performance, increased risk of contracting HIV and other sexually transmitted diseases (STDs), and psychiatric disorders such as lethargy, hopelessness, insomnia, and depressive symptoms [4]. Substance use can also lead to physical health problems. These include motor vehicle injuries, sexual assaults, alcohol/drug poisoning, and medical emergencies [5].

Given the effects of substance use on high school students, academia, including those in Ghana, has paid attention to the topic. The three most common substances that high school students—and adolescents—use are alcohol, cigarette and marijuana [8-11]. A publication concluded that substance use among high school students in Ghana, and certain sub-Saharan African countries is "a major public health problem" [9]. Studies have, however, not explored the full extent of the problem. In Ghana, no known study has been conducted to investigate substance use among high school students at the coastal part of the country. This represents a critical literature gap; the country's coastal line spans 334 miles and accounts for about a quarter of the national population. Studies that have been conducted in other parts of the country typically select one or two of the three most common substances. Also, prior studies fell short of examining the relationship between these three substances as it relates to their use among high school students. To fill this gap and literature, and present stakeholders with an avenue of tailored policymaking, the current study investigated the prevalence of substance use among high school students in a coastal setting in Ghana.

2. Methods

2.1. Study Design and Setting

An institutional-based cross-sectional study was conducted among students who were enrolled in Keta Senior High Technical School, Keta, Anlo Technical Institute, Anloga, and Zion College of West Africa, Anloga. These schools are located along the coast in Southeastern Ghana.

Sample size calculation and sampling procedure

A sample size of 405 respondents was used for the study. The sample size was calculated using the Cochran formulae: $n = \frac{Z^2 P(1-P)}{d^2}$ [12]. Z score was 1.96 at 95% confidence level, d = margin of error of 5% (0.05), and p of 47.9% was estimated proportion of substance [13]. A non-response rate of 5% was added. A multi-stage sampling technique, which involves different sampling methods, was used in selecting the sample to participate in the study [14, 15]. The first stage was the random selection of the three using a simple random sampling without replacement technique. In the second stage of sampling, stratified sampling technique was used to allot respondents according to the population of each selected school. The final sample was then collected using simple random sampling, balloting with pieces of papers with "yes," or "no" inscribed on them.

2.2. Data Collection Instruments and Techniques

A structured, self-administered questionnaire, adopted from "Youth That Care Survey," which has since been altered and used to examine substance use within school environments in Ghana was used [1, 16]. Demographic data such as age, gender, school residency status, original residency, father's level of education, mother's level of education, religion, level of education, and household head (s) served were collected. Alcohol consumption, cigarette smoking and marijuana use were determined through "yes," or "no" responses [17]. Information on lifetime and current use of these substances was collected. Current use was defined by substance use within the 30 days prior to the study [18].

2.3. Data Analysis

Data was entered, cleaned, and coded and analyzed using IBM SPSS version 25. Categorical variables were represented in tables and charts, presenting their frequencies and percentages. We initially examined the relationships between the explanatory variables and substance use through Pearson's Chi-square test, with a significance level of 0.05. Subsequently, a multivariate analysis was conducted using logistic regression to determine the strength of the association, and the findings were conveyed by reporting the adjusted odds ratios (AOR) for each outcome variable. The odds ratios were presented alongside their 95% confidence intervals, with statistical significance defined at the 0.05 level. Additionally, collinearity analysis was performed, revealing minimum and maximum variance inflation factor (VIF) values were 1.05 and 1.68, respectively. These results indicate the absence of substantial collinearity among the study variables.

3. Results

The response rate was 94.8%. Twenty-one entries had missing values, as such, they were removed from the analysis.

3.1. Sociodemographic Characteristics of the Respondents

From Table 1, the mean age was 17.82 years. Most of the respondents (71.4%) were male. Most of the respondents (56.3%) were boarding students. Likewise, most of the respondents (55.5%) were third-year students. Christianity accounted for the religion of most the respondents (95.8%). Most of the respondents' fathers (37.5%) had tertiary education, and most of the mothers (34.1%) had basic education. Most of the respondents (63.3%) were living with their parents, and over half of the respondents (52.6%) hailed from urban areas.

Table 1. *Sociodemographic characteristics of the respondents.*

Socio-demographic variables	Frequency	Percent (%)
Age		
Mean	17.82±2.24	
Minimum	13	
Maximum	29	
Gender		
Male	274	71.4
Female	110	28.6
School residency status		
Day student	168	43.8
Boarding student	216	56.3
Religion		
Christian	368	95.8
Traditional	11	2.9
Muslim	5	1.3
Years of study		
Second year	171	44.5
Third year	213	55.5
Father's level of education		
None	23	6.0
Basic	85	22.1
Secondary	132	34.4
Tertiary	144	37.5
Mother's level of education		
None	56	14.6
Basic	131	34.1
Secondary	114	29.7
Tertiary	83	21.6
Residence		
Rural area	182	47.4
Urban area	202	52.6
Household head		
Both parents	243	63.3
Single parent	102	26.6
Someone other than parent	39	10.2

3.2. Lifetime and Current Prevalence of the Three Substances

Two hundred and forty-nine respondents consumed alcohol in their lives, resulting in a lifetime prevalence of 64.8% (Figure 1). Out of the 249 who consumed alcohol in their lifetime, 103 (41.4%) were currently consuming alcohol which translated into overall current prevalence of 26.8%. The lifetime prevalence of cigarette smoking was 12.2%. Out of the 47 respondents who smoked cigarettes, 27 (57.4%) were still smoking it, translating into an overall current prevalence of 7.0%. Regarding marijuana use, the lifetime prevalence was 9.1%. Out of the 35 respondents who used marijuana, 24 (68.6%) of them were still using it, as such, the overall current prevalence was 6.3%.

Current users based on the proportion of lifetime users who reported using any of the substances within the previous 30 days.

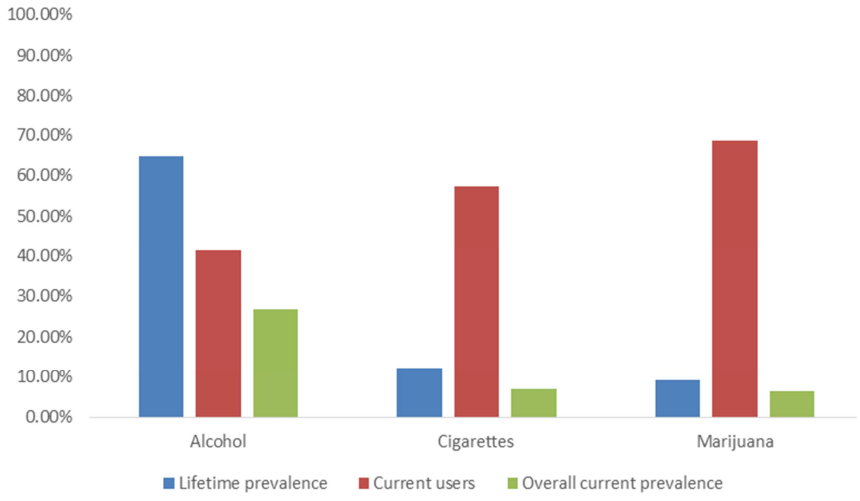

Figure 1. *Prevalence of use of the three substances.*

3.3. Factors Associated with Substance Use Among the Students

Results from the bivariate analysis showed that school residency status (χ^2=9.12, p<0.05), household head (s) (χ^2=9.86, p<0.05), lifetime cigarette smoking (χ^2=19.12, p<0.001), and lifetime marijuana use (χ^2=14.64, p<0.001) were significantly associated with alcohol consumption among the high school students (Table 2).

Table 2. *Factors associated with lifetime alcohol consumption among the students.*

Variables	Alcohol consumption		Chi-square (χ^2)	P-value
	No n (%)	Yes n (%)		
Age			1.46	0.228
13-17years	77 (37.9)	126 (62.1)		
18years and above	58 (32.0)	123 (68.0)		

Variables	Alcohol consumption		Chi-square (χ^2)	P-value
	No n (%)	Yes n (%)		
Gender			2.24	0.135
Male	90 (32.8)	184 (67.2)		
Female	45 (40.9)	65 (59.1)		
School residency status			9.12	0.002
Day student	45 (26.8)	123 (73.2)		
Boarding house	90 (41.7)	126 (58.3)		
Religion			4.73	0.094
Christian	128 (34.8)	240 (65.2)		
Traditional	3 (27.3)	8 (72.7)		
Muslim	4 (80.0)	1 (20.0)		
Years of study			0.04	0.849
Two	61 (35.7)	110 (64.3)		
Three	74 (34.7)	139 (65.3)		
Father's level of education			2.78	0.426
None	9 (39.1)	14 (60.9)		
Basic	26 (30.6)	59 (69.4)		
Secondary	53 (40.2)	79 (59.8)		
Tertiary	47 (32.6)	97 (67.4)		
Mother's level of education			0.50	0.919
None	21 (37.5)	35 (62.5)		
Basic	48 (36.6)	83 (63.4)		
Secondary	38 (33.3)	76 (66.7)		
Tertiary	28 (33.7)	55 (66.3)		
Residence			1.64	0.200
Rural area	58 (31.9)	124 (68.1)		
Urban area	77 (38.1)	125 (61.9)		
Household head (s)			9.86	0.007
Both parents	94 (38.7)	149 (61.3)		
Single parent	36 (35.3)	66 (64.7)		
Someone other than parent	5 (12.8)	34 (87.2)		
Lifetime cigarette smoking			19.45	0.000
No	132 (39.2)	205 (60.8)		
Yes	3 (6.4)	44 (93.6)		
Lifetime marijuana use			14.64	0.000
No	133 (38.1)	216 (61.9)		
Yes	2 (5.7)	33 (94.3)		

School residency status (χ^2=7.01, p<0.01), religion (χ^2=19.43, p<0.001), residence (χ^2=8.37, p<0.01), household head (s) (χ^2=10.54, p<0.01), lifetime alcohol consumption (χ^2=19.45, p<0.001), and lifetime marijuana use (χ^2=138.02, p<0.001) were significantly associated with cigarette smoking among the high school students (Table 3).

Table 3. *Factors associated with lifetime cigarette smoking among the students.*

Variables	Cigarette smoking		Chi-square (χ^2)	P-value
	No n (%)	Yes n (%)		
Age			0.07	0.792
13-17years	179 (88.2)	24 (11.8)		
18years and above	158 (87.3)	23 (12.7)		
Gender			3.54	0.060
Male	235 (85.8)	39 (14.2)		
Female	102 (92.7)	8 (7.3)		
School residency status			7.01	0.008
Day student	139 (82.7)	29 (17.3)		
Boarding house	198 (91.7)	18 (8.3)		
Religion			19.43	0.000
Christian	327 (88.9)	41 (11.1)		
Traditional	5 (45.5)	6 (54.5)		
Muslim	5 (100.0)	0 (0.0)		
Years of study			0.09	0.771
Two	151 (88.3)	20 (11.7)		
Three	186 (87.3)	27 (12.7)		
Father's level of education			4.64	0.200
None	23 (100.0)	0 (0.0)		
Basic	72 (84.7)	13 (15.3)		
Secondary	118 (89.4)	14 (10.6)		
Tertiary	124 (86.1)	20 (13.9)		

Variables	Cigarette smoking		Chi-square (χ^2)	P-value
	No n (%)	Yes n (%)		
Mother's level of education			2.36	0.500
None	51 (91.1)	5 (8.9)		
Basic	118 (90.1)	13 (9.9)		
Secondary	97 (85.1)	17 (14.9)		
Tertiary	71 (85.5)	12 (14.5)		
Residence			8.37	0.004
Rural area	169 (92.9)	13 (7.1)		
Urban area	168 (83.2)	47 (16.8)		
Household head (s)			10.54	0.005
Both parents	219 (90.1)	24 (9.9)		
Single parent	90 (88.2)	12 (11.8)		
Someone other than parent	28 (71.8)	11 (28.2)		
Lifetime alcohol consumption			19.45	0.000
No	132 (97.8)	3 (2.2)		
Yes	205 (82.3)	44 (17.7)		
Lifetime marijuana use			138.02	0.000
No	328 (94.0)	21 (6.0)		
Yes	9 (25.7)	26 (74.3)		

Gender ($\chi2=3.89$, $p<0.05$), school residency status ($\chi2=711.99$, $p<0.01$), religion ($\chi2=10.57$, $p<0.01$), residence ($\chi2=14.14$, $p<0.001$), household head (s) ($\chi2=10.30$, $p<0.01$), lifetime alcohol consumption ($\chi2=14.64$, $p<0.001$), and lifetime cigarette smoking ($\chi2=138.02$, $p<0.001$) were significantly associated with marijuana use among the high school students (Table 4).

Table 4. *Factors associated with marijuana use among the students.*

Variables	Marijuana use		Chi-square ($\chi2$)	P-value
	No n (%)	Yes n (%)		
Age			0.03	0.860
13-17years	184 (90.6)	19 (9.4)		
18years and above	165 (91.2)	16 (8.8)		
Gender			3.89	0.049
Male	244 (89.1)	30 (10.9)		
Female	105 (95.5)	5 (4.5)		
School residency status			11.99	0.001
Day student	143 (85.1)	25 (14.9)		
Boarding house	206 (95.4)	10 (4.6)		
Religion			10.57	0.005
Christian	337 (91.6)	31 (8.4)		
Traditional	7 (63.6)	4 (36.4)		
Muslim	5 (100.0)	0 (0.0)		
Years of study			1.48	0.223
Two	152 (88.9)	19 (11.1)		
Three	197 (92.5)	16 (7.5)		
Father's level of education			3.08	0.380
None	23 (100.0)	0 (0.0)		
Basic	78 (91.8)	7 (8.2)		
Secondary	120 (90.9)	12 (9.1)		
Tertiary	128 (88.9)	16 (11.1)		
Mother's level of education			2.71	0.439
None	53 (94.6)	3 (5.4)		
Basic	121 (92.4)	10 (7.6)		
Secondary	100 (87.7)	14 (12.3)		
Tertiary	75 (90.4)	8 (9.6)		
Residence			14.14	0.000
Rural area	176 (96.7)	6 (3.3)		
Urban area	173 (85.6)	29 (14.4)		
Household head (s)			10.30	0.006
Both parents	224 (92.2)	19 (7.8)		
Single parent	95 (93.1)	7 (6.9)		
Someone other than parent	30 (76.9)	9 (23.1)		
Lifetime alcohol consumption			14.64	0.000
No	133 (98.5)	2 (1.5)		
Yes	216 (86.7)	33 (13.3)		
Lifetime cigarette smoking			138.02	0.000
No	328 (97.3)	9 (2.7)		
Yes	21 (44.7)	26 (55.3)		

3.4. Predictors of Substance Use Among the Students

Results of the regression analysis show the predictors of alcohol consumption, cigarette smoking and marijuana use among the respondents (Table 5). In the adjusted model for alcohol consumption, students who were living with someone other than their parents were 3.53 times more likely to consume alcohol than those who were living with their parents [AOR=3.53, 95% CI=1.24, 10.03] (Table 5). Students who had ever smoked cigarettes were 5.7 times more likely to consume alcohol than those who had never smoked cigarettes [AOR=5.72, 95% CI=1.50, 21.76] (Table 5). Pertaining to cigarette smoking, students who belonged to traditional religion were 7.2 more likely to smoke cigarette than Christians [AOR=7.19, 95% CI=1.21, 42.58] (Table 5). Students who had ever consumed alcohol were 5.7 times more likely to smoke cigarettes than those who had never consumed alcohol in their lifetime [AOR=5.73, 95% CI=1.51, 21.83] (Table 5). Also, students who had ever used marijuana in their life were 24 times more likely to smoke cigarettes than those who had never used marijuana in their life [AOR=23.95, 95% CI=8.00, 71.66] (Table 5). Regarding marijuana use, boarding students were 85% less likely to use marijuana than those who were day students [AOR=0.15, 95% CI=0.05, 0.47] (Table 5). Students who belonged to traditional religion were 7 times more likely to use marijuana than Christians [AOR=6.99, 95% CI=1.07, 45.84] (Table 5). Students who hailed from urban areas were 12.6 times more likely to use marijuana than those who hailed from rural areas [AOR=12.61, 95% CI=3.07, 51.88] (Table 5). In addition, students who had ever smoked cigarettes in their life were 25.1 times more likely to use marijuana than those who had never smoked cigarettes [AOR=25.07, 95% CI=8.00, 78.60] (Table 5). Predictors of substance use among the students.

Table 5. *Predictors of substance use among the students.*

Alcohol use	**Lifetime alcohol consumption**	**Lifetime cigarette smoking**	**Lifetime marijuana use**
	AOR [95% CI]	**AOR [95% CI]**	**AOR [95% CI]**
Age			
Less than 18 years	Ref	Ref	Ref
18 years or more	0.92 [0.53, 1.59]	0.86 [0.32, 2.31]	0.84 [0.27, 2.65]
Gender			
Male	Ref	Ref	Ref
Female	0.94 [0.56, 1.56]	0.66 [0.23, 1.95]	0.54 [0.14, 2.07]
School residency status			
Day student	Ref	Ref	Ref
Boarding student	0.59 [0.34, 1.03]	0.77 [0.30, 1.98]	0.15** [0.05, 0.47]
Religion			
Christianity	Ref	Ref	Ref
Traditional	0.36 [0.07, 1.88]	7.19* [1.21, 42.58]	6.99* [1.07, 45.84]
Muslim	0.21 [0.02, 2.01]	-	-
Years of study			
Second year	Ref	Ref	Ref
Third year	1.06 [0.65, 1.75]	2.11 [0.83, 5.38]	0.45 [0.14, 1.44]
Father's level of education			
None	Ref	Ref	Ref
Basic	1.51 [0.55, 4.20]	-	-
Secondary	1.07 [0.39, 2.90]	-	-
Tertiary	1.60 [0.57, 4.50]	-	-
Mother's level of education			
None	Ref	Ref	Ref
Basic	1.26 [0.61, 2.60]	1.49 [0.31, 7.10]	4.96 [0.63, 39.25]
Secondary	1.40 [0.62, 3.15]	3.47 [0.64, 18.65]	4.14 [0.49, 34.76]
Tertiary	1.34 [0.55, 3.25]	3.30 [0.55, 19.91]	0.95 [0.10, 9.40]
Residence			
Rural	Ref	Ref	Ref
Urban	0.79 [0.48, 1.30]	2.48 [0.93, 6.58]	12.61*** [3.07, 51.88]
Household head			
Both parents	Ref	Ref	Ref
Single parent	1.17 [0.69, 1.96]	1.51 [0.57, 4.01]	0.96 [0.26, 3.60]
Someone other than parent	3.53* [1.24, 10.03]	2.06 [0.61, 7.01]	3.01 [0.69, 13.18]
Lifetime alcohol consumption			
No		Ref	Ref
Yes		5.73* [1.51, 21.83]	5.62 [0.90, 35.25]
Lifetime cigarette smoking			
No	Ref		Ref
Yes	5.72* [1.50, 21.76]		25.07*** [8.00, 78.60]
Lifetime marijuana use			
No	Ref	Ref	

Alcohol use	Lifetime alcohol consumption	Lifetime cigarette smoking	Lifetime marijuana use
	AOR [95% CI]	AOR [95% CI]	AOR [95% CI]
Yes	3.75 [0.77, 18.34]	23.95*** [8.00, 71.66]	
pseudoR^2	0.166	0.496	0.613

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

4. Discussion

This study examined the prevalence of the use of three common substances—and its predictors—among high school students in a Ghanaian population. The lifetime prevalence of alcohol consumption was 64.8%. This finding is supported by a study in the in Northwest Ethiopia and South Africa which found that the lifetime prevalence of alcohol consumption among high school students was 63.1% and 69% respectively [19, 20]. Similar results were realized by studies in the Philippines and Laos [21]. This finding, however, runs contrary to the results of some studies. For instance, a study in rural South Africa determined that the prevalence of lifetime consumption of alcohol among high school students was 87% [22]. An earlier study on alcohol use among high school students in Ghana reported a lifetime prevalence of 44.6% [10]. Time could account for the differences between the results of our study and the earlier Ghanaian study. This possibly implies an increasing trend in alcohol consumption among high school students. The legal age of drinking in Ghana is 18 years, however, in our study, 62.1% of high school students indicated that they have consumed alcohol. This high prevalence of underage drinking should be a concern for policy makers.

The lifetime prevalence of cigarette smoking in this study was 12.2%. Similar findings were made elsewhere. In Yilo Krobo, Ghana, lifetime prevalence of cigarette smoking was 14.3% [11]. Likewise, the lifetime prevalence of cigarette smoking among high school students in the Iran ranged from 14.9% to 15.7% [23]. Unlike the result of our study, researchers in Northwest Ethiopia and South Africa recorded higher lifetime prevalence of cigarette smoking among high school students: 23.9% and 45% [20, 22]. On the hand, the lifetime prevalence of cigarette smoking among the same population in in northern Tanzania was 7.6% [24]. The wide-ranging nature of lifetime smoking of cigarette among high school students suggests that local policies may go a long way in controlling this behavior among high school students. The authorities in Ghana must take care to ensure that cigarette smoking among high school students does not rise to the levels recorded in Ethiopia and South Africa.

Additionally, this study recorded a 9.1% lifetime prevalence of marijuana use among the students. An identical finding was made in a South African study [19]. Higher prevalence was also recorded in other parts of South Africa [22]. Again, the result shows the need for measures to curb the use of marijuana, an illegal substance in Ghana, among high school students. Some of these students may find themselves at the wrong end of the law by virtue of their marijuana use.

Our study showed that living with someone other than parents strongly predicted alcohol use. This finding is consistent with literature, which suggests that household situation can be a risk factor for alcohol consumption among adolescents—and high school students [25]. Like ours, a study in some seven school districts in Thailand established that not living with parents increased the likelihood of substance use among high school students [26]. When adolescents live with their parents, they get higher levels of supervision which limits their ability to experiment with illegal substances like alcohol. This could explain the relationship between household situations and alcohol consumption.

Lifetime cigarette smoking strongly predicted both alcohol and marijuana use among the students. Partly consistent with the results of this study is a Ghanaian study which showed that lifetime alcohol consumption strongly predicted cigarette smoking among high school students in Ghana [11]. This strong interrelationship provides an avenue for the players within the health promotion space to effectively tackle substance use among the students. In essence, health promotion officers could "kill two birds with one stone," if they reduce or eliminate cigarette smoking among the students. Also, belonging to the African traditional religion predicted both cigarette smoking and marijuana use among the students. The influence of religion, and belief systems, on risky behaviors among adolescent populations is well established [27-29]. Young people tend to follow the dictates of their religion [30]. Unlike the traditional religion in Ghana, Christianity and Islam expressly forbids cigarette smoking and marijuana use for these behaviors are seen as unholy.

Furthermore, our study showed that hailing from an urban area increases the likelihood of marijuana use among the students. Students who hail from urban areas may have higher avenues to access marijuana [31-33]. Access promoted the use of substances among high school students [26]. This may explain the observation in our study on the influence of urban residency on marijuana use. Additionally, boarding students were less likely to use marijuana than day students. Many Ghanaian high schools, like the study population for this study, has a dual residency system [34]. Those who live in dormitories on campus are known as boarding students and those who do not live on campus are known as day students [34]. Boarding houses have very strict rules, including prohibition of illegal substances such as marijuana. This prohibition possibly explains our findings.

5. Limitations of the Study

Even though cross-sectional study design describes the associated factors of the outcome, an inherent flaw of cross-

sectional studies is that they cannot establish causality. Also, due to the self-reported nature of the use of the various substances, recall and desirability bias might have influenced the results. Additionally, the study is not generalizable to other populations. It was conducted among high schools in coastal Ghana, and even so, the results may not represent coastal high schools in metropolis. Simple random sampling might have also limited the diversity of the sample.

6. Conclusion

The study showed a high prevalence of substance use, which can degenerate into a public health problem. Underage drinking and the use of marijuana—a contraband substance—could land the students into legal problems with life-long lasting effects. Ghana is thought of as a conservative country where underage drinking and use of illegal substances are frowned upon. The findings of this study undermine this common perception. Stakeholders must be alert to the changing dynamics and make urgent efforts to address the problem in order to avert an impending public health crisis. A starting point for the stakeholders is to tackle the predictors of substance use which were established in this study.

Declarations

Ethics Approval and Consent to Participate

Ethical clearance for the study was sought and obtained from the Institutional Review Board of the Ghana Health Services (GHSERC122/05). Administrative permission was sought from the management of the various schools. Informed consent was sought from students who were at least 18 years old. And assent was taken from students who were less than 18 years old with consent from their parents/legal guardians.

Availability of Data and Materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflicts of Interest

The authors declare no competing interests.

Authors' Contributions

KA conceptualized, designed, analyzed, drafted, and interpreted the results. EAA wrote the discussion and critically revised the draft and final manuscript. All authors have approved the final version of the manuscript.

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