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SUBSTANCE USE AND SEXUAL RISK BEHAVIOURS AMONGST IN-SCHOOL YOUTH AND YOUNG ADULTS LIVING IN LIBERIA

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ABSTRACT

Little is known about the prevalence of and association of substance use and sexual risk behaviors among youth in Liberia. The present study was undertaken to examine the substance use behaviors and sexual practices of students in 16 secondary schools in greater and central Monrovia, Liberia. The sample consisted of 802 students in grades 7th to 12th who were enrolled in a co-educational school. Among substances reported, alcohol was the most commonly tried substance with almost 50% using it at some point in their life. 78% of respondents had engaged in sex with 13% reported having sex for monetary gain. Of those, more than 25% never or occasionally used a condom. Results indicated an association between alcohol and engaging in sex and an increase in the number of sexual partners. Future research should target both in-school and out-of-school students to develop school education and health services unique to this population.

Keywords: post-conflict Liberia, substance use, sexual risk behaviors, in-school students

INTRODUCTION

Africa has the highest prevalence of HIV infection in the world. According to UNAIDS, the number of people living with HIV in Liberia is 35,000 with the prevalence rate of people from the age of 15 to 49 years old estimated at 1.7%. (WHO, 2008) This figure is similar to rates in neighboring countries of Guinea (1.5%) and Ghana (2.2%) but substantially lower than in eastern and southern Africa, where seven countries have an HIV infection prevalence higher than 15% (WHO, 2008). Unfortunately, AIDS case reporting can be problematic since those affected must be seen in a hospital or clinical setting and clinicians must recognize physical manifestations of the disease, if laboratory testing is unavailable.

In 1847, the Republic of Liberia was created as a haven for "free people of color," descendants of Africans who were made free due to luck, birth, or their own efforts to establish freedom. Many Africans

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came to Liberia seeking independence, where they could live without pressures of slavery. Between 1989 and 2003, Liberia experienced a brutal civil war, which devastated much of its infrastructure including roads, schools, hospitals, and factories. Most major businesses were destroyed or heavily damaged, prompting many foreign investors and businesses to leave the country. Educational systems broke down and many distraught youth were forced to turn to other means to support themselves and their families. Young boys had little opportunities for employment, so many of them joined the army of rebels. Due to stigma and poverty, girls were forced to survive by doing sex work. Post-conflict, Liberia continues to struggle as there are few resources and services available to rebuild the country. As children returned to school, some of them had been away for more than a decade. The disruption of the educational systems heavily impacted the current classroom, which now contains a wide range of student ages. Some high school students are in their twenties and a few in their thirties. Having older children and young adults together in the same classroom impacts the development of younger children, who may be exposed to alcohol and other substances and sex at an earlier age. Younger children may be more vulnerable to such acts like coercive sex than older children, especially if it involves goods or monetary gain.

Statistics show that 63.8% of the population live on less than $1 per day (UNDP, 2006). Despite its rich natural resources and potential for self-sufficiency in food production, Liberia has difficulty competing with lower costs of production in neighboring countries and imports many of its goods. Although the employment rate, including formal or informal work, appears to be 96%, much of this work (79%) is vulnerable and inconsistent, often generating very low wages (UNDP, 2006).

Studies from refugee and internally-displaced populations in other countries have shown that alcohol and drugs can serve as a means of coping with such psychiatric problems as depression, anxiety, and stress disorders, which are particularly common in this low socioeconomic group (de Jong & Kompro, 2002; Steel, et al., 2009; Weaver & Roberts, 2010; Weiser, et al., 2006). Other studies in Africa have demonstrated how alcohol use is associated with risky sexual behaviors (CSA, 2000; D. Kebede, Akilu, & Sanders, 2000; MOH, 1999), sexually transmitted disease prevalence, HIV incidence, and HIV prevalence.

Young people are a vulnerable population as many start to experiment with alcohol and other drugs, engage in sexual risk behaviors such as unprotected sex and have multiple partners during this time (Pela, 1986; Blum, McNeely, & Nonnemaker, 2002) developed an ecological model to explain the vulnerability of adolescents to risk behaviors that takes into account macro-level environment, social environment, school, family, peers, and individual factors. In Ethiopia, youth who used alcohol, khat, and other substances were also found to engage in risky sexual behaviors (D. Kebede, et al., 2005). Sexual intercourse among adolescents is a risk factor for teen pregnancy, clandestine abortions, sexually transmitted infections including HIV, and school dropout (Illika & Igwegbe, 2004; Oye-Adeniran, Adewole, Umoh, Fapohunda, & Iwere, 2004) (Illika & Igwegbe, 2004). A qualitative study among military conscripts

in Northern Thailand drew the following conclusions regarding alcohol consumption and inconsistent condom use: Alcohol is (1) consciously used by men to reduce inhibitions that constrain their interpersonal interaction with women and with each other; (2) reduces inhibitions of individuals to sexual risk taking; (3) provides a socially acceptable excuse for non-use of condoms; (4) is associated by conscripts with brothel attendance; and (5) is seen to enhance male sexual pleasure, in contrast to condoms, which are said to reduce pleasure (Gossaye, Deyessa & Berhane, 2003).

While there have been a few published studies regarding the sexual practices of adolescents living in Liberia, there has been no published data on the possible association between sexual risk behaviors and substance use in young people. One study in Liberia estimated that 30-49% of females ages 14-17 had sexual relations at least once a month; while over 80 percent of female non-students ages 18-21 years were sexually active (Nichols, Woods, Gates, & Sherman, 1987).

The present study was undertaken to examine the substance use behaviors and sexual practices of students in 16 secondary schools in greater and central Monrovia, Liberia. We have sought to determine the prevalence and possible association of substance use and current sexual practices in this population in order to better characterize the extent of the problem, guide future research, and implement prevention and control programs to better educate young people. To our knowledge, there has been no national public health initiative in Liberia to discuss abstinence, "safer sex" practices or sobriety thus far.

METHOD

Primary and secondary education in Liberia

After the 1997 elections in Liberia, which established a civilian government, several schools reopened and were being operated by churches or Christian missions. Other schools were being funded by the government under the supervision of the Monrovia Cooperative School System (MCSS). Most of the schools are found in Monrovia since there is a lack of good roads throughout the country. The Liberia education system consists of primary and secondary education, which is free and compulsory, although enforcement of attendance is lax. Primary education is typically 10 years of schooling comprised of a pre-primary grade followed by 6 years at the primary level and 3 years at the secondary level. Secondary education consists of 3 years at the junior level followed by 3 years at the senior level. The majority of students can only afford to attend public or government schools because of high tuition fees at most private schools. Private schools offer a better quality of education to their students, often providing books and other materials.

Study design and participant recruitment

A cross-sectional study was performed examining substance use behaviors and sexual practices of in-school youth and young adults. It was conducted during a one-week period in June 2008 in central and greater Monrovia, the country's largest and most densely populated city. The study was conducted by the World Health Organization with collaboration and ethical and research protocol approval by the

Liberian Ministry of Health and Social Welfare, and the Ministry of Education.

Recruitment occurred at all co-educational secondary schools in central and greater Monrovia. All schools received a letter from the principal investigator requesting participation in a questionnaire to understand the psychoactive substance use and sexual practices amongst secondary school students in Monrovia. The first 16 schools that responded were included in the study. Six of these schools were public institutions (approximate cost $21/semester) and 10 were private (approximate cost $142/semester). The study consisted of students from Grade 7 through 12. Those students interested in participating in the questionnaire were asked to put their names in a box. The first 50 names drawn were chosen to participate in the questionnaire. Two schools picked an additional name so the study participants totaled 802. No attempts were made to control for gender or grade.

Two field assistants administered the questionnaire to each school and 20 field assistants were utilized. All 20 field assistants were affiliated with non-governmental organizations working in the neighboring areas and had at least a high school diploma. The PI provided training to the field assistants on questionnaire administration, questionnaire overview and questionnaire instructions.

The principal at each school approached students regarding voluntary participation in an anonymous study on substance use and health behaviors conducted by the World Health Organization and approved by the Ministries of Health and Education. Students verbally consented to participate in the study. The students completed the questionnaire in a separate class on the schools' premises during regular school hours. All participating students completed the questionnaire in the same room along with the field assistants. Field assistants provided instructions and reinforced that the questionnaire was anonymous, voluntary, and that there would be no repercussions to the responses. Field assistants were present in the classroom during the full length of the questionnaire along with a designated school representative. This designated representative was chosen by the school principal. The field assistant collected all questionnaires and then placed them in a box with a school code.

Measures

All information collected was obtained through self-reporting. Demographical data was collected regarding age, gender, and substance use behaviors. All questions were in English, which all students must learn to enter secondary schools. The questionnaire did not have any identifiers or markers from the World Health Organization, Ministry of Health or Ministry of Education.

Information was collected about substance use including alcohol, cigarettes, marijuana and other drugs. Questions were asked about lifetime and current use, age at first use, time elapsed since most recent use, frequency of use, whether respondent uses substance alone (yes/no), and other specifics of alcohol, cigarettes and marijuana. Lifetime and current use was asked about cocaine, bubbles, heroin, dungee, and brown sugar. Questions regarding sexual practices included age of first intercourse, frequency of sex, and condom use and frequency. Additional information regarding whether sex was ever used for monetary gain or gifts and

possible homosexual feelings or sexual acts was also collected.

Statistical Analysis

We analyzed the data using the Statistical Package for the Social Sciences for Windows Version 17. We stratified respondents by age and gender. We computed frequencies for dichotomous variables and means and standard deviations for continuous variables. Comparison between age and substance use, age and sexual behaviors, gender and substance use, and gender and sexual behaviors was conducted using Pearson chi square test. All associations were considered to be statistically significant at $p \leq 0.05$.

RESULTS

A total of 802 students between 12 and 36 years were included in the study as shown in Table 1. Of these, more than half of the respondents were 19 years of age or older (n=445; 55.5%). Approximately equal number of males (n=388; 48%) and females (n=379; 47%) were included in the study. For grades 7 and 8, the mean age of the respondents was 17 ± 2 years with an age of range of 12 to 29 years. For grade 9 and 10, the mean age was 20 ± 3 years with an age range of 13 to 35 years. For grades 11 and 12, the mean age was 21 ± 3 years with an age range of 14 to 36 years.

Table 1. Demographics of in-school youth and young adults in post-conflict Liberia (N=802)

Demographic variables	N (% of study pop.)	Mean	Median	Range (years)
Gender				
Male	388 (48.4)			
Female	379 (47.3)			
Missing	35 (4.4)			
Age (years)		19 ± 3	19	12-36
≤18 years of age	344 (42.9)			
≥19 years of age	445 (55.5)			
Missing	13 (1.6)			
Grade				
7th and 8th	224 (27.9)			
Age		17 ± 2	17	12-29
Male	107 (47.8)			
Female	98 (43.8)			
9th and 10th	293 (36.5)			
Age		20 ± 3	19	13-35
Male	143 (48.8)			
Female	144 (49.1)			
11th and 12th	229 (28.6)			
Age		21 ± 3	20	14-36
Male	113 (49.3)			
Female	109 (47.6)			
Missing	56 (7)			

Alcohol was the most commonly tried substance with close to half of all respondents consuming it at least once in their lives (n=394, 49.1%) as shown in Table 2. Of the 394 students that used alcohol, 78.9% (310) consumed it before the age of 18. 59.6% (235) used it at least once within the last month and 54.0% (213) would describe their drinking habits as continued use of alcohol. In age comparisons, 78.7% of younger respondents (≤ 18 years of age) drank alcohol occasionally compared to 59% of older respondents (≥ 19 years of age). Older respondents were more likely to drink at least once a week (x^2=11.709; p=.001) and drink alone (x^2=5.662; p=.019). Regarding other substances, older respondents were more likely to have smoked cigarettes (x^2=6.672; p=0.010) and used marijuana (x^2=10.290; p=0.001) compared to younger respondents. There were no differences in use of cocaine, bubbles (benzodiazepines), heroin, dungee, or brown sugar by age.

In terms of gender, males were more likely to smoke cigarettes, use marijuana, and drink alcohol compared to females (x^2=7.991; p=0.005) (x^2=12.013; p=0.002) (x^2=15.767; p=0.001). There was no difference in use of cocaine, bubbles, heroin, dungee, or brown sugar by gender (see Table 3).

Sex was also prominent, with 78.8% (632) reporting that they had sex at least once thus far (Table 4). Of those that had sex, 89.1% (563) had sex at least once a month. Younger respondents were more likely to have had early sex defined as sex ≥15 years of age than older respondents (x^2=32.2; p=0.01). There were 82 (24.9%) respondents who reported having sex for monetary gain. More than 25% (n=21) of them were 18 years and younger. 14.8% (92) reported that they had homosexual feelings or engaged in sexual acts with persons of the same sex. 20.9% (128) reported never using a condom, while 13.1% (80) reported using a condom occasionally. Only 47.3% (289) reported using a condom every time. More than 60% (354) perceived their HIV risk as low. Only 19.1% (113) characterized their risk as high or very high. Males were more likely to have sex than females (x^2=6.667; p=.010). Those males that engaged in sex, 35.2% of them had early sex compared to 24.1% of females (x^2=8.873; p=.003). 12.6% (n=39) of males reported 7 or more sexual partners which was significantly higher than 4.6% (n=13) of females (x^2=16.827; p=.001). 17.9% (n=56) of males had homosexual feelings or engaged in sexual acts with persons of the same sex compared to 11.0% (n=32) of females (x^2=5.839; p=.016). There were no significant gender differences between using sex for monetary gain, perceived HIV risk or frequency of condom use as shown in Table 5.

In comparing alcohol consumption and sexual behaviors in Table 6, those students that admitted to drinking alcohol at least once were more likely to engage in sexual behaviors (x^2=31.540; p=.001). They also had a greater likelihood of having more sexual partners (x^2=25.555; p=.001). When alcohol was used before age of 18 years, 36.7% (97) students reported having early sex and 17.3% (45) students never used a condom. This was significantly higher than students who used alcohol after the age of 19 years (x^2=9.306; p=.025). Those students that had at least one drink a week were more likely to have a greater number of sexual partners (x^2=18.331; p=.001) and use sex for monetary gain (x^2=28.972; p=.001). 56.0% of them perceived their HIV risk

Table 2. Associations of explanatory variables and age (N=802)

Demographic variables	Age 18 or younger N (%)	Age 19 or older N (%)	χ^2	df	*p*-value
Sex					
Male	154 (47.0)	230 (53.6)			
Female	174 (53.0)	199 (46.4)	3.300	1	.069
Grade					
7th and 8th grade	159 (50.6)	62 (14.7)			
9th and 10th grade	115 (36.6)	177 (41.9)			
11th and 12th grade	40 (12.7)	183 (43.4)	134.487	2	<.001*
Ever smoked a cigarette					
No	306 (95.9)	389 (91.1)			
Yes	13 (4.1)	38 (8.9)	6.672	1	.010*
Ever use alcohol					
No	186 (55.5)	193 (44.1)			
Has used alcohol	149 (44.5)	245 (55.9)	9.973	1	.002*
Early alcohol use					
Used before age 18	149(100)	162 (66.7)			
Used at age 19 or after	0 (0)	81 (33.3)	62.602	1	<.001*
Frequency of alcohol intake					
Occasionally	85 (78.7)	110 (59.1)			
On a weekly basis	23 (21.3)	76 (40.9)	11.709	1	.001*
Drinking alcohol socially					
Does not drink alone	96 (80.7)	139 (68.5)			
Sometimes drinks alone	23 (19.3)	64 (31.5)	5.662	1	.019[a*]
Last used alcohol					
Last month (at least once)	96 (75.6)	162 (81.8)			
Other	31 (24.4)	36 (18.2)	1.834	1	.176
Continued alcohol use					
Not continued	63 (45.0)	91 (40.1)			
Continued alcohol use	77 (55.0)	136 (59.9)	.858	1	.354
Ever use marijuana					
No	311 (94.2)	363 (87.3)			
Has used marijuana	19 (5.8)	53 (12.7)	10.290	1	.001*
Used marijuana alone					
No	11 (73.3)	17 (48.6)			
Used marijuana alone	4 (26.7)	18 (51.4)	2.613	1	.106
Ever use cocaine					
No	343 (99.7)	441 (99.1)			
Has used cocaine	1 (0.3)	4 (0.9)	1.140	1	.286[a]
Ever use bubbles					
No	341 (99.1)	439 (98.7)			
Has used bubbles	3 (0.9)	6 (1.3)	.390	1	.532[a]
Ever use heroin					
No	344 (100)	444 (99.8)			
Used marijuana alone	0 (0)	1 (0.2)	.774	1	.379[a]
Ever use dungee					
No	343 (99.7)	440 (98.9)			
Has used dungee	1 (0.3)	5 (1.1)	1.783	1	.182[a]
Ever use brown sugar					
No	342 (99.4)	443 (99.6)			
Has used bubbles	2 (0.6)	2 (0.4)	.067	1	.796[a]

*Significant at p<.05

[a]One or more cells have expected count less than 5. Reported Fisher's Exact Test.

Table 3. Associations between substance use and gender (N=802)

Substance use	Male N (%)	Female N (%)	χ^2	df	*p*-value
Ever smoked a cigarette					
No	331 (90.9)	346 (96.1)			
Yes	33 (9.1)	14 (3.9)	7.991	1	.005*
Ever use alcohol					
No	158 (41.6)	208 (56.1)			
Has used alcohol	222 (58.4)	163 (43.9)	15.767	1	<.001*
Early alcohol use					
Used before age 18	175 (79.5)	126 (77.8)			
Used at age 19 or after	45 (20.5)	36 (22.2)	.174	1	.676
Frequency of alcohol intake					
Occasionally	112 (67.5)	83 (68.6)			
On a weekly basis	54 (32.5)	38 (31.4)	.041	1	.840
Drinking alcohol socially					
Does not drink alone	128 (69.9)	103 (77.4)			
Sometimes drinks alone	55 (30.1)	30 (22.6)	2.202	1	.138
Last used alcohol					
Last month (at least once)	143 (79.4)	108 (78.8)			
Other	37 (20.6)	29 (21.2)	.018	1	.894
Continued alcohol use					
Not continued	96 (46.6)	56 (36.6)			
Continued alcohol use	110 (53.4)	97 (63.4)	3.597	1	.058
Ever use marijuana					
No	319 (86.7)	339 (94.2)			
Has used marijuana	49 (13.3)	21 (5.8)	12.013	1	.002[a]*
Ever use cocaine					
No	363 (98.7)	379 (100)			
Has used cocaine	5 (1.3)	0 (0)	5.369	1	.068[a]
Ever use bubbles					
No	382 (98.5)	377 (99.5)			
Has used bubbles	6 (1.5)	2 (0.5)	2.786	1	.248[a]
Ever use heroin					
No	388 (100)	378 (99.7)			
Used marijuana alone	0 (0)	1 (0.3)	1.117	1	.572[a]
Ever use dungee					
No	384 (99.0)	377 (99.5)			
Has used dungee	4 (1.0)	2 (0.5)	.930	1	.628[a]
Ever use brown sugar					
No	384 (99.0)	379 (100)			
Has used bubbles	4 (1.0)	0 (0)	4.289	1	.117[a]

*Significant at p<.05

[a]One or more cells have expected count less than 5. Reported Fisher's Exact Test.

Table 4. Associations between sexual behaviours and age (N=802)

Sexual behaviours	Age 18 or younger N (%)	Age 19 or older N (%)	χ^2	df	p-value
Sex					
Male	154 (47.0)	230 (53.6)			
Female	174 (53.0)	199 (46.4)	3.300	1	.069
Grade					
7th and 8th grade	159 (50.6)	62 (14.7)			
9th and 10th grade	115 (36.6)	177 (41.9)			
11th and 12th grade	40 (12.7)	183 (43.4)	134.487	2	<.001*
Had sex					
Not had sex	109 (32.5)	29 (6.7)			
Had sex	226 (67.5)	406 (93.3)	86.108	1	<.001*
Had early sex					
Before age 15	98 (44.7)	91 (22.8)			
At age 16 or after	121 (55.3)	309 (77.3)	32.290	1	<.001*
Sex frequency					
At least once a month	196 (95.6)	367 (96.3)			
Other	9 (4.4)	14 (3.7)	.181	1	.670
Number of sex partners					
Less than 3	172 (78.9)	259 (66.2)			
Between 3 and 6	28 (12.8)	96 (24.6)			
7 or more	18 (8.3)	36 (9.2)	12.735	2	.002*
Sex for monetary gain					
No sex for monetary gain	201 (90.5)	336 (84.6)			
Sex for monetary gain	21 (9.5)	61 (15.4)	4.321	1	.038*
Homosexual feelings or sexual acts					
No feelings or acts	194 (87.8)	333 (83.7)			
Feelings/sexual acts	27 (12.2)	65 (16.3)	1.901	1	.168
Perceived HIV risk					
Low	128 (60.7)	226 (59.8)			
Moderate	23 (10.9)	57 (15.1)			
High	10 (4.7)	32 (8.5)			
Very high	50 (23.7)	63 (16.7)	7.883	3	.048*
Condom Use					
Never	49 (22.3)	79 (20.3)			
Occasionally	22 (10.0)	58 (14.9)			
Often	36 (16.4)	77 (19.7)			
Every time	113 (51.4)	176 (45.1)	4.840	3	.184

*Significant at p<.05

as low. 17.3% (13) students that drank alone had 7 or more sexual partners and 28.9% (22) used sex for monetary gain. If they reported their alcohol use as continuous, they were more likely than those students who did not drink on a continuous basis to have sex (x^2=6.548; p=.010), have a greater number of sexual partners

Table 5. Associations between sexual behaviours and gender (N=802)

Sexual behaviours	Male N (%)	Female N (%)	χ^2	df	*p*-value
Had sex					
Not had sex	53 (14.2)	80 (21.4)			
Had sex	321 (85.8)	294 (78.6)	6.667	1	.010*
Had early sex					
Before age 15	111 (35.2)	70 (24.1)			
At age 16 or after	204 (64.8)	220 (75.9)	8.873	1	.003*
Sex frequency					
At least once a month	282 (94.6)	269 (97.8)			
Other	16 (5.4)	6 (2.2)	3.935	1	.047*
Number of sex partners					
Less than 3	201 (64.8)	223 (78.2)			
Between 3 and 6	70 (22.6)	49 (17.2)			
7 or more	39 (12.6)	13 (4.6)	16.827	2	<.001*
Sex for monetary gain					
No sex for monetary gain	226 (84.4)	259 (89.3)			
Sex for monetary gain	49 (15.6)	31 (10.7)	3.116	1	.078
Homosexual feelings or sexual acts					
No feelings or sexual acts	256 (82.1)	259 (89.0)			
Feelings/sexual acts	56 (17.9)	32 (11.0)	5.839	1	.016*
Perceived HIV risk					
Low	182 (60.5)	163 (59.7)			
Moderate	40 (13.3)	38 (13.9)			
High	25 (8.3)	18 (6.6)			
Very high	54 (17.9)	54 (19.8)	.873	3	.832
Condom Use					
Never	67 (21.6)	56 (19.8)			
Occasionally	40 (12.9)	36 (12.7)			
Often	52 (16.8)	59 (20.8)			
Every time	151 (48.7)	132 (46.6)	1.685	3	.640

*Significant at p<.05

(x^2=11.831; p=.003), use sex for monetary gain (x^2=4.288; p=.038) and use a condom every time (x^2=11.134; p=.011) (Table 7)

DISCUSSION

To our knowledge, this is the first questionnaire exploring the prevalence of substance use and sexual risk behaviors in Liberia. During the civil war, many children were forced to drop out of school to either participate in the war or help support their family. This resulted in many Liberian children being close to fifteen years behind in school relative to their counterparts in other countries. As the country of Liberia attempted to reform its educational systems post-conflict, many children, now adults, went back to school.

Table 6. Associations between alcohol consumption and sexual behaviours (N=802)

Sexual behaviours	N (%)	N (%)	χ^2	df	*p*-value
	Never had alcohol	*Has had alcohol*			
Had sex					
Not had sex	96 (25.3)	38 (9.8)			
Had sex	284 (74.7)	348 (90.2)	31.540	1	<.001*
Had early sex					
Before age 15	79 (28.6)	110 (32.2)			
At age 16 or after	197 (71.4)	232 (67.8)	.902	1	.342
Sex frequency					
At least once a month	246 (95.7)	318 (96.1)			
Other	11 (43.3)	13 (3.9)	.046	1	.830
Number of sex partners					
Less than 3	218 (81.3)	213 (62.2)			
Between 3 and 6	36 (13.4)	87 (25.6)			
7 or more	14 (5.2)	40 (11.8)	25.555	2	<.001*
Sex for monetary gain					
No sex for monetary gain	246 (88.2)	292 (85.6)			
Sex for monetary gain	33 (11.8)	49 (14.4)	.864	1	.353
Homosexual feelings or sexual acts					
No feelings or acts	243 (86.8)	284 (83.5)			
Feelings/sexual acts	37 (13.2)	56 (16.5)	1.277	1	.258
Perceived HIV risk					
Low	160 (63.0)	190 (57.1)			
Moderate	27 (10.6)	54 (16.2)			
High	15 (5.9)	29 (8.7)			
Very high	52 (20.5)	60 (18.0)	6.075	3	.108
Condom Use					
Never	60 (21.8)	67 (20.0)			
Occasionally	33 (12.0)	47 (14.0)			
Often	45 (16.4)	71 (21.2)			
Every time	137 (49.8)	150 (44.8)	3.383	3	.336
	Used alcohol before age 18	*Used alcohol at 19 or after*			
Had sex					
Not had sex	32 (10.7)	6 (7.2)			
Had sex	268 (89.3)	77 (92.8)	.860	1	.354
Had early sex					
Before age 15	97 (36.7)	13 (17.3)			
At age 16 or after	167 (63.3)	62 (82.7)	10.038	1	.002*
Sex frequency					
At least once a month	243 (95.3)	73 (98.6)			
Other	12 (4.7)	1 (1.4)	1.701	1	.192
Number of sex partners					
Less than 3	167 (63.3)	44 (60.3)			
Between 3 and 6	68 (25.8)	18 (24.7)			
7 or more	29 (11.0)	11 (15.1)	.912	2	.634
Sex for monetary gain					
No sex for monetary gain	224 (85.5)	66 (86.8)			
Sex for monetary gain	38 (14.5)	290 (85.8)	.088	1	.767
Homosexual feelings or sexual acts					
No feelings or acts	221 (84.0)	61 (82.4)			
Feelings/sexual acts	42 (16.0)	13 (17.6)	.108	1	.742
Perceived HIV risk					
Low	150 (57.7)	39 (55.7)			
Moderate	41 (15.8)	13 (18.6)			
High	21 (8.1)	7 (10.0)			
Very high	48 (18.5)	11 (15.7)	.776	3	.855
Condom Use					
Never	45 (17.3)	21 (29.2)			
Occasionally	43 (16.5)	4 (5.6)			
Often	57 (21.9)	13 (18.1)			
Every time	115 (44.2)	34 (47.2)	9.306	3	.025*

Table 7. Associations between frequency of alcohol consumption and sexual behaviours

Sexual behaviours	N (%)	N (%)	χ^2	df	*p*-value
	Drinks Occasionally	*Drinks at least 1/wk*			
Had sex					
Not had sex	19 (9.9)	6 (6.3)			
Had sex	173 (90.1)	89 (93.7)	1.024	1	.311
Had early sex					
Before age 15	56 (32.6)	25 (29.4)			
At age 16 or after	116 (67.4)	60 (70.6)	.261	1	.609
Sex frequency					
At least once a month	158 (95.2)	85 (96.6)			
Other	8 (4.8)	3 (3.4)	.276	1	.752[a]
Number of sex partners					
Less than 3	123 (72.4)	40 (45.5)			
Between 3 and 6	32 (18.8)	35 (39.8)			
7 or more	15 (8.8)	13 (14.8)	18.331	2	<.001*
Sex for monetary gain					
No sex for monetary gain	163 (94.8)	60 (70.6)			
Sex for monetary gain	9 (5.2)	25 (29.4)	28.972	1	<.001*
Homosexual feelings or sexual acts					
No feelings or acts	149 (87.1)	61 (70.9)			
Feelings/sexual acts	22 (12.9)	25 (29.1)	10.055	1	.002*
Perceived HIV risk					
Low	104 (61.5)	47 (56.0)			
Moderate	17 (10.1)	20 (23.8)			
High	9 (5.3)	10 (11.9)			
Very high	39 (23.1)	7 (8.3)	17.490	3	.001*
Condom Use					
Never	35 (20.6)	15 (18.1)			
Occasionally	22 (12.9)	17 (20.5)			
Often	34 (20.0)	20 (24.1)			
Every time	79 (46.5)	31 (37.3)	3.742	3	.291
	Not continued alcohol use	*Continued alcohol use*			
Had sex					
Not had sex	20 (13.0)	11 (5.3)			
Had sex	134 (87.0)	195 (94.7)	6.548	1	.010*
Had early sex					
Before age 15	42 (32.1)	63 (32.8)			
At age 16 or after	89 (67.9)	129 (67.2)	.020	1	.887
Sex frequency					
At least once a month	117 (95.1)	183 (96.3)			
Other	6 (4.9)	7 (3.7)	.267	1	.605
Number of sex partners					
Less than 3	97 (74.6)	109 (56.5)			
Between 3 and 6	21 (16.2)	61 (31.6)			
7 or more	12 (9.2)	23 (11.9)	11.831	2	.003*
Sex for monetary gain					
No sex for monetary gain	120 (90.9)	159 (82.8)			
Sex for monetary gain	12 (9.1)	33 (17.2)	4.288	1	.038*
Homosexual feelings or sexual acts					
No feelings or acts	116 (88.5)	154 (80.2)			
Feelings/sexual acts	15 (11.5)	38 (19.8)	3.950	1	.047*

Table 7. Associations between frequency of alcohol consumption and sexual behaviours (continued)

Perceived HIV risk					
Low	70 (55.6)	111 (58.7)			
Moderate	20 (15.9)	32 (16.9)			
High	8 (6.3)	16 (8.5)			
Very high	28 (22.2)	30 (15.9)	2.283	3	.516
Condom Use					
Never	35 (27.6)	30 (15.8)			
Occasionally	14 (11.0)	31 (16.3)			
Often	19 (15.0)	49 (25.8)			
Every time	59 (46.5)	80 (42.1)	11.134	3	.011*

*Significant at p<.05

[a] One or more cells have expected count less than 5. Reported Fisher's Exact Test.

The oldest secondary school respondent was 36 years old. While the impact of having to go back to school after close to 15 years can create its own psychological and emotional distress, many of these young adults have also faced significant trauma and economic hardships, which make them more vulnerable to other comorbidities such as substance use, depression, anxiety and post-traumatic stress disorder. The impact of having students in their early and middle thirties affects the dynamics of the classroom. The brain of a 13 year old is less developed than the brain of a 35 year old. Adolescents are very influenced by their peer groups and having peers that are in their 30s who may be using alcohol and other substances and engaging in sexual activity, may have a significant impact on these young adolescents. Most schools group children by age, as children of the same age have similar development trajectories. Having students of various ages in one classroom can change the nature of the classroom, and present significant challenges and barriers for the teacher, who may be used to instructing students at a specific developmental age.

Alcohol was the most commonly used substance amongst youth and young adults with close to 50% consuming it at least once in their lives. This is substantially higher than other African countries such as Kenya where the prevalence rate of alcohol is 5.2% among secondary school students (Ndetei, Khasakhala, Mutiso, Ongecha-Owuor, & Kokonya, 2010). While there are several factors contributing to this increased alcohol use, one explanation could be that many secondary school students may be using alcohol as a way to cope with trauma and their psychosocial distress from dealing with war. War can be very distressing to many people especially if there is loss of lives, property, and jobs within their families. Young people may not have developed effective coping strategies necessary to deal with these types of losses. By not having someone to discuss these issues with or resolve internal struggles with loss, they may be turning to maladaptive behaviors such as drinking alcohol and using other substances to deal with these losses. Using alcohol and other substances can worsen mental health outcomes. In a ten year prospective study

in the United States, adolescents who had engaged in drinking at least once or twice in the past 12 months were more likely to exhibit more substance use, face academic problems and become involved in delinquent behaviors during high school compared to the nondrinkers (Ellickson, Tucker, & Klein, 2003).

Sexual intercourse was also prominent with almost 50% reporting early sex or sex before the age of 15 years. In a cross-sectional study looking at health-related behaviors in Zambia, 9.4% of in-school adolescents reported having early sex (Siziya, Muula, Kazembe, & Rudatsikira, 2008). This is substantially lower than our Liberian questionnaire of youth and young adults. Similar findings were consistent with early sex associated with early drinking (Burack, 1999; MacQueen, et al., 1996). Weekly alcohol assumption for both males and females was a strong correlate for some high-risk sexual behaviors including having multiple partners, exchanging sex for money or other resources and engaging in homosexual acts. In spite of engaging in these high-risk sexual behaviors, 80% of these students believed that their HIV risk was low to moderate. Post-conflict, the Liberian secondary school classroom has a wide age range. Due to this age variability, many of the older students may pressure their younger counterparts to start drinking alcohol and engaging in sexual activity at an earlier age. Adolescents are often affected by their peer groups and having peers that are engaging in these activities may even appear to the younger student as the norm. These findings suggest the complexity of tailoring school education for a diverse age population. Interventions may including discussions on knowing when one is ready to engage in sex, promoting safer sex practices, HIV transmission and prevention, and awareness of effects of alcohol and other substances.

More males engaged in early sex, had seven or more partners and had homosexual feelings or engaged in sexual acts than females. This may reflect the pervasive and continual male-dominating society where men are considered the "givers" and females are the "receivers." There may be expectations from other males regarding stereotypes that males should have multiple partners while women should be more monogamous. Sex is rarely discussed openly in Liberian society.

This study had several limitations. Firstly, the findings in this study may only be applicable to in-school students. Ndyanabangi et al (Ndyanabangi, Kipp, & Diesfeld, 2004) compared in-school and out-of-school adolescents in Uganda and found that out-of school adolescents were more likely to initiate sex at a younger age, were less likely to use modern contraception, and were more likely to have multiple sexual partners. Since the civil war displaced many youth from school, our study included a wide age range of secondary school students that returned back to school. Our data was collected through convenience sampling, with several students in their thirties and is more representative of post-conflict societies whose educational systems may have been broken down due to war. It is less representative of typical secondary school student populations and are most comparable to other post-conflict countries. We also did not examine the prevalence of mental and behavioral disorders of these secondary school students; many of whom were probably severely affected by war. In comparison, a study in Ethiopia

showed a prevalence of these disorders in adolescents (Ashenafi, Kebede, Desta, & Alem, 2001; M. Kebede, Kebede, & Desta, 2000), while another study demonstrated that alcohol-related sexual risk-taking, psychiatric morbidity and high frequency of alcohol consumption were all strongly associated in 16-17 year olds in Australia (Bonomo, et al., 2001).

Secondly, data from the questionnaire were collected through self-completion of the questionnaire by study participants. Since all of the data relied on self-report and many people commonly underreport socially undesirable behaviors including substance use and sexual risk behaviors, this can lead to social desirability bias (Davis, Thake, & Vilhena, 2010). Also, students were asked to answer these questions while in school with a designated representative chosen by the principal, which may have raised some concerns with the students in spite of reassuring them that all answers would be confidential.

Sex was not specifically defined. In our study, students were asked: Have you ever had sex? In a study by Thurman et al. (2006) in South Africa, study participants were asked whether they had ever engaged in sex, defined as full penile-vaginal penetration. Broadly speaking, sex can have various definitions depending on the individual. In comparing studies, there may be limitations on studies that broadly define it as opposed to ones that specifically define it. Also the occurrence of homosexual feelings or sexual acts was assessed as one question; thus, if students answered yes, it would be impossible to differentiate between students having homosexual feelings or engaging in sexual acts. Some students who had homosexual feelings may not engage in sexual acts, while most or almost all students who engage in homosexual experience, probably had homosexual thoughts at some point, prior to engaging in sexual acts. To further strengthen our study, homosexuality should be assessed as one question with subsequent in-depth questions relating to touching, sexual acts and intercourse.

Finally, the lack of a pilot study meant that the questionnaire had not been validated in this population. Participants may have been confused by some of the terminology since many youth identify drugs by their street name rather than the drug's real name. While the questionnaire attempted to correct for these terms by using terms like "brown sugar" for heroin, it did not list all the drug nicknames and may not have chosen the most commonly used ones. There was also no specific timeframe requested to report substance use or sexual risk behaviors. Most questions addressed the initial time or the last time, which may fail to accurately report the frequency of use.

CONCLUSION

This study found that a substantial proportion of youth and young adults are engaging in alcohol use and sexual risk behaviors. Our findings suggest that school and community-based programs should be initiated to decrease HIV risk behaviors and alcohol consumption given the high prevalence of alcohol use and sexual risk behaviors. These programs should be age-appropriate given the wide range in the Liberian school population. Future studies should also examine the prevalence of mental and behavioral disorders such as depression, anxiety and post-traumatic stress disorder among Liberian

youth and young adults given the many psychosocial and psychological stressors that occurred as a result of the war. These studies should include Liberians' own definitions of symptoms and qualitative research may be appropriate for this. Counseling or mental health follow-ups should also be made available for those students who are in need of treatment.

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