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Prevalence and predictors of lifetime amphetamine use among in-school adolescents in Sierra Leone.

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ABSTRACT

Objective This study examined the prevalence of amphetamine use and its associated factors among in-school adolescents in Sierra Leone.

Design Data for the study was sourced from the 2017 Sierra Leone Global School-based Health Survey. Percentages with confidence intervals (CIs) were used to present the prevalence of amphetamine use among in-school adolescents. A multivariable binary logistic regression analysis was employed to examine the factors associated with amphetamine use. The results were presented using adjusted odds ratios (aORs) with 95% CIs.

Setting Sierra Leone.

Participants A weighted sample of 1,314 in-school adolescents in Sierra Leone.

Outcome measure Lifetime amphetamine use.

Results The prevalence of amphetamine use was 6.1% (3.9%–9.5%). In-school adolescents who planned suicide were more likely to use amphetamine compared with those who did not (aOR 2.54; 95% CI 1.02 to 6.31). Also, the odds of amphetamine use were higher among in-school adolescents who received support from their peers (aOR 3.19, 95% CI 1.71 to 5.96), consumed alcohol (aOR 4.85, 95% CI 2.61 to 9.03), and those who had previously used marijuana (aOR 13.31, 95% CI 6.61 to 28.78) compared with those who did not receive any support, never consumed alcohol, and never used marijuana, respectively.

Conclusion Amphetamine use is prevalent among in-school adolescents in Sierra Leone. There is a need to implement comprehensive public health policies that extend beyond school-based psychobehavioural therapies. These policies should specifically address the considerable risk factors associated with amphetamine use among in-school adolescents in Sierra Leone.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This study provides the most recent information on the prevalence of lifetime amphetamine use among in-school adolescents in Sierra Leone.
⇒ The study identifies significant risk factors for amphetamine use, such as planned suicide, peer support, current alcohol use, and lifetime marijuana use.
⇒ Only data from in-school adolescents was included in the study, which may not represent out-of-school adolescents or adolescents who have dropped out of school in Sierra Leone.
⇒ The use of cross-sectional data means that casual inferences cannot be established.

INTRODUCTION

The use of substances, such as amphetamine, by young people could potentially lead to adverse outcomes related to cognitive and emotional growth during the critical period of transitioning from adolescence to early adulthood.[1] The onset of substance use typically happens during adolescence, primarily starting with cigarette and alcohol consumption before progressing to the use of illicit substances.[1] A recent assessment indicates a notable increase in the global disease burden linked to substance use among adolescents and young people.[1]

Studies have reported that amphetamine use is prevalent in high income and low-and middle-income countries.[2 3] For instance, a study conducted in nine countries in sub-Saharan Africa (SSA) reported a prevalence of 4.1% for cannabis use and 5.1% for lifetime amphetamine use among adolescents, ranging from 0.9% in Mauritius to 8.1% in Ghana.[4]

Evidence suggests that the factors associated with lifetime amphetamine use among adolescents can be grouped into sociodemographic, psychosocial, and parental.[5] For sociodemographic characteristics, the sex[6 7] and age[8] of the adolescent have been found to influence substance use. Psychosocial factors such as mental anguish,[9–11] smoking,[7 12] school absenteeism,[10 12] and insufficient peer support[12] have been cited in the literature to be associated with substance use. The parental factors encompass parental substance use,[13] inadequate parental support, insufficient parental supervision,[10 12 14] and limited parental connection.[10] Other factors that may influence substance use include

hunger, poor economic status,[7 10 15] bullying, fighting,[6 8] and violence.[11]

In Sierra Leone, there is a dearth of studies conducted to examine the prevalence of amphetamine use and its associated factors among in-school adolescents. Previous studies conducted in Sierra Leone focused on tobacco[16] and cannabis use[17] and their associated factors. Hence, studies are required to fill this gap in the dearth of literature on amphetamine use among in-school adolescents. Therefore, this study examined the prevalence of amphetamine use and its associated factors among adolescents using a nationally representative survey dataset. Findings would be essential for developing and implementing interventions aimed at reducing amphetamine use among adolescents. Gaining insight into the prevalence of amphetamine use and associated factors is a crucial step in effectively addressing this issue.

MATERIALS AND METHODS

Data source and design

Data for the study was sourced fron the 2017 Sierra Leone Global School-based Student Health Survey (GSHS). The 2017 Sierra Leone GSHS[18] was conducted as a comprehensive assessment of students in junior secondary school (JSS) 2, JSS 3, senior secondary school (SSS) 2, and SSS 3. Adolescents aged 10–19 years typically attend these grades. The GSHS employed a two-stage cluster sampling technique to recruit the adolescents for the survey. During the initial phase, schools were chosen based on the likelihood proportional to their enrollment size. During the second step, a random selection process was employed to choose grades and classes, and all adolescents within the selected classes aged between 10 and 19 years and present during the day of the data collection were deemed eligible to participate in the study. The response rate of the schools was 94%, while that of the students was 87%. Consequently, the overall response rate was found to be 82%. A weighted sample of 1,314 in-school adolescents in Sierra Leone was considered for this study.We followed the Strengthening the Reporting of Observational Studies in Epidemiology in writing this paper (online supplemental file 1).

Variables

Lifetime use of amphetamine was the outcome variable. This variable was assessed using the question, 'During your life, how many times have you used amphetamines or methamphetamines?' The response options to this question ranged from 1=0 times to 5=20 or more times. We recoded the response options into 1=0 'no' and 2 to 5=1 'yes' in the final analysis.

Nineteen explanatory variables were included in the study. The variables consisted of the age of the adolescent, grade, sex, suicidal ideation, suicidal plan, suicidal attempt, bullying, anxiety, truancy, loneliness, alcohol use, marijuana use, peer support, ever had sexual intercourse, presence of close friends, parental supervision, parental connectedness, parental knowledge of activities, and parental invasion of privacy. These variables were selected for inclusion in the study based on their significant associations with amphetamine use or substance use among adolescents from the literature.[2–10 15 18] The categories of each variable can be found in table 1.

Statistical analyses

The data analysis was performed with Stata software V.17.0 (Stata). To ensure a precise representation of in-school adolescents in Sierra Leone, a sample weighting methodology was used, considering the variables of school, gender, and the number of students in each grade. Frequencies and percentages were used to present the background characteristics of the adolescents. Percentages and confidence intervals (CIs) were used to present the prevalence and distribution of lifetime amphetamine use among in-school adolescents in Sierra Leone. Subsequently, a multivariable binary logistic regression analysis was used to examine the factors associated with amphetamine use among in-school adolescents in Sierra Leone. The results were reported using crude odds ratio (cOR) and adjusted odds ratio (aOR) along with a 95% CI. The statistical significance level was set at $p<0.05$.

Patient and public involvement

Patients and the public were not included in the design and conduct of this research.

RESULTS

Background characteristics of the in-school adolescents in Sierra Leone.

Of the 1,314 in-school adolescents included in the study, the majority of them were aged ≥15 years (66.1%). Additionally, 51.5% of the in-school adolescents were males. About 13.8% of the in-school adolescents had ever engaged in sexual intercourse. Also, 49.2% have been bullied. Moreover, 5.0% and 11.9% of the in-school adolescents used marijuana and alcohol, respectively (see table 1).

Prevalence of amphetamine use among in-school adolescents in Sierra Leone.

Table 2 presents the results of the prevalence of amphetamine use and its distribution across the explanatory variables. The prevalence of amphetamine use was 6.1% (3.9%–9.5%). The proportion of amphetamine use was high among in-school adolescents aged 15 years and above (6.3%), males (7.4%), those who were anxious (7.35%), those who with suicidal ideation (9.8%), those who planned suicide (12.4%) and those who attempted suicide (13.7%). Also, amphetamine use was prevalent among in-school adolescents who were truant at school (10.8%), ever had sex (10.7%), used alcohol (24.8%), and those who used marijuana (49.7%).

Factors associated with amphetamine use among in-school adolescents in Sierra Leone.

Table 3 shows the results of the factors associated with amphetamine use among in-school adolescents. In

Table 1 Background characteristics of the in-school adolescents

Variables	Weighted frequency (n)	Weighted percentage (%)
Age (years)		
≤14	445	33.9
≥15	869	66.1
Grade		
JSS	913	69.5
SSS	401	30.5
Sex		
Female	638	48.5
Male	676	51.5
Anxiety		
No	1081	82.2
Yes	233	17.8
Suicidal ideation		
No	1175	89.4
Yes	139	10.6
Planned suicide		
No	1133	86.2
Yes	181	13.8
Attempted suicide		
No	1128	85.8
Yes	186	14.2
Felt lonely		
No	1108	84.4
Yes	206	15.6
Close friends		
No	110	8.4
Yes	1204	91.6
Bullied		
No	668	50.8
Yes	646	49.2
Ever had sexual intercourse		
No	801	60.9
Yes	513	39.1
Peer support		
No	939	71.5
Yes	375	28.5
Truant at school		
No	896	68.2
Yes	418	31.8
Current alcohol use		
No	1158	88.1
Yes	156	11.9
Ever used marijuana		
No	1248	95.0
Yes	66	5.0
Parental supervision		
No	673	51.2
Yes	641	48.8
Parental connectedness		
No	714	54.4
Yes	600	45.6
Parental knowledge of activities		
No	684	52.0
Yes	630	48.0
Parental invasion of privacy		
No	905	68.9
Yes	409	31.1

JSS, junior secondary school; SSS, senior secondary school.

the adjusted model, the odds of amphetamine use was higher among in-school adolescents who planned suicide compared with those who did not (aOR 2.54, 95% CI 1.02 to 6.31). Furthermore, in-school adolescents who received peer support (aOR 3.19, 95% CI 1.71 to 5.96) were more likely to use amphetamines relative to those who did not. The likelihood of amphetamine use was higher among in-school adolescents who use alcohol (aOR 4.85, 95% CI 2.61 to 9.03) and those who used marijuana (aOR 13.31, 95% CI 6.61 to 28.78) compared with those who did not use alcohol and marijuana, respectively.

DISCUSSION

Our study examined the prevalence of amphetamine use and its associated factors among in-school adolescents in Sierra Leone. The results showed that 6.1% of the in-school adolescents included in the study used amphetamine. Factors associated with amphetamine use were suicide plans, peer support, alcohol use, and marijuana use.

The findings of our study indicate that 6.1% of in-school adolescents in Sierra Leone use amphetamine. The prevalence rate recorded in the present study is lower than the 7.1% reported in the study conducted in Ghana.[3] Nevertheless, the current prevalence is higher compared with the proportion of amphetamine use reported in a study conducted in eight sub-Saharan African countries.[19] The high proportion of amphetamine use among

Table 2 Prevalence and distribution of amphetamine use among in-school adolescents

Variables	Amphetamine use	
	No % (95% CI)	Yes % (95% CI)
Prevalence	93.9 (90.5 to 96.1)	6.1 (3.9 to 9.5)
Age (years)		
≤14	94.2 (87.9 to 97.3)	5.8 (2.7 to 12.1)
≥15	93.7 (90.1 to 96.1)	6.3 (2.7 to 12.1)
Grade		
JSS	94.7 (90.2 to 97.2)	5.3 (2.8 to 9.8)
SSS	92.0 (85.0 to 95.8)	8.0 (4.2 to 15.0)
Sex		
Female	95.3 (90.9 to 97.6)	4.7 (2.4 to 9.1)
Male	92.6 (88.1 to 95.4)	7.4 (4.6 to 11.9)
Anxiety		
No	94.2 (90.2 to 96.6)	5.8 (3.4 to 9.8)
Yes	92.7 (85.3 to 96.5)	7.3 (3.5 to 14.7)
Suicidal ideation		
No	94.3 (90.9 to 96.5)	5.7 (3.5 to 9.1)
Yes	90.2 (77.8 to 96.0)	9.8 (4.0 to 22.2)
Planned suicide		
No	94.9 (91.6 to 96.9)	5.1 (3.1 to 8.4)
Yes	87.6 (78.3 to 93.2)	12.4 (6.8 to 21.7)
Attempted suicide		
No	95.1 (91.9 to 97.1)	4.9 (2.9 to 8.1)
Yes	86.3 (76.7 to 92.4)	13.7 (7.6 to 23.3)
Felt lonely		
No	94.0 (90.1 to 96.4)	6.0 (3.6 to 9.9)
Yes	93.2 (87.8 to 96.4)	6.8 (3.6 to 12.2)
Close friends		
No	93.0 (84.9 to 96.9)	7.0 (3.1 to 15.1)
Yes	94.0 (90.3 to 96.3)	6.0 (3.7 to 9.7)
Bullied		
No	95.9 (90.7 to 98.2)	4.1 (1.8 to 9.3)
Yes	91.9 (87.0 to 95.0)	8.1 (5.0 to 13.0)
Ever sexual intercourse		
No	96.8 (92.0 to 98.8)	3.2 (1.2 to 8.0)
Yes	89.3 (83.7 to 93.2)	10.7 (6.8 to 16.3)
Peer support		
No	94.9 (91.9 to 96.9)	5.1 (3.1 to 8.1)
Yes	91.3 (84.1 to 95.5)	8.7 (4.5 to 15.9)
Truant at school		
No	96.1 (92.5 to 98.0)	3.9 (2.0 to 7.5)
Yes	89.2 (81.8 to 93.8)	10.8 (6.2 to 18.2)
Current alcohol use		
No	96.4 (93.3 to 98.1)	3.6 (1.9 to 6.7)
Yes	75.2 (60.7 to 85.6)	24.8 (14.4 to 39.3)
Ever used marijuana		
No	96.2 (93.3 to 97.9)	3.8 (2.1 to 6.7)
Yes	50.3 (23.7 to 76.8)	49.7 (23.2 to 76.3)
Parental supervision		
No	93.7 (88.9 to 96.5)	6.3 (3.5 to 11.1)
Yes	94.1 (89.3 to 96.8)	5.9 (3.2 to 10.7)
Parental connectedness		
No	93.1 (89.7 to 95.4)	6.9 (4.6 to 10.3)
Yes	94.8 (89.9 to 97.4)	5.2 (2.6 to 10.1)
Parental knowledge of activities		
No	92.2 (87.9 to 95.0)	7.8 (5.0 to 12.1)
Yes	95.8 (92.0 to 97.8)	4.2 (2.2 to 8.0)
Parental invasion of privacy		
No	93.8 (90.2 to 96.2)	6.2 (3.8 to 9.8)
Yes	94.0 (88.3 to 97.0)	6.0 (3.0 to 11.7)

JSS, junior secondary school; SSS, senior secondary school.

in-school adolescents in Sierra Leone relative to other countries could imply the ineffective implementation of laws on substance use, especially among in-school-going adolescents. Additionally, the ease of accessibility and availability coupled with the frequent advertisement of various substances, including amphetamine, could have influenced its high usage among in-school adolescents in Sierra Leone.[19]

Our study showed that in-school adolescents aged 15 years and above, as well as males, were more likely to use amphetamine. However, these associations were not statistically significant. The findings presented in this study are inconsistent with those of previous studies.[4 8 20] In Sierra Leone, amphetamine use may be under-reported or over-reported by in-school adolescents of different age groups or sexes due to social desirability bias, fear of stigma or lack of awareness. Also, amphetamine use may be a relatively new phenomenon among in-school adolescents in Sierra Leone, and thus, it has not yet shown any clear patterns or trends by age or gender.[7]

Our study found that in-school adolescents who planned suicide had higher odds of amphetamine use. This finding is consistent with the results of a previous study.[10] In-school adolescents who live in postconflict Sierra Leone may face additional stressors, such as

Table 3 Factors associated with amphetamine use among in-school adolescents

	Amphetamine use	
Variables	**cOR (95% CI)**	**aOR (95% CI)**
Age (years)		
≤14	1.00	–
≥15	1.09 (0.65 to 1.82)	–
Grade		
JSS	1.00	–
SSS	1.58 (0.98 to 2.54)	–
Sex		
Female	1.00	–
Male	1.63 (0.99 to 2.68)	–
Anxiety		
No	1.00	–
Yes	1.28 (0.72 to 2.72)	–
Suicidal ideation		
No	1.00	1.00
Yes	1.81* (1.01 to 3.24)	0.60 (0.23 to 1.56)
Planned suicide		
No	1.00	1.00
Yes	2.63*** (1.55 to 4.46)	2.54* (1.02 to 6.31)
Attempted suicide		
No	1.00	1.00
Yes	3.10*** (1.87 to 5.16)	1.11 (0.56 to 2.20)
Felt lonely		
No	1.00	–
Yes	1.14 (0.63 to 2.08)	–
Close friends		
No	1.00	–
Yes	0.85 (0.37 to 1.94)	–
Bullied		
No	1.00	1.00
Yes	2.05** (1.24 to 3.40)	0.98 (0.54 to 1.79)
Ever sexual intercourse		
No	1.00	1.00
Yes	3.61*** (2.16 to 6.04)	1.45 (0.78 to 2.68)
Peer support		
No	1.00	1.00
Yes	1.77* (1.08 to 2.91)	3.19*** (1.71 to 5.96)
Truant at school		
No	1.00	1.00
Yes	2.97*** (1.82 to 4.85)	1.69 (0.94 to 3.05)
Current alcohol use		
No	1.00	1.00
Yes	8.85*** (5.36 to 14.62)	4.85*** (2.61 to 9.03)
Ever used marijuana		
No	1.00	1.00
Yes	24.99*** (13.99 to 44.66)	13.31*** (6.16 to 28.78
Parental supervision		
No	1.00	–
Yes	0.933 (0.58 to 1.51)	–
Parental connectedness		
No	1.00	–
Yes	0.74 (0.45 to 1.22)	–
Parental knowledge of activities		
No	1.00	1.00
Yes	0.52* (0.31 to 0.86)	0.66 (0.34 to 1.28)
Parental invasion of privacy		
No	1.00	–
Yes	0.96 (0.57 to 1.62)	–

*p<0.05, **p<0.01, ***p<0.001.
aOR, adjusted OR; cOR, crude OR; JSS, junior secondary school; SSS, senior secondary school.

poverty, violence, displacement or loss of loved ones, which may increase their vulnerability to planned suicide and subsequently lead to amphetamine use.[21] Government and relevant organisations in Sierra Leone should integrate programmes into school curricula that teach coping mechanisms, stress management and problem-solving skills.[21]

Alcohol and marijuana use were associated with amphetamine use among in-school adolescents. There exists a potential correlation between substance use and an increased propensity to experiment with more drugs.[22] The results of this study indicate a strong case for implementing a ban on the sale, purchase and distribution of substances within school premises, with a particular focus on adolescents who are currently attending school.[22]

In-school adolescents who received social support or help from their classmates or friends showed a higher likelihood of engaging in lifetime amphetamine use. In-school adolescents may feel compelled to use amphetamines if their peers are using them, even if they initially had no intention to do so. In-school adolescents might perceive lifetime amphetamine use to fit in, especially if it is a norm in their social circle. In contrast, research conducted in Ghana revealed no discernible correlation between peer support and the prevalence of lifelong amphetamine use.[3] According to a study conducted in Malaysia, it was found that in-school adolescents who lacked sufficient peer support were more prone to engaging in substance use.[12] Promoting favourable peer associations and providing educational resources and support to in-school adolescents is crucial in reducing the likelihood of amphetamine use.

Policy and practice implications

To mitigate the long-term use of amphetamines in Sierra Leone, the government and other relevant stakeholders in Sierra Leone should implement measures aimed at enforcing a comprehensive prohibition on the utilisation of amphetamines. The inclusion of comprehensive education on the detrimental consequences associated with long-term amphetamine usage must be integrated into the official national school curriculum of Sierra Leone.

Limitations of the study

The present study has certain limitations. First, it is important to note that the outcome variable, lifetime amphetamine usage, was obtained through self-report measures with only a single item. Systematic and social desirability biases might potentially introduce confounding factors in self-report measures. Furthermore, most of the measures used in the study were single-item, which limited the scope of assessment for these variables.Moreover, it is important to note that the findings of this study were derived from a cross-sectional data, which limits our study's ability to establish causal associations between the explanatory variables and lifetime amphetamine use. The survey only included in-school adolescents enrolled in educational institutions, specifically excluding 10–19 years who were not attending school. Hence, the results do not accurately reflect the characteristics and behaviours of all individuals within the specified age range of adolescents.

CONCLUSION

A substantial proportion of in-school adolescents in Sierra Leone use amphetamine. Factors identified to be associated with amphetamine use were suicidal plan, current alcohol usage, marijuana use, and peer support. It is imperative for the government, health and education agencies, as well as relevant stakeholders and organizations to develop and implement school-based health programmes that incorporate the risk factors associated with amphetamine use among adolescents attending schools in Sierra Leone.

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Patient consent for publication Not applicable.

Ethics approval As our study relied on the analysis of a publicly accessible secondary dataset. Hence, formal ethical clearance was not required. Prior to the survey in Sierra Leone, the WHO obtained the requisite ethics approval from the Ministry of Health and Sanitation in the country. In addition, the WHO obtained informed child consent from adolescents under the age of 18 as well as parental or guardian consent before their inclusion in the study. Also, informed consent was sought from the adolescents aged 18 years and older.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available in a public, open access repository. The dataset used for this analysis was obtained from the GSHS-Sierra Leone, 2017. Access to the data can be obtained at the WHO website: https://extranet.who. int/ncdsmicrodata/index.php/catalog/879.

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