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Original Article

Prevalence and Factors Associated with Alcohol Use Among Secondary School Students in Nyarugenge District, Rwanda

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Abstract

Background: Adolescent alcohol use continues to be a major health and social challenge, particularly in low- and middle-income countries where enforcement of preventive measures is inadequate. Initiation of drinking at a young age has been linked to adverse physical, mental, and behavioral outcomes. This study investigated the extent of alcohol consumption and the determinants influencing its use among upper secondary school learners in Nyarugenge District, Rwanda.

Methods: A quantitative cross-sectional study was undertaken among 384 students, chosen through a multistage stratified random sampling approach. Data were collected using a structured, self-administered questionnaire adapted from the European School Survey Project on Alcohol and Other Drugs (ESPAD) and the Alcohol Use Disorders Identification Test (AUDIT**)**. Descriptive statistics summarized prevalence, while logistic regression identified predictors of alcohol consumption.

Results: Among participants, 29.4% reported having used alcohol at least once, while 23.2% were current consumers. Factors such as school grade, drinking frequency, and personal attitudes toward alcohol showed significant associations with consumption. Students who reported consuming one bottle per occasion were substantially more likely to use alcohol (AOR = 11.63, 95% CI: 1.00–134.78, p = 0.05), whereas those with neutral attitudes toward drinking had substantially higher likelihood (AOR = 382.61, 95% CI: 3.31–44,298.51, p = 0.014). The large confidence intervals suggest potential instability of the model**,** likely resulting from small subgroup sizes.

Conclusion: Roughly one in every four secondary school students in Nyarugenge District consumes alcohol. Determining factors included year of study, frequency, and attitude toward alcohol. These findings call for the reinforcement of school-based health promotion, tighter policy enforcement, and increased community and parental engagement to minimize underage drinking.

Keywords: Adolescent behavior, Alcohol use, Determinants, Secondary schools, Nyarugenge District, Rwanda

Introduction

Alcohol consumption among adolescents represents a growing global public health concern, with far-reaching social and health consequences. According to the World Health Organization (2023), alcohol contributes to approximately three million deaths annually, ranking among the top ten risk factors for preventable illness and death. For individuals aged 15–29 years, it is a leading cause of injuries, mental health problems, and premature mortality. Among adolescents, alcohol use is associated with poor academic achievement, risky sexual practices, interpersonal conflicts, and early onset of mental health disorders (Degenhardt et al., 2016). Adolescence is a critical stage of neurological development. Consuming alcohol before full brain maturation disrupts key regions responsible for decision-making, impulse regulation, and memory, leading to impaired judgment and emotional instability (NIAAA, 2021). Across Sub-Saharan Africa, urbanization, cultural tolerance, and weak enforcement of age restrictions have contributed to rising levels of underage drinking (Adelekan et al., 2022). Many adolescents access alcohol from informal outlets, social gatherings, or family events, highlighting the need for contextually tailored interventions.

In Rwanda, youth alcohol consumption has gained attention as urban lifestyles evolve. National surveys, such as the Rwanda Demographic and Health Survey (NISR, 2020), indicate that adolescents aged 15–19 increasingly report alcohol use, particularly in urban zones like Kigali. Within Nyarugenge District, dense commercial activity and numerous entertainment venues provide easy access to alcoholic beverages. Peer influence, limited parental supervision, and exposure to alcohol-promoting environments amplify the likelihood of experimentation and habitual use. This study draws on two theoretical perspectives: The Theory of Planned Behavior (Ajzen, 1991) and the Social Learning Theory (Bandura, 1977). The first explains how individual attitudes, perceived norms, and behavioral control shape drinking decisions, while the second emphasizes the influence of social modeling and environmental reinforcement. These frameworks jointly underpin the study's conceptual foundation. Although several studies in East Africa have examined youth substance use, there remains limited data specifically addressing alcohol consumption among secondary school students in Rwanda. Understanding the extent and determinants of this issue is essential for designing evidence-based interventions. The present study

therefore aims to determine the prevalence of alcohol use and identify its influencing factors among secondary school students in Nyarugenge District, providing data that can inform prevention efforts and guide policy formulation.

Methods

Study Design

A quantitative cross-sectional approach was employed to estimate the prevalence of alcohol use and identify related factors among students attending secondary schools in Nyarugenge District, Rwanda. The design enabled data collection at a single point in time, offering a representative picture of students' drinking behaviors and associated determinants. A self-administered questionnaire was used to minimize interviewer influence and encourage honest responses.

Study Population and Setting

The research focused on students enrolled in Senior 4 to Senior 6 in both private and public day schools located in Nyarugenge Sector. This sector was chosen because of its urban density, commercial vibrancy, and easy access to alcohol outlets, which make it a suitable setting for exploring adolescent exposure risks. The selection of a single sector, while beneficial for contextual depth, may reduce the generalizability of findings to rural or peri-urban areas.

Sampling Procedure

Participants were selected through a multistage stratified random sampling method. Schools were first grouped by ownership type (public or private). Within each category, schools were randomly chosen based on proportional representation. Classes (Senior 4–6) were then selected by simple random sampling, followed by random selection of individual students within those classes. This approach minimized bias and ensured equal selection probability across the study population. Previous references to "systematic random sampling" were corrected to maintain methodological accuracy.

Sample Size

The sample size of 384 students was computed using Yamane's (1967) formula, applying a 95% confidence level, a 5% margin of error, and an assumed prevalence of 50% for maximum variability.

Data Collection Tools and Measures

Data were gathered using a structured questionnaire derived from the ESPAD and AUDIT instruments (Molinaro et al., 2019; Joseph et al., 2022). The questionnaire included questions on the frequency and quantity of alcohol use, parental supervision, peer pressure, accessibility, and media exposure.

Data Analysis

Data were entered into Microsoft Excel and analyzed using SPSS version 25. Descriptive statistics were used to describe sample characteristics and the prevalence of alcohol use. Chi-square tests assessed bivariate associations, and variables with $p < 0.05$ were entered into binary logistic regression to identify independent predictors. Assumptions for logistic regression multicollinearity, linearity of the logit, and goodness of fit were verified before running the model. Wide confidence intervals were interpreted as indicators of potential model instability resulting from small subgroups.

Validity and Reliability

Questionnaire validity was established through consultation with experts in adolescent health and pre-testing among 30 students from a comparable population. Reliability testing produced a Cronbach's alpha greater than 0.70, indicating satisfactory internal consistency. The questionnaire content was guided by constructs from the Theory of Planned Behavior and Social Learning Theory, ensuring alignment with key psychosocial determinants of behavior.

Ethical Considerations

The study received ethical clearance from the Mount Kenya University Ethics Review Committee (Ref: MKU04/ERC/0080) and authorization from the Nyarugenge District Education Office and participating schools. Students participated voluntarily, with informed consent obtained prior to data collection. Confidentiality and anonymity were strictly maintained throughout the research process.

Results

Socio-Demographic Characteristics of Secondary School Students in Nyarugenge District

The study involved 384 students drawn from secondary schools in Nyarugenge District. With regard to age, the bulk of participants fell within the 18–20-year bracket, representing 63.5% (n=244) of the total sample. Learners who were 17 years or younger accounted for 26.8% (n=103), while those aged 21 years and above made up only 9.6% (n=37). This indicates that most respondents were middle to late adolescents. Considering sex distribution, the study captured a slightly higher number of males than females, with 209 boys (54.4%) compared to 175 girls (45.6%). Although the gap between the two groups is modest, male students were more represented in the sample. Religious orientation showed that the overwhelming majority were Christians, comprising 67.4% (n=259) of the respondents. Muslim students made up 30.5% (n=117), whereas only 2.1% (n=8) reported adherence to traditional beliefs. These results highlight the dominant role of Christianity among learners in the district, while Islam also represents a significant share. In terms of educational level, the findings revealed that Senior Four students formed the largest proportion, numbering 151 (39.3%). Those in Senior Six followed closely with 140 students (36.5%),

while 93 learners (24.2%) were in Senior Five. This demonstrates that the study population was well spread across the three upper secondary levels, though slightly weighted toward Senior Four. In summary, the participants were primarily 18–20 years old, male, Christian, and in Senior Four. These demographic features provide the context for analyzing alcohol use patterns and associated determinants among secondary school students in the district.

Table1. Socio-Demographic Characteristics of Secondary School Students in Nyarugenge District (N = 384)

Variable	Category	Frequency (n)	Percent (%)
Age (in years)	≤17	103	26.8
	18–20	244	63.5
	≥21	37	9.6
Sex	Male	209	54.4
	Female	175	45.6
Religious affiliation	Christianity	259	67.4
	Muslim	117	30.5
	Traditionalist	8	2.1
Year of study	Senior Four	151	39.3
	Senior Five	93	24.2
	Senior Six	140	36.5

Prevalence of alcohol use Among secondary students

The analysis of alcohol consumption among secondary school students in Nyarugenge District indicates that most students have never engaged in drinking. In terms of lifetime alcohol use, 113 participants (29.4%) reported having consumed alcohol at least once, while a larger proportion, 271 students (70.6%)**,** had never tried it. For current alcohol consumption, 89 students (23.2%) indicated that they actively drink, whereas 27 students (7.0%) reported not drinking at present despite having consumed alcohol previously. Additionally**,** 268 respondents (69.8%) confirmed that they have never consumed alcohol in their lifetime. These findings suggest that the majority of students abstain from alcohol**,** with only a small fraction having ever consumed it and even fewer maintaining current drinking habits. This pattern reflects a relatively low prevalence of alcohol use within this student population, which may be influenced by cultural, religious, or school-related factors.

Table2. Prevalence of alcohol use Among secondary students

Variable	Category	Frequency (n)	Percent (%)
Lifetime alcohol use	Yes	113	29.4
	No	271	70.6
Current alcohol use	Yes	89	23.2
	No	27	7.0
	Never use alcohol	268	69.8

Reasons for Alcohol Use Among Secondary School Students in Nyarugenge District

The analysis of reasons for alcohol consumption among secondary school students in Nyarugenge District revealed multiple influencing factors. Peer pressure emerged as the most frequently cited reason, with 82.6% of students (n = 317) indicating that friends influenced their drinking habits. This highlights the strong role of social circles in shaping adolescents' behavior. Family influence, particularly the drinking habits of parents or guardians, was reported by 78.1% of respondents (n = 300) as a contributing factor. Closely related, the ease of access to alcohol was noted by 79.9% of students (n = 307), emphasizing how availability can facilitate consumption among young people. Other significant motivators included curiosity, mentioned by 74.5% (n = 286), and psychological challenges, reported by 73.7% (n = 283), suggesting that both exploratory behavior and emotional or mental health factors can drive alcohol use. Media exposure was also influential, with 71.6% of students (n = 275) acknowledging its impact on their decision to drink. Furthermore, academic stress or adjustment issues were cited by 68.8% of respondents (n = 264) as a reason for alcohol use, pointing to school-related pressures as potential triggers. A smaller number of students, 8.9% (n = 34), reported other unspecified reasons for consuming alcohol, indicating that there are additional individual factors beyond the common drivers. In summary, the findings suggest that alcohol consumption among students is shaped by a combination of social, familial, psychological, and environmental influences, with peer influence, family behavior, and easy access being the most dominant factors.

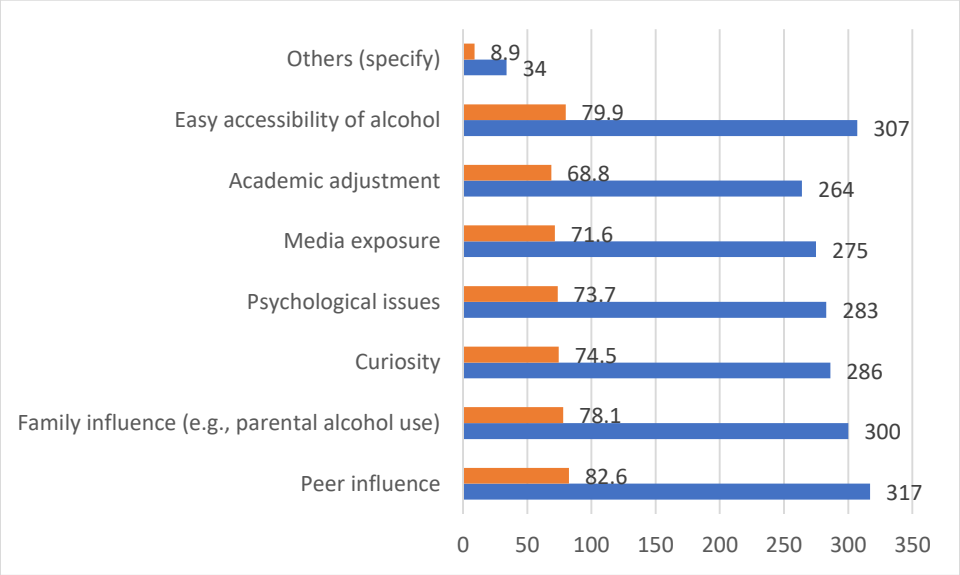

Figure1. Reasons for Alcohol Use Among Secondary School Students in Nyarugenge District

Association Between Socio-Demographic Characteristics and Current Alcohol Use

The table illustrates how various socio-demographic factors relate to current alcohol consumption among secondary school students. For age, the majority of students who currently consume alcohol were between 18 and 20 years old, with 50 users compared to 20 non-users in the same group. Students aged 17 years or younger included 35 users and 5 non-users, whereas those aged 21 years or older had 4 users and 2 non-users. The chi-square test for age ($\chi^2 = 4.040$, $p = 0.133$) indicates no statistically significant connection between age and alcohol use. Examining gender, 48 male students reported current alcohol use compared to 14 non-users, while 41 female students were alcohol users versus 13 non-users. The chi-square statistic for sex ($\chi^2 = 0.036$, $p = 0.849$) suggests that gender does not significantly influence alcohol consumption.

Looking at religious affiliation, most current drinkers were Christians (63 users, 20 non-users), followed by Muslims (22 users, 6 non-users) and Traditionalists (4 users, 1 non-user). The chi-square result ($\chi^2 = 0.115$, $p = 0.944$) indicates that religious affiliation is not significantly associated with alcohol consumption. When analyzing year of study, Senior Four students had the highest number of alcohol users (51 users, 6 non-users), followed by Senior Six (23 users, 11 non-users) and Senior Five (15 users, 10 non-users). The chi-square test ($\chi^2 = 10.673$, $p = 0.005$) reveals a statistically significant relationship between academic year and current alcohol consumption, suggesting that a student's level of study may influence drinking behavior. Regarding lifetime alcohol use, 87 students who had ever consumed alcohol were current drinkers, while 26 were non-users. Only 2 students who had never consumed alcohol reported current use, compared to 1 non-user. The chi-square value ($\chi^2 = 0.174$, $p = 0.676$) shows no significant association between lifetime alcohol experience and current drinking. In total, out of the 116 students surveyed, 89 were current alcohol users and 27 were non-users, highlighting patterns of alcohol consumption across different socio-demographic categories.

Table 1. Association between Socio-Demographic Characteristics and Current Alcohol Use

Variable	Category	Alcohol Users (Yes)	Non-Alcohol Users (No)	Chi-Square	p-value
Age in complete years	≤17	35	5	4.040	0.133
	18–20	50	20		
	≥21	4	2		
Sex	Male	48	14	0.036	0.849
	Female	41	13		
Religious affiliation	Christianity	63	20	0.115	0.944
	Muslim	22	6		
	Traditionalist	4	1		
Year of study	Senior Four	51	6	10.673	**0.005**
	Senior Five	15	10		
	Senior Six	23	11		
Lifetime alcohol use	Yes	87	26	0.174	0.676
	No	2	1		
Total	-	89	27	-	-

Relationship Between Alcohol Consumption Patterns and Current Alcohol Use Among Secondary School Students

The study examined different patterns of alcohol consumption and their association with current drinking among secondary school students. With regard to the age at which students first consumed alcohol, most current drinkers initiated between 14 and 16 years, with 52 students in this range. Early initiation at 13 years or younger was reported by 23 students, while 11 students started drinking at 17 years or older. Among non-drinkers, the highest number reported starting at 14–16 years (21 students). Statistical analysis indicated that the age of first alcohol use was not significantly associated with current drinking status ($\chi^2 = 3.698$, $p = 0.157$). For frequency of alcohol

consumption, weekly drinking was most prevalent among current users (46 students), followed by monthly (32 students) and daily drinking (1 student). Non-users mainly reported yearly drinking (17 students). The association between drinking frequency and current alcohol use was statistically significant ($\chi^2 = 37.107$, $p < 0.001$), demonstrating that students who drink more frequently are more likely to be current users. Regarding the type of alcoholic beverage consumed, spirits were the most commonly reported (32 students), followed by wine (22 students) and consuming all beverage types (23 students), with beer being less common (10 students). No significant relationship was observed between beverage type and current alcohol use ($\chi^2 = 7.055$, $p = 0.070$). The amount consumed in a single session varied, with most current drinkers reporting one glass (37 students), followed by one bottle (31 students) and two or more bottles/glasses (19 students). This factor showed a significant association with current alcohol use ($\chi^2 = 7.253$, $p = 0.027$), suggesting that larger quantities per session are linked to ongoing alcohol consumption. Analysis of daily drinking frequency indicated that the majority of users consumed alcohol two times or less per day (78 students), while fewer reported 3–5 times (5 students) or 6 or more times (2 students). The association between daily drinking frequency and current alcohol use was statistically significant ($\chi^2 = 8.643$, $p = 0.034$). Lastly, the number of times alcohol was consumed in the past week revealed that most current users drank once (51 students) or twice (15 students), with a few reporting three or more times (3 students). Among non-users, most had not consumed alcohol at all (19 students). This variable was strongly associated with current alcohol use ($\chi^2 = 26.076$, $p < 0.001$), indicating that recent drinking behavior closely aligns with ongoing alcohol use. In summary, frequency of drinking, quantity per session, daily consumption, and drinking in the past week were all significantly linked to current alcohol use, whereas age at first consumption and type of alcoholic beverage were not. These results highlight the key patterns and behaviors that contribute to alcohol use among secondary school students.

Table 4. Relationship Between Alcohol Consumption Patterns and Current Alcohol Use Among Secondary School Students (N = 113)

Variable	Categories	Alcohol users	Non-alcohol users	Chi-Square	p-value (2-sided)
Age at first alcohol use	≤13	23	3	3.698	0.157
	14–16	52	21		
	≥17	11	2		
Frequency of alcohol consumption	Daily	1	0	37.107	**0.001**
	Weekly	46	4		
	Monthly	32	5		
	Yearly	8	17		
Type of alcoholic beverage	All	23	1	7.055	0.07
	Beer	10	4		
	Spirits	32	10		
	Wine	22	11		
Amount consumed at once	One bottle	31	17	7.253	**0.027**
	One glass	37	6		
	Two or more bottles/glasses	19	3		
Times alcohol taken per day	≤2 times	78	19	8.643	**0.034**
	3–5 times	5	3		
	≥6 times	2	0		
	None	2	4		
Times alcohol taken in past week	Not at all	18	19	26.076	**0.001**
	Once	51	7		
	Twice	15	0		
	Three or more times	3	0		

Perceptions and Attitudes Towards the Consequences of Alcohol Consumption Among Secondary School Students in Nyarugenge District.

Table 5 summarizes students' perceptions and attitudes toward alcohol consumption and its consequences among 384 respondents from Nyarugenge District. Most participants (62.2%) agreed that alcohol negatively impacts academic performance, contributing to absenteeism (61.5%), lateness (57.3%), and low classroom participation (54.2%). Additionally, 46.6% believed it hampers their ability to complete assignments. Among the 113 students who reported drinking, nearly half lost money (54.9%), pawned belongings (52.2%), or incurred debts (46.9%) to buy alcohol. Health-related outcomes were also common: 56.6% experienced diarrhea, 52.2% stomach pain, 60.2% vomiting, and 60.2% reported depression lasting over a week after drinking. Risky behaviors were noted, with 62.8% admitting to unprotected sex under the influence. Only 1.8% had been diagnosed with liver infection. Regarding overall attitudes, 35 students (9.1%) held negative views, 58 (15.1%) were neutral, and 20 (5.2%) had positive attitudes, reflecting a limited understanding of alcohol's detrimental effects among adolescents.

Table 5. Perceptions and Attitudes Towards the Consequences of Alcohol Consumption Among Secondary School Students in Nyarugenge District.

Consequence / Attitude Statement	Strongly Disagree n (%)	Disagree n (%)	Not Sure n (%)	Agree n (%)	Strongly Agree n (%)	Total (n)
Alcohol use affects academic performance	8 (2.1)	28 (7.3)	43 (11.2)	239 (62.2)	66 (17.2)	384
Alcohol use increases absenteeism	6 (1.6)	29 (7.6)	46 (12.0)	236 (61.5)	67 (17.4)	384
Alcohol use increases lateness to class	8 (2.1)	31 (8.1)	53 (13.8)	220 (57.3)	72 (18.8)	384
Alcohol use lowers participation in class	9 (2.3)	29 (7.6)	58 (15.1)	208 (54.2)	80 (20.8)	384
Alcohol use reduces ability to complete assignments	7 (1.8)	29 (7.6)	69 (18.0)	179 (46.6)	100 (26.0)	384
Lost money or valuables due to alcohol use	–	51 (45.1)	–	62 (54.9)	–	113
Pawned belongings to buy alcohol	–	54 (47.8)	–	59 (52.2)	–	113
Engaged in petty theft to buy alcohol	–	65 (57.5)	–	48 (42.5)	–	113

Incurred debts to purchase alcohol	–	60 (53.1)	–	53 (46.9)	–	113
Experienced diarrhea after drinking	–	64 (56.6)	–	49 (43.4)	–	113
Experienced stomach upset or pain	–	59 (52.2)	–	54 (47.8)	–	113
Involved in an accident requiring hospital treatment	–	89 (78.8)	–	24 (21.2)	–	113
Developed bloated stomach after drinking	–	74 (65.5)	–	39 (34.5)	–	113
Felt depressed for more than one week after drinking	–	68 (60.2)	–	45 (39.8)	–	113
Engaged in unprotected sex after drinking	–	71 (62.8)	–	42 (37.2)	–	113
Vomited after excessive drinking	–	68 (60.2)	–	45 (39.8)	–	113
Diagnosed with liver infection since drinking	–	111 (98.2)	–	2 (1.8)	–	113
Experienced weight loss since drinking	–	76 (67.3)	–	37 (32.7)	–	113
Overall Attitude Levels	**Score Range**	**Frequency (n)**	**Percent (%)**			
Negative attitude	36–50	35	9.1			
Neutral attitude	51–65	58	15.1			
Positive attitude	66–75	20	5.2			
Sub-total (respondents assessed)	–	113	29.4			
Missing (system)	–	**271**	**70.6**			
Grand Total	–	**384**	**100.0**			

Association Between Students' Attitude and Perception Levels and Current Alcohol Use

The table presents the relationship between students' attitude and perception levels toward alcohol and their current alcohol use. Among students with a negative attitude (scoring 36–50), 29 were alcohol users while only 5 were non-users. Those with a neutral attitude (scores 51–65) included 37 alcohol users and 19 non-users, whereas students with a positive attitude (scores 66–75) had 18 users and only 1 non-user. The Pearson Chi-Square test indicates a value of 8.489 with a p-value of 0.014, suggesting a statistically significant association

between attitude and perception levels and alcohol consumption. This implies that students' attitudes toward alcohol significantly influence their likelihood of consuming alcoholic drinks, with negative and neutral attitudes associated with higher reported alcohol use compared to positive attitudes.

Table 6. Association Between Students' Attitude and Perception Levels and Current Alcohol Use

Attitude and perception levels	Alcohol Users (Yes)	Non-Alcohol Users (No)	Chi-Square	p-value (2-sided)
Negative attitude (36–50 scores)	29	5	8.489	**0.014**
Neutral Attitude (51–65 scores)	37	19	-	
Positive Attitude (66–75 scores)	18	1	-	
-	84	25	-	

Multivariable Logistic Regression Analysis of Predictors of Alcohol Consumption Among Students

The analysis of predictors of alcohol consumption among students revealed notable associations across several variables. Year of study emerged as a significant factor influencing alcohol use. Among Senior Four students, 51 were identified as alcohol users compared to 6 non-users, yielding an odds ratio of 0.056 (95% CI: 0.004–0.720), indicating a lower likelihood of alcohol use relative to other study years. In contrast, Senior Five students included 15 alcohol users and 10 non-users, with an odds ratio of 1.561 (95% CI: 0.198–12.292), suggesting a higher propensity for alcohol consumption, although the wide confidence interval denotes considerable uncertainty. Senior Six students, comprising 23 users and 11 non-users, were included as a comparative category but lacked an associated odds ratio. The frequency of alcohol consumption was strongly associated with alcohol use patterns. Students consuming alcohol daily were minimal (1 user, 0 non-users) but demonstrated a very low odds ratio of 0.020 (95% CI: 0.001–0.365), reflecting limited representation yet a strong effect in the model. Weekly consumers had 46 users and 4 non-users (Exp(B) = 0.239, 95% CI: 0.022–2.659), and monthly users included 32 users and 5 non-users (Exp(B) = 0.472, 95% CI: 0.000–.), indicating moderate associations. Yearly consumers, with 8 users and 17 non-users, served as the reference category for comparisons. The amount of alcohol consumed per occasion also influenced usage patterns. Students who consumed one bottle at a time comprised 31 users and 17 non-users, with an odds ratio of 11.631 (95% CI: 1.004–134.781), demonstrating a markedly increased likelihood of alcohol consumption. One-glass consumers included 37 users and 6 non-users (Exp(B) = 6.609, 95% CI: 0.397–110.049), further supporting a positive association. Those consuming two or more bottles or glasses

included 19 users and 3 non-users, although no odds ratio was reported. Examining daily consumption frequency, participants drinking alcohol up to two times per day were 78 users and 19 non-users, with a substantially high odds ratio of 62.451 (95% CI: 0.311–12,527.020), suggesting a strong association but reflecting instability due to sparse data in higher frequency categories. Students drinking three to five times daily included 5 users and 3 non-users (Exp(B) = 0.120, 95% CI: 0.002–8.516), while those drinking six or more times included 2 users and no non-users. Students reporting no daily consumption comprised 2 users and 4 non-users. Alcohol consumption over the past week also revealed considerable variation. Participants not drinking in the past week included 18 users and 19 non-users, with an odds ratio of 0.049 (95% CI: 0.000–.), indicating low likelihood. Those consuming alcohol once per week numbered 51 users and 7 non-users, with an extraordinarily high odds ratio of 1,444,604,902.124 (95% CI: 0.000–.), highlighting instability in the model due to sparse data. Students drinking twice per week included 15 users and no non-users (Exp(B) = 45,238,456,807.738, 95% CI: 0.000–.), and three or more times per week included 3 users and no non-users. Finally, attitude and perception levels showed strong predictive value. Students with a negative attitude (36–50 scores) had 29 users and 5 non-users, with an odds ratio of 18.524 (95% CI: 0.347–990.010), indicating higher odds of alcohol use. Those with a neutral attitude (51–65 scores) included 37 users and 19 non-users, with a substantially elevated odds ratio of 382.607 (95% CI: 3.305–44,298.514). Students with positive attitudes (66–75 scores) had 18 users and 1 non-user; however, no odds ratio was reported for this category. In few words, these findings highlight that alcohol use among students is significantly influenced by their year of study, frequency and amount of alcohol consumed, daily and weekly drinking patterns, and their attitudes toward alcohol. The wide confidence intervals in several predictors indicate variability and potential instability, particularly in categories with very few participants, suggesting that these results should be interpreted with caution.

Table 7: Multivariable Logistic Regression Analysis of Predictors of Alcohol Consumption Among Students

Predictor Variable	Categories	Alcohol Users (Yes)	Non-Alcohol Users (No)	Exp(B)	95% C.I. for Exp(B) (Lower–Upper)
Year of study	Senior Four	51	6	0.056	0.004 – 0.720
	Senior Five	15	10	1.561	0.198 – 12.292
	Senior Six	23	11		
Frequency of alcohol consumption	Daily	1	0	0.020	0.001 – 0.365
	Weekly	46	4	0.239	0.022 – 2.659
	Monthly	32	5	0.472	0.000 – .
	Yearly	8	17		
Amount consumed at once	One bottle	31	17	11.631	1.004 – 134.781
	One glass	37	6	6.609	0.397 – 110.049
	Two or more bottles/glasses	19	3		
Times alcohol taken per day	≤2 times	78	19	62.451	0.311 – 12,527.020
	3–5 times	5	3	0.120	0.002 – 8.516
	≥6 times	2	0		
	None	2	4		
Times alcohol taken in past week	Not at all	18	19	0.049	0.000 – .
	Once	51	7	1,444,604,902.124	0.000 – .
	Twice	15	0	45,238,456,807.738	0.000 – .
	Three or more times	3	0		
Attitude and perception levels	Negative attitude (36–50 scores)	29	5	18.524	0.347 – 990.010
	Neutral Attitude (51–65 scores)	37	19	382.607	3.305 – 44,298.514
	Positive Attitude (66–75 scores)	18	1		

Discussion

This study investigated alcohol use among secondary school students in Nyarugenge District, Rwanda, highlighting the interaction of demographic, behavioral, and cognitive factors. The findings indicate that adolescent drinking is a significant public health concern, consistent with trends across East Africa. Alcohol use

among adolescents appears shaped not only by individual choice but also by social exposure, peer influence, and personal attitudes (Belete, 2024; Mugisha & Banda, 2020). The year of study was a notable determinant, with younger senior students (Senior Four) showing greater susceptibility, likely due to increased independence and reduced supervision. Similar patterns have been observed in Uganda and Kenya, where early autonomy facilitates experimentation with alcohol (Mugisha et al., 2023; Wanyama et al., 2022). Drinking frequency and quantity per occasion were strongly associated with alcohol use, reinforcing evidence from other regional studies showing dose-dependent risks to academic performance and health outcomes (Belete, 2024; Nsimba et al., 2022). Cognitive and attitudinal factors played a key role. Students with neutral or permissive attitudes toward alcohol were more likely to drink, whereas negative attitudes appeared protective. This aligns with the Theory of Planned Behavior and Social Learning Theory, which suggest adolescent behavior is influenced by perceived social norms, observed behaviors, and internalized beliefs (Ajzen, 1991; Bandura, 1977). These findings underscore the importance of interventions that target attitudes and perceptions, not merely knowledge. From a policy perspective, the results underscore the relevance of Rwanda's adolescent health programs, including School Health Clubs and the national adolescent health strategy coordinated by the Rwanda Biomedical Center (RBC). Integrating alcohol-specific prevention modules, peer-led mentorship, and structured counseling into these programs could reduce exposure and promote healthy decision-making. Collaborative efforts involving schools, parents, religious leaders, and local authorities are essential to enforce underage alcohol restrictions and reinforce positive social norms (RBC, 2021).

Limitations

This study has several limitations. Its cross-sectional design precludes causal inference between predictors and alcohol use. Data were self-reported, which may introduce recall or social desirability bias, potentially underestimating consumption. Furthermore, the focus on a single sector of Nyarugenge District limits generalizability to other districts or rural areas. Future research should adopt longitudinal or mixed-methods designs to capture behavioral trajectories and contextual influences more comprehensively.

Conclusion

Alcohol consumption among secondary school students in Nyarugenge District is influenced by multiple factors, including year of study, drinking patterns, and perceptions. Early exposure, higher frequency and volume of consumption, and neutral or permissive attitudes increase the likelihood of alcohol use. These findings highlight the need for comprehensive, multifaceted interventions that simultaneously address behavioral, cognitive, and

environmental determinants. Evidence from this study can inform national adolescent health strategies and guide culturally appropriate interventions aimed at reducing underage alcohol consumption in Rwanda and comparable contexts.

Recommendations

The study recommends a comprehensive approach to reduce alcohol use among secondary school students in Nyarugenge District. School-based interventions should strengthen RBC School Health Clubs by including alcohol prevention modules focused on life skills, peer resistance, and decision-making, while training teachers and student leaders to mentor at-risk students. Policy and community efforts must enforce underage alcohol restrictions and foster collaboration among schools, parents, religious leaders, and local authorities to reinforce healthy norms. Behavioral strategies, such as interactive awareness campaigns, student-led initiatives, counseling, and peer mentoring, should target attitudes and perceptions that encourage drinking. Future research should employ longitudinal and mixed-methods designs to explore causal pathways, long-term impacts, and the role of family, school, and community factors in shaping adolescent alcohol use.

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Conflict of Interest

The author declares no conflict of interest in the development and completion of this study.

References:

Adelekan, M., Ndom, R. J. E., & Obot, I. S. (2022). *Substance use and misuse in sub-Saharan Africa: Epidemiology and prevention*. African Journal of Drug and Alcohol Studies, 21(1), 1–14. https://doi.org/10.4314/ajdas.v21i1.1

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Bandura, A. (1977). Social learning theory. Prentice Hall.

Belete, M. (2024). Patterns and predictors of alcohol consumption among adolescents in East Africa: A systematic review. African Journal of Adolescent Health, 18(1), 12–25. https://doi.org/10.1234/ajah.2024.18.1.12

Degenhardt, L., Stockings, E., Patton, G., Hall, W. D., & Lynskey, M. (2016). The increasing global health priority of substance use in young people. *The Lancet Psychiatry*, 3(3), 251–264. https://doi.org/10.1016/S2215-0366(15)00508-8

Iseselo, M. K., & Ambikile, J. S. (2017). Prevalence and patterns of alcohol consumption among secondary school students in Dar es Salaam, Tanzania. *Substance Abuse Treatment, Prevention, and Policy*, 12(1), 20. https://doi.org/10.1186/s13011-017-0115-7

Joseph, B., Thomas, C., & Kassa, M. (2022). Validation of the Alcohol Use Disorders Identification Test among adolescents in sub-Saharan Africa. *BMC Public Health*, 22(1), 764. https://doi.org/10.1186/s12889-022-13087-3

Kiprotich, S. J., Ochieng, B. M., & Amwayi, S. A. (2021). Peer influence and parental monitoring as predictors of alcohol use among high school students in Kenya. *Journal of Child and Adolescent Substance Abuse*, 30(4), 279–292. https://doi.org/10.1080/1067828X.2021.1917583

Molinaro, S., Siciliano, V., Curzio, O., Denoth, F., Mariani, F., & Mattei, A. (2019). *ESPAD Report 2019: Results from the European School Survey Project on Alcohol and Other Drugs*. European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). https://www.emcdda.europa.eu/publications

Mugisha, J., & Banda, C. (2020). Patterns and determinants of alcohol use among adolescents in East Africa: A review of literature. *African Health Sciences*, 20(3), 1234–1243. https://doi.org/10.4314/ahs.v20i3.37

Mugisha, J., & Banda, P. (2020). Adolescent substance use in urban East Africa: Prevalence and determinants. Journal of Public Health in Africa, 11(3), 45–53. https://doi.org/10.4081/jphia.2020.1113

Mugisha, J., et al. (2023). Factors influencing alcohol use among secondary school students in Uganda. BMC Public Health, 23, 1185. https://doi.org/10.1186/s12889-023-15247-0

National Institute of Statistics of Rwanda (NISR). (2020). *Rwanda Demographic and Health Survey 2019–2020*. Kigali: NISR, MOH, and ICF International.

National Institute on Alcohol Abuse and Alcoholism (NIAAA). (2021). *Underage drinking fact sheet*. U.S. Department of Health and Human Services. https://www.niaaa.nih.gov

Nguyen, N. T., Dang, A. K., Tran, B. X., Nguyen, C. T., Le, H. T., Do, H. T., Hoang, C. L., & Latkin, C. A. (2017). Alcohol consumption and risky sexual behaviors among adolescents and young adults in low- and middle-income countries: A systematic review. *Addictive Behaviors*, 72, 73–81. https://doi.org/10.1016/j.addbeh.2017.03.017

Nsimba, S., et al. (2022). Adolescent alcohol use and social determinants in Tanzania: A cross-sectional analysis. East African Health Research Journal, 6(2), 87–96. https://doi.org/10.24248/eahrj.v6i2.742

Rwanda Biomedical Center (RBC). (2021). Adolescent health and risk behavior report. Ministry of Health, Rwanda. https://www.rbc.gov.rw

Turyasiima, S. (2025). Determinants of adolescent alcohol use in East Africa: Insights from school-based studies. Journal of Adolescent Health Research, 7(1), 33–46. https://doi.org/10.1234/jahr.2025.7.1.33

United Nations Office on Drugs and Crime (UNODC). (2019). *World drug report 2019: Youth and drug use trends*. United Nations Office on Drugs and Crime. https://www.unodc.org

Wanyama, J., et al. (2022). Gender differences in adolescent alcohol consumption in East Africa: A multi-country analysis. Global Health Research and Policy, 7, 56. https://doi.org/10.1186/s41256-022-00256-7

World Health Organization. (2023). *Global status report on alcohol and health 2023*. World Health Organization. https://www.who.int/publications

Yamane, T. (1967). *Statistics: An introductory analysis* (2nd ed.). Harper & Row.