Trends in Psychology (2024) 32:122–137
https://doi.org/10.1007/s43076-022-00236-w

ORIGINAL ARTICLE

# The Epidemiology of Alcohol Use Among a Nationally Representative Sample of School-Going Adolescents in Namibia

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Accepted: 8 September 2022 / Published online: 14 October 2022


## Abstract

Alcohol use and drunkenness, along with other risky behaviours, tend to emerge during the adolescent years. This study aimed to investigate the prevalence and correlates of alcohol use and lifetime drunkenness among school-going adolescents in Namibia. Using the 2013 Namibia Global School-Based Student Health Survey (GSHS), 3089 adolescents aged 12–17 years ($M = 15.1$; $SD = 1.4$) responded to a cross-sectional survey that assessed substance use, psychological distress, and other health risk behaviours. Bivariate and multivariate statistical approaches were used to analyse the data. Overall, 29.8% (95% CI = 28.2–31.4%) of the total analytic sample reported past-month alcohol use, representing 34.1% (95% CI = 31.7–36.6%) among males and 26.4% (95% CI = 24.2–28.5%) among females. Similarly, the prevalence of lifetime drunkenness was 26.0% (95% CI = 24.5–27.5%), representing 33.3% (95% CI = 30.9–35.9%) among males and 20.3% (95% CI = 18.4–22.3%) in females. The final adjusted logistic models indicated that demographic characteristics (age and male gender), mental health variables (anxiety and loneliness), and lifestyle factors (cannabis use, cigarette smoking, and leisure-time sedentary behaviour) showed strong associations with increased odds of past-month alcohol use and lifetime drunkenness. Among the family-level factors, only parental supervision was found to have strong association with reduced odds of both past-month alcohol use and lifetime drunkenness. The multi-level nature of the findings underscores the need for the development of a multi-contextual and multi-sectoral intervention and prevention programmes that could target school-going adolescents who may be at risk of misusing alcohol.

**Keywords** Adolescents · Alcohol use · Lifetime drunkenness · Mental health outcomes · Namibia

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## Introduction

Alcohol use and drunkenness, along with other risky behaviours, tend to emerge during the adolescent years (WHO, 2021a), and alcohol in particular is reported as the most common psychoactive substance used by young people (WHO, 2021a). Within sub-Saharan Africa, alcohol, which is readily available in societies, has been found to be one of the substances with addictive potential that are most commonly used by adolescents (Ferreira-Borges et al., 2017; WHO, 2021b). Due to the socio-psychological challenges associated with the transition from childhood to adulthood, many adolescents use alcohol to fulfil social and personal needs, enhance contact with peers, and initiate new relationships, but its public health burden is high (Morojele & Ramsoomar, 2016).

The most recent World Health Organization (WHO) Global Status Report on Alcohol and Health indicated a prevalence of 6.3% of alcohol use disorders (AUDs) among young people and adults in Namibia (10.9% among males and 2.1% among females) (WHO, 2018) and a prevalence of 2.2% for alcohol dependence (3.7% for males and 0.8% for females) (WHO, 2018). These estimates of AUDs and alcohol dependence are higher than the WHO African region values of 3.7% (AUD) and 1.7% (alcohol dependence). The WHO emphasised the need to examine alcohol use among adolescents, as the majority of alcohol-related mental health problems among the adult population have their onset in adolescence (WHO, 2020a). This is further reinforced by current evidence indicating that the early onset of alcohol use in adolescents is associated with negative outcomes such as mental health problems and neurocognitive impairments that can persist into adulthood (Ning et al., 2020, 2021; Noorbakhsh et al., 2020). In Namibia, this is important, as the country has one of the highest prevalence of AUDs and alcohol dependence in the general population, relative to other countries in the African Region (WHO, 2018).

Within sub-Saharan Africa and other low- and middle-income countries (LAMICs), emerging evidence is consistently indicating that multiple factors are associated with alcohol use and drunkenness among school-attending adolescents (e.g. Asante & Kugbey, 2019; Atorkey & Asante, 2022; Darteh, 2021; Harris et al., 2012; Htet et al., 2020; Noosorn et al., 2020; Ogundare et al., 2020; Onyeaka & Asante, 2021; Peltzer & Pengpid, 2018). The factors are also multi-layered, existing at the *personal/individual level* such as gender, age, and grade (Asante & Kugbey, 2019), *mental health-related factors* such as loneliness, anxiety, self-harm, and suicidal behaviour (Quarshie et al., 2020), and *lifestyle factors* (mainly, health risk behaviours) such as marijuana use, cigarette smoking, and leisure-time sedentary behaviour (Onyeaka & Asante, 2021; Peltzer & Pengpid, 2018). Furthermore, *school-level factors* found to be associated with alcohol use are truancy, bullying victimisation, and peer support at school (Darteh, 2021; Htet et al., 2020) and *interpersonal factors* implicated in alcohol use included number of friends, and involvement in a physical fight (Onyeaka & Asante, 2021; Peltzer and Pengpid, 2018). Finally, within the *family environment*, parental monitoring, parental understanding, parental supervision, parental intrusion of privacy, and parental tobacco use have been found to be associated

with alcohol use and drunkenness among school-attending adolescents (Asante & Kugbey, 2019; Darteh, 2021).

As one of the fastest growing economies, Namibia is undergoing rapid urbanisation, demographic transition, and changes in lifestyle behaviour, including changing drinking and smoking patterns. Furthermore, current evidence shows high prevalence estimates of alcohol and tobacco use among the general population (He et al., 2019). Despite these problems, research on adolescent mental health issues including alcohol use remains notably less than enough. The lack of quality data on adolescent alcohol use and its determinants remains a common barrier to evidence-based policy-making in Africa. Thus far, only one country-specific study has analysed the 2013 Namibia WHO-GSHS dataset on concurrent alcohol use and tobacco use and their associated factors (Peltzer & Pengpid, 2018). Also, some previous studies that have performed secondary analyses of datasets from the earlier editions of the Namibia WHO Global School-Based Health Survey (WHO-GSHS) have focused on psychosocial distress and substance use, and social correlates of sexual risk behaviours (Chinsembu et al., 2008; Page et al., 2011).

To the best of the authors' knowledge, there is no comprehensive peer-reviewed publication of the WHO-GSHS latest data from Namibia (collected in 2013) on alcohol use and lifetime drunkenness which focuses on multi-factor correlates. In the context of the gap in the literature, a more nationally representative sample of adolescents has been used in the current study to specifically investigate the prevalence and correlates of alcohol use and lifetime drunkenness among adolescents in Namibia. The findings of this study could inform the development of multi-contextual and multi-sectoral intervention and prevention programmes that could target high school students who may be at risk for alcohol use and abuse.

## Theoretical Framework

The study was located within the adapted socio-ecological theory (Bronfenbrenner, 1994) which explains that human behaviour is influenced by multiple factors within the different systems (i.e. microsystem, mesosystem, exosystem, and macrosystem). This means that in order to study and understand adolescent health behaviour, we need to consider the different levels of influence not only at an individual level, but also at the immediate and the broader community and society levels. Thus, this framework suggests that an individual's behaviour is influenced by multiple levels of influence. In applying this framework to this study, the importance of adolescents' personal and interpersonal relationships, parental factors, and school environmental factors cannot be overemphasised, as they have been found to influence their substance use behaviour including alcohol misuse (Bronfenbrenner, 1994; Asante & Kugbey, 2019; WHO, 2018). Based on this framework, the current study draws on data from the 2013 Namibia World Health Organization Global School-based Student Health Survey (WHO-GSHS) conducted nationwide among school-going adolescents to:

1. Estimate the prevalence of past-month alcohol use and lifetime drunkenness among school-going adolescents in Namibia.
2. Explore individual, mental health, lifestyle, family-level, school-related, and interpersonal factors that are associated with past-month alcohol use and lifetime drunkenness among school-going adolescents in Namibia.

## Methods

### Study Design

As applied in all participating countries, the 2013 Eswatini WHO-GSHS used a cross-sectional survey design involving a structured context-validated self-report questionnaire (WHO, 2020b). This study has been reported according to Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) criteria (Vandenbroucke et al., 2007).

### Participants and Procedure

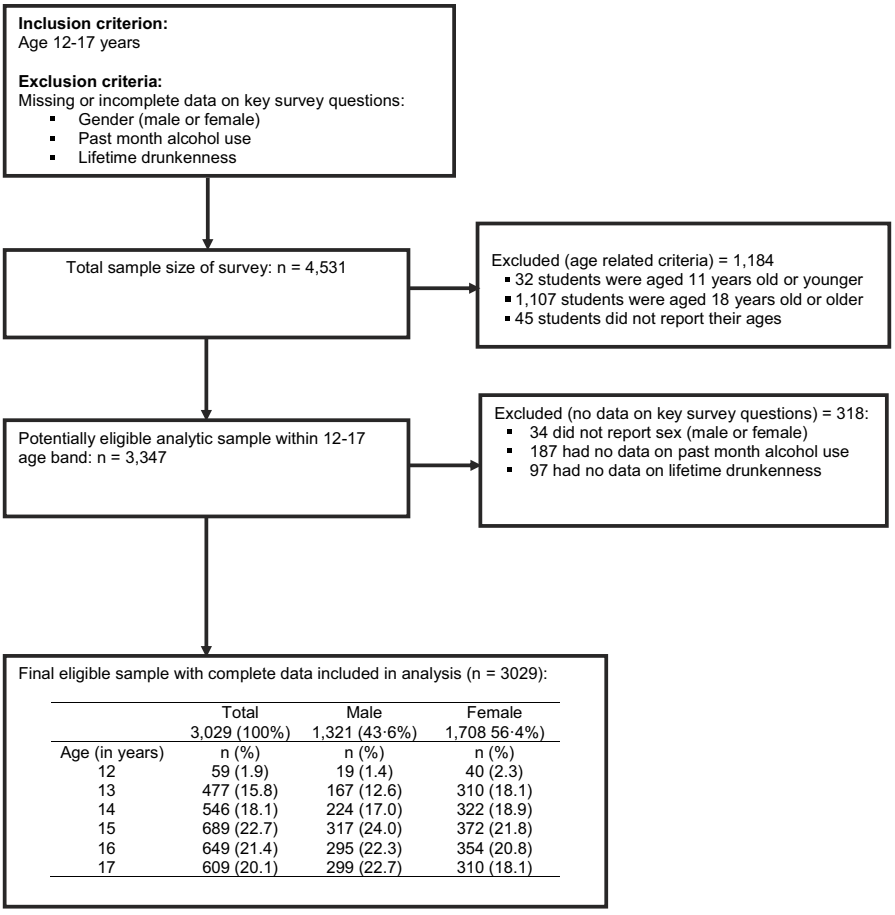
Data for this study were obtained from the Namibia WHO Global School-based Student Health Survey (WHO-GSHS) conducted in 2013. This survey was conducted through a partnership between the WHO, the Centers for Disease Control and Prevention (CDC), and the Ministry of Health and Social Services, Namibia. The data were collected using a cross-sectional survey design among WHO countries which were interested in examining the behavioural risk factors and protective factors in several domains of functioning among school-going adolescents. Data were collected using close-ended structured questionnaires administered to the students. A two-stage cluster sample design was used to produce data representative of all students in grades 7–12 in Namibia. At the first stage, schools were selected with probability proportional to enrollment size. At the second stage, classes were randomly selected and all students in selected classes were eligible to participate. As stipulated by WHO-GSHS, participation in the study was voluntary, anonymous, and confidential (WHO, 2020b). The Institutional Review Board of the Country Office of WHO in Namibia, and the Ministry of Health and Social Services, Namibia, approved the survey (WHO, 2020a, 2020b). The overall response rate was 89%.

Overall, 4531 students responded to the survey, but our final analytical sample included 3089 after the analytical data selection criteria were applied (see Fig. 1). Of the 3089 students aged between 12 and 17 years ($M = 15.1$ years, $SD = 1.4$) who provided complete data, 1321 (43.6%) were males and 1708 (56.4%) were females (Fig. 1).

### Measures

#### Demographic Variables

Gender (male or female) and age were demographic variables included in this study.




| | Total | Male | Female |
|---|---|---|---|
| | 3,029 (100%) | 1,321 (43·6%) | 1,708 56·4%) |
| Age (in years) | n (%) | n (%) | n (%) |
| 12 | 59 (1.9) | 19 (1.4) | 40 (2.3) |
| 13 | 477 (15.8) | 167 (12.6) | 310 (18.1) |
| 14 | 546 (18.1) | 224 (17.0) | 322 (18.9) |
| 15 | 689 (22.7) | 317 (24.0) | 372 (21.8) |
| 16 | 649 (21.4) | 295 (22.3) | 354 (20.8) |
| 17 | 609 (20.1) | 299 (22.7) | 310 (18.1) |

**Fig. 1** Flow diagram of analytic sample selection process and criteria

## Exposure Variables

Drawing on previous publications based on the WHO-GSHS data (Asante & Kugbey, 2019; Darteh, 2021; Onyeaka & Asante, 2021; Peltzer & Pengpid, 2018), the following variables were considered as potential correlates of the outcome variables: *mental health* (i.e. loneliness, anxiety, suicide ideation, and suicide attempt); *lifestyle factors* (i.e. cannabis use, cigarette smoking, and leisure-time sedentary behaviour); *family-level factors* (i.e. parental monitoring, parental understanding, parental supervision, parental intrusion of privacy, and parental tobacco use); *school-level factors* (i.e. truancy, bullying victimisation, and peer support at school); and *interpersonal-level factors* (i.e. number of close friends, and physical fight). The questions used in assessing each variable, the original responses, and how these responses were recoded for statistical analysis are presented in Supplementary e-Table 1.

### Outcome Variables

This study's outcome variables were past-month current alcohol use and lifetime drunkenness. Each of these two outcome variables was assessed with a single-item self-report measure on the questionnaire. Specifically, past-month alcohol use was assessed with the item, "During the past 30 days, on how many days did you have at least one drink containing alcohol?" The responses for this question were 0 days, 1–2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, and all 30 days. This item was recoded as 0 days = 0 and 1 or more days = 1. Additionally, lifetime drunkenness was assessed with the item, "During your life, how many times did you drink so much alcohol that you were really drunk?" The responses for this question were 0 times, 1–2 times, 3–9 times, and 10 or more times. This item was recoded as 0 times = 0 and 1 or more times = 1.

### Statistical Analyses

Statistical analyses were performed using SPSS (version 24 for Windows). All variables were recoded on a dichotomous scale in this study as used in other existing WHO-GSHS studies (Asante & Kugbey, 2019; Onyeaka & Asante, 2021; Onyeaka et al., 2020; Quarshie et al., 2020). Descriptive statistics (percentages and frequencies) was used to determine the prevalence estimates of the past-month alcohol use and lifetime drunkenness. The primary analyses were performed in two steps: (1) bivariate analyses using the chi-square test ($\chi^2$) were used to determine the relationship between each prespecified exposure variable and each of the outcome variables; and (2) multivariate models, one each for the outcome variables involving logistic regression, were used to determine the demographic factors and exposure variables associated with the outcome variables (past-month alcohol use and lifetime drunkenness). To avoid overfitting of the models, the demographic and exposure variables were entered into the logistic regression models regardless of their significant bivariate associations with the outcome variables (Babyak, 2004). The two demographic variables were included as covariates in all two multivariate models. The results from the logistic regression analyses are presented as odds ratio (OR) and 95% confidence interval (CI). Missing responses were excluded from the analysis; e-Table 1 (in Supplementary Material) shows the proportion of missing data related to each variable. Statistical significance was defined as a two-tailed $p$-value $< 0.05$ in all analyses.

## Results

### Prevalence of Past-Month Alcohol Use and Lifetime Drunkenness

Overall, 29.8% (95% CI = 28.2–31.4%) of the total analytic sample reported past-month alcohol, representing 34.1% (95% CI = 31.7–36.6%) among males and 26.4% (95% CI = 24.2–28.5%) among females. This prevalence estimate was significantly higher among males than females $\chi^2 = 21.3$, $p < 0.001$. The prevalence of lifetime drunkenness was 26.0% (95% CI = 24.5–27.5%), representing 33.3% (95% CI = 30.9–35.9%) among males and 20.3% (95% CI = 18.4–22.3%). It was observed that this prevalence estimate was significantly higher among males than females, $\chi^2 = 65.4$, $p < 0.001$ (see e-Table 2 in Supplementary Material).

It was also observed in the bivariate analysis that several of the factors were associated with both past-month alcohol use and lifetime drunkenness (see e-Table 2 in Supplementary Material). These factors that had statistically significant associations with past-month alcohol use and lifetime drunkenness were largely mental health factors (i.e. anxiety and loneliness), lifestyle factors (i.e. cannabis, cigarette smoking, and leisure-time sedentary behaviour), and school-context factors including truancy, bullying victimisation, and social support at school. Some interpersonal factors (physical fight) and family-related factors such as parental supervision and parental tobacco use were all associated with both past-month alcohol use and lifetime drunkenness.

### Factors Associated with Past-Month Alcohol Use and Lifetime Drunkenness

The factors that were associated with past-month alcohol use and lifetime drunkenness are presented in Table 1. Overall, we found that eight factors were associated with increased odds of past-month alcohol use among the participants. These included *demographic factors* such as age (AOR = 1.38, 95% CI = 1.28, 1.48; $p < 0.001$), male gender (AOR = 1.24, 95% CI = 1.01, 1.50; $p = 0.039$), and a single *mental health variable*: anxiety (AOR = 1.54, 95% CI = 1.24, 1.92; $p < 0.001$). All the lifestyle factors, cannabis use (AOR = 4.16, 95% CI = 2.20, 7.89; $p < 0.001$), cigarette smoking (AOR = 4.74, 95% CI = 3.75, 8.14; $p < 0.001$), and leisure-time sedentary behaviour (AOR = 1.23, 95% CI = 1.01, 1.51; $p = 0.046$), were associated with increased odds of past-month alcohol use. Social support at school (AOR = 1.64, 95% CI = 1.25, 2.15; $p < 0.001$), truancy (AOR = 1.46, 95% CI = 1.16, 1.85; $p = 0.002$), engagement in physical fight (AOR = 1.36, 95% CI = 1.09, 1.69; $p = 0.007$), and parental monitoring (AOR = 1.35, 95% CI = 1.04, 1.51; $p = 0.023$) were also associated with increased odds of past-month alcohol use. However, parental supervision (AOR = 0.64, 95% CI = 0.50, 0.81; $p = 0.023$) was associated with reduced odds of past-month alcohol use.

As shown in Table 1, ten factors were associated with increased odds of lifetime drunkenness. These factors included cigarette smoking (AOR = 5.76, 95% CI = 3.90,

**Table 1** Multivariate logistic regression predicting risk and protective factors for alcohol use

| Study variables | Past-month alcohol use | | | Lifetime drunkenness | | |
|---|---|---|---|---|---|---|
| | *β* | AOR [95% CI] | *p*-value | *β* | AOR [95% CI] | *p*-value |
| *Demographics* | | | | | | |
| Gender | | | | | | |
| Female | | 1 | | | 1 | |
| Male | **0.22** | **1.24 [1.01, 1.50]** | **0.039** | **0.66** | **1.93 [1.55, 2.40]** | **< 0.001** |
| Age | **0.32** | **1.38 [1.28, 1.48]** | **< 0.001** | **0.32** | **1.38 [1.27, 1.49]** | **< 0.001** |
| *Mental health factors* | | | | | | |
| Anxiety | **0.43** | **1.54 [1.24, 1.92]** | **< 0.001** | **0.48** | **1.62 [1.28, 2.06]** | **< 0.001** |
| Loneliness | 0.55 | 1.06 [0.84, 1.32] | 0.632 | **0.35** | **1.42 [1.11, 1.81]** | **0.005** |
| Suicidal ideation | 0.09 | 1.09 [0.83, 1.44] | 0.523 | 0.08 | 0.85 [0.63, 1.14] | 0.273 |
| Suicidal attempt | − 0.17 | 0.85 [0.65, 1.11] | 0.224 | − 0.17 | 0.83 [0.62, 1.11] | 0.214 |
| Lifestyle factors | | | | | | |
| Cannabis use | **1.43** | **4.16 [2.20, 7.89]** | **< 0.001** | **1.37** | **3.94 [2.08, 7.49]** | **< 0.001** |
| Cigarette smoking | **5.52** | **4.74 [3.75, 8.14]** | **< 0.001** | **1.75** | **5.76 [3.90, 8.05]** | **< 0.001** |
| Leisure-time sedentary behaviour | **0.21** | **1.23 [1.01, 1.51]** | **0.046** | **0.48** | **1.62 [1.30, 2.00]** | **< 0.001** |
| School-level factors | | | | | | |
| Truancy | **0.38** | **1.46 [1.16, 1.85]** | **0.002** | **0.55** | **1.74 [1.36, 2.23]** | **< 0.001** |
| Bullying victimisation | 0.05 | 1.05 [0.85, 1.30] | 0.650 | − 0.30 | 0.97 [0.78, 1.21] | 0.792 |
| Social support at school | **0.50** | **1.64 [1.25, 2.15]** | **< 0.001** | 0.19 | 1.21 [0.91, 1.60] | 0.194 |
| Interpersonal-level factors | | | | | | |
| Number of close friends | 0.13 | 1.14 [0.84, 1.55] | 0.407 | 0.24 | 1.27 [0.91, 1.78] | 0.153 |
| Physical fight | **0.31** | **1.36 [1.09, 1.69]** | **0.007** | 0.16 | 1.17 [0.92, 1.48] | 0.200 |
| Family-level factors | | | | | | |
| Parental supervision | **− 0.45** | **0.64 [0.50, 0.81]** | **< 0.001** | **− 0.62** | **0.54 [0.42, 0.69]** | **< 0.001** |
| Parental understanding | − 0.01 | 0.99 [0.76, 1.28] | 0.940 | 0.02 | 1.02 [0.77, 1.34] | 0.890 |
| Parental monitoring | **0.30** | **1.35 [1.04, 1.78]** | **0.023** | 0.08 | 1.09 [0.83, 1.43] | 0.547 |
| Parental intrusion of privacy | − 0.01 | 0.98 [0.80, 1.21] | 0.910 | **0.22** | **1.26 [1.01, 1.55]** | **0.050** |
| Parental tobacco use | 0.14 | 1.16 [0.88, 1.51] | 0.297 | **0.46** | **1.59 [1.20, 2.10]** | **0.001** |
| Cox & Snell $R^2$ | | 0.159 | | | 0.194 | |
| Nagelkerke $R^2$ | | 0.227 | | | 0.285 | |
| Hosmer–Lemeshow GOF test (sig.) | | 7.88 (0.445) | | | 7.09 (0.527) | |
| Overall percentage correctly classified | | 75.8% | | | 80.0% | |

Note. *AOR*, adjusted odds ratio; *CI*, confidence interval; statistically significant results are in boldface

8.05; $p < 0.001$), cannabis use (AOR = 3.94, 95% CI = 2.07, 7.49; $p < 0.001$), anxiety (AOR = 1.62, 95% CI = 1.28, 2.06; $p < 0.001$), leisure-time sedentary behaviour (AOR = 1.62, 95% CI = 1.30, 2.00; $p < 0.001$), and loneliness (AOR = 1.42, 95% CI = 1.11, 1.81; $p = 0.005$). Other factors such as male gender (AOR = 1.93, 95% CI = 1.55, 2.40; $p < 0.001$), truancy (AOR = 1.74, 95% CI = 1.36, 2.23; $p < 0.001$), parental tobacco (AOR = 1.59, 95% CI = 1.20, 2.10; $p = 0.001$), age (AOR = 1.38,

95% CI = 1.27, 1.49; $p < 0.001$), and parental intrusion of privacy (AOR = 1.26, 95% CI = 1.01, 1.55; $p = 0.050$) were also associated with increased odds of lifetime drunkenness. However, parental supervision (AOR = 0.54, 95% CI = 0.42, 0.69; $p < 0.001$) was associated with reduced odds of lifetime drunkenness.

## Discussion

In this study, we analysed the 2013 Namibia WHO-GSHS to investigate the prevalence and correlates of alcohol use and lifetime drunkenness among a nationally representative sample of school-going adolescents. We found that 3 out of 10 of the participants reported to have used alcohol in the past month and about 2.1 out of 8 reported lifetime drunkenness. These prevalent estimates of both past-month alcohol use and lifetime drunkenness were higher among males than females. Multivariate statistical modeling of the data showed that demographic characteristics (age and male gender), mental health variables (anxiety and loneliness), and lifestyle factors (cannabis use, cigarette smoking, and leisure-time sedentary behaviour) were associated with increased odds of past-month alcohol use and lifetime drunkenness. Among the family-level factors, only parental supervision showed a strong association with reduced odds of both past-month alcohol use and lifetime drunkenness.

### Prevalence of Alcohol Use Behaviours

The prevalence estimates of alcohol use behaviour as found in the current study are lower than the previous prevalence estimate of 43% (47.6%, males; 40.0%, females) among students in 2008 (Chinsembu et al., 2008) and the 32.4% reported in 2011 (34.6%, males; 30.2%, females) (Page et al., 2011) among school-going adolescents in Namibia. However, the reported estimates in the current study are within the expected range of a recent systematic review and meta-analysis of pooled evidence on adolescent alcohol use in sub-Saharan Africa that found a prevalence estimates of alcohol use to be 32.8% (95% CI 26.0–39.5%) (Olawole-Isaac et al., 2018). The estimates of current alcohol use and lifetime drunkenness in the present study confirm the recent observation that there are elevated prevalent estimates of alcohol (mis)use in LAMICs (WHO, 2018). However, the prevalence estimates of alcohol use in the current study are lower compared to a recent community-based sample of young adults that reported an alcohol use prevalence of 53% (95% CI 51.5–54.6%) (He et al., 2019). While the differences in the prevalence estimates of alcohol use behaviour between school-based and community-based studies could be due to the measures used in assessing alcohol use and plausible sample differences, it could also be possible that the school environment is protective of health risk behaviours among adolescents in schools. It is also possible that school-going adolescents could be benefiting from functional health literacy related to alcohol use and abuse (Fleary et al., 2018). Indeed, the literature is replete with studies that have shown how a sense of school-belongingness is protective of health risk behaviours including alcohol use (Govender et al., 2013; Kalu et al., 2020).

Furthermore, the prevalence estimates of both alcohol use and lifetime drunkenness in the current study are similar to other prevalence estimates found among school-going adolescents from other Southern African countries, including Botswana (Riva et al., 2018), Mozambique (Darteh, 2021), South Africa (Morojele & Ramsoomar, 2016; Reddy et al., 2013), and Zimbabwe (Siziya et al., 2009). The similarity of these prevalence estimates points to the possibility that the triggering factors for alcohol use among school-going adolescents may be similar rather than varied. Additionally, these high prevalence estimates of alcohol use in Namibia and other neighbouring Southern African countries confirm previous studies that have reported similar high prevalence estimates of alcohol use among adolescents and young adults within the African Region (Morojele et al., 2021; WHO, 2018).

### Factors Associated with Alcohol Use Behaviours

At the personal level, sociodemographic characteristics such as age and male gender were associated with increased odds of past-month alcohol use and lifetime drunkenness. This finding is not surprising as other studies conducted within Southern African countries including Botswana, Mozambique, South Africa, Zambia, and Zimbabwe have also revealed similar results (e.g. Darteh, 2021; Morojele & Ramsoomar, 2016; Reddy et al., 2013; Riva et al., 2018; Siziya et al., 2009). This finding related to gender and age could be due to two plausible explanations. First, boys generally are more likely (than girls) to engage in risky health behaviours including alcohol consumption due to peer pressure from older boys within the school environment. This is further exacerbated by the fact that alcoholic drinks are easily accessible at cheaper prices in Namibia (Southern African Alcohol Policy Alliance, SAAPA, 2021). The fact that adolescent boys generally engage in alcohol use than girls is attributable to the unique socio-behavioural characteristics associated with gendered social norms. Secondly, older school-going adolescents are more likely than younger ones to engage in externalising behaviours such as alcohol use. This could be supported by the fact that the developmental changes that are associated with the transition from childhood to adulthood predispose young people to increased vulnerability to adverse health risk behaviours.

At the personal level, mental health variables (anxiety and loneliness) and lifestyle factors (cannabis use, cigarette smoking, and leisure-time sedentary behaviour) were associated with increased odds of past-month alcohol use and lifetime drunkenness. Previous studies (e.g. Asante & Kugbey, 2019; Quarshie et al., 2020; Savage et al., 2016) have reported an association between mental health variables (anxiety and loneliness) and alcohol use among school-going adolescents. Studies have demonstrated that individuals who are lonely are more vulnerable to alcohol-related problems (e.g. McKay et al., 2017). It is plausible that adolescents in school may cope with or respond to the agonising feelings of loneliness by engaging in other health-compromising behaviours such as alcohol use. It is globally acknowledged that the developmental changes in adolescence are accompanied by psychological challenges that may increase the vulnerability of young people to poor health behaviours and outcomes such as alcohol use (WHO,

2020a). The significant relationship between cannabis use, cigarette smoking, and leisure-time sedentary behaviour (lifestyle factors) and alcohol use is not surprising as these findings have been reported by nearly all the GSHS across the African region (Atorkey & Asante, 2022; Asante & Kugbey, 2019; Darteh, 2021; Onyeaka & Asante, 2021; Peltzer & Pengpid, 2018; Pengpid & Peltzer, 2019, 2020). This evidence confirms the possible existence of clustering of concurrent health-compromising behaviours among our sample. The WHO (2020a) reports that alcohol use among the general population interferes with human behaviour, thus making individuals susceptible to other health risky behaviours. Our results also affirm the observation that young adults within sub-Saharan Africa continue to face multiple challenges that predispose them to several health risk behaviours (Clark et al., 2020; Patel et al., 2018). The development of contextually relevant school-based interventions that focus on the concurrent health-compromising behaviours including alcohol use will help improve the health and wellbeing of the adolescents.

We further found that school-related factors such as truancy were associated with increased odds of both past-month alcohol use and lifetime drunkenness, while social support at school is associated with increased odds of only past-month alcohol use. The relationship between truancy and alcohol use among school-going students has been reported by previous studies (e.g. Graves et al., 2020; Onyeaka & Asante, 2021; Onyeaka et al., 2020), where students who have reported high levels of truancy were more likely to report a higher frequency of alcohol abuse and drunkenness. The association between alcohol use and truancy among school-going adolescents is known to be mediated by behavioural and emotional factors and thus may have a forthright explanation. In Namibia, where high levels of absenteeism are reported among school-going adolescents (Namibia Ministry of Education, Arts & Culture, 2019), there is the possibility that school-going adolescents who absent themselves from school may form other groups where the use of alcohol may be found to be acceptable. This finding calls for the strengthening of the existing school attendance policy and increases a sense of school membership among school-going adolescents. This is particularly important as the school is known as a key social institution that controls problematic behaviour among children and young people.

The positive association between social support at school (defined as how helpful and kind most of the students in your school were) and past-month alcohol use contradicts previous studies that have shown that social support at school is associated with reduced past-month alcohol use (Darteh, 2021; Onyeaka & Asante, 2021). Plausibly, having a larger pool of helpful friends could be negative and may be associated with increased pressure to engage in health risk behaviours such as alcohol use—which may be considered recreational and socially sanctioned by peer groups. This finding underscores the need to emphasise the importance of pro-health supportive relationships among peers and to develop strategies to promote positive peer support. Our findings also showed physical fighting to be associated with increased odds of past-month alcohol use. This supports recent evidence from Liberia, Ghana, and Mozambique (Peltzer & Pengpid, 2018; Onyeaka & Asante, 2021; Asante & Kugbey, 2019).

Across the included family-level factors, only parental supervision was found to have a strong association with reduced odds of both past-month alcohol use and lifetime drunkenness. However, parental monitoring was associated with increased odds of past-month alcohol use, and parental intrusion of privacy and parental tobacco use were both associated with increased odds of lifetime drunkenness. The negative relationship between parental supervision and adverse health behaviour including alcohol has been documented in previous studies in Africa (Arat & Wong, 2016). This finding is not surprising as adolescents who have developed a strong sense of attachment with their parents and primary caregivers are less likely to engage in negative social behaviours (Sabatine et al., 2017). Plausibly, parents who engaged meaningfully with their adolescent child have better knowledge about where and with whom their adolescent child associates, and (co-)create rules that limit the engagement in adverse health behaviours including alcohol and substance use. The positive relationship between parental monitoring and past-month alcohol use and each of parental intrusion of privacy and parental tobacco use being associated with increased odds of lifetime drunkenness are inconsistent with previous evidence that shows a negative relationship between alcohol use, lifetime drunkenness, and these family-level variables (e.g. Arat & Wong, 2016; Baiden et al., 2019). The relationship between these family or parental indices and past-month alcohol use and life drunkenness is complicated, and may be moderated by other family and school-related factors. However, it is plausible that some interpersonal-level risk factors within the school environment (e.g. peer influence; delinquent behaviours) may have played a role in this association, as indicated by previous systematic reviews (Jokinen et al., 2021; Sileo et al., 2021). Notwithstanding these contrasting results, our findings underscore the need for the participatory involvement of parents in the academic life of these adolescents, as this has the possibility of reducing adolescent involvement with alcohol-related behaviours.

### Strengths and Limitations of the Study

The results of this study should be interpreted and adopted with caution, as there are some notable limitations. First, considering that the WHO-GSHS data were collected through a one-off cross-sectional survey, the exposure and outcome variables were measured at the same time, making it impossible to assess sequence, causation, and the temporal link between the exposure and outcome variables. Next, the survey items asking participants to report their alcohol use that might have happened in the past 30 days and the common knowledge that alcohol use among underage persons is a socially undesirable behaviour might have led to recall bias and social desirability effects in this study. Relatedly, the plausible presence of socially desirable responses could also account for the lack of (statistically significant) associations between some potentially key exposure variables and the two indicators of alcohol use. Beyond these limitations, this study is one of the first primary studies to have used a relatively large dataset (contributed by a nationally representative sample) to advance our knowledge of the prevalence and associated factors of alcohol use among school-going adolescents in Namibia.

## Conclusion

In this study, we examined the prevalence and correlates of alcohol use and lifetime drunkenness among school-going adolescents using the 2013 Namibia WHO-GSHS. Approximately, 3 out of 10 of the participants reported to have used alcohol in the past month and about 2.1 out of 8 reported lifetime drunkenness. While these prevalence estimates of alcohol use behaviour among school-going adolescents in Namibia are comparable to other estimates within Southern African countries, the multi-level nature of the predictors of alcohol use behaviour underscores the need for the development of multi-contextual and multi-sectoral intervention and prevention programmes that could target school-going adolescents who may be—at risk of—(mis)using alcohol.

**Supplementary Information** The online version contains supplementary material available at https://doi.org/10.1007/s43076-022-00236-w.

**Acknowledgements** We are grateful to the Namibia Ministry of Education and World Health Organization and its partners for making freely available the data from the Global School-based Student Health Survey. More importantly, we thank all the students who contributed data for this survey.

**Author Contribution** KOA conceived, designed and organised the study. KOA and ENBQ curated and performed the statistical analysis of the data, and KOA interpreted the analysed results.. KOA drafted the manuscript; and ENBQ critiqued the manuscript for important intellectual content. All authors read and approved the final version of the manuscript.

**Data Availability** The datasets used and/or analysed during the current study are freely available from the WHO website:https://www.who.int/teams/noncommunicable-diseases/surveillance/systems-tools/global-school-based-student-health-survey.

**Code Availability** Not applicable.

## Declarations

**Ethics Approval** The Institutional Review Board of the Country Office of the WHO in Namibia as well as the Ministry of Education in Namibia approved the study. Policies laid out regarding consent procedures for participation in surveys were followed including detachment of identifier information.

**Consent to Participate** Official written permissions were obtained from the Namibia Ministry of Education, the selected schools, and classroom teachers. Participating students provided written informed consent, while parental written consent was obtained from parents of participants aged 17 and younger. Finally, the study procedures were carried out in accordance with the Declaration of Helsinki.

**Consent for Publication** Not applicable.

**Competing Interests** The authors declare no competing interests.

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