ENSIGN GLOBAL COLLEGE

KPONG, EASTERN REGION, GHANA

FACULTY OF PUBLIC HEALTH
DEPARTMENT OF COMMUNITY HEALTH

ALCOHOL USE AMONG ADOLESCENTS IN EIGHT SUB-SAHARAN AFRICAN COUNTRIES: EVIDENCE FROM THE GLOBAL SCHOOL-BASED STUDENT HEALTH SURVEY (2012-2017)

BY

NUWORZA KUGBEY
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AUGUST 2023

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A THESIS SUBMITTED TO THE DEPARTMENT OF COMMUNITY HEALTH, FACULTY OF PUBLIC HEALTH, ENSIGN GLOBAL COLLEGE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE MASTER OF PUBLIC HEALTH DEGREE

AUGUST 2023

DECLARATION

I, Nuworza Kugbey declare that this thesis is as result of my own work carried out as a student at Ensign Global College, Kpong and supervised by Dr. Stephen Manortey. All relevant sources cited in this study have been duly acknowledged and that, this thesis has not been presented partially or wholly for the award of any degree in another institution.

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(Supervisor)	Signature	Date

Certified by:

Dr. Stephen Manortey	……	……..
(Head, Academic Programme)	Signature	Date

DEDICATION

This thesis is dedicated to my late parents (Emmanuel & Vincentia) and my late grandmother (Maria).

ACKNOWLEDGEMENT

I acknowledge the creator of heaven and earth for his mercies and blessings throughout this MPH journey.

Special thanks to my Thesis supervisor, Dr. Stephen Manortey for his guidance and support throughout this journey. I really appreciate all the constructive criticisms and insightful comments.

My sincere gratitude also goes to the Ensign faculty and staff who made my stay in Ensign memorable.

To my family and friends, I say a very big thank you for always being available in the most difficult times of the journey. God bless you.

DEFINITION OF TERMS

Anxiety:	During the past 12 months, how often have you been so worried about something that you could not sleep at night?
Bullied:	During the past 30 days, how many days were you bullied?
Close friends:	How many close friends do you have?
Current alcohol use:	During the past 30 days, on how many days did you have at least one drink containing alcohol?
Current smoking of cigarette:	During the past 30 days, how many days did you smoke cigarette?
Hunger:	During the past 30 days, how often did you go hungry because there was not enough food in your home?
Lifetime alcohol trouble:	During your life, how many times have you got into trouble with your family or friends, missed school, or got into fights, as a result of drinking alcohol?
Lifetime drunkenness:	During your life, how many times did you drink so much alcohol that you were really drunk?
Loneliness:	During the past 12 months, how often have you felt lonely?

Marijuana use:	During the past 30 days, how many times have you used marijuana (also called weed, jah, indian hemp, ahabammmono and ganja)?
Parental bonding:	During the past 30 days, how often did your parents or guardians really know what you were doing you're your free time?
Parental intrusion of privacy:	During the past 30 days, how often did your parents or guardians go through your things without your approval?
Parental monitoring:	During the past 30 days, how often did your parents or guardians check to see if your homework was done?
Parental understanding:	During the past 30 days, how often did your parents or guardians understand your problems and worries?
Peer support:	During the past 30 days, how often were most of the students in your class kind and helpful?
Physical fight:	During the past 12 months, how many times were you in a physical fight?
Physically attacked:	During the past 12 months, how many times were you physically attack?
Suicidal Attempt:	During the past 12 months, how many times, did you actually attempt suicide?

Suicidal Ideation:	During the past 12 months, did you ever seriously consider attempting suicide?
Suicidal plan:	During the past 12 months, did you make a plan about how you would attempt suicide?
Truancy:	During the past 30 days, how many days did you miss classes or school without permission?

ABBREVIATION/ACRONYMS

AOR-	Adjusted Odd Ratio
CDC-	Centers for Disease Control and Prevention
COVID-19	Coronavirus disease
CI-	Confidence Interval
GSHS-	Global School-based student Health Survey
IRB-	Institutional Review Board
LMCs-	Low-and middle-income countries
OR-	Odd Ratio
SSA-	sub-Saharan Africa
SAMHSA	The Substance Abuse and Mental Health Services Administration
UN-	United Nations
US-	United States
WHO-	World Health Organization

ABSTRACT

Introduction: Alcohol use is a major and a global public health issue due to associated negative physical, mental and social health outcomes among adolescents. Alcohol use is a major risk factor for adolescents' increased morbidity and mortality. However, there is dearth of literature on the burden of alcohol use in adolescents in sub-Saharan Africa (SSA) to inform evidence-based cost-effective public health interventions targeted at identified vulnerability and resilience factors.

Aims: This study examined the current alcohol use, drunkenness and alcohol problems among 16,331 adolescents from eight selected SSA countries. The study further assessed the vulnerability and resilience factors of alcohol use behaviours among the adolescents.

Methods: A secondary analysis of the Global School-based student Health Survey (GSHS) datasets from 8 cross-sectional surveys was conducted. The Stata statistical software package (Version 17) was used for the data analysis. Descriptive statistics, Pearson's Chi-square and multivariate logistic regression analyses were conducted with statistical significance set at p-value <0.05.

Results: Findings showed that overall prevalence of current alcohol use, drunkenness and alcohol problems were 12.56% (95%CI = 12.05%-13.08%), 8.32% (95%CI = 7.90% - 8.76%) and 4.74% (95%CI = 4.42% - 5.08%) respectively in the selected countries in SSA. For current alcohol use, adolescents in Seychelles reported the highest prevalence of 47.21% (95%CI = 44.86% - 49.61%) and adolescents in Tanzania reported the lowest prevalence of 2.89% (95%CI = 2.28% - 3.58%). For lifetime drunkenness, adolescents in Seychelles reported the highest prevalence of 42.17% (95%CI = 39.82% - 44.52%) and adolescents in Tanzania reported the lowest prevalence of 1.41% (95%CI = 1.00% - 1.92%). For lifetime alcohol problem, adolescents in Namibia reported the highest prevalence of 13.76% (95%CI = 12.56% - 15.05%) and adolescents in Tanzania reported the lowest prevalence of 1.89% (95%CI =

1.41% - 2.47%). Being male, older age, truancy, bullying, fighting, having no close friends, smoking cigarette, smoking marijuana and anxiety are significant risk factors for current alcohol use among adolescents who are in school in SSA. Parental supervision and parental bonding are significant protective factors for current alcohol use among adolescents who are in school in SSA. For lifetime drunkenness, being male, older age, truancy, bullying, fighting, hunger, smoking cigarette, smoking marijuana, anxiety, loneliness, and suicidal plan are the significant risk factors whereas parental supervision and parental bonding are significant protective factors. For lifetime alcohol trouble, older age, truancy, bullying, fighting, physical attack, smoking cigarette, smoking marijuana, anxiety and suicidal attempt are significant risk factors.

Conclusion: There is a relatively high alcohol use behaviours among adolescents who are in school in the eight selected countries SSA with country-level variations. Multilevel vulnerability and resilience factors consistent with the socio-ecological model were identified and should be incorporated in school-based public health interventions to reduce the risk and burden of alcohol use among adolescents in SSA.

Key words: Adolescent, Alcohol, Drunkenness, Behaviour, sub-Saharan Africa

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Adolescence as a transitional period is characterised by several psychosocial and physical challenges. During this period, adolescents experiment with several risky behaviours including sexual debut and substance use. These experimentations put adolescents at risk for developing several health and psychosocial challenges which negatively affect their growth and smooth transition to adulthood (Aiken *et al.,* 2018; Enstad *et al.,* 2019; Maimaris and McCambridge, 2014). One of the well documented risky behaviours among adolescents worldwide is substance use, especially among school-going ones who are faced with several personal, school-environmental and psychosocial stressors (Oppong Asante and Kugbey, 2019). One of the most experimented substances among adolescents is alcohol. Alcohol use across all ages (especially during adolescence) is a major problem as its negative consequences are enormous. For example, adolescents who are exposed to alcohol at an early age suffer from several problems including social, academic, economic, physical and psychological issues (Degenhardt *et al.,* 2016; Livingston *et al.,* 2023).

Evidence from the previous studies found alcohol use leading to disease and death among youth between 10 and 24 years by placing 4 out of the 10 identified leading causes of adolescents' disability (Gore *et al.,* 2011; Ward *et al.,* 2021). However, it was observed in the studies that significant differences exist between male and female adolescents in their rate of alcohol use as alcohol ranked highest among males than females (Gore *et al.,* 2011; Ward *et al.,* 2021).

Globally, the epidemiology of adolescents' alcohol use is pervasive. For instance, a study in the US in 2019 showed that over 7 million youth between 12 and 20 years reported alcohol use beyond "just a few sips" over a one-month period (McCance-Katz, 2019). Past research findings have shown differing patterns and frequency of adolescents' use of alcohol. In a systematic review of rates of alcohol use among adolescents in India, (Nadkarni *et al.,* 2022a) found that lifetime alcohol use ranges between 3.9% and 69.8% and past year alcohol consumption ranged between 10.6% and 32.9% with significant gender and age variations. A study conducted in Thailand showed 60.5% and 53.0% rates for lifetime and past-year alcohol use among adolescents (Pramaunururut et al., 2022). Similar findings were reported among school-going Italian adolescents (Addolorato *et al.,* 2018).

On the continent of Africa, several cross-sectional studies showed differences in alcohol consumption in adolescents. For a sample, findings from some previous studies conducted in different countries in Africa reported the range of alcohol use from 10% to 44% (Oppong Asante and Kugbey, 2019; Oppong Asante and Quarshie, 2022; Darteh, 2022; Pengpid and Peltzer, 2020). Interestingly, a study conducted in Morocco reported close to 10% prevalence of alcohol use among adolescents (Ben El Jilali *et al.,* 2020). It is interesting to note that an Islamic country with strict alcohol regulations still records a substantial alcohol consumption use among adolescents.

In addressing adolescents' alcohol use and its associated problems, there is the need to unravel the factors that influence their alcohol consumption to inform appropriate and relevant programmes. Factors ranging from individual characteristics (Adade *et al.,* 2022; Leonard *et al.,* 2015), psychosocial problems (Oppong Asante and Kugbey, 2019), school-level issues (Adade *et al.,* 2022; Peltzer and Pengpid, 2018b) and parental involvement (Adade *et al.,* 2022; Kpozehouen *et al.,* 2015; Peltzer and Pengpid, 2018b) are implicated in alcohol consumption

among adolescents. The findings from these studies provide the basis for assessing their roles in adolescents' alcohol use and its associated consequences.

1.2 Problem statement

Alcohol consumption among adolescents is associated with severe negative consequences. According to the Centers for Disease Control and Prevention (CDC) Report on Alcohol and Public Health (2023), "underage alcohol consumption may lead to school problems (such as higher rates of absences or lower grades), social problems (such as fighting or lack of participation in youth activities), legal problems (such as arrest for driving or physically hurting someone while drunk), physical problems (such as hangovers or illnesses), unwanted, unplanned, and unprotected sexual activity, physical and sexual violence, increased risk of suicide and homicide, alcohol-related motor vehicle crashes and other unintentional injuries, such as burns, falls, or drowning among others".

These consequences of adolescents' alcohol use, if left unattended especially on the continent of Africa where there are ineffective implementation and enforcement of alcohol regulations and laws, the continent is likely to suffer the health, social and economic implications. These issues can only be addressed if we understand the country-specific and overall burden of alcohol use and alcohol problems among adolescents to inform public health decision making. The plight of African is worsened by the liberal attitude towards alcohol as it is seen as a recreational drug with alcohol being an integral part of our cultural heritage. However, if effective public health measures are not put in place, the continent of Africa is likely to pay bitterly for the aftermath of adolescent alcohol use.

1.3 Rationale for the study

The rationale for the present study is situated in three areas including scientific, education and applied relevance. Scientifically, literature regarding adolescents' use of alcohol in SSA is limited, especially, looking at the burden of this serious public health issue in Africa. The latest study which attempted to present evidence on adolescents' substance use in selected SSA countries relied on data from the Global School-based student health survey from the year 2009 to 2013 (Peltzer and Pengpid, 2018a).

This current study provides an update on the magnitude and burden of alcohol consumption and related behaviours among adolescents who are in school in eight selected SSA countries using the "Global School-based Student Health Survey" data obtained from nationally representative samples between 2012 and 2017. The findings may serve as a source of relevant literature for future studies. For the educational relevance of this study, findings from this study are likely to shape the contents of teaching of non-communicable diseases with emphasis on the burden of alcohol use among the youth. The findings highlight the key determinants of alcohol to shape academic discourse on non-communicable diseases. For the applied relevance of this study, the findings may inform comprehensive public health interventions aimed at addressing the significant determinants of adolescents'' alcohol use.

Finally, but not the least, the findings may inform public health policy reforms to address the use of alcohol among the youth in SSA to minimise the negative physical, social and economic consequences.

1.4 Conceptual framework

This study will adopt the socio-ecological model (Bronfenbrenner, 1999) as a guiding theory. Based on this theory, human behaviour is influenced by several factors including personal characteristics, relationships, community and society-level factors. Therefore, to understand a particular behaviour holistically, there is a need to examine factors from all these levels of influence. This study therefore, analysed the potential determinants of adolescents' alcohol consumption across demographic characteristics, psychosocial factors, mental health factors and parenting factors as depicted in figure 1 below.

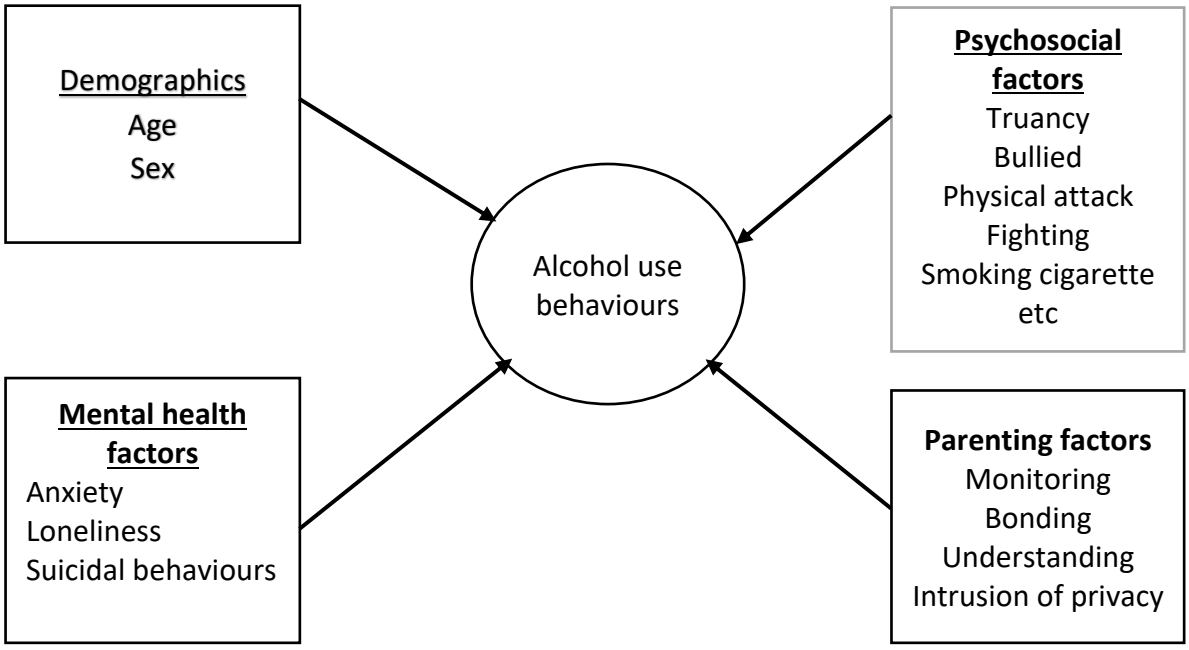

Figure 1.1: *A conceptual model of determinants of alcohol consumption among adolescents who are in school in SSA*

Source: Adapted from Bronfenbrenner (1999).

1.5 Research questions

1. What is the overall prevalence of current alcohol use, lifetime drunkenness and alcohol What is the country-specific prevalence rates of current alcohol use, lifetime drunkenness and alcohol problems among in-school adolescents in SSA?
2. What are the associated vulnerability and resilience factors of current alcohol use, lifetime drunkenness and alcohol problems among in-school adolescents in SSA?

1.6 General Objective

The overall aim of this research is to highlight the burden of alcohol use among adolescents in eight selected countries in sub-Saharan Africa.

1.7 Specific Objectives

This study seeks to examine;

1. The overall prevalence of current alcohol use, lifetime drunkenness and alcohol problems among in-school adolescents in SSA
2. The country-specific prevalence of current alcohol use, lifetime drunkenness and alcohol problems among in-school adolescents in SSA
3. The associated vulnerability and resilience factors of current alcohol use, lifetime drunkenness and alcohol problems among in-school adolescents in SSA

1.8 Profile of study area

According to the United Nations (2010) "sub-Saharan Africa is geographically, the area and regions of the continent of Africa that lie south of the Sahara. These include Central Africa, East Africa, Southern Africa, and West Africa". "Geopolitically, in addition to the African countries and territories that are situated fully in that specified region, the term may also include polities that only have part of their territory located in that region, per the definition of the United Nations" (UN, 2010). Data to be used are mainly from countries in the south of the Sahara. Figure 2 shows the map of sub-Saharan Africa.

Map 1.1: ***African map showing sub-Saharan African countries (green)***

1.9 Scope of Study

This study covers only eight selected sub-Saharan African countries with complete data on alcohol use behaviours, and their determinants. Countries were only included from 2012 to present depending on the availability of data from the GSHS.

1.10 Organizational structure of the thesis

This thesis is in six parts. Chapter One which is the introductory chapter presents an overview of the study by providing a brief background to alcohol use behaviours and its consequences, and their associated factors identified by previous studies from a global perspective to the African context. This is followed by the problem statement which highlighted the burden of adolescents' alcohol consumption in SSA.

The second chapter involves the review of literature and it presents an introduction to the chapter, the main theory/model underpinning the study and a review of empirical literature on adolescents' alcohol use behaviour taking into cognizance the multi-level factors influencing adolescents' alcohol use behaviours across the world.

The Chapter Three is the methodology that was used in the present study. This consists of research methods and design as well as the necessary procedures that are required to carry out a successful research project.

The Chapter Four is the findings and this consists of a summary of the socio-demographic characteristics, prevalence of adolescents' alcohol use behaviours, bivariate associations between alcohol use behaviours and associated factors and the multivariate analysis of the determinants of adolescents'' alcohol consumption.

Chapter Five of this thesis presents the discussions of the key findings by contextualizing the findings and relating the findings to previous works on alcohol use behaviours among adolescents who are in school. The implications of the findings are also discussed in this chapter.

Finally, Chapter Six presents the conclusion from the study and recommendations for public health practice, policy and research regarding adolescents' alcohol consumption in SSA.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter provides an overview of both theoretical and empirical literature on risky behaviours among adolescents, especially alcohol use. The chapter begins with a review of the socio-ecological systems theory by Bronfenbrenner (1971) by examining the key assumptions and their applicability to adolescents' alcohol use. The theoretical review is followed by an empirical review of studies conducted among adolescents who are in school on the prevalence of alcohol use, mental health factors and alcohol use, psychosocial factors and alcohol use, parenting factors and alcohol use, as well as socio-demographics and alcohol use. The chapter concludes with highlights of some specific research lacuna to be addressed.

2.2 Theoretical framework (Bronfenbrenner's Ecological Systems Theory, 1971)

This study is underpinned by the socio-ecological model which differs from the individual behavioural models which emphasize the influence of individual characteristics that influence health-related behaviours. The socio-ecological model's main proposition is that all levels of influence are important in determining behaviours of all types (Sallis et al., 2015). That is, factors at the intrapersonal, interpersonal, organizational, community and policy levels interact to exert influence on health-related behaviours. Five key principles underpin the ecological models of behaviour. These include the fact that, "there are multiple levels of influence on health behaviours, environmental contexts are significant determinants of health behaviours, influences on behaviours interact across levels, ecological models should be behaviour-specific and multilevel interventions should be most effective in changing behaviours to improve health"(Sallis et al., 2015).

According to the socio-ecological model, intrapersonal factors include individual's biological dispositions and characteristics that predispose people to health and health-risk behaviours. For the interpersonal influences, family, peers and close relations are key in influencing an individual's behaviour. For organizational and community level factors, the social and physical environments such as the school, community and violence among others are key determinants of health behaviours. At the larger policy level, regulations and policies regarding a particular health behaviour, for example, alcohol advertisement and access are critical in influencing an individual's health behaviour. A study conducted in the Ashaiman Municipality in Ghana revealed that advertisements for alcohol is implicated in youth alcohol consumption that geographical area (Manortey and Kugbega, 2020).

It is important to note that, it takes a combination of these multi-level factors to influence a health behaviour and therefore, public health research and practice must incorporate multi-level factors in their activities. Thus, the determinants of adolescents' alcohol consumption behaviours in this study were selected from a multi-level perspective to provide a comprehensive understanding of alcohol use behaviours among adolescents who are in school in the selected sub-Saharan African countries.

However, the model is not without any limitations as it has been argued that there are several concepts or factors that are proposed to influence health behaviours which may be impossible to address. For example, it has been argued that there is a lack of specificity in the model in terms of which level exerts the greatest influence as a target for health promotion interventions. Thus, the onus lies on public health practitioners to identify the critical factors relevant to health promotion interventions (Sallis and Owen, 2015).

2.3 Review of related studies

2.3.1 Prevalence of alcohol use among adolescents

Alcohol use among adolescents predisposes them to develop substance use problems as adults and other behavioural problems. However, the burden and magnitude of alcohol use and its related problem may vary depending on several factors specific to sociocultural, economic, political and regulatory influences. Evidence in the literature on alcohol use among adolescents has shown that almost 6 million youth between the ages of 12 and 20 years reported current alcohol use in the US ([SAMHSA], 2021). A systematic review of alcohol use among adolescents in India reported a lifetime prevalence of alcohol use of 3.9% to 69.8% and current alcohol among adolescents to range between 10.6% to 32.9% (Nadkarni *et al.,* 2022b). In another study among adolescents who are in school in Thailand, it was reported that 22.2%, 24.3% and 10.8% of the adolescents were current users, being drunk in their lifetime and had alcohol trouble respectively (Pengpid and Peltzer, 2019). These prevalence rates of alcohol use behaviours across the globe suggest that alcohol use is a major public health which needs to be addressed with evidence-based public health interventions.

Studies conducted in some African countries have reported varied rates of alcohol use among adolescents. For example, analysis of the 2012 GSHS of Ghana showed the prevalence of alcohol use behaviours among Senior High School students to be 12.6%, 11.1% and 6.8% respectively for current alcohol use, drunkenness and alcohol trouble respectively (Oppong Asante and Kugbey, 2019). Similarly, prevalence rate of 42% was reported for alcohol use among 1400 adolescents who are in school in the Central region of Ghana and out of the current alcohol users, 73% reported drunkenness (Hormenu *et al.,* 2018). However, a recent study of 5024 children and adolescents between the ages of 8 and 17years in Ghana reported a relatively lower rate (6.6%) of current alcohol use but 63.4% of the alcohol users reported ever being

drunk (Kyei-Gyamfi *et al.,* 2023). These variations in alcohol use patterns among adolescents and children in Ghana can be attributed to varied periods of the data collection as well as age compositions of the study samples as age has been found to be a significant factor in influencing alcohol use among the adolescents.

Studies conducted in other African countries have revealed varied prevalence rates of alcohol use behaviours among adolescents. For example, analysis of the GHSH in Mozambique has shown that among in-school adolescents, 13.8% reported current alcohol use, 10% reported drunkenness and 3.2% reported alcohol trouble (Darteh, 2022). In a qualitative study among Nigerian students to explore drinking practices and alcohol related problems, it was observed that 24 out of the 31 participants reported heavy drinking and these heavy drinkers reported problems in their academics, finances and their health and wellbeing (Dumbili, 2020). In a related study in Nigeria, it was reported among a total of 2530 secondary school students that prevalence rates of lifetime alcohol use and current alcohol use were 21.0% and 15.6% respectively (Fagbule *et al.,* 2021). These relatively high rates of alcohol use behaviours among adolescents in African countries call for urgent attention as the associated health, education and economic consequences are enormous.

Furthermore, a study among adolescents in Morocco reported close to 10% prevalence of alcohol use (Ben El Jilali *et al.,* 2020). This means that one (1) in every 10 adolescents in Morocco is likely to have ever used or currently use alcohol. This is indicative of the fact that alcohol problem is a major issue for the youth in Africa as one would have expected a relatively lower rate among adolescents from a conservative Islamic society with strict alcohol regulations. However, since alcohol is an experimental drug which most adolescents use to display maturity and a sense of independence, the relatively higher rates are not farfetched. Despite these reported rates of alcohol use behaviours among adolescents in Africa, there are

no published studies which examined the magnitude and burden of alcohol use behaviours in SSA except for a recent study which examined substance use among adolescents who are in school in selected countries in SSA which reported prevalence rates between 2% and 11.3% (Kugbey, 2023).

2.3.2 Mental health factors and alcohol use

Mental health problems are significant determinants for adolescents' alcohol use behaviours. This is because of the distress associated with the experience of mental health problems. Thus, alcohol may be seen as an escape route or a coping strategy to deal with mental distress. Mental health issues such as anxiety, loneliness and depression are reported as predisposing factors for adolescents' alcohol consumption (Ben El Jilali *et al.,* 2020; Darteh, 2022; Hormenu *et al.,* 2018; Kabiru *et al.,* 2010; Kugbey, 2023; Kyei-Gyamfi *et al.,* 2023; Oppong Asante and Kugbey, 2019). A study among adolescents who are in school in Thailand found that psychological distress positively predicted both current alcohol use and drunkenness among the study sample (Pengpid and Peltzer, 2019).

In a study among Ghanaian adolescents who are in school, it was found that loneliness increased the odds for current alcohol use, lifetime drunkenness and alcohol problems (Oppong Asante and Kugbey, 2019). Relatedly, a multi-country study was conducted on substance use among adolescents who are in school in six selected African countries. Findings showed that mental health problems such as loneliness, sleeping problems and sadness increased the risk for substance use among the study population (Peltzer, 2009). These findings call for the need to address mental health issues among adolescents as untreated mental health issues may have severe consequences for the health and wellbeing of the adolescents.

Suicidal behaviours among adolescents have also been identified in various studies across the work to predispose adolescents to substance use problems including alcohol use behaviours. For example, a study among adolescents who are in school sampled from Eastern and Southern African found suicidal behaviours such as ideation, plan and attempt to be significant risk factors for substance use including alcohol use (Peltzer, 2009). Some individual studies from different countries have also reported the significant impact of suicidal behaviours on adolescent substance use including alcohol (Onyeaka and Oppong Asante, 2022; Oppong Asante and Kugbey, 2019; Oppong Asante and Quarshie, 2022; Peltzer and Pengpid, 2022). The impact of suicidal behaviours on alcohol use among adolescents is not surprising as most suicidal behaviours are underlined by some psychological distress or severe mental health problems.

However, some studies among adolescents showed no major influence of suicidal behaviours on alcohol use after adjusting for all other related variables that influence adolescents' alcohol use behaviours. A study among 1,793 in-school adolescents in Mozambique did not find any significant influence of suicidal behaviours on alcohol use behaviours in exception of drunkenness where suicidal attempt served as a protective factor (Darteh, 2022). These findings are similar to other findings which did not find any significant influence of suicidal behaviours on adolescents' alcohol use behaviours (Onyeaka and Oppong Asante, 2022; Peltzer and Pengpid, 2022). These inconsistent findings underscore the complexity in suicidal behaviours as it has been argued that the mechanisms of suicide antecedents and consequences are characterized by a web of complex interactions. These inconsistencies are some of the justifications for further studies to shed more light on the influence of mental health issues including suicidal behaviours on adolescents'' alcohol use behaviours.

2.3.3 Psychosocial factors and alcohol use

Psychosocial factors are key in influencing health and health-related behaviours. Identification of these psychosocial factors is crucial in designing and delivery of health promotion interventions. In the adolescent health literature, psychosocial factors such as food insecurity, bullying, fighting, physical attack, truancy, tobacco use, marijuana use, having no close friends and peer support are significant in influencing the probability of adolescents who are in school engaging in health risk behaviours including alcohol use behaviours. For example, studies have shown that being bullied predisposes adolescents to alcohol use behaviours (Onyeaka and Oppong Asante, 2022; Oppong Asante and Kugbey, 2019; Oppong Asante and Quarshie, 2022; Peltzer and Pengpid, 2022). In addition to being bullied, adolescents who are truant, experience hunger/food insecurity and fighting contribute to increased chances of adolescents engaging in alcohol use behaviours (Pengpid and Peltzer, 2020; Rodríguez-Cano *et al.,* 2023).

Poly substance use is very common among adolescents as evidence suggests that adolescents who smoke tobacco products and marijuana are more likely to engage in alcohol use behaviours compared with adolescents who do not smoke. In a study among university students across 30 countries on smoking and alcohol-related behaviours, it was observed that tobacco and marijuana smoking increased the risk of alcohol use behaviours (Peltzer and Pengpid, 2018b). However, peer support and having close friends have been found to significantly influence alcohol use behaviours among adolescents such that, adolescents with peer support are less likely to use alcohol (Patrick and Schulenberg, 2013) and this is corroborated by an earlier finding where close friends help to reduce current alcohol use (Oppong Asante and Kugbey, 2019). Understanding how these psychosocial factors influence alcohol use behaviours among adolescents who are in school is critical to inform effective public health activities pertinent to promoting adolescents' health and wellbeing.

2.3.4 Parenting factors and alcohol use

Parental involvement has been seen as a significant determinant of adolescents' behavioural outcomes. Evidence in the extant literature suggests that parental supervision, bonding and monitoring of their adolescents who are in school decrease the odds of truancy, mental health issues and substance use including alcohol behaviours (Adade *et al.,* 2022; Kpozehouen *et al.,* 2015; Peltzer and Pengpid, 2018b). For example. A study among 451 adolescents in Benin found that conflictual family structure and lack of parental involvement in the affairs of their adolescents predicted increased substance use behaviours including alcohol consumption (Kpozehouen *et al.,* 2015). A similar study in Morocco among 3020 adolescents reported family insecurity as a key determinant of substance use among adolescents (Zarrouq *et al.,* 2016). These findings underscore the need for involving parents in any public health interventions with focus on reducing substance use and other behavioural risks among adolescents.

However, other studies using the GSHS did not find any significant influence of some of the parental variables on the risky behaviours among adolescents who are in school. For example, a multi-country study on parental factors that influence current alcohol use reported that none of the parental factors was significantly associated with current alcohol use among adolescents in school after controlling for all other factors (Kugbey, 2023). Similar findings were reported by some studies which found parenting variables to be weakly associated with alcohol use and misuse (Visser *et al.,* 2012). These inconsistencies in the evidence regarding the influence of parental factors in alcohol use behaviours among adolescents require an update with current data from a multi-country perspective to determine the extent to which parental factors influence adolescents' alcohol use in SSA where alcohol has been a major public health issue of concern.

2.3.5 Socio-demographic characteristics and alcohol use

The impact of socio-demographic characteristics on adolescents' health risk behaviours has been investigated. Sex, age and religious affiliations have been found to be significantly associated with substance use including alcohol use behaviours. For example, a study among adolescents on alcohol use in Thailand showed that older age was a significant risk factor for alcohol misuse but no significant sex differences were observed for all the alcohol use behaviours (Pengpid and Peltzer, 2019). Unlike Pengpid and Peltzer, other studies have reported significant sex differences in alcohol use behaviours among adolescents who are in school with male-sex being a significant risk factor for alcohol use behaviours (Adade *et al.,* 2022; Andersen *et al.,* 2007; Leonard *et al.,* 2015; Oppong Asante and Kugbey, 2019; Oppong Asante and Quarshie, 2022). Largely, due to the high sensation-seeking nature of boys, it is expected that they are more likely to engage in risky behaviours than girls.

On the other hand, some studies have found no such influences of sex and age on substance use including alcohol use. For instance, there was no significant sex and age differences were observed for alcohol use behaviours in adolescents who are in school in the Central Region of Ghana (Hormenu *et al.,* 2018). The lack of evidence for significant sex and age differences in alcohol use behaviour could be due to variations in gender-roles across the study settings. For example, more Ghanaian youth including girls engage in substance abuse which could lessen the gender gaps. Similar findings were also reported in some country-specific studies where no significant sex or age differences were observed in adolescents' alcohol use (Oppong Asante and Kugbey, 2019; Onyeaka and Oppong Asante, 2022).

Being affiliated with the Islamic religion is a significant protective factor in adolescents' alcohol use behaviours (Jaisoorya *et al.,* 2016). This is because, the Islamic religion frowns upon alcohol use and this is likely to explain why Moslem adolescents are less likely to engage

in alcohol use behaviours. However, inconsistencies reported in studies on how socio-demographic characteristics influence adolescents' alcohol use behaviours warrant further investigation using representative and large data to draw valid conclusions on the roles of these characteristics to inform public health promotion activities.

CHAPTER THREE

3.0 METHODOLOGY

This chapter looks at the methods and procedures that were used to gather data, the variables included in the analyses and the statistical analyses that were used to analyse the data. This methodology section consists of the data source and sample, study variables, ethics and data analysis among others. The details are presented below.

3.1 Research Methods and Design (Study methods and design)

The quantitative method was adopted in this study as the study analysed large datasets from series of cross-sectional surveys conducted among adolescents who are in school in eight selected countries in sub-Sahara Africa.

3.2 Data Collection Techniques and Tools

Secondary data was used for this study. Data was obtained from the Global School-based Student Health Survey of eight (8) countries in SSA between 2012 and 2017(Ghana-2012, Liberia-2017, Benin-2016, Mauritus-2017, Mozambique-2015, Namibia-2013, Seychelles-2015 and Tanzania-2014). The Global School-based Health Survey is sponsored by the World Health Organization (WHO) and the Centre for Disease Control and Prevention (CDC) to collect data of health behaviours and their associated factors in adolescents who are in school across several low-income and middle-income countries in the world. The variables considered in the data collected include issues concerning adolescents' health and wellbeing as well as academic outcomes.

3.3 Study Population

The study population included all adolescents sampled for the Global School-based Student Health Survey of eight (8) selected countries in sub-Saharan Africa between 20122 and 2017. The total population from the combined dataset was over 27000 from which eligible adolescents were selected.

3.4 Study variables

3.4.1 Outcome variables

For this study, three alcohol-related outcomes were considered and these are "*current alcohol use*", "*lifetime drunkenness*" and "*alcohol problem*". Single-item questions were used to measure each of the three outcome variables. For example, "***current alcohol use"*** was measured with the item "During the past 30 days, on how many days did you have at least one drink containing alcohol? A 6-point Likert response format was used with responses ranging from 0 days, 1–2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days to all 30 days. The responses were recoded as no day = 0 and one or more days = 1.

Lifetime drunkenness was measured with the item "During your life, how many times did you drink so much alcohol that you were really drunk?". A 4-point Likert response format was used with responses ranging from 0 times, 1–2 times, 3–9 times to 10 or more times. The responses were recoded as 0 times = 0 and one or more times = 1.

Lifetime alcohol problem was measured with the item "During your life, how many times have you got into trouble with your family or friends, missed school, or got into fights, as a result of drinking alcohol?". A 4-point Likert response format was used with responses ranging from 0 times, 1–2 times, 3–9 times to 10 or more times. The responses were recoded as 0 times = 0 and one or more times = 1. The recoding of the variables was based on similar recoding used

in previous studies among adolescents (Oppong Asante and Kugbey, 2019; Oppong Asante and Quarshie, 2022; Darteh, 2022; Nadkarni *et al.,* 2022a; Peltzer and Pengpid, 2018b).

3.4.2 Explanatory variables

The explanatory variables in this study were divided into four; socio-demographic factors (age and sex), Psychosocial factors (truancy, bullying, physical attack, fighting, close friends, peer support, smoking cigarette, hunger, and marijuana), mental health factors (anxiety, loneliness, suicidal ideation, plan and attempt), and parenting factors (monitoring, bonding, understanding and intrusion of privacy). The choice of these explanatory variables is underpinned by the socio-ecological model (Bronfenbrenner, 1999). Details of the explanatory variables and items used to measure them are presented in Table 3.1 below;

Table 3.1: Explanatory variables used in the analysis

Variable	Survey question	Original response options	Recoded
Age	How old are you?	11-18 years (coded categorically)	
Sex	What is your sex	1 = male; 0 = female	N/A
Anxiety	During the past 12 months, how often have you been so worried about something that you could not sleep at night?	1 = never to 5 = always	1– 3 = 0 and 4 – 5 = 1
Loneliness	During the past 12 months, how often have you felt lonely?	1 = never to 5 = always	1– 3 = 0 and 4 – 5 = 1
Suicidal Ideation	During the past 12 months, did you ever seriously consider attempting suicide?	yes = 1; no = 2	yes = 1 and no = 0
Suicidal plan	During the past 12 months, did you make a plan about how you would attempt suicide?	yes = 1; no = 2	yes = 1 and no = 0
Suicidal Attempt	During the past 12 months, how many times, did you actually attempt suicide	1 = 0 times to 5 = 6 times or more	1 = 0 and 2–5 = 1
Truancy	During the past 30 days, how many days did you miss classes or school without permission?	1 = 0 days to 5 = 10 or more days	1 = 0 and 2–5 = 1
Bullied	During the past 30 days, how many days were you bullied?	1 = 0 days to 7 = All 30 days	1– 3 = 0 and 4–7 = 1
Physically attacked	During the past 12 months, how many times were you physically attack?	1 = 0 times to 8 = 12 or more times	1 = 0 and 2–8 = 1
Physical fight	During the past 12 months, how many times were you in a physical fight?	1 = 0 times to 8 = 12 or more times	1 = 0 and 2–8 = 1
Hunger	During the past 30 days, how often did you go hungry because there was not enough food in your home?	1 = neve to 5 = always	1– 3 = 0 and 4–5 = 1
Close friends	How many close friends do you have?	1 = 0 friends to 4 = 3 or more close friend	1 = 0 and 2–4 = 1
Peer support	During the past 30 days, how often were most of the students in your class kind and helpful?	1 = never to 5 = always	1– 3 = 0 and 4 – 5 = 1
Current smoking of cigarette	During the past 30 days, how many days did you smoke cigarette?	1 = 0 days to 7 = All 30 days	1 = 0 and 2–7 = 1
Marijuana use	During the past 30 days, how many times have you used marijuana (also called weed, jah, indian hemp, ahabammmono and ganja)?"	1 = 0 days to 5 = All 30 days	1 = 0 and 2–5 = 1
Parental monitoring	"During the past 30 days, how often did your parents or guardians check to see if your homework was done?"	"1 = never to 5 = always"	"1– 3 = 0 and 4 – 5 = 1"
Parental understanding	"During the past 30 days, how often did your parents or guardians understand your problems and worries?"	"1 = never to 5 = always"	"1– 3 = 0 and 4 – 5 = 1"
Parental bonding	"During the past 30 days, how often did your parents or guardians really know what you were doing you're your free time?"	"1 = never to 5 = always"	"1– 3 = 0 and 4 – 5 = 1"
Parental intrusion of privacy	"During the past 30 days, how often did your parents or guardians go through your things without your approval?"	"1 = never to 5 = always"	"1– 3 = 0 and 4 – 5 = 1"

3.5 Sampling

In terms of sampling, the multi-stage sampling technique was used and representative sample sizes were obtained from the eight selected countries in SSA. The respective country-level data were generated between 2012 through 2017. The total sample from the eight countries after screening and dropping missing cases resulted in 16,331 adolescents as shown in Table 3.2 below.

Table 3.2: Sample sizes from the eight selected countries in sub-Saharan Africa

Country	Date	Frequency	Percentage
Benin	2016	1,854	11.35%
Ghana	2012	2,383	14.59%
Liberia	2017	1,218	7.46%
Mauritius	2017	2,296	14.06%
Mozambique	2015	1,109	6.79%
Namibia	2013	3,029	18.55%
Seychelles	2015	1,734	10.62%
Tanzania	2014	2,708	16.58%
Total	**2012-2017**	**16,331**	**100%**

3.6 Pre-testing

Pretesting of the data collection tools or questionnaires was not applicable in this study as the study made use of already existing datasets from selected countries in SSA. However, prior to the primary data collection, the WHO and CDC supervised the piloting of the research instruments to ensure their reliability in measuring the study variables among adolescents. The

tools used have become standard WHO data collection tools among adolescents across the world in LMCs to assess health risk behaviours and their associated factors.

3.7 Data Handling

The Stata versions of the datasets were extracted from the WHO website (https://extranet.who.int/ncdsmicrodata/index.php/catalog/GSHS/?page=1&ps=15&repo=GSHS) and merged into one dataset. The variables of interest were recoded and all missing cases were dropped for each explanatory variable as well as the three outcome variables. Simple frequencies were run to ensure that none of the variables included in the analysis did not have missing cases.

3.8 Data Analysis

STATA statistical software was used for the data analysis. Prevalence of alcohol use was done using percentages with graphical illustrations. Chi-square test was used to determine the association between the explanatory variables and all the three categorical outcome variables. Logistic regression analyses were conducted to examine the predictive effects of the explanatory variables on the outcome variables to address the objective three. Both unadjusted odd ratios (OR) and adjusted odd ratios were presented and complex sampling weights were to all the analyses.

3.9 Ethical Considerations

Ethical clearance was sought and obtained from the IRB of Ensign Global College to undertake the study. Administrative permission was sought from the institution hosting the dataset. Since, the study made use of an already existing data without direct contacts with the adolescents, there was no need for informed consent and other ethical issues that were already addressed by the primary data collectors in each country.

3.10 Limitations of Study

The present study has some limitations which are worthy of mention to guide the interpretation and application of the findings. One of the key limitations is the focus on only adolescents who are in school to the neglect of out-of-school adolescents who are at higher risk of health risk behaviours due to their predispositions. Thus, the findings are limited and applicable to in-school adolescents which do not represent the full spectrum of adolescents.

Additionally, the use of self-report measures to gather information on sensitive issues such as alcohol use behaviours which society generally frowns upon might have resulted in socially desirable responses leading to relatively low magnitude of alcohol use behaviours in most of the selected countries. Finally, the time periods for the data collection in the selected countries could bias the findings as socio-economic and political situations might differ with time. Despite these limitations, this study is the first multi-country study to use representative samples from several countries to establish the magnitude of alcohol use behaviours and their associated vulnerability and resilience factors in SSA to inform health promotion activities and policies as well as public health research.

3.11 Assumptions

It was assumed that overall alcohol use behaviours among the adolescents who are in school in the selected sub-Saharan African countries will be relatively high and there will be variations across the countries due to the socio-economic, religions and political as well as regulatory frameworks. It was also assumed that socio-demographic characteristics, mental health factors and psychosocial factors will significantly predict alcohol use behaviours among the adolescents who are in school in the selected SSA countries. Parental involvement which includes supervisions, understanding, bonding and intrusion of privacy was assumed to be a significant protective factor for alcohol use behaviours among adolescents in the selected SSA countries.

CHAPTER FOUR

4.0 RESULTS

This chapter presents the results of the analysis. The results section includes the socio-demographic profiles of the adolescents in each country included, the prevalence of alcohol use, a bivariate association between alcohol use and associated factors and finally, a multivariate association between alcohol use and associated factors.

4.1 Socio-demographic profiles of the participants

From Table 4.1, it can be observed that were more male adolescents (55.56%) than females with a majority (84.47%) of the adolescents aged 15-18 years in Benin. In Ghana, there were more adolescents (55.39%) than females with a majority (77.47%) of the adolescents aged 15-18 years. In Liberia, there were more male adolescents (54.93%) than females with a majority (84.89%) of the adolescents aged 15-18 years. In Mauritius, there were more female adolescents (56.05%) than males with a majority (57.01%) of the adolescents aged 15-18 years. In Mozambique, there were more male adolescents (53.29%) than females with a majority (82.78%) of the adolescents aged 15-18 years. In Namibia, there were more female adolescents (53.45%) than males with a majority (73.75%) of the adolescents aged 15-18 years. In Seychelles, there were more female adolescents (57.96%) than males with a majority (62.63%) of the adolescents aged 11-14 years. In Tanzania, there were more female adolescents (52.29%) than males with a majority (52.73%) of the adolescents aged 11-14 years. In the total sample, the sex distribution was fairly equal with females representing 50.75% and the majority of the adolescents were between the ages of 15 and 18 years.

Table 4.1: Summary of Socio-demographic profiles of the participants

	Sex		Age group	
Country	***Male***	***Female***	***11-14 years***	***15-18 years***
Benin-2016	1,030	824	288	1,566
	(55.56%)	(44.44%)	(15.53%)	(84.47%)
Ghana-2012	1,320	1,063	537	1,846
	(55.39%)	(44.61%)	(22.53%)	(77.47%)
Liberia-2017	669	549	184	1,034
	(54.93%)	(45.07%)	(15.11%)	(84.89%)
Mauritius-2017	1,009	1,287	987	1,309
	(43.95%)	(56.05%)	(42.99%)	(57.01)
Mozambique-2015	591	518	191	918
	(53.29%)	(46.71%)	(17.22%)	(82.78%)
Namibia-2013	1,410	1619	795	2,234
	(46.55%)	(53.45%)	(26.25%)	(73.75%)
Seychelles-2015	729	1005	1086	648
	(42.04%)	(57.96%)	(62.63%)	(37.37%)
Tanzania-2014	1292	1416	1428	1280
	(47.71%)	(52.29%)	(52.73%)	(47.27%)
Total (2012-2017)	**8,050**	**8,281**	**5496**	**10,835**
	(49.29%)	**(50.71%)**	**(33.65%)**	**(66.35%)**

4.2 Adolescents' alcohol use in SSA

Findings showed that, the overall prevalence of current *alcohol use*, *drunkenness* and *alcohol problems* was 12.56% (95%CI = 12.05%-13.08%), 8.32% (95%CI = 7.90% - 8.76%) and 4.74% (95%CI = 4.42% - 5.08%), respectively. For current alcohol use, adolescents in Seychelles reported the highest prevalence of 47.21% (95%CI = 44.86% - 49.61%) and adolescents in Tanzania reported the lowest prevalence of 2.89% (95%CI = 2.28% - 3.58%).

For lifetime drunkenness, adolescents in Seychelles reported the highest prevalence of 42.17% (95%CI = 39.82% - 44.52%) and adolescents in Tanzania reported the lowest prevalence of 1.41% (95%CI = 1.00% - 1.92%).

For lifetime alcohol problem, adolescents in Namibia reported the highest prevalence of 13.76% (95%CI = 12.56% - 15.05%) and adolescents in Tanzania reported the lowest prevalence of 1.89% (95%CI = 1.41% - 2.47%). The details of the country-specific prevalence of current alcohol use, drunkenness and alcohol problems are presented in Figure 4.1 below.

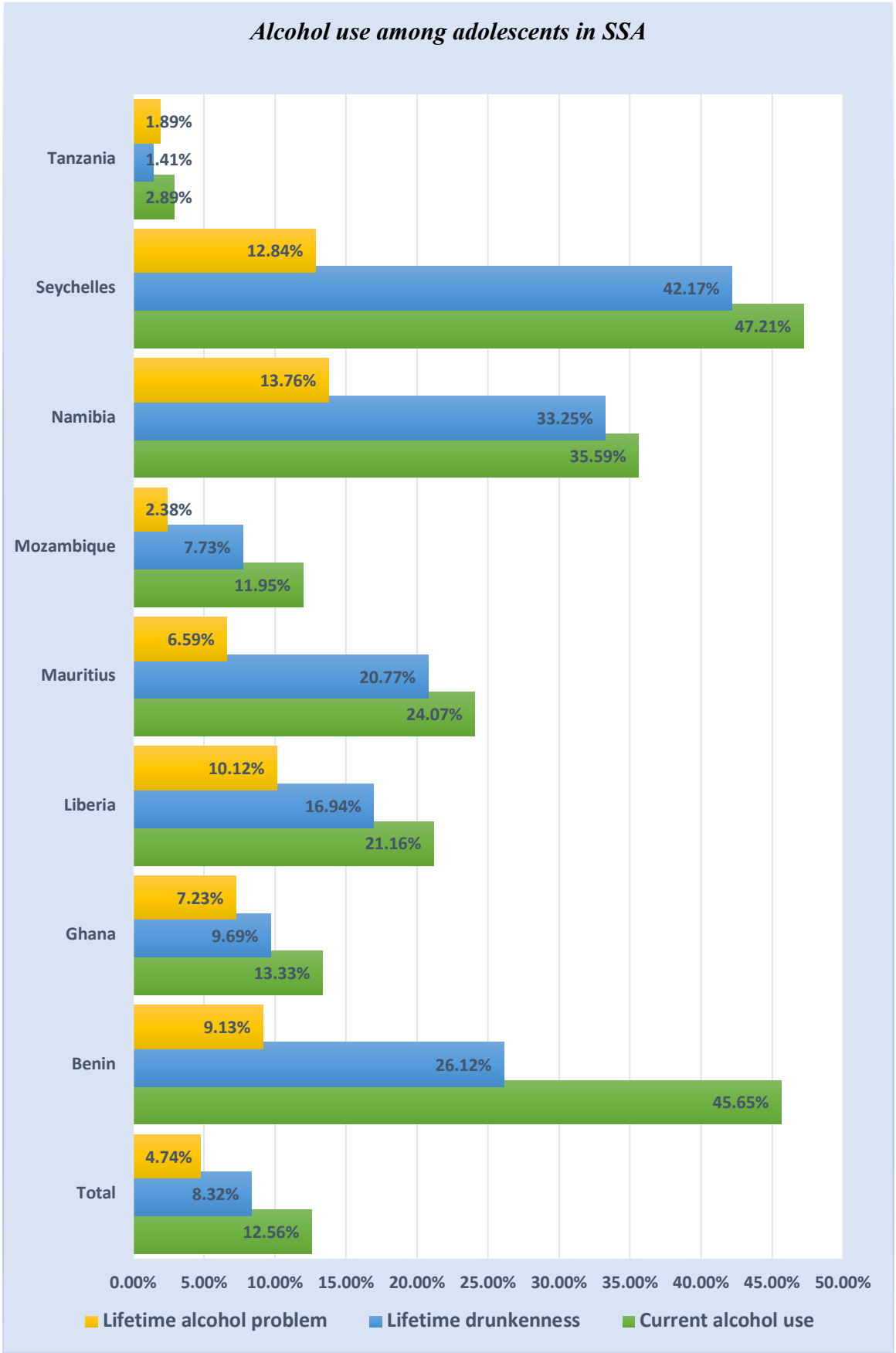

Figure 4.1: Prevalence of alcohol use among adolescents in SSA

4.3 Association between correlates and alcohol use among adolescents

Results from the bivariate analysis (Table 4.2) showed that all the explanatory variables except "*parental intrusion of privacy"* were significantly associated with current alcohol use among the adolescents (Yes =24.56% vrs No = 24.90%, ρ = 0.636). However, all the explanatory variables in the analysis were significantly associated with lifetime drunkenness among the adolescents in SSA. Similarly, it was also observed from Table 4 that all the explanatory variables were statistically and significantly associated with lifetime alcohol trouble among the adolescents in SSA.

4.4 Multivariate models of vulnerability and resilience factors of alcohol use among adolescents

4.4.1 Current alcohol use

Results from the multivariate analysis (Table 4.3) below showed that sex of adolescents significantly predicted their current alcohol use in both the unadjusted (OR= 1.67, 95%CI = 1.47-1.90) and the adjusted models (AOR = 1.40, 95%CI = 1.22-1.60) where being a male participant increasing the odds (1.40) for current alcohol use after controlling for all other covariates in the model. Age of the adolescents significantly predicted current alcohol use in both unadjusted (OR = 2.80, 95%CI = 2.38- 3.30) and adjusted models (AOR = 2.77, 95%CI = 2.32-3.29) with adolescents between 15 and 18 years reporting 2.77 increased odds for current alcohol use compared to adolescents between 11 and 14years. Truancy among adolescents significantly increased the odds for alcohol use among the adolescents in both the unadjusted (OR = 2.19, 95%CI = 1.93-2.49) and adjusted models (AOR = 1.46, 1.26-1.68). Being bullied significantly increased the odds for alcohol use among adolescents in both the

unadjusted (OR = 2.33, 95%CI = 2.06-2.64) and adjusted models (AOR = 1.60, 95%CI= 1.39-1.85).

However, being physically attacked did not significantly predict current alcohol use among adolescents in the unadjusted model (OR = 1.00, 95%CI = .88-1.13) but predicted decreased odds for alcohol use in the adjusted model (AOR = .73, 95%CI = .63-.85). Being involved in physical fight increased the odds for current alcohol use among adolescents in both the unadjusted (OR = 1.91, 95%CI = 1.67-2.17) and adjusted models (AOR = 1.46, 95%CI = 1.25-1.69). However, having no close friends did not significantly predict alcohol use among adolescents in the unadjusted model (OR = 1.17, 95%CI =.95-1.45) but increased the odds for current alcohol use among adolescents in the adjusted model (AOR = 1.47, 95%CI = 1.15-1.87). Peer support significantly decreased the odds for current alcohol use among adolescents in the unadjusted model (OR = .66, 95%CI = .58-.76) but was not significant in the adjusted model (AOR = .90, 95%CI = .77-1.04).

Hunger was associated with increased the odds for current alcohol use in the unadjusted model (OR = 1.69, 95%CI = 1.41-2.02) but was not significant in predicting current alcohol use in the adjusted model (AOR = 1.16, 95%CI = .94-1.44). Smoking cigarette increased the odds for alcohol use among adolescents in both unadjusted (OR = 13.09, 95%CI = 10.02-17.11) and adjusted models (AOR = 5.97, 95%CI = 4.39-8.12). Smoking marijuana increased the odds for current alcohol use among adolescents in both the unadjusted (OR = 23.36, 95%CI = 15.64-34.90) and adjusted models (AOR = 8.09, 95%CI = 4.92-13.31). Anxiety increased the odds for current alcohol use among adolescents in both the unadjusted (2.71, 95%CI = 2.29-3.20) and adjusted models (AOR = 1.84, 95%CI = 1.52-2.23). Loneliness increased the odds for current alcohol use among adolescents in the unadjusted model (OR = 1.96, 95%CI = 1.65-2.32) but not significant in the adjusted model (AOR =1.17, 95%CI = .95-1.44). For suicidal

behaviours, ideation (OR = 1.91, 95%CI = 1.63-2.24), plan (OR = 2.00, 95%CI = 1.71-2.33) and attempt (OR = 2.38, 95%CI = 2.03-2.79) significantly increased the odds for current alcohol use in the unadjusted model but were not significant in the adjusted models.

For parenting variables, parental supervision significantly decreased the odds for current alcohol use among adolescents in both the unadjusted (OR = .48, 95%CI = .42-.55) and adjusted models (AOR = .73, 95%CI = .62-.84). Parental understanding significantly decreased the odds for current alcohol use among adolescents in the unadjusted model (OR = .69, 95%CI = .61-.78) but not significant in the adjusted model (AOR = 1.03, 95%CI = .88-1.19). Parental bonding significantly decreased the odds for current alcohol use among adolescents in both the unadjusted (OR = .50, 95%CI = .43-.57) and adjusted models (AOR = .65, 95%CI = .55-.76). However, parental intrusion of privacy did not significantly predict current alcohol use among adolescents in both the unadjusted (OR = 1.02, 95%CI = .89-1.16) and adjusted models (AOR = 1.16, 95%CI = 1.00-1.34).

4.4.2 Lifetime Drunkenness

Results from the multivariate analysis (Table 4.3) below showed that sex of adolescents significantly predicted their lifetime drunkenness in both the unadjusted (OR= 1.75, 95%CI = 1.52-2.02) and the adjusted models (AOR = 1.48, 95%CI = 1.27-1.72) with being a male increasing the odds (1.48) for drunkenness. Age of the adolescents significantly predicted drunkenness in both unadjusted (OR = 3.34, 95%CI = 2.74-4.08) and adjusted models (AOR = 3.21, 95%CI = 2.59-3.99) with adolescents between 15 and 18years reporting 3.21 increased odds for drunkenness compared to adolescents between 11 and 14years.Truancy among adolescents significantly increased the odds for drunkenness among the adolescents in both the unadjusted (OR = 2.52, 95%CI = 2.18-2.90) and adjusted models (AOR = 1.65, 1.41-1.93). Being bullied significantly increased the odds for drunkenness among adolescents in both the

unadjusted (OR = 2.40, 95%CI = 2.09-2.76) and adjusted models (AOR = 1.57, 95%CI= 1.33-1.84).

However, being physically attacked did not significantly predict drunkenness among adolescents in the unadjusted model (OR = .99, 95%CI = .86-1.14) but predicted decreased odds for drunkenness in the adjusted model (AOR = .72, 95%CI = .61-.85). Being involved in physical fight increased the odds for drunkenness among adolescents in both the unadjusted (OR = 1.75, 95%CI = 1.51-2.02) and adjusted models (AOR = 1.23, 95%CI = 1.03-1.46). However, having no close friends did not significantly predict drunkenness among adolescents in both the unadjusted (OR = 1.02, 95%CI =.81-1.28) and adjusted models (AOR = 1.28, 95%CI = .98-1.66).

Peer support significantly decreased the odds for drunkenness among adolescents in the unadjusted model (OR = .66, 95%CI = .57-.77) but was not significant in the adjusted model (AOR = .91, 95%CI = .77-1.07). Hunger significantly increased the odds for drunkenness among adolescents in both the unadjusted (OR = 1.92, 95%CI = 1.57-2.35) and adjusted models (AOR = 1.27, 95%CI = 1.01-1.59). Smoking cigarette increased the odds for drunkenness among adolescents in both unadjusted (OR = 10.79, 95%CI = 8.37-13.90) and adjusted models (AOR = 4.07, 95%CI = 3.02- 5.48). Smoking marijuana increased the odds for drunkenness among adolescents in both the unadjusted (OR = 24.64, 95%CI = 16.68-36.41) and adjusted models (AOR = 8.93, 95%CI = 5.55-14.36).

Anxiety increased the odds for drunkenness among adolescents in both the unadjusted (2.95, 95%CI = 2.46-3.54) and adjusted models (AOR = 1.83, 95%CI = 1.48-2.25). Loneliness increased the odds for drunkenness among adolescents in both the unadjusted (OR = 2.24, 95%CI = 1.85-2.70) and adjusted models (AOR =1.29, 95%CI = 1.03-1.61). For suicidal behaviours, ideation significantly increased the odds for drunkenness among adolescents in the

unadjusted model (OR = 2.13, 95%CI= 1.79-2.53) but not significant in the adjusted model (AOR = 1.10, 95%CI = .86-1.40). Suicidal plan significantly increased the odds for drunkenness among adolescents in both the unadjusted (OR = 2.51, 95%CI = 2.12-2.97) and adjusted model (AOR = 1.54, 95%CI = 1.19-1.98). Suicidal attempt significantly increased the odds for drunkenness among adolescents in the unadjusted model (OR = 2.60, 95%CI= 2.19-3.09) but not significant in the adjusted model (AOR = .96, 95%CI = .75-1.23).

For parenting variables, parental supervision significantly decreased the odds for drunkenness among adolescents in both the unadjusted (OR = .45, 95%CI = .39-.53) and adjusted models (AOR = .70, 95%CI = .59-.83). Parental understanding significantly decreased the odds for drunkenness among adolescents in the unadjusted model (OR = .63, 95%CI = .55-.73) but not significant in the adjusted model (AOR = .88, 95%CI = .74-1.05). Parental bonding significantly decreased the odds for drunkenness among adolescents in both the unadjusted (OR = .53, 95%CI = .46-.62) and adjusted models (AOR = .75, 95%CI = .63-.90). However, parental intrusion of privacy did not significantly predict drunkenness among adolescents in both the unadjusted (OR = .87, 95%CI = .75-1.01) and adjusted models (AOR = .98, 95%CI = .83-1.15).

4.4.3 Lifetime Alcohol Trouble

Results from the multivariate analysis (Table 4.3) below showed that sex of adolescents significantly predicted their lifetime alcohol trouble in the unadjusted model (OR= 1.34, 95%CI = 1.09-1.66) but was not significant in the adjusted models (AOR = 1.17, 95%CI = .93-1.47). Age of the adolescents significantly predicted alcohol trouble in both unadjusted (OR = 2.04, 95%CI = 1.57-2.63) and adjusted models (AOR = 2.00, 95%CI = 1.51-2.66) with adolescents between 15 and 18years reporting 2.00 increased odds for alcohol trouble compared to adolescents between 11 and 14years. Truancy among adolescents significantly

increased the odds for alcohol trouble among the adolescents in both the unadjusted (OR = 4.00, 95%CI = 3.25-4.91) and adjusted models (AOR = 2.39, 1.90-3.00). Being bullied significantly increased the odds for alcohol trouble among adolescents in both the unadjusted (OR = 2.98, 95%CI = 2.42-3.67) and adjusted models (AOR = 1.47, 95%CI= 1.15-1.86). Being physically attacked increased the odds for alcohol problem among adolescents in the unadjusted (OR = 1.97, 95%CI = 1.61-2.41) and adjusted models (AOR = 1.29, 95%CI = 1.01-1.65). Being involved in physical fight increased the odds for alcohol problem among adolescents in both the unadjusted (OR = 2.71, 95%CI = 2.21-3.33) and adjusted models (AOR = 1.33, 95%CI = 1.03-1.72). However, having no close friends did not significantly predict alcohol problem among adolescents in both the unadjusted (OR = 1.03, 95%CI = .73-1.44) and adjusted models (AOR = 1.15, 95%CI = .79-1.67).

Peer support significantly decreased the odds for alcohol problem among adolescents in the unadjusted model (OR = .64, 95%CI = .51-.81) but was not significant in the adjusted model (AOR = .88, 95%CI = .68-1.13). Hunger significantly increased the odds for alcohol problem among adolescents in the unadjusted model (OR = 1.81, 95%CI = 1.37- 2.41) but was not significant in the adjusted model (AOR = 1.12, 95%CI = .80-1.57). Smoking cigarettes increased the odds for alcohol problem among adolescents in both unadjusted (OR = 14.25, 95%CI = 10.73-18.90) and adjusted models (AOR = 4.02, 95%CI = 2.70-6.00). Smoking marijuana increased the odds for alcohol problem among adolescents in both the unadjusted (OR = 34.45, 95%CI = 23.79-49.89) and adjusted models (AOR = 8.79, 95%CI = 5.15-15.01).

Anxiety increased the odds for alcohol problem among adolescents in both the unadjusted (3.81, 95%CI = 2.98-4.87) and adjusted models (AOR = 2.31, 95%CI = 1.68-3.17). Loneliness increased the odds for alcohol problem among adolescents in the unadjusted model (OR = 2.01, 95%CI = 1.54-2.61) but not significant in the adjusted model (AOR =.94, 95%CI = .68-1.29).

For suicidal behaviours, ideation significantly increased the odds for alcohol problem among adolescents in the unadjusted model (OR = 2.70, 95%CI= 2.13-3.41) but not significant in the adjusted model (AOR = 1.23, 95%CI = .89-1.71). Suicidal plan significantly increased the odds for alcohol problem among adolescents in the unadjusted (OR = 2.79, 95%CI = 2.14-3.37) but not significant in the adjusted model (AOR = 1.10, 95%CI = .78-1.55). Suicidal attempt significantly increased the odds for alcohol problem among adolescents in both the unadjusted (OR = 4.23, 95%CI= 3.39-5.29) and adjusted models (AOR = 1.51, 95%CI = 1.09-2.07).

For parenting variables, parental supervision significantly decreased the odds for alcohol problem among adolescents in the unadjusted model (OR =.54, 95%CI = .43-.67) but not significant in the adjusted model (AOR = .80, 95%CI = .63-1.03). Parental understanding significantly decreased the odds for alcohol problem among adolescents in the unadjusted model (OR = .76, 95%CI = .61-.94) but not significant in the adjusted model (AOR = 1.05, 95%CI = .82-1.36). Parental bonding significantly decreased the odds for alcohol problem among adolescents in the unadjusted (OR = .61, 95%CI = .48-.76) but not significant in the adjusted model (AOR = .84, 95%CI = .65-1.08). Finally, parental intrusion of privacy decreased the odds for alcohol problem among adolescents in the unadjusted model (OR = .72, 95%CI = .58-.89) but not significant in the adjusted model (AOR = .94, 95%CI = .74-1.19).

Table 4.2: Bivariate association between correlates and alcohol use among adolescents

Variables	Weighted N	Weighted %	Current alcohol use	p-value	Drunkenness	p-value	Alcohol trouble	p-value
Sex								
Male	8652	52.98%	25.99%	<0.001	21.71%	<0.001	8.88%	<0.001
Female	7679	47.02%	23.39%		17.75%		6.73%	
Age Group								
11-14years	6717	41.13%	18.01%	<0.001	13.57%	<0.001	5.31%	<0.001
15-18years	9614	58.87%	28.05%		22.79%		9.04%	
Truancy								
Yes	4388	26.87%	35.54%	<0.001	29.86%	<0.001	14.93%	<0.001
No	11943	73.13%	20.92%		16.17%		5.32%	
Bullied								
Yes	5479	33.55%	31.30%	<0.001	24.48%	<0.001	11.69%	<0.001
No	10852	66.45%	20.91%		16.97%		5.58%	
Physically attacked								
Yes	6985	57.23%	25.99%	0.005	21.11%	0.001	11.09%	<0.001
No	9346	42.77%	23.98%		18.94%		6.06%	
Fighting								
Yes	4665	28.56%	32.32%	<0.001	26.28%	<0.001	13.36%	<0.001
No	11666	71.44%	21.74%		17.16%		5.66%	
No Close friends								
Yes	14838	90.86%	25.04%	0.001	19.92%	0.019	7.83%	**0.548**
No	1493	9.14%	21.17%		17.44%		7.40%	
Peer support								
Yes	5504	33.71%	20.68%	<0.001	16.39%	<0.001	6.40%	<0.001
No	10827	66.29%	26.57%		21.26%		8.45%	
Hunger								
Yes	1482	9.08%	28.89%	<0.001	24.08%	<0.001	11.00%	<0.001
No	14849	90.92	24.22%		19.21%		7.44%	

Variables	Weighted N	Weighted %	Current alcohol use	p-value	Drunkenness	p-value	Alcohol trouble	p-value
Smoking cigarette								
Yes	544	3.33%	70.78%	<0.001	64.83%	<0.001	31.72%	<0.001
No	15787	96.67%	21.15%		16.23%		5.96%	
Marijuana use								
Yes	281	1.72%	76.40%	<0.001	72.00%	<0.001	45.80%	<0.001
No	16050	98.28%	23.04%		18.03%		6.59%	
Anxiety								
Yes	1512	9.26%	35.33%	<0.001	29.44%	<0.001	14.96%	<0.001
No	14818	90.74%	23.25%		18.39%		6.83%	
Loneliness								
Yes	1579	9.67%	32.22%	<0.001	27.61%	<0.001	12.40%	<0.001
No	14752	90.33%	23.68%		18.65%		7.19%	
Suicidal ideation								
Yes	2165	13.26%	34.29%	<0.001	29.03%	<0.001	13.96%	<0.001
No	14166	86.74%	22.85%		17.92%		6.62%	
Suicidal plan								
Yes	2114	12.94%	33.63%	<0.001	28.83%	<0.001	13.43%	<0.001
No	14217	87.06%	22.79%		17.76%		6.60%	
Suicidal attempt								
Yes	2132	13.05%	33.92%	<0.001	28.33%	<0.001	16.34%	<0.001
No	14199	86.95%	22.94%		18.07%		6.19%	
Parental supervision								
Yes	8171	50.29%	18.32%	<0.001	13.25%	<0.001	5.64%	<0.001
No	8078	49.71%	29.58%		24.65%		9.48%	
Parental understanding								
Yes	6510	39.87%	20.40%	<0.001	15.13%	<0.001	6.33%	<0.001
No	9821	60.13%	27.55%		22.75%		8.78%	
Parental bonding								
Yes	6362	38.95%	18.70%	<0.001	14.13%	<0.001	5.49%	<0.001

Variables	Weighted N	Weighted %	Current alcohol use	p-value	Drunkenness	p-value	Alcohol trouble	p-value
No	9969	61.05%	28.51%		23.26%		9.26%	
Parental intrusion of privacy								
Yes	11791	72.20%	24.56%	0.636	19.14%	0.012	7.07%	<0.001
No	4540	27.80%	24.90%		20.81%		9.29%	

Table 4.3: Multivariate association between correlates and alcohol use among adolescents in SSA

Variables	Current alcohol use		Drunkenness		Alcohol trouble	
	OR(95%CI)	AOR(95%CI)	OR(95%CI)	AOR(95%CI)	OR(95%CI)	AOR(95%CI)
Sex						
Female	1	1	1	1	1	1
Male	1.67(1.47-1.90)***	1.40 (1.22-1.60)***	1.75(1.52-2.02)***	1.48(1.27-1.72)***	1.34(1.09-1.66)**	1.17(.93-1.47)
Age group						
11-14years	1	1	1	1	1	1
15-18years	2.80(2.38- 3.30)***	2.77(2.32-3.29)***	3.34(2.74-4.08)***	3.21(2.59-3.99)***	2.04(1.57-2.63)***	2.00(1.51-2.66)***
Truancy						
No	1	1	1	1	1	1
Yes	2.19(1.93-2.49)***	1.46(1.26-1.68)***	2.52(2.18-2.90)***	1.65(1.41-1.93)***	4.00(3.25-4.91)***	2.39(1.90-3.00)***
Bullied						
No	1	1	1	1	1	1
Yes	2.33(2.06-2.64)***	1.60(1.39-1.85)***	2.40(2.09-2.76)***	1.57(1.33-1.84)***	2.98(2.42-3.67)***	1.47(1.15-1.86)**
Physically attacked						
No	1	1	1	1	1	1
Yes	1.00(.88-1.13)	.73(.63-.85)***	.99(.86-1.14)	.72(.61-.85)***	1.97(1.61-2.41)***	1.29(1.01-1.65)*
Fighting						
No	1	1	1	1	1	1
Yes	1.91(1.67-2.17)***	1.46(1.25-1.69)***	1.75(1.51-2.02)***	1.23(1.03-1.46)*	2.71(2.21-3.33)***	1.33(1.03-1.72)*
No Close friends						
No	1	1	1	1	1	1
Yes	1.17(.95-1.45)	1.47(1.15-1.87)**	1.02(.81-1.28)	1.28(.98-1.66)	1.03(.73-1.44)	1.15(.79-1.67)
Peer support						
No	1	1	1	1	1	1
Yes	.66(.58-.76)***	.90(.77-1.04)	.66(.57- .77)***	.91(.77-1.07)	0.64(.51-.81)***	0.88(.68-1.13)

Variables	Current alcohol use		Drunkenness		Alcohol trouble	
	OR(95%CI)	AOR(95%CI)	OR(95%CI)	AOR(95%CI)	OR(95%CI)	AOR(95%CI)
Hunger						
No	1	1	1	1	1	1
Yes	1.69(1.41-2.02)***	1.16(.94-1.44)	1.92(1.57-2.35)***	1.27(1.01-1.59)*	1.81(1.37- 2.41)***	1.12(.80-1.57)
Smoking cigarette						
No	1	1	1	1	1	1
Yes	13.09(10.02-17.11)***	5.97(4.39-8.12)***	10.79(8.37-13.91)***	4.07(3.02-5.48)***	14.25(10.73-18.90)***	4.02(2.70-6.00)***
Marijuana use						
No	1	1	1	1	1	1
Yes	23.36(15.64-34.90)***	8.09(4.92-13.31)***	24.64(16.68-36.41)***	8.93(5.55-14.36)***	34.45(23.79-49.89)***	8.79(5.15-15.01)***
Anxiety						
No	1	1	1	1	1	1
Yes	2.71(2.29-3.20)***	1.84(1.52-2.23)***	2.95(2.46-3.54)***	1.83(1.48-2.25)***	3.81(2.98-4.87)***	2.31(1.68-3.17)***
Loneliness						
No	1	1	1	1	1	1
Yes	1.96(1.65-2.32)***	1.17(.95-1.44)	2.24(1.85-2.70)***	1.29(1.03-1.61)*	2.01(1.54-2.61)***	.94(.68-1.29)
Suicidal ideation						
No	1	1	1	1	1	1
Yes	1.91(1.63-2.24)***	1.14(.92-1.42)	2.13(1.79-2.53)***	1.10(.86-1.40)	2.70(2.13-3.41)***	1.23(.89-1.71)
Suicidal plan						
No	1	1	1	1	1	1
Yes	2.00(1.71-2.33)***	1.17(.94-1.46)	2.51(2.12-2.97)***	1.54(1.19-1.98)**	2.79(2.14-3.37)***	1.10(.78-1.55)
Suicidal attempt						
No	1	1	1	1	1	1
Yes	2.38(2.03-2.79)***	1.09(.88-1.35)	2.60(2.19-3.09)***	.96(.75-1.23)	4.23(3.39-5.29)***	1.51(1.09-2.07)*
Parental supervision						

Variables	Current alcohol use		Drunkenness		Alcohol trouble	
	OR(95%CI)	AOR(95%CI)	OR(95%CI)	AOR(95%CI)	OR(95%CI)	AOR(95%CI)
No	1	1	1	1	1	1
Yes	.48(.42-.55)***	.73(.62-.84)***	.45(.39-.53)***	.70(.59-.83)***	.54(.43-.67)***	.80(.63-1.03)
Parental understanding						
No	1	1	1	1	1	1
Yes	.69(.61-.78)***	1.03(.88-1.19)	.63(.55-.73)***	.88(.74-1.05)	.76(.61-.94)*	1.05(.82-1.36)
Parental bonding						
No	1	1	1	1	1	1
Yes	.50(.43-.57)***	.65(.55-.76)***	.53(.46-.62)***	.75(.63-.90)**	.61(.48-.76)***	.84(.65-1.08)
Parental intrusion of privacy						
No	1	1	1	1	1	1
Yes	1.02(.89-1.16)	1.16(1.00-1.34)	.87(.75-1.01)	.98(.83-1.15)	.72(.58-.89)**	.94(.74-1.19)

CHAPTER FIVE

5.0 DISCUSSION

This study examined alcohol use and its related problems among adolescents who are in school in eight SSA countries and the various vulnerability and resilience factors are discussed under this section. This section starts with the overall prevalence and country-specific prevalence of alcohol use behaviours. This is followed by discussion of key vulnerability and resilience factors of current alcohol use, drunkenness and alcohol problem among adolescents by relating the findings to previous literature.

5.1 Prevalence of current alcohol use, drunkenness and alcohol problem

Findings from the analysis showed overall prevalence rates of 12.56% (95%CI = 12.05%-13.08%), 8.32% (95%CI = 7.90% - 8.76%) and 4.74% (95%CI = 4.42% - 5.08%) for current alcohol use, drunkenness and alcohol problems respectively. The overall prevalence rate of current alcohol use among school going adolescents means that more than 1 in every 10 adolescents who are in school in SSA currently use alcohol. This is a major challenge which requires coordinated efforts on the continent to address the menace of alcohol. The overall current alcohol use rate is within the ranges of individual findings of current alcohol use in SSA which reported between 10% and 44% (Oppong Asante and Kugbey, 2019; Oppong Asante and Quarshie, 2022; Darteh, 2022; Pengpid and Peltzer, 2020). Since alcohol has been noted as an experimental drug across the world especially among adolescents, it is not surprising that a substantial number of the school going adolescents in SSA currently use alcohol.

The overall prevalence rate of drunkenness among adolescents who are in school in the selected SSA countries shows that almost 1 in every 10 adolescents who are in school has ever been drunk in their lifetime. Although this rate appears relatively small, drunkenness could predispose these adolescents to other risky behaviours including unprotected sex with its attendant problems. However, the reported drunkenness is lower than the prevalence reported by an earlier study among adolescents in Thailand which found a 42% rate of hazardous drinking among the study participants (Pramaunururut *et al.,* 2022). These variations in the rates could be attributed to macro-level factors especially socio-cultural practices, legislations and other regulatory activities on access and the use of alcohol products.

Further, alcohol problem was observed in every 1 out of 20 adolescents who are in school in SSA. This observation has significant public health relevance to both practitioners, policy makers and researchers. This is because, alcohol-related problems or troubles are not limited to only the individual adolescents but may have significant negative economic, social, financial and emotional impacts on the family and society at large. For example, alcohol trouble may result in truancy, other illicit drug use, interpersonal injuries, physical attacks and ultimately death (Carney *et al.,* 2013).

Furthermore, significant variations were observed alcohol use among the selected countries for this study. Findings showed that for current alcohol use, adolescents in Seychelles reported the highest prevalence of 47.21% (95%CI = 44.86% - 49.61%) and adolescents in Tanzania reported the lowest prevalence of 2.89% (95%CI = 2.28% - 3.58%). It was also observed that adolescents who are in school in Seychelles reported the highest prevalence of 42.17% (95%CI = 39.82% - 44.52%) for lifetime drunkenness, and adolescents in Tanzania reported the lowest prevalence of 1.41% (95%CI = 1.00% - 1.92%) for lifetime drunkenness. For lifetime alcohol problems, adolescents in Namibia reported the highest prevalence of 13.76% (95%CI = 12.56%

- 15.05%) and adolescents in Tanzania reported the lowest prevalence of 1.89% (95%CI = 1.41% - 2.47%). These variations in the prevalence rates across the countries in SSA can be attributed to several factors. Firstly, one of the key factors found to influence alcohol use is religious affiliations as Islam-dominated countries have strict regulations on access and use of alcohol unlike countries with liberal religious orientations or African traditions practices with alcohol being an integral part of their rituals. For example, some studies have reported that religious norms and commitments regarding alcohol significantly predicted alcohol use among adolescents (Luczak *et al.,* 2014; Najjar *et al.,* 2016). Secondly, the variations in the regulatory frameworks around advertisement, access and use alcohol products could account for these variations. For example, it has been argued by some scholars that weak enforcement of laws and regulations prohibiting alcohol access and use especially among the youth are major contributors to high alcohol mis/use among the youth in SSA (Oppong Asante and Kugbey, 2019; Oppong Asante and Quarshie, 2022; Peltzer and Pengpid, 2022).

5.2 Risk factors for current alcohol use, drunkenness and alcohol problem

Several risk factors have been identified for alcohol use behaviours among adolescents who are in school in SSA. It was observed from this study that socio-demographic characteristics such as being a male and being a late adolescent (15-18 years) are significant risk factors for alcohol use behaviours among adolescents who are in school. These findings are consistent with previous evidence among adolescents across the world on their health risk behaviours such as substance use (Adade *et al.,* 2022; Andersen *et al.,* 2007; Leonard *et al.,* 2015). Male adolescents are found to be prone to risky behaviours compared to females. Several explanations are proffered regarding gender differences in health risk behaviours among adolescents. One of the evolutionary perspectives is that males are prone to risk taking compared to females due to their nature and thus, are high on sensation seeking (Pawlowski *et*

al., 2008; Archer, 2019). Culture could also underlie the significant sex differences in alcohol use behaviours as most cultures in SSA associate certain health risk behaviours including alcohol use to masculinity (Connell and Messerschmidt, 2005; Prestwich *et al.,* 2016).

Late adolescence was found to be a significant risk factor for current alcohol use, drunkenness and alcohol problem among adolescents who are in school in SSA. This means that older adolescents tend to engage in alcohol use and its related behaviours as they approach or transition to adulthood. Some adolescents engage in health risk behaviours including risky sexual behaviours and substance as a sign of maturity and show of independence from adults. These findings have been reported in some previous country-specific studies which found age to be a significant predictor of alcohol use behaviours (Adade *et al.,* 2022; Oppong Asante and Kugbey, 2019; Oppong Asante and Quarshie, 2022; Leonard *et al.,* 2015). Since alcohol is an experimental drug, it is not surprising that older adolescents tend to engage in more alcohol use behaviours than younger adolescents.

Some key mental health factors have been found to increase the risk of alcohol use among adolescents who are in school in SSA. For example, experiences of anxiety, loneliness, suicidal plan and attempt have been found to be significant risk factors for at least one of the three alcohol-related behaviours (current alcohol use, drunkenness and alcohol problem). Experience of mental health challenges can predispose adolescents to substance use including alcohol, as substance use is seen as a coping strategy to deal the stressful situation. Adolescence as a period is characterised by several challenges that can negatively impact on their mental health. If these challenges are not adequately addressed, alcohol may be seen as a haven to deal with issues about anxiety and loneliness. The literature is replete with evidence on the link between mental health factors and alcohol use with some studies suggesting a bidirectional relationship between alcohol use and mental health problems (Oppong Asante and Kugbey, 2019; Oppong

Asante and Quarshie, 2022; Ben El Jilali *et al.,* 2020; Darteh, 2022; Kabiru *et al.,* 2010; Leung *et al.,* 2019).

Suicidal behaviours among adolescents have been identified as a major public health issue as it is associated with increased morbidity and mortality. The complexities in suicidal behaviours in terms of their consequences implicate alcohol use behaviours among adolescents in SSA. Most especially, having suicidal plans and attempts are significant risk factors for alcohol use behaviours after adjusting for all the other study variables. It is important to note that in the unadjusted regression models, all the suicidal behaviours (ideation, plan and attempt) significantly predicted increased odds for all alcohol use behaviours. The significant links between suicidal behaviours and alcohol use among adolescents who are in school have been reported by studies from relatively small samples from single countries (Oppong Asante and Kugbey, 2019; Pengpid and Peltzer, 2019; Pengpid and Peltzer, 2020). On the other hand, some studies did not find any significant association between suicidal behaviours when other study variables were controlled for in their analysis (Oppong Asante and Quarshie, 2022; Darteh, 2022; Onyeaka and Oppong Asante, 2022; Kugbey, 2023). Addressing mental health issues among adolescents who are in school are crucial as they predispose them to engage in alcohol-related behaviours that can engender negative health and educational outcomes.

Furthermore, some key psychosocial risk factors have been found to increase the risk for alcohol use behaviours among adolescents who are in school in SSA. Truancy, being bullied, fighting, having no close friends, hunger, being attacked physically, cigarette smoking and smoking marijuana increased the risk for at least one of the alcohol behaviours (current alcohol use, drunkenness and alcohol problem). Evidence in the adolescence health literature showed the interconnected of behavioural risk factors as it has been observed that, for example, truant adolescents are more likely to engage in other risky behaviours such as fighting, alcohol use,

marijuana smoking and risky sexual behaviours (Pengpid and Peltzer, 2020; Pramaunururut *et al.,* 2022; Swahn and Donovan, 2005). It is important to note that polysubstance use among adolescents is very pervasive as adolescents who use tobacco and marijuana are more likely to use alcohol and other substances (Rodríguez-Cano *et al.,* 2023). Thus, in this study, cigarette and marijuana smoking were associated with very high odds for alcohol use behaviours. This finding implies the need for substance use prevention programmes in various schools to address the risk of polysubstance abuse. The findings of cigarette and marijuana smoking as significant risk factors for alcohol use behaviours are consistent with previous works (Peltzer and Pengpid, 2018b; Pramaunururut *et al.,* 2022; Rodríguez-Cano *et al.,* 2023).

5.3 Protective factors against current alcohol use, drunkenness and alcohol problem

Identifying protective factors against alcohol use behaviours is key to designing effective public health interventions to promote the health and well-being of adolescents in SSA. Evidence from this study showed that peer support and parenting variables are key protective factors against alcohol use behaviours. For example, parental supervision and bonding are key protective factors of alcohol use behaviours. However, peer support, parental understanding and parental intrusion of privacy were significant protective factors in the unadjusted models which suggests that they should be considered in any intervention strategies aimed at reducing substance use among adolescents who are in school in SSA. The impact of parental involvement in adolescents' health and educational outcomes have been reported by several studies (Darteh, 2022; Kabiru *et al.,* 2010; Kugbey, 2023; Onyeaka and Oppong Asante, 2022; Peltzer and Pengpid, 2022; Richter *et al.,* 2009; Rüütel *et al.,* 2014).

Parental supervision of their adolescents is key in reducing risky behaviours through monitoring of their activities. Adolescents whose parents are not privy to what they do are likely to engage in risky behaviours on the blind side of their parents. Thus, it is important that parents pay attention to their adolescents. In addition to parental supervision, bonding between parents and adolescents has proven to be a significant protective factor for alcohol use behaviours such that when adolescents are able to relate well with their parents, they can share their anxiety and fears whether school-related or general issues. This bonding can provide a safe haven for adolescents to express their challenges and be addressed adequately rather than resorting to alcohol and other substances to deal with their problems (Kuendig and Kuntsche, 2006; Visser *et al.,* 2012).

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

This study examined the prevalence and associated factors of current alcohol use, drunkenness and alcohol problem among adolescents who are in school in 8 SSA countries to inform public health interventions, practice, education and research. Findings from the study showed that 1 in every 10 adolescents who are in school in the eight selected countries in SSA currently use alcohol. It was also observed that almost 1 in every 10 adolescents who are in school in the eight selected countries in SSA has experienced drunkenness in their lifetime. It was further observed that alcohol problem was observed in every 1 out of 20 adolescents who are in school in SSA.

These rates although relatively low, there are variations across the eight countries studied. For example, current alcohol use among adolescents who are in school ranged between 2.89% and 47.21%. Seychelles (47.21%), Benin (45.65%) and Namibia (35.59%) reported the highest rates whereas Tanzania (2.89%), Mozambique (11.95%) and Ghana (13.33%) reported the lowest rates during the study periods. For lifetime drunkenness, Seychelles (42.17%), Namibia (35.59%) and Benin (26.12%) reported the highest rates whereas Tanzania (1.41%), Mozambique (7.73%) and Ghana (9.69%) reported the lowest rates. For lifetime alcohol trouble, Namibia (13.76%), Seychelles (12.84%) and Liberia (10.12%) reported the highest rates whereas Tanzania (1.89%), Mozambique (2.35%) and Mauritius (6.59%) reported the lowest rates. These inter-country variations require measures at both local, national and regional levels to address alcohol use among adolescents who are in school in SSA. This is important in the face of the challenges posed by COVID-19 which have exacerbated the use of

substance among the youth as a form of coping strategy (Gohari *et al.,* 2022; Kapetanovic *et al.,* 2022).

Key vulnerability and resilience factors identified in this study are in congruence with the socio-ecological model of adolescents' risky behaviours. This is because socio-demographic characteristics such as sex and age were found to have significant influences on adolescents' alcohol-drinking behaviours. It was also observed that mental health factors such as the experiences of anxiety, loneliness, and suicidal behaviours were significant risk factors for alcohol use behaviours among adolescents in the selected countries in SSA. Psychosocial factors such as truancy, bullying, hunger, fighting, being physically attacked, having no close friends, cigarette smoking and marijuana smoking are significant risk factors for alcohol use behaviours among adolescents who are in school in the selected countries in SSA. The unearthing of these significant risk factors of alcohol use behaviours among adolescents who are in school in SSA is a precursor to effective public health interventions aimed at addressing these risk factors at the local, national and regional levels.

Peer support and parenting variables such as parental supervisions, understanding and bonding play significant roles in decreasing the risk of alcohol use behaviours among adolescents who are in school in the selected countries in SSA. The role of parents in addressing alcohol use behaviours among adolescents in SSA cannot be overemphasized as parental involvement is a sine qua non in several positive outcomes among adolescents including good academic performance, decreased mental health problems and substance use behaviours (Muchiri and dos Santos, 2018; LaFreniere *et al.,* 2022; Darko-Asumadu and Sika-Bright, 2021).

6.2 Recommendations

The findings from this study have implications for public health practice, education, health policy and public health research. The details are discussed in the specific recommendation sections below.

6.2.1 Recommendations for public health practice and education

Based on the findings from this study, there is the need for comprehensive alcohol education programs in schools across the selected countries in SSA. These programs should focus on increasing awareness about the risks associated with alcohol use, addressing peer pressure, and building life skills to resist alcohol consumption. The key vulnerability and resilience factors identified in the current study should be incorporated into public health programmes in all the studied countries and possibly beyond. Emphasis should be placed on age-appropriate, culturally sensitive, and evidence-based curricula that engage students effectively.

Additionally, public health practitioners with focus on adolescents' health and well-being should advocate for stricter regulations on the marketing and sales of alcoholic beverages targeting adolescents. Public awareness campaigns that highlight the negative impacts of alcohol marketing on young people and their susceptibility to alcohol-related harms should be put in place locally, nationally and regionally. Education of parents, caregivers, and communities to play an active role in limiting adolescents' exposure to alcohol advertising is also one of the key areas public health practitioners can contribute to the reduction of alcohol burden in SSA.

6.2.2 Recommendations for public health policy

In terms of policy recommendations, there is the need for the development and enforcement of policies that mandate the inclusion of alcohol education in school curricula in SSA. These policies can set guidelines for the content, frequency, and delivery methods of alcohol education programs. Effective collaboration between educational boards, health authorities, and community stakeholders to ensure consistent implementation and evaluation of these programs are very key to the effectiveness and sustainability of these policies and programmes.

Additionally, state authorities in the various studied countries, especially where alcohol use behaviours are relatively high should introduce and enforce policies that limit the advertising and promotion of alcoholic products in ways that appeal to adolescents. For example, Ghana has introduced a ban on the advertisement of alcoholic products during prime hours on both television and radio stations which can be replicated in other countries experiencing high rates of alcohol use behaviours. State authorities should also implement regulations to restrict alcohol sales near schools and youth-populated areas. Finally, there is the need for collaboration with regional bodies, such as the World Health Organization (WHO), to develop standardized guidelines for alcohol marketing and sales restrictions to reduce the rate of alcohol use behaviours and its attendant problems among adolescents who are in school in SSA.

6.2.3 Recommendations for public health research

For public health research, there is the need for longitudinal research and data collection to examine the trends in alcohol use behaviours among school going adolescents in SSA to determine whether interventions and public health policies regarding alcohol use behaviours at national and regional levels are yielding the desired results.

Future studies should also include out-of-school adolescents in the sample to present a holistic picture of the alcohol use problems in SSA to inform holistic policies and interventions as the current study is only limited to adolescents in the 8 selected countries. In addition, there is the need for regular analysis and updates using the most recent data from the Global School-based Student Health Survey to update literature on adolescents' health risk behaviours including alcohol consumption.

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APPENDICES

Appendix 1: Ethical Clearance from IRB-ENSIGN

PLAGIARISM REPORT

ALCOHOL USE AMONG ADOLESCENTS IN EIGHT SUB-SAHARAN AFRICAN COUNTRIES: EVIDENCE FROM THE GLOBAL SCHOOL-BASED STUDENT HEALTH SURVEY (2012-2017)

ORIGINALITY REPORT

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