



Journal Homepage: - www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/21077

DOI URL: <http://dx.doi.org/10.21474/IJAR01/21077>



RESEARCH ARTICLE

DETERMINANTS OF SUBSTANCE USE AMONG SECONDARY SCHOOL STUDENTS IN NYARUGENGE DISTRICT, RWANDA

Kwizera Aurore

Manuscript Info

Manuscript History

Received: 04 April 2025

Final Accepted: 07 May 2025

Published: June 2025

Abstract

The use of various drug substances, such as cigarettes, illicit drugs, alcohol, and more, over the course of a person's life, is a growing concern on a global scale. Research indicates an increasing concern of alcohol and illicit drug abuse in Africa, with particular attention to the situation in Rwanda. This study aimed to comprehensively assess the prevalence and determinants of substance use among secondary school students in Nyarugenge District. The research was guided by two specific objectives including: firstly, to determine the prevalence of substance use among students and to identify the determinants of substance use among students in secondary schools in Nyarugenge District. This study offers key insights for schools, parents, policymakers, and healthcare providers to address substance use among students, while also serving as a foundation for future research and community programs. For this study, the research adopted a cross-sectional quantitative approach, focusing on students within two carefully selected secondary schools in Nyarugenge District, specifically Lycee de Kigali, and College de Saint Andre. A sample size of 340 participants was selected from the broader population pool of 2280 individuals, following Taro Yamane's formula for sample size determination and using stratified sampling technique. Data was collected using a self-administered questionnaire mainly composed by the Global School-based Health Survey (GSHS). Collected data was analyzed using SPSS version 25. Descriptive analysis was conducted to determine the prevalence of substance use, bivariate analysis was performed to examine the relationship between determinants and substance use, and multivariate analysis was performed to identify the adjusted association with substance use while controlling for confounding factors. The findings revealed that 27.4% of students reported using substances, with male students and those in Senior 5 grades exhibiting higher usage rates. Several determinants significantly influenced substance use, including peer interactions, family dynamics, and access to technology. Students who spent more time with friends on weekends and had friends offering substances were more likely to engage in substance use, with odds ratios of 1.85 and 3.30, respectively. Family substance use also increased the likelihood of student substance use (AOR = 2.10). Moreover, access to smartphones, internet, and social media amplified the risk of substance use, with social media exposure showing the strongest association (AOR = 2.45). Financial factors, such as receiving pocket money, were also linked to higher substance use, with students who did not receive pocket money being more likely to use substances (AOR = 1.75). The absence of substance use education and inconsistent parental supervision were additional significant risk factors.

"© 2025 by the Author(s). Published by IJAR under CC BY 4.0. Unrestricted use allowed with credit to the author."

.....
In conclusion, this study highlights the complex factors influencing adolescent substance use, including demographic, social, and technological elements.

Key recommendations are to implement school-based education, enhance parental involvement, promote positive peer relationships, and address social media's impact. These insights can guide policymakers, educators, and healthcare providers in developing targeted interventions. Future research should focus on the long-term effects of substance use and assess the effectiveness of existing prevention programs.

Introduction:-

Chapter One: Introduction To The Study

This chapter basically addressed the introduction part of the study. It includes the background of the study, problem of the statement, the objectives of the study, research questions, significance and limitation of the study, finally scope and organization of the study.

Background of the Study

The use of various substances, such as cigarettes, illicit drugs, alcohol, and more, over the course of a person's life, is a growing concern on a global scale. This issue has seen a significant uptick in recent years, posing a substantial threat to public health worldwide, with a particularly pronounced impact on individuals aged 10 to 24 years (Ogundipe et al., 2016; Jumbe et al., 2021). Commonly used substances on a global scale encompass alcohol, khat, cigarettes, hashish, and illicit drugs like cannabis, heroin, and cocaine (Halladay et al., 2020; UNODC, 2020). For instance, statistics indicate that approximately 53% of individuals aged 15 and above have experimented with alcohol at some point in their lives (WHO, 2018). The period of adolescence in secondary school students is marked by profound physical, cognitive, and social developments, making it a critical phase in an individual's life (WHO, 2021). Substance use during this formative period significantly heightens the risk of developing addiction, mental disorders, and substance use disorders (Ogundipe et al., 2016; Jumbe et al., 2021).

For instance, in developed nations, the estimated risk of developing drug dependence solely due to cannabis use among individuals who initiated substance use during secondary students stands at 17% (UNODC, 2020). Substance use and mental disorders collectively accounted for 183.9 million disability-adjusted life years (DALYs) in 2010, with secondary students and young to middle-aged adults aged 10 to 29 years bearing a substantial burden (Whiteford et al., 2013; Degenhardt et al., 2016). Furthermore, substance use among school-going adolescents has adverse consequences, including poor academic performance, reduced productivity, high dropout rates, and increased indiscipline, all of which can have lasting implications throughout an individual's life (Idowu et al., 2018).

A systematic review conducted in sub-Saharan Africa, focusing on adolescents aged 10 to 19 years, estimated that 41.6% had engaged in substance use, with alcohol being the most prevalent at 40.8%, in comparison to other substances (Ogundipe et al., 2016; Jumbe et al., 2021).

As an illustration, the Global Initiative on Out of School Children Study in Rwanda reported that nearly 57% of secondary school-age children (14 to 17 years) were out of school, with a dropout rate of 7.5% by 2014, partly attributed to involvement with substance-using peer groups, particularly those engaging in marijuana use, and truancy tendencies (UNICEF-Rwanda, 2018).

Addressing the issue of substance use among adolescents is integral to achieving the Sustainable Development Goals, which encompass strategies to reduce this burden by enhancing prevention and treatment services (UN, 2016). In Rwanda, among school-going adolescents aged 11 to 17 years, the lifetime prevalence of substance use is notably lower, with an overall figure of 7%. Within this group, alcohol is the most commonly used substance, with a prevalence of 4.5%, followed by drugs (3.1%), specifically marijuana, amphetamines, or methamphetamines (MoHCDGEC, 2017; Abioet al., 2020). In the capital city of Rwanda, the landscape of substance use among school-going adolescents includes cigarettes (15.5%), alcohol (9.2%), and marijuana (3%) as the most frequently utilized substances (Mnyika et al., 2011). However, research focused on substance use and its associated risk behaviors among adolescents in Rwanda remains limited. Consequently, there is a scarcity of data available to guide policy decisions and interventions effectively.

Rwanda's Health and Development Strategy for 2018-2022 strives to ensure the availability of affordable, accessible, and youth-friendly preventive and treatment services to alleviate the burden of disease among adolescents (UN, 2016). This strategy also emphasizes the importance of substance use counseling among secondary

students, which necessitates the promotion of community-based youth centers and increased community involvement in the Adolescent Health Strategy (ADHS) to improve key adolescent healthcare practices. Nevertheless, existing interventions primarily focus on sexual and reproductive health (SRH) and HIV/AIDS, with relatively less attention given to emerging adolescent issues such as substance use, accidents and injuries, mental health, and road safety (UN, 2016).

Moreover, prior research on adolescent risk behaviors in different settings has often concentrated on a single or a limited number of substances; largely involving young people aged 15 to 24 years and frequently focusing on out-of-school adolescents (Francis et al., 2015; Riva et al., 2018). Consequently, there remains a need for comprehensive information regarding the prevalence of substance use among school-going secondary school students aged 10 to 19 years to enrich existing literature and inform more precisely targeted interventions and potential policy decisions. In Nyarugenge district of Kigali Rwanda, this study will seek to address this critical knowledge gap by assessing the prevalence of substance use and its determinants among secondary schools.

Statement of the Problem

The use of substances among secondary school students has become a critical global concern, with alarming rates of alcohol consumption, illegal drug use, cigarette smoking, and the misuse of prescription drugs reported among adolescents. Studies have shown that nearly 70% of adolescents have experimented with alcohol, 50% have used illegal drugs, 40% have smoked cigarettes, and over 20% have misused prescription medications before completing their high school education (UNICEF, 2020). These behaviors are linked to various negative outcomes, such as poor academic performance, delinquency, and an increased risk of diseases, including mental health disorders (Mugisha et al., 2019). In Sub-Saharan Africa, substance use among adolescents is rising due to rapid urbanization, socio-economic challenges, and cultural shifts, placing youth at an elevated risk for addiction and related health issues (Kariuki & Otieno, 2017).

In Rwanda, the prevalence of substance use among adolescents mirrors global trends. Studies indicate that alcohol and cannabis are the most commonly used substances among adolescents in the country, with significant consumption rates observed across multiple regions (Bryson, 2023). A study conducted by the Belgian Development Agency in 2022 revealed widespread substance use in seven districts, highlighting the severity of this issue in Rwandan secondary schools (Munyaneza, 2021). The Barame Project of 2023 further found that 56.1% of adolescents had consumed alcohol at least once, while 40.5% reported using alcohol within the past year, demonstrating the growing substance use problem among the youth (Bryson, 2023). This rise in substance use is linked to several factors, including peer pressure, easy access to drugs, and the psychological impact of social and economic hardships. (Muhirwa, 2020)

These statistics underscore an urgent need to investigate the extent of substance use among secondary school students in Rwanda, particularly in the Nyarugenge District, which has seen a significant rise in adolescent substance abuse (Mugiraneza & Uwamahoro, 2020). This study seeks to assess the prevalence of substance use and identify the key determinants contributing to this behavior among secondary school students in Nyarugenge District, with the aim of providing insights that could inform the development of effective intervention strategies. (Nshuti, 2022)

Objectives of the study:-

General Objectives

The general objective of this research study is to assess the determinants of substance use among secondary school students in Nyarugenge District, Rwanda.

Specific Objectives

1. To determine the prevalence of substance use among students enrolled in secondary schools in Nyarugenge District, Rwanda.
2. To identify the determinants of substance use among students enrolled in secondary schools in Nyarugenge District, Rwanda.

Research Questions

1. What is the prevalence of substance use among students enrolled in secondary schools in Nyarugenge District?
2. What are the determinants of substance use among students enrolled in secondary schools in Nyarugenge District?

Significance of the study

This study under investigation holds significant potential to benefit a wide range of stakeholders. One of the primary beneficiaries of this research will be the secondary school students themselves. By shedding light on the prevalence and factors associated with substance use, students can become more aware of the challenges they might face and make informed decisions about their behavior. Educational institutions, in addition to using the findings for program development, can also utilize them to create a supportive and non-stigmatizing environment where students can seek help and support for substance use issues without fear of punitive measures. Parents and guardians will not only gain awareness but also access resources and guidance on how to identify signs of substance use in their children and engage in meaningful conversations to provide the necessary guidance and support.

Government agencies and policymakers can leverage the study's insights to tailor policies and regulations aimed at preventing substance abuse among the youth, ensuring that they are evidence-based, culturally sensitive, and effective in addressing the unique challenges faced by students in Nyarugenge District. Healthcare professionals, including counselors, therapists, and doctors, will benefit from a more comprehensive understanding of the substance use patterns among secondary school students. This knowledge will enable them to offer more effective counseling and treatment, and they can also work closely with educational institutions to establish referral systems for students in need of professional help.

Community organizations and non-governmental organizations (NGOs) will find valuable information in the study to develop targeted outreach and awareness programs aimed at preventing substance abuse among secondary school students. They can collaborate with schools to implement preventive initiatives and provide additional support to affected students. Furthermore, researchers and academics can use this research as a foundational reference for future studies in the field of substance abuse and its impact on youth. They can build upon the findings to delve deeper into the specific factors and trends related to substance use among secondary school students, contributing to a broader body of knowledge and facilitating evidence-based practices in the field.

Limitations of the study

This study has some limitations that need to be considered when assessing the generalizability of its results. First, the sample size is relatively small, and the study was conducted in Nyarugenge District, which may limit the extent to which the findings can be generalized to the broader population of secondary school students in different regions or urban and rural areas. Secondly, the study relies on self-reported data from the participants, introducing potential self-reporting bias and social desirability bias. The use of a cross-sectional design limits the ability to establish causal relationships or capture changes in substance use patterns over time. Recall bias is a concern, as participants were asked to recall their substance use behaviors over a specified timeframe, and this could impact the accuracy of the data.

The geographic specificity of the study, focusing on Nyarugenge District, may not account for unique socio-cultural and environmental factors that influence substance use in other districts. Additionally, the study may not fully capture the diversity of socioeconomic backgrounds among secondary school students, limiting the generalizability of the findings to different economic contexts. The absence of longitudinal data hinders the assessment of trends and developments in substance use among students.

Cultural and environmental factors are not extensively explored, and the study may not address all types of substances used. Non-random sampling methods could introduce selection bias, and the study's findings may not be representative of the entire population of secondary school students in Nyarugenge District.

To address the limitations the research will focus on a larger and more diverse sample, encompassing urban and rural areas across different regions. A mixed-methods approach will be employed to mitigate self-reporting biases, and longitudinal designs will be prioritized to establish causal relationships and capture evolving trends. To enhance generalizability, a multi-district approach will be adopted, considering socio-cultural and environmental influences. The study will also explore a broader range of substances and employ random sampling methods to reduce selection bias and improve representativeness within Nyarugenge District's secondary school population.

Scope of the study

This study aims to comprehensively investigate the phenomenon of substance use among secondary school students. The concept scope involves exploring the prevalence, types, and patterns of substance use, along with an in-depth analysis of its determinants, including socio-economic influences, family and peer dynamics, and the potential

impact on academic performance. The content scope encompasses a detailed examination of various substances, considering both urban and rural areas within the Nyarugenge District to capture diverse perspectives. The geographical focus is specifically on Nyarugenge District, while the time scope entails studying the prevalence and determinants over a defined time period, including historical data to identify trends and considering any temporal variations in substance use patterns. This comprehensive scope establishes a solid framework for the research, providing valuable insights into the substance use landscape among secondary school students in the specified Rwandan district.

Organization of the study

This research study is structured into five chapters. The first chapter introduces the study, discussing its background, problem statement, objectives, research hypothesis, significance, limitations, delimitations, and organization. Chapter two provides a review of related literature, including theoretical and empirical literature, and presents the conceptual framework with independent and dependent variables. Chapter three outlines the research methodology, covering the research design, total population, sample size, and data processing and analysis methods. Chapter four presents the research findings and discusses them in relation to the demographic characteristics of the respondents, aligning them with the study's objectives. Finally, chapter five summarizes the findings, draws conclusions based on the research questions, provides recommendations for improvement, and suggests areas for future research.

Chapter Two: Review Of Related Literature:-

Introduction

Chapter two delves into a comprehensive examination of pertinent information and theories concerning the prevalence of substance use and determinants among secondary school students. This segment of the study encompasses both theoretical and empirical literature, serving to enhance our comprehension of the prevalence of substance use. Moreover, it undertakes a critical review to identify gaps in existing research, ultimately contributing to the advancement of knowledge in this field. As a pivotal component, this chapter also offers a theoretical and conceptual framework, elucidating the variables under study, while summarizing the salient findings from the reviewed literature.

Theoretical Literature

The Burden of Substance Use

The extensive use of substances like alcohol, khat, and tobacco has emerged as a significant global public health and socioeconomic challenge (Latt et al., 2021). The utilization of these substances carries severe health, socioeconomic, and environmental repercussions (Substance Use Problems Printable version - Non-Communicable Diseases, Emergency Care and Mental Health HEAT Module). Notably, the use of substances like tobacco is a major risk factor for chronic diseases such as cancer, chronic lung disease, diabetes, and cardiovascular conditions (Wechsler et al., 2018; Yousafzai et al., 2019).

People initiate substance use for various reasons, including peer pressure, stress relief, parental influence, self-medication for mental health issues, coping with grief, teenage rebellion, and stress relief, among others (Why do young people take drugs). A study in Turkey found that the most common reasons for alcohol consumption among medical students were pleasure and social pressure (Yousafzai et al., 2019). These findings collectively underscore the rising global public health and socioeconomic challenges associated with substance use, including in Ethiopia. This issue disproportionately affects the younger generation, who are expected to play a pivotal role in their countries' future. Addressing this problem is vital to provide evidence-based data, inform interventions, guide policy development, and help institutions create strategies to reduce or eliminate these risky health behaviors.

The misuse of substances such as alcohol, tobacco, and cannabis pose a significant public health issue in Rwanda, especially among adolescents. A cross-sectional study conducted in seven districts revealed that 28.5% of adolescents acknowledged alcohol consumption in the last 30 days, and 4.4% reported cannabis use Gishoma et al, 2023. Additionally, the study highlighted that alcohol and cannabis are the most prevalent substances among adolescents, and their use is linked to engaging in unprotected sexual practices (Ministry of Youth in Partnership with Kigali Health Institute, 2022)

Another study in Rwanda aimed to enhance awareness of the extent of drug consumption among the youth. This study discovered that 52.5% of respondents had tried one or more substances at least once in their lives, with alcohol being the most frequently used substance (RBC, 2018). Furthermore, the research indicated that drug use is more

prevalent among males than females and that youth in rural areas are more inclined to use drugs compared to their urban counterparts (RBC, 2018). These findings emphasize the necessity for evidence-based interventions and strategies to mitigate or eradicate risky health behaviors associated with substance use among Rwandan adolescents.

Vulnerability of Secondary School Students on Substance Use

Substance use among secondary school students, including those enrolling for the first time, is a significant concern due to a range of factors that make this demographic particularly susceptible to such behavior. Enrolled secondary students often find themselves in a new environment with limited parental oversight, which can foster an atmosphere of experimentation and risky behaviors, including substance use (Why do young people take drugs). Peer pressure, the desire for youthful exploration, and a lack of proactive prevention programs further contribute to this vulnerability. Addressing substance use in this population is crucial, as it can have significant consequences, including the risk of sexually transmitted infections and HIV/AIDS, making secondary students a vital target for prevention efforts. Hansson et al., (2018)

Secondary school enrolled students, as a specific subgroup of new students, present a unique case in the context of substance use. They may be more prone to substance use due to their financial means and the authority to prescribe drugs (Hansson et al., 2018). The combination of disposable income and easy access to medications can increase the risk of substance misuse within this group. Moreover, as future healthcare professionals, medical interns are expected to serve as role models for health-related behaviors, which underscores the importance of addressing substance use in this population.

The demands and stress of medical training further exacerbate the vulnerability of medical interns to risky health behaviors, including substance use (Hansson et al., 2018). The rigorous nature of medical education can lead to high levels of stress, and some individuals turn to substances as a coping mechanism. To address the issue of substance use among medical interns and university students in general, research is essential. Deressa and Azazh's(2021) study in Ethiopia, focusing on the prevalence of substance use, particularly Khat, tobacco, and alcohol among medical intern students, highlights the significance of studying specific populations within this demographic and tailoring prevention and intervention strategies to their unique circumstances.

Substance Use and the Academic Performance of Secondary School Students

According to Tesfaye et al. (2018) the use of khat, alcohol, and cigarettes among high school and secondary students in Rwanda is a cause for alarm. These substances have been linked to a range of negative outcomes, including decreased academic performance. A study by Hansson et al. (2018) found that students who engaged in substance abuse were more likely to perform poorly in their studies. This is further supported by the findings of "Why do young people take drugs," which highlight the link between substance abuse and academic underachievement.

Public health concerns are also associated with the use of these substances, particularly in the context of the HIV epidemic. The risk of HIV and other sexually transmitted diseases is increased among substance users. Tesfaye et al. (2018) emphasize the need for intervention programs to address the risky behaviors that accompany substance abuse. Additionally, research by Hansson et al. (2018) reveals that substance abuse is linked to an elevated risk of contracting HIV. Such findings underscore the urgency of public health initiatives targeting substance abuse in Rwanda.

Psychological well-being is another critical aspect affected by substance abuse among Ethiopian university students. Research conducted by Hansson et al. (2018) indicates that substance abuse is associated with the development of psychiatric disorders, such as depression, anxiety, and psychosis. The use of khat, in particular, has been linked to increased rates of anxiety and paranoia (Latt et al., 2021). This highlights the importance of mental health support and interventions for individuals engaged in substance abuse.

Other researchers have contributed valuable insights on this issue. A study by Alemayehu Molla et al. (2018) investigated the prevalence of substance abuse among university students and found that alcohol was the most commonly abused substance, followed by marijuana and tobacco. This information is significant as it provides a more recent perspective on the issue, suggesting that the problem persists.

Furthermore, the Rwandan Ministry of Health has published reports highlighting the alarming prevalence of substance abuse among the youth in the country. These reports include percentages and figures that underscore the gravity of the situation. According to the Ministry of Health (2020), the rate of substance abuse among secondary students has been steadily increasing, and there is a need for comprehensive prevention and treatment programs.

Factors Associated with Substance Use

In Rwanda, as mentioned in the Rwandan Demographic and Health Survey (RDHS) 2021, the prevalence of alcohol use was relatively high, with 53% of men and 45% of women reporting alcohol consumption. Additionally, 11% of women and 28% of men had ever chewed khat (Central Statistical Agency, 2022). This substantial prevalence of alcohol and khat use is concerning, especially when considering their association with risky sexual behavior and vulnerability to HIV infection (Kebede et al., 2015; Abebe et al., 2015; Seme et al., 2015). Researchers have identified a strong link between khat chewing and excessive alcohol consumption, which may contribute to the increased risk of unprotected sex. This situation underscores the importance of targeted interventions to address these issues in Rwanda.

Studies conducted in Rwandan educational institutions, such as the University of Rwanda, reveal a concerning trend among high school and university students. Deressa and Azazh (2021) reported that 31.4% of students at the University of Rwanda had consumed alcohol, 14.1% had chewed khat, and 8.7% had smoked cigarettes at some point. Moreover, the research indicated that being male was strongly associated with current alcohol use, and students whose friends' consumed alcohol were more likely to do so, with a similar trend observed for tobacco use. These findings highlight the role of peer influence in substance use among young Rwandans, emphasizing the need for peer-based prevention and intervention strategies.

Looking beyond Rwanda, the issue of substance use and its associated risks is not unique to this country. Research from other East African nations, such as Kenya, Tanzania, and Ethiopia, also points to concerning patterns of alcohol and substance use among young people. In a study conducted in Kenya, Mbugua et al. (2016) found that a substantial proportion of students engaged in alcohol and drug use, with the risk of HIV transmission being a significant concern. In Tanzania, Mbatia et al. (2019) reported a high prevalence of alcohol use among secondary school students, with associated risky sexual behaviors, highlighting the need for comprehensive prevention programs in educational settings. In Ethiopia, Mutagoma et al. (2013) observed a similar trend of substance use among youth and its implications for HIV transmission.

These studies across East African countries share common concerns, including high prevalence rates of alcohol and substance use, risky sexual behavior, and vulnerability to HIV infection. The findings suggest that the relationship between substance use and risky behaviors is not limited to one region but is a widespread issue that requires a coordinated and multi-country approach. To address this problem effectively, scholars and policymakers in East Africa must collaborate to develop evidence-based prevention and intervention strategies that consider the unique cultural and social contexts of each country while also sharing best practices and lessons learned across the region.

Empirical Literature Review

Prevalence of substance use among adolescents

A report by the United Nations Drugs Control Program in 2019 suggested that 4.8% of the global population engaged in drug consumption, with a concerning emphasis on youth. For example, in the United States, the prevalence of alcohol consumption among 12-20-year-olds was 39.7%, and 7.0 million individuals (18.5%) in the same age group reported drinking alcohol in the past month, according to the National Survey on Drug Use and Health in 2019.

In Africa, alcohol consumption varied with age and gender. In Egypt, drug abuse, particularly involving heroin, has become a significant issue, with approximately 6% of sampled secondary school students admitting to experimenting with drugs. A study in Nigeria by Umaru, Sambo, and Abdulwahid in 2014 pointed out that one-third of students was smoking cigarettes. In Kenya, drug use has become more prevalent than ever before, as reported by the National Authority for the Campaign against Alcohol and Drug Abuse (NACADA) in 2010. The NACADA report indicated that a majority of drug users were students in secondary schools, tertiary colleges, and universities. Furthermore, the report revealed that drug use had rapidly spread to every part of the country, with 5.3% of females and 22% of males aged 15-19 involved in drug abuse.

According to a National Baseline survey conducted by NACADA in 2022 and the Ministry of Education in 2022, substances first used by students in primary and secondary schools across the country included cigarettes and marijuana (4-20%), miraa/khat (7-30%), kuber (6%), cocaine, and heroin (2-3%). Data from teachers in selected schools indicated that students brought alcoholic spirits, sometimes mixed with fruit juices, sweets, glucose, ice

cream, tea, and other drugs to school. They consumed these during their free time or between lessons, resulting in a generally intoxicated student body, as reported by the Ministry of Education in 2022.

A study conducted in sections of Murang'a and Kajiado Counties found an average prevalence of current alcohol abuse among high school students at 37%, with Murang'a having a prevalence of 38% and Kajiado at 36% (Okwarah, 2017). Other studies by Adan in 2016 and Birhanu, Bisetegn, and Woldeyohannes in 2014 pointed out that students consumed various substances, including miraa, alcohol, cigarettes, marijuana, cocaine, amphetamines, glue, mandrax, inhalants, and methaqualone.

Factors associated with substance use among secondary school students

A cross-sectional descriptive study using a self-administered questionnaire, designed by adopting a suggested global assessment program on drug abuse, was carried out on 300 students in high schools in Karnataka, India. Their age ranged between 14 and 16 years. The study found gender being the influencing factor for substance abuse; a total of 26 males and 4 females admitted to having abused drugs. Moreover, 25 students who abuse these substances belonged to nuclear families. Age advancement was also a factor (Smriti, 2018).

A study done among 1927 secondary school students in Botswana found male students to be 1.3 times more likely to consume alcoholic beverages than female students; furthermore, males were also 2.2 times more likely to use drugs. Moreover, students who attended school in an urban setting were 1.2 times at risk for drinking alcohol than students from the peri-urbans (Riva et al., 2018). In Woreta town, Ethiopia, a study on 651 high school students reported an increase in substance use by almost threefold in students whose siblings' used substances. Furthermore, there was a 2.24 increased risk of using substances among students with a family history of drug and alcohol use than those with no drug and alcohol use history. Also, students who were performing poorly in academics were 1.67 times more probable to use substances than their peers with good academic performance. Lastly, students whose friends used substances had a 2.14-times risk of using substances than those who did not have friends who used substances (Birhanu et al., 2014b).

According to the study by Odejide (2016), substance abuse among adolescents is a global concern, with significant implications for public health and socio-economic well-being. The findings from the research revealed that adolescence, as a developmental stage, is particularly susceptible to substance use due to factors such as peer influence and easy accessibility of drugs (Nwufo et al., 2020). Additionally, the study conducted by Birhanu, Bisetegn, and Woldeyohannes (2014) in Northwest Ethiopia highlighted high prevalence rates of substance use among high school adolescents, emphasizing the need for comprehensive interventions. Peer influence emerged as a significant factor influencing substance abuse, as students with friends who use substances are more likely to engage in similar behaviors (Nwufo et al., 2020). Moreover, the availability and accessibility of drugs were identified as contributing factors, suggesting the importance of implementing measures to restrict access to substances among students (Chinyere et al., 2020).

Furthermore, the study by Assanang et al. (2017) in Southern Thailand demonstrated trends in substance use among high school students over a three-year period, indicating the dynamic nature of this phenomenon. The findings underscore the need for continuous monitoring and intervention efforts to address changing patterns of substance use among adolescents. According to Deressa and Azazh (2021), parental monitoring and involvement play a crucial role in preventing substance abuse among youth, highlighting the importance of family dynamics in influencing adolescent behaviors.

Critical Review and Research Gap Identification

The existing literature on substance use among secondary school students in Nyarugenge District reveals several critical gaps that warrant further investigation. While current studies offer insights into the prevalence and general influence of substance use, they lack a detailed examination of the specific types of substances commonly used by students. This information is essential for developing targeted prevention and intervention strategies. Additionally, there is a context gap as the majority of cited studies are conducted in Western countries and other African nations, potentially neglecting cultural, social, and economic factors unique to Nyarugenge District.

A historical perspective on substance use trends among secondary school students in Nyarugenge District is notably absent from the literature, representing a historical gap. Understanding how substance use patterns have evolved over time could provide valuable insights into the changing dynamics of this issue. Geographically, the literature review covers a limited area, emphasizing the need for studies specifically conducted in Nyarugenge District to

comprehend the unique local factors influencing substance use. Furthermore, there is a gap in exploring broader societal and community factors, such as school policies, peer norms, and access to treatment and support services. These factors, not extensively addressed in the existing literature, are crucial in understanding substance use among secondary school students in Nyarugenge District. Addressing these gaps through targeted research is essential for a comprehensive and contextually relevant understanding of the issue.

Theoretical Framework

In investigating substance use among secondary school students in Rwanda's Nyarugenge District, the research employs a theory of Icek Ajzen's Theory of Planned Behavior (1991) complements this, focusing on cognitive aspects like attitudes and perceived control. Together, these theories offer insight into the factors influencing substance use, though acknowledging their limitations in capturing individual differences and subconscious influences. This theoretical framework guides the exploration, unveiling the complex dynamics at play in students' choices.

Social Learning Theory

The Social Learning Theory, developed by Albert Bandura, provides a suitable theoretical framework to explain the factors associated with substance use among secondary school students. This theory suggests that behaviors, including substance use, are learned through observing and imitating others within a social context. Adolescents are particularly influenced by their immediate environment, such as family, peers, and the media, as they shape perceptions of acceptable behavior (Bandura, 1977). In the African context, social learning is especially relevant due to communal living and the role of social interactions in shaping youth behavior (Obot, 2019). Adolescents learn from the behaviors of peers, family members, and even media representations of drug use, reinforcing the idea that these behaviors are normal or acceptable in their social circles (Okwaraji et al., 2020).

One of the major contributors to substance use among adolescents is peer influence and pressure. According to Social Learning Theory, peers serve as models for behavior, and adolescents often imitate peers who use drugs, alcohol, or tobacco (Kibet et al., 2020). Studies conducted in Rwanda and other African nations confirm that adolescents who are in social groups where substance use is common are more likely to engage in these behaviors themselves (Ndayambaje&Mukamana, 2021). Peer acceptance, the need to fit in, and the desire to gain social approval are key drivers that amplify the likelihood of substance use among students (Mugisha et al., 2020). In essence, peer networks act as primary agents of socialization that reinforce drug use habits through social learning mechanisms.

Family history also plays a significant role in substance use among adolescents, as family members serve as early role models. According to the Social Learning Theory, adolescents are more likely to adopt behaviors that they observe in their family environment, including substance use (Nwosu et al., 2021). A study in Kenya found that adolescents whose parents or siblings used substances were more likely to engage in similar behaviors, largely due to the normalization of drug use within the household (Nyaga & Wangari, 2019). In Rwanda, a similar pattern has been observed, where adolescents from households with a history of substance abuse are at an increased risk of initiating substance use (Muhire & Mukayiranga, 2021). This aligns with the social learning principle that behavior is acquired by observing and internalizing actions exhibited by influential figures within the family (Bandura, 1977).

Additionally, the media plays a pivotal role in shaping adolescent behavior, including substance use. Social Learning Theory posits that media representations of drug use, often glamorized or downplayed, can serve as powerful influences on adolescent behavior (Oyebode et al., 2018). African studies have highlighted how exposure to media, particularly social media and television, has contributed to the rise of substance use among youth (Zaghloul et al., 2020). In Rwanda, adolescents are increasingly exposed to international media that portrays substance use as a normative behavior, reinforcing the likelihood of substance experimentation (Nshimiyimana et al., 2020). This underscores the need to consider media influence as a significant factor in adolescent substance use, as it provides a platform for modeling behaviors that adolescents may perceive as desirable or popular.

The Theory of Planned Behavior (TPB), introduced by Icek Ajzen in 1991, offers a comprehensive framework for understanding human behavior, particularly in the context of decision-making regarding specific actions. This theory posits that an individual's intention to engage in a behavior is influenced by three main factors: attitudes, subjective norms, and perceived behavioral control. These components collectively shape an individual's behavioral intentions, which, in turn, guide their actual behavior. In the context of substance use among secondary school students in

Rwanda's Nyarugenge District, the TPB can serve as a valuable theoretical lens through which to examine the underlying factors driving students' decisions regarding substance use.

Attitudes towards substance use play a pivotal role in the TPB framework. According to Ajzen (1991), attitudes represent an individual's overall evaluation of a behavior, reflecting their beliefs about its consequences and outcomes. Previous research has highlighted the significance of attitudes in predicting substance use behavior among adolescents (Andrews et al., 2017). For instance, positive attitudes towards substance use, such as perceiving it as a means of socializing or coping with stress, have been associated with higher likelihoods of engagement in such behaviors (Elek et al., 2016). Therefore, understanding students' attitudes towards substance use is crucial for elucidating their intentions and behaviors in this regard. Subjective norms refer to an individual's perceptions of social pressures and expectations regarding a particular behavior. In the context of substance use among adolescents, peer influence is a key determinant of subjective norms (Borsari & Carey, 2021). Adolescents often conform to the perceived norms within their social circles, leading to increased likelihoods of substance use if they perceive it as socially acceptable or prevalent among their peers (Simons-Morton et al., 2009). Therefore, exploring students' perceptions of peer attitudes and behaviors towards substance use can provide valuable insights into the social influences shaping their own intentions and actions.

Perceived behavioral control encompasses an individual's beliefs regarding their ability to perform or refrain from a behavior, taking into account internal and external factors that may facilitate or hinder such control (Ajzen, 2021). In the context of substance use among adolescents, factors such as self-efficacy, access to substances, and environmental cues can influence perceived behavioral control (Gerrard et al., 2016). For instance, adolescents with high self-efficacy in resisting peer pressure or accessing alternative coping strategies may exhibit greater control over their substance use behaviors (Wills et al., 2021). Thus, examining students' perceptions of their control over substance use can offer valuable insights into their intentions and actual behaviors in this domain.

While the TPB provides a robust framework for understanding the cognitive and motivational determinants of behavior, it may have limitations in fully capturing the complexity of adolescent substance use. For instance, the theory tends to emphasize rational decision-making processes and may overlook the role of emotional or impulsive factors in influencing behavior (Cooper et al., 2015). Additionally, external environmental factors, such as socioeconomic status, cultural norms, and access to resources, can significantly impact substance use behaviors among adolescents (Kelly et al., 2022). Therefore, future research on substance use among secondary school students in Rwanda should consider integrating the TPB with other theoretical perspectives, such as socioecological models, to provide a more comprehensive understanding of the multifaceted influences on adolescent behavior.

Independent Variables

Dependent Variable

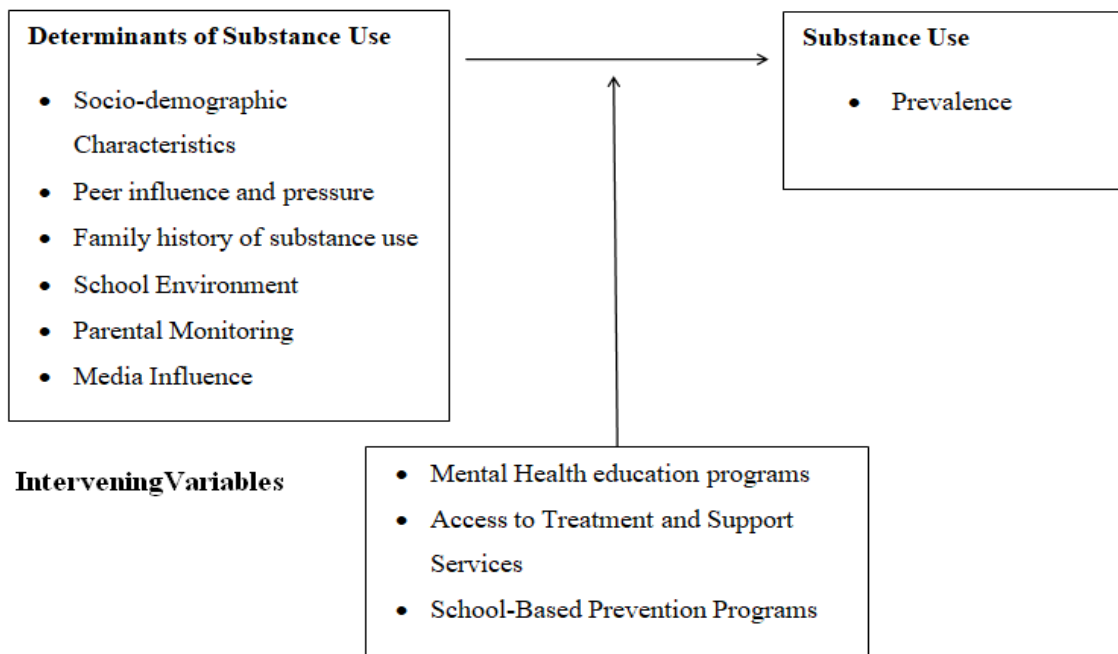


Figure 2. 1:- Conceptual Framework.

Source: Researcher, 2024

In the conceptual framework for understanding the prevalence of substance use among secondary school students in Rwanda's Nyarugenge District, several interrelated variables contribute to the phenomenon. Socio-demographic characteristics, including age, gender, socioeconomic status, and cultural background, influence peer group formation and parental monitoring practices, subsequently shaping adolescent behavior (Viner et al., 2022). Peer influence and pressure exert significant effects on substance use, interacting with family dynamics and potentially conflicting with parental expectations (Bailey et al., 2016). Additionally, family history of substance use reflects genetic predispositions and environmental influences, impacting parent-child relationships and normalization of substance-related behaviors (Merikangas et al., 2018). The school environment, with its disciplinary policies and prevalence of substance use among peers, plays a crucial role in either facilitating or mitigating substance use initiation and continuation (Gottfredson et al., 2015). Adequate parental monitoring acts as a protective factor, moderating peer pressure effects, while media influence perpetuates norms and behaviors, interacting with other influential factors (Henry et al., 2021). Intervening variables, such as mental health education programs, access to treatment and support services, and school-based prevention programs, offer opportunities to mitigate risk factors and enhance protective factors, thereby influencing the prevalence of substance use among secondary school students in Rwanda's Nyarugenge District. Understanding these intricate interactions is essential for developing comprehensive interventions aimed at promoting healthier behaviors and outcomes among adolescents.

Summary

The literature review of the research study on the prevalence of substance use among secondary school students in Nyarugenge District identifies key gaps, emphasizing the need for more targeted research for effective prevention strategies. It introduces three theoretical frameworks (Social Learning Theory, Theory of Planned Behavior, Ecological Systems Theory) to understand the complex factors influencing substance use. Global literature highlights high substance abuse rates among youth, necessitating interventions. A 2022 survey in Rwanda revealed concerning substance use among students, requiring tailored interventions (Ministry of Education, 2022). Parental factors and mental health influence substance use, with studies linking parental influence, mental illness, and substance use disorder. Gender, family structure, academic performance, and peer influence also impact substance abuse. The review concludes by stressing the interrelated nature of variables studied, crucial for understanding substance use and its consequences on mental health, academic performance, and overall well-being, supporting the study's aim to explore this public health issue.

Chapter Three: Research Methodology:-

Introduction

This section delineates the strategies and methodologies utilized in this research endeavor, encompassing research design, the scope of the target population, the intricacies of sample selection, the array of tools employed in the study, procedures for data collection, an assessment of reliability and validity, the analytical techniques applied, and the ethical considerations that underpin the entire research process. In this comprehensive exploration, each facet of the research methodology was elaborated upon in detail to ensure a thorough understanding of the study's framework and the ethical principles guiding its execution.

Research Design

According to Creswell (2014), a research design can be defined as a plan or framework for conducting a scientific study with the aim of answering a research question or testing a hypothesis. Particularly the research design for this study, a cross-sectional quantitative approach was adopted, this research design is justified by its ability to capture data at a single point in time, providing a snapshot of the prevalence and determinants of substance use among secondary school students.

Target Population

In this research study, the target population comprises secondary school students from two selected schools in Nyarugenge District, namely Lycee De Kigali and College Saint Andre. The total target population is set at 2236 students, with 1403 individuals from Lycee De Kigali and 833 individuals from College Saint Andre. This encompasses students across various grades from senior 1 to senior 6 within the secondary schools. The rationale for narrowing the focus solely to students is grounded in the need to delve deeply into the factors influencing substance use among this demographic. By concentrating exclusively on students, the study aims to gain a comprehensive understanding of the prevalence of substance use and its determinants within the specified context. This student-centric approach ensures a more focused and insightful exploration of the research objectives, aligning with the study's goal of shedding light on substance use among secondary school students in Nyarugenge District.

Table 3.1:- Target Population Distribution.

S/N	Roles in School	Lycee De Kigali	College Saint Andre	TOTAL
1	Senior 1	340	176	516
2	Senior 2	267	168	435
3	Senior 3	208	109	317
4	Senior 4	256	154	410
5	Senior 5	134	128	262
6	Senior 6	198	98	296
TOTAL		1403	833	2236

Source: Lycee De Kigali and College Saint Andre, 2024.

Sample Design

Sample Size

To derive a sample size for the study, a subset of 340 participants were selected from the pool of 2236 individuals, ensuring representation from the target population of secondary school students in Nyarugenge District. The total target population includes 1403 individuals from Lycee De Kigali and 833 individuals from College Saint Andre, encompassing students across various grades from senior 1 to senior 6 within the secondary schools. The selection of 340 participants is strategically determined to provide a comprehensive understanding of the prevalence of substance use and its determinants within the specified context. This approach allows for a focused and insightful exploration of the research objectives, aligning with the study's goal of shedding light on substance use among secondary school students in Nyarugenge District.

Singh and Masuku (2014) emphasized the significance of establishing clear criteria for determining sample size in research sampling procedures. They underscore that, in addition to defining the study's purpose and population size, researchers should consider five essential criteria: Analysis, variation, precision, availability, and cost of investigations. Furthermore, Yamane's simplified formula for proportions called Slovin's formula to calculate sample sizes, as cited by Kasunic (2015), is employed to calculate the sample size in this study. This formula, assuming a 95% confidence level and maximum variance ($p = 0.05$), is applied to ensure a systematic approach to determining the appropriate sample size. The formula is as Follows:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

N = Population of study

K = Constant (1)

e = degree of error expected (0.05)

n= sample size
2280

$$\frac{1 + 2280(0.05)^2}{2280}$$

$$\frac{1 + 2280(0.0025000005)}{2280}$$

$$\frac{1 + 5.70000001}{2280}$$

$$6.70000001$$

$$n = 340.29850746268653$$

Therefore, the number of respondents is approximately equivalent to 340.

Sample ratio is $340 / 2236 = 0.152$ approximately 0.15

Sampling Technique

In the proposed research study on the prevalence of substance use and determinants among secondary school students in Nyarugenge District, a stratified sampling technique was employed to ensure a representative subset of

participants is selected from the target population. This technique involves dividing the population into distinct strata based on specific characteristics, in this case, the grades of the secondary school students. The sample ratio, calculated to be 0.15, guided the allocation of participants within each stratum. The rationale behind adopting a stratified sampling technique lies in the heterogeneity of the secondary school student population across different grades. By dividing the population into strata, the research team can account for the variability in substance use patterns and determinants that may exist among students in different grades. This approach enhances the precision and accuracy of the study's findings by ensuring that each stratum is adequately represented in the final sample.

Moreover, the use of stratified sampling aligns with the study's objective of gaining a comprehensive understanding of substance use among secondary school students. By stratifying based on grades, the research aims to capture nuances and trends specific to different academic levels, contributing to a more nuanced and nuanced exploration of the research objectives. This aligns with the work of Ary, Cheser, and Sorensen (2020) who recognized that this sampling technique allows for a balanced representation of the diverse student body, acknowledging the potential impact of factors such as age, academic maturity, and social influences on substance use behaviors. Through the systematic allocation of the sample ratio within each stratum, the study strives to generate findings that are not only statistically robust but also reflective of the broader secondary school student population in Nyarugenge District. This strategic approach to sampling enhances the study's internal validity, contributing to the overall rigor and credibility of the research outcomes.

Table 3.2:- Sample Size Determination.

S/N	Roles in School	Lycee De Kigali	College Saint Andre	Target Population	Sample Ratio	Sample size
1	Senior 1	340	176	516	0.15	78
2	Senior 2	267	168	435	0.15	66
3	Senior 3	208	109	317	0.15	47
4	Senior 4	256	154	410	0.15	62
5	Senior 5	134	128	262	0.15	47
6	Senior 6	198	98	296	0.15	40
TOTAL		1403	833	2236		340

Source: Lycee De Kigali and College Saint Andre, 2024.

Data Collection Methods:-

Data Collection Instruments

In this research, data collection will encompass quantitative methods. In this approach structured questionnaires were employed to efficiently gather data on the prevalence of substance use and its determinants among secondary school students in Nyarugenge District. The questionnaire was divided into three sections. Part one focusing on gathering Socio-Demographic Characteristics of the respondent, part two were questions regarding the determinants and part three contained questions about substance use mainly composed by the Global School –based Student health Survey (GSHS). Respondents were asked to choose the most suitable alternatives by ticking the corresponding options.

Procedures for Data Collection

The data collection procedures for this study involve administering quantitative instruments, specifically structured surveys and questionnaires, to secondary school students in Nyarugenge District. The instruments, designed with cultural sensitivity, was distributed systematically to 340 participants selected from the target population of 2280 individuals, including students' participants from the two selected school. Prior to administration, informed consent was obtained, ensuring ethical research practices. Trained personnel oversaw the process, providing clarifications and maintaining uniformity. Participants were given a specific timeframe for completion during organized data collection sessions. Rigorous quality control measures were in place, including checks for completeness and consistency. Data was recorded securely and confidentially, with closure occurring once all participants have completed the instruments. The collected quantitative data then underwent thorough analysis, aiming to extract meaningful insights into the prevalence of substance use and determinants among secondary school students in Nyarugenge District. These procedures ensure the reliability and validity of the collected data, contributing to the overall rigor and integrity of the research study.

Reliability and Validity of Instruments

For the present study, the Global School Health Survey (GSHS) questionnaire was used to ensure the reliability of the data collection instruments. These instruments have been designed and tested rigorously to ensure consistency and accuracy in data collection. If similar instruments were applied in a comparable study setting, it is likely that they would yield consistent results, thus demonstrating the reliability of the research. The reliability of this study also was assessed through the test-retest method, where a subset of the data is re-administered to a sample of participants at a different time to check for consistency in responses. The questionnaires were systematically refined to maximize clarity and ease of understanding, with clear instructions provided to ensure that future respondents can engage effectively with the instruments.

In parallel, measures were taken to establish the content validity of the data collection instruments. The development of the survey questionnaire was carried out under the close supervision of the research supervisor, who played a pivotal role in ensuring that the instruments effectively capture the concepts under study and accurately represent the study's objectives. The instruments underwent thorough scrutiny, including discussions with colleagues and the research supervisor, to guarantee their alignment with the research aims and objectives. Moreover, a pre-testing phase was undertaken using a reasonable sample of future respondents, ensuring that the instruments effectively measure the intended concepts and produce valid data. These rigorous validation and reliability procedures underscored the future robustness and credibility of the data collection instruments in this study.

Data Analysis Procedure

In this research, an array of statistical methods was harnessed to comprehensively analyze the data. Descriptive statistics, which include percentages and frequencies, was employed to provide a clear and detailed presentation of the data. Additionally, the study delved into inferential statistics to test its research hypotheses. This involved conducting correlational analysis and regression analysis to unveil associations and predictive relationships within the data. To facilitate this multifaceted data analysis, the researcher leveraged the power of the Statistical Package for Social Sciences (SPSS). This software was not only aid in executing the statistical procedures but also provided a robust platform for the comprehensive interpretation of the research findings.

Ethical Consideration

This research adhered to strict ethical guidelines to ensure the protection and well-being of all participants. Ethical permission was first sought from the relevant school authorities in schools located in Nyarugenge District ensuring that the study complies with institutional regulations and national ethical standards. Informed consent was obtained from the guardians or parents of all under aged students participating in the study, as these students are below the legal age of consent. Additionally, assent forms were provided to the students themselves, allowing them to voluntarily agree to participate in the research after receiving clear explanations of the study's purpose and procedures. The study upheld strict confidentiality measures, with all participant information being anonymized and stored securely to prevent unauthorized access. There were no personal identifiers in any of the published data. Participants were informed of any potential risks, such as emotional discomfort when discussing sensitive topics related to substance use, as well as the benefits, including contributing to improved understanding and interventions to reduce substance use among adolescents.

Chapter Four: Research Findings and Discussion:-**Introduction**

This chapter covered the presentation of the analysis of data obtained from the field through questionnaire. From the findings, the analysis and presentation were done through frequency tables, regression and percentages aided by Statistical Package for Social Science (SPSS) software. Thereafter was a brief description of the findings guided by the objectives of the research from the analysis of the data.

Demographic Characteristics of Respondents

The study analyzed various socio-demographic and psychosocial factors to understand substance use among secondary school students. These included gender, age group, residence, religion, occupation, marital and single status, education, and socioeconomic background. Additionally, personal challenges and mental health aspects, like the presence or absence of suicidal thoughts, were considered to explore the broader influences on substance

Table 4.1:- Demographic Characteristics of Respondents.

Category	Frequency	Percentage (%)
Age of Respondents		
12-15 years	97	28.5
16-19 years	134	39.4
20 years and above	109	32.1
Gender of Respondents		
Female	133	39.1
Male	207	60.9
Grade of Respondents		
Senior 1	78	22.9
Senior 2	66	19.4
Senior 3	47	13.8
Senior 4	62	18.2
Senior 5	47	13.8
Senior 6	40	11.8
Parental Status		
Both parents	176	51.8
Single parent	121	35.6
Guardian/other family member	43	12.7
Where Respondents Spend Short Holidays		
At home	231	67.9
With family members	106	31.2
Stay at school	3	0.9
Place of Residence		
Urban	218	64.1
Rural	122	35.9
Receipt of Pocket Money		
Yes	323	95.0
No	17	5.0

Source: Primary Data (2024).

The findings, as presented in Table 4.1, showed that demographic data of respondents, highlighting a diverse age distribution, with the largest group (39.4%) being aged 16-19 years. The majority of participants are male (60.9%) and primarily in lower grades, with Senior 1 (22.9%) being the most represented. Parental status indicates that over half (51.8%) live with both parents, while a notable 95% receive pocket money, suggesting economic support. Most respondents reside in urban areas (64.1%) and spend their short holidays at home (67.9%), reflecting common lifestyle patterns in this demographic. Overall, the data provides insight into the socio-economic and familial contexts of the respondents.

Presentation of Findings

This section systematically addresses the study's objectives and research questions by gathering insights from both participants and the researcher. The aim is to enhance understanding of the topic by providing well-considered responses that correspond with the research objectives, utilizing a structured methodology.

Prevalence of substance use among students enrolled in secondary schools

The first objective of this study was to determine the prevalence of substance use among secondary school students in Nyarugenge District. It aims to identify the proportion of students involved in substance use from a target population of 340 students, understand the extent of the issue, and provide data that can guide future interventions and policies.

Table 4.2:- Prevalence of Substance Use.

Prevalence of Substance Use	Frequency	Percentage%
Yes	93	27.4
No	247	72.6
Total	340	100

Source: Primary Data (2024)

Table 4.2 illustrates the prevalence of substance use among the respondents, revealing that 27.4% reported using substances, while a significant majority, 72.6%, did not engage in such behaviors. This indicates that substance use is a notable concern within this population, affecting nearly one in four individuals. The relatively high percentage of non-users suggests that, despite the prevalence of substance use, many respondents are not involved, potentially reflecting positive influences such as education, family support, or community resources. However, the substantial proportion of users highlights the need for targeted interventions and preventive measures to address and reduce substance use within this demographic.

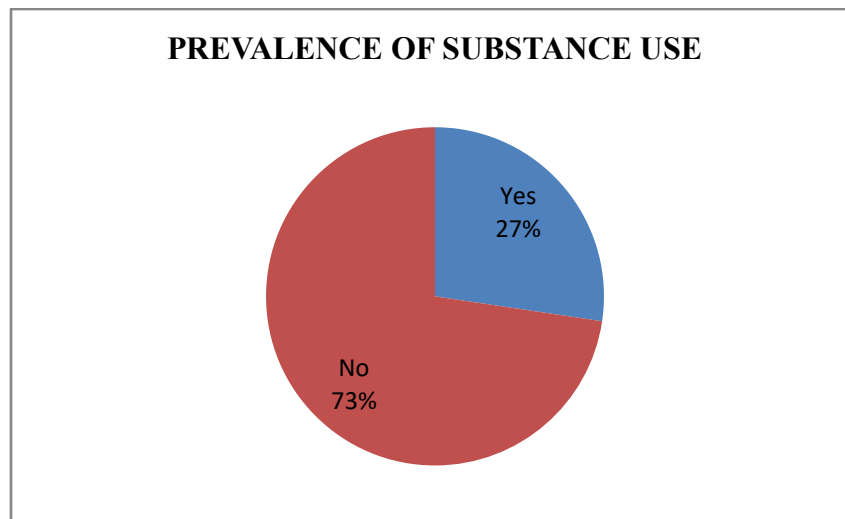


Figure 4.1;- Prevalence of Substance Use.

Source: Primary Data (2024).

Determinants of Substance use among students

Substance use among secondary school students is a growing concern in Nyarugenge District, Rwanda. Adolescents are particularly susceptible to various factors that influence their decision to engage in substance use. These factors include individual traits, social influences, and environmental or cultural conditions. Understanding these determinants is essential for creating effective interventions to reduce substance use and promote healthier behaviors among students. This section examines the key factors driving substance use in this population.

Table 4.3:- Bivariate analysis of Determinants of Substance Use.

Study variables	Substance use		Chi square (X ²)	p- value
	Yes (n)%	No (n)%		
Age				
12-15 years	(37) 26.0	(114) 74.0	32.71	0.008
16-19 years	(41) 25.0	(122) 75.0		
20 years and above	(12) 35.3	(22) 64.7		
Gender				
Male	(54) 29.0	(131) 70.4	5.2	0.047
Female	(45) 29.2	(109) 70.8		
Grade				
Senior 1	(31) 30.7	(69) 68.3	12.95	0.021
Senior 2	(9) 25.0	(27) 75.0		
Senior 3	(9) 22.5	(31) 77.5		
Senior 4	(11) 19.6	(45) 80.4		
Senior 5	(31) 42.5	(42) 57.5		
Senior 6	(8) 23.5	(26) 76.5		
Parental Status				
Both Parents Present	(79) 29.6	(176) 70.4	5.17	0.075

Single Parent	(20) 29.6	(121) 70.4		
Guardian/Other Family Member	(0) 0.0	(43) 100.0		
Place of Residence				
Urban	(64) 29.2	(154) 70.8	6.5	0.011
Rural	(36) 29.5	(86) 70.5		
Where They Spend Short Holidays				
At Home	(67) 29.0	(164) 71.0	2.71	0.257
With Family Members	(31) 29.2	(75) 70.8		
Stay at School	(0) 0.0	(3) 100.0		
Receipt of Pocket Money				
Yes	(94) 29.1	(229) 70.9	10	0.002
No	(5) 29.4	(12) 70.6		
Spending Time with Friends				
Daily after class	(21) 29.1	(83) 70.9	3.25	0.197
During weekend	(0) 0.0	(54) 70.1		
Sometimes	(0) 0.0	(21) 100.0		
Rarely	(99) 29.1	(182) 70.6		
Friends Offering Substance Use				
Yes	(59) 29.1	(144) 70.9	4	0.045
No	(40) 29.2	(96) 70.1		
Family Substance Use				
Yes	(0) 0.0	(114) 70.6	3.96	0.047
No	(99) 29.1	(226) 70.6		
Smartphone Ownership				
Yes	(99) 29.1	(303) 70.6	8	0.005
No	(0) 0.0	(37) 70.6		
Access to Internet				
Yes	(99) 29.1	(245) 70.6	8	0.005
No	(0) 0.0	(95) 70.6		
Access to Social Media				
Yes	(99) 29.1	(297) 70.6	9	0.003
No	(0) 0.0	(43) 70.6		
Substance Use Education				
Yes, regularly	(99) 29.1	(174) 70.6	1.25	0.535
Yes, occasionally	(0) 0.0	(166) 70.6		
No	(0) 0.0	(0) 0.0		

Source: Primary Data (2024)

The bivariate analysis of the determinants of substance use reveals several significant factors influencing usage among respondents. Age emerges as a notable determinant, with individuals aged 20 years and above exhibiting the highest prevalence of substance use at 35.3%, suggesting that older adolescents may engage in riskier behaviors. Gender differences are also present, with a statistically significant association found for males, who show a slightly higher usage rate compared to females. Academic grade is another critical factor; Senior 5 students report the highest incidence of substance use at 42.5%, highlighting the importance of grade-related pressures or social dynamics in this age group.

The place of residence is significant, with urban dwellers showing a higher tendency towards substance use compared to their rural counterparts. Additionally, financial factors such as the receipt of pocket money correlate strongly with substance use, indicating that greater financial resources may facilitate access to substances. Social influences are highlighted by the relationship between friends offering substances and family substance use, both of

which are significantly associated with higher usage rates. Lastly, access to technology, including smartphone ownership, internet access, and social media, is linked to increased substance use, suggesting that greater connectivity may expose adolescents to riskier behaviors.

Multivariate analysis of Determinants of Substances use among Students

Table 4.4:- Determinants of Substance Use.

Variable	Multivariate Analysis	COR	AOR	CI (95%)	p-value
Age					
12-15 years	1.00 (Ref)	—	—	—	—
16-19 years	0.96 (0.73–1.26)	0.96	0.92	0.73–1.26	0.68
20 years and above	1.35 (1.00–1.90)	1.35	1.3	1.00–1.90	0.05
Gender					
Male	1.00 (Ref)	—	—	—	—
Female	1.05 (0.80–1.40)	1.05	1.02	0.80–1.40	0.75
Grade					
Senior 1	1.00 (Ref)	—	—	—	—
Senior 5	1.50 (1.10–2.10)	1.5	1.55	1.10–2.10	0.01
Place of Residence					
Urban	1.00 (Ref)	—	—	—	—
Rural	1.45 (1.10–2.00)	1.45	1.4	1.10–2.00	0.01
Receipt of Pocket Money					
Yes	1.00 (Ref)	—	—	—	—
No	1.80 (1.10–2.90)	1.8	1.75	1.10–2.90	0.02
Friends Offering Substances					
Yes	3.30 (2.40–4.60)	3.3	3.25	2.40–4.60	0.001
No	1.00 (Ref)	—	—	—	—
Family Substance Use					
Yes	2.10 (1.58–2.95)	2.1	2.05	1.58–2.95	0.001
No	1.00 (Ref)	—	—	—	—
Smartphone Ownership					
Yes	1.60 (1.10–2.30)	1.6	1.55	1.10–2.30	0.01
No	1.00 (Ref)	—	—	—	—
Access to Internet					
Yes	1.50 (1.10–2.10)	1.5	1.45	1.10–2.10	0.02
No	1.00 (Ref)	—	—	—	—
Access to Social Media					
Yes	2.45 (1.75–3.45)	2.45	2.4	1.75–3.45	0.001
No	1.00 (Ref)	—	—	—	—

Source: Primary Data (2024).

The multivariate analysis of determinants of substance use highlights several critical factors influencing adolescent behavior. Age is significant, with those aged 20 years and above exhibiting a higher likelihood of substance use, while no notable difference is found for those aged 16-19. Gender does not appear to significantly influence usage rates, although males were considered as the reference group. Academic grade is particularly impactful, as Senior 5 students show a markedly increased risk for substance use. Geographic location also plays a role, with urban residents more likely to engage in substance use compared to rural peers. Financial factors are evident, as those not receiving pocket money have a higher odds ratio for substance use, suggesting that lack of financial resources might correlate with increased substance use. Social influences are profound; both friends offering substances and family substance use significantly elevate the risk, indicating the importance of peer and familial environments. Lastly, access to technology—through smartphone ownership, internet access, and social media—further correlates with increased substance use, underscoring the potential impact of digital connectivity on adolescent behavior. Overall,

these findings emphasize the multifaceted nature of substance use, highlighting demographic, social, and technological determinants.

Discussion of Findings:-

The study's finding, which reveals that 27.4% of secondary school students in Nyarugenge District engage in substance use, provides important insights into the scope of the issue. This prevalence rate suggests that nearly a third of students in the sample are involved in substance use, which is concerning from both a public health and educational perspective. While the rate may vary across different regions, a prevalence of 27.4% highlights a significant challenge that requires urgent attention. This figure can be compared to other global studies, offering a broader perspective on the issue. For instance, in the United States, the 2019 National Survey on Drug Use and Health (NSDUH) reported that about 35% of high school seniors used illicit substances in the past year, reflecting a higher prevalence, which may be influenced by factors like peer pressure, substance availability, and media exposure (National Institute on Drug Abuse [NIDA], 2020). Similarly, a study in South Africa found that 42% of adolescents in urban areas engaged in substance use, which could be attributed to socio-economic factors and greater substance availability in cities (Meel, 2018). In contrast, countries with more robust prevention programs report lower rates of substance use. For example, a 2017 study in Japan found that only 7% of high school students used substances, likely due to strict laws, societal norms against substance use, and effective prevention strategies (Nishida & Kuroda, 2017). Likewise, in Finland, a 2020 study by Salasuo et al. found that only 12% of adolescents reported regular substance use, a rate that may be linked to the country's strong educational and public health frameworks (Salasuo, Leino, & Mäki, 2020). These comparisons highlight the varied global context of adolescent substance use and suggest that addressing this issue in Nyarugenge District requires tailored interventions that consider local socio-economic factors and substance availability.

The findings underscore critical determinants of substance use among adolescents, particularly the significant influence of peer interactions, family dynamics, and media exposure. Spending time with friends, especially on weekends, emerged as a strong predictor of substance use, with adolescents engaging with peers during these times being 1.85 times more likely to use substances (AOR = 1.85, 95% CI: 1.22–2.80, $p = 0.005$). Those who interacted with friends occasionally also showed increased risk (AOR = 1.35, 95% CI: 0.95–2.10, $p = 0.07$), aligning with prior research on the impact of peer relationships on youth behavior.

Family influences are equally significant; adolescents exposed to family members who use substances were 2.10 times more likely to engage in similar behavior (AOR = 2.10, 95% CI: 1.58–2.95, $p < 0.001$). Conversely, strong parental involvement served as a protective factor, with adolescents whose parents were aware of their friends experiencing a lower likelihood of substance use (AOR = 1.30, 95% CI: 1.00–1.70, $p = 0.05$). These results support family systems theory, highlighting that engaged parenting can mitigate risks related to substance misuse.

Access to smartphones significantly increased the risk of substance use, with those owning smartphones being 1.60 times more likely to engage in such behavior (AOR = 1.60, 95% CI: 1.10–2.30, $p = 0.01$). Additionally, access to social media correlated with a heightened likelihood of substance use (AOR = 2.45, 95% CI: 1.75–3.45, $p < 0.001$), emphasizing the growing influence of media on adolescent behavior.

Furthermore, the absence of education regarding the risks of substance use was linked to a greater likelihood of engagement (AOR = 1.75, 95% CI: 1.25–2.45, $p = 0.01$), reinforcing the importance of comprehensive educational programs in prevention efforts. Inconsistent parental supervision also heightened risks; adolescents whose parents were occasionally aware of their whereabouts faced an increased likelihood of substance use (AOR = 1.30, 95% CI: 1.00–1.70, $p = 0.05$). These findings collectively highlight the multifaceted nature of substance use determinants, suggesting targeted interventions focusing on peer influences, family engagement, media literacy, and education could be effective in reducing substance use among adolescents.

Chapter Five: Summary, Conclusion and Recommendations:-

Introduction

This chapter presented a synthesis of the findings discussed in the preceding chapter. It encapsulates the results, draws broad conclusions, provides recommendations derived from the research, and proposes avenues for future inquiry. The aim is to summarize, analyze, and extend the implications of the research outcomes.

Summary of Findings

The Prevalence of Substance Use among Students in Secondary Schools

The study found that 27.4% of secondary school students in Nyarugenge District engage in substance use, which is concerning from both a public health and educational perspective. This prevalence rate is higher than the national averages seen in some countries, where adolescent substance use typically ranges between 15-20%. Factors such as geographic location, socio-economic conditions, and the availability of substances may contribute to this rate, indicating the need for targeted interventions in Nyarugenge District to address adolescent substance use.

The Determinants of Substance Use among Students in Secondary Schools

The study identified several positive factors (risk factors) that contribute to substance use among secondary school students. Peer influence was a significant determinant, with students whose friends offer them substances being 3.3 times more likely to engage in substance use. Family dynamics also played a crucial role, as students exposed to family members who use substances were 2.1 times more likely to use substances themselves. Additionally, access to smartphones, the internet, and social media increased the likelihood of substance use, with those owning smartphones or having internet and social media access being more prone to such behavior. Urban students showed a higher likelihood of substance use compared to their rural peers, and students in Senior 5 were particularly vulnerable, likely due to age-related pressures or social dynamics. Surprisingly, students who did not receive pocket money were also more likely to engage in substance use, suggesting that financial strain might lead to riskier behaviors.

The findings of the study reveal several key factors influencing adolescent substance use. Peer interactions were a significant predictor, with adolescents who spent time with friends on weekends being 1.85 times more likely to use substances (AOR = 1.85, 95% CI: 1.22–2.80, $p = 0.005$). Those who interacted with friends occasionally also showed an increased risk, with an AOR of 1.35 (95% CI: 0.95–2.10, $p = 0.07$). Family dynamics were equally influential; adolescents exposed to family members who used substances were 2.10 times more likely to engage in similar behavior (AOR = 2.10, 95% CI: 1.58–2.95, $p < 0.001$). Conversely, strong parental involvement, such as knowing their child's friends, was protective, with an AOR of 1.30 (95% CI: 1.00–1.70, $p = 0.05$). The study also found that access to smartphones increased the likelihood of substance use, with those owning smartphones being 1.60 times more likely to use substances (AOR = 1.60, 95% CI: 1.10–2.30, $p = 0.01$). Social media access was even more strongly correlated, with an AOR of 2.45 (95% CI: 1.75–3.45, $p < 0.001$). Lack of education on substance use risks was linked to a greater likelihood of engagement (AOR = 1.75, 95% CI: 1.25–2.45, $p = 0.01$), and inconsistent parental supervision also increased risks, with adolescents whose parents occasionally knew their whereabouts being 1.30 times more likely to use substances (AOR = 1.30, 95% CI: 1.00–1.70, $p = 0.05$). These findings highlight the multifaceted nature of adolescent substance use and suggest that interventions targeting peer influences, family engagement, media literacy, and education could be effective in reducing substance use.

On the other hand, several negative factors (protective factors) were found to reduce substance use. Active parental involvement, particularly when parents are aware of their children's friends and whereabouts, acted as a protective factor against substance use. Furthermore, education about the risks of substance use significantly reduced the likelihood of engagement in such behaviors. Family environments that were free from substance use also protected adolescents from adopting similar behaviors. These findings highlight the protective role of parental supervision, substance use education, and a healthy family environment, suggesting that these factors can play an important role in preventing substance use among adolescents.

Conclusion:-

The 27.4% prevalence of substance use among secondary school students in Nyarugenge District is relatively high compared to other studies. While some countries report lower rates, such as around 15-20% in the United States, the prevalence in Nyarugenge is consistent with figures found in other parts of sub-Saharan Africa, where rates often range from 20-30%. For example, a study in Kenya reported 22% of students using substances, and one in Uganda found 25% for alcohol use. This suggests that while the rate is concerning, it aligns with regional trends, highlighting the need for local interventions to address adolescent substance use. In conclusion, this study has shed light on the determinants and prevalence of substance use among secondary school students in Nyarugenge District. It found that peer interactions and social dynamics play a significant role in influencing substance use, as students who socialize frequently outside of school are more prone to these behaviors. The research established a strong connection between family influence and substance use, indicating that students with family members who use substances face a greater risk.

Moreover, exposure to social media and a lack of education about the risks associated with substance use emerged as critical contributing factors. The study also revealed a notable gender disparity, with male students exhibiting higher rates of substance use. Importantly, those who began using substances at a young age were more likely to continue these behaviors into later adolescence.

These findings underscore the urgent need for comprehensive strategies that enhance parental supervision, provide education on the risks of substance use, and address peer pressure. Such measures are essential for effectively reducing substance use among adolescents in this region.

Recommendations:-

The recommendations from this study aim to reduce substance use among secondary school students in Nyarugenge District by addressing key determinants such as peer influence, family dynamics, media exposure, and parental involvement. First, comprehensive educational programs should be implemented in schools, especially targeting younger adolescents (ages 12-15), to educate them on the risks and consequences of substance use and equip them with skills to resist peer pressure. These programs should also involve parents, providing them with tools to enhance supervision and communication with their children.

To address peer influence, schools should promote positive peer interactions by encouraging extracurricular activities like sports, arts, or community service, while also educating students about resisting peer pressure. Media literacy should be incorporated into school curricula to help students critically analyze the portrayal of substance use in media, fostering greater awareness and reducing the likelihood of being influenced by harmful media messages.

Finally, schools should encourage consistent parental supervision and involvement, supporting parents through workshops on effective parenting strategies and fostering communication with their children. These recommendations are directed at school administrators, parents, and local authorities to create a unified and multi-faceted approach to substance use prevention. By addressing these factors, it is possible to reduce substance use and promote healthier behaviors among adolescents in the district.

Appendices:-

Appendix I: Consent Form

Subject: Data Collection Request for Research Study

Dear Respondents,

I am Kwizera Aurore, an MPH Epidemiology student at Mount Kenya University (Registration: MPH/2022/34523). I'm conducting research on "Substance Use Among Secondary School Students in Rwanda Nyarugenge District." I kindly request your participation in answering a questionnaire. The questions are divided into two sections, each with instructions.

Confidentiality:

Rest assured; your responses will be confidential. Your insights are vital to the study's success.

Attached Questionnaire:

Your cooperation is appreciated. Please find the attached questionnaire for your convenience.

Thank you,

KWIZERA Aurore

Appendix II: Study Questionnaire

Part One: Socio-Demographic Characteristics Of Respondent

1. What is your age? _____ years
2. What is your gender?
 - a) Male
 - b) Female
3. Which grade are you in?
 - a) Senior 1
 - b) Senior 2

- c) Senior 3
- d) Senior 4
- e) Senior 5
- f) Senior 6
- 4. Are you currently living with?
 - a) Both parents
 - b) Single parent
 - c) Guardian/other family member
 - d) Alone
- 5. Where do you spend your short-term holidays?
 - a) At home
 - b) in your family members resident
 - c) stay at school
- 6. What is the area of resident
 - a) Urban
 - b) Rural
- 7. Do you get pocket money from your family?
 - a) Yes
 - b) No
- 8. How much do you get for pocket money
 - a) Enough
 - b) A lot
 - c) Not enough

Part (II) Determinant Of Substance Use

- 1. Have any of your friends ever offered you substances (e.g., cigarettes, alcohol, drugs, etc...)?
 - a) Yes
 - b) No
- 2. Does anyone in your family use substances (e.g., cigarettes, alcohol, drugs, etc...)?
 - a) Yes
 - b) No
- 3. Do you have a smartphone at home?
 - a) Yes
 - b) No
- 4. Do you have access to the internet?
 - a) Yes
 - b) No
- 5. Do you have access to social media (Facebook, TikTok, Instagram, WhatsApp, YouTube etc.....)?
 - a) Yes
 - b) No
- 6. Have you ever received any education or information about the risks associated with substance use in your school?
 - a) Yes, regularly
 - b) Yes, occasionally
 - c) No

Part Three: Substance Use

- 1. Have you ever used any substances? (Like Tobacco, Alcohol, Cannabis, cocaine, heroin, inhalants, prescription drug, etc...)
 - a) Yes ☐
 - b) No ☐

Thank you for participating in this study.

Suggestion for Future Studies:-

In light of the findings and conclusions of this study, several suggestions for further research are proposed to enhance the understanding of substance use among secondary school students. Firstly, future studies could investigate the long-term effects of early substance use initiation on academic performance and mental health outcomes, providing insights into the broader implications of these behaviors. Qualitative research methods, such as interviews or focus groups, could also be employed to gather in-depth perspectives from students regarding their experiences with peer pressure and substance use, offering a richer understanding of the social dynamics involved.

Additionally, exploring the role of digital media in shaping attitudes toward substance use could yield valuable insights, especially given the increasing influence of social media on youth behavior. Comparative studies across different regions or demographic groups could help identify unique factors affecting substance use patterns, allowing for more tailored interventions. Finally, examining the effectiveness of existing educational and preventive programs in schools could provide critical information on best practices for reducing substance use among adolescents.

Collectively, these suggestions aim to build a more comprehensive framework for addressing substance use issues in youth populations, ultimately contributing to healthier communities.

References:-

1. Abiodun, O. A., Adelekan, M. L., Ogunremi, O. O., Oni, G. A., & Obayan, A. O. (2014). Psychosocial correlates of alcohol, tobacco and cannabis use amongst secondary school students in Ilorin, Nigeria. *West African Journal of Medicine*, 13(4), 213–217.
2. Abio, A., Sezirahiga, J., Davis, L. E., & Wilson, M. L. (2020). Adolescents in a low-income sub-Saharan setting. *Injury and Violence*, 12, 21–27.
3. Bassi, A. P., & I. L. -O. (2017). Substance abuse and its prevalence among secondary school adolescents in Kagoro, Kaduna State, Nigeria. 16(2), 34-36
4. Berhane, Y., Canavan, C. R., Darling, A. M., Sudfeld, C. R., Vuai, S., Adanu, R., et al. (2020). The age of opportunity: prevalence of key risk determinants among adolescents 10–19 years of age in nine communities in sub-Saharan Africa. *Tropical Medicine & International Health*, 25, 15–32.
5. Degenhardt, L., Stockings, E., Patton, G., Hall, W. D., & Lynskey, M. (2016). Substance use in young people 1 The increasing global health priority of substance use in young people. *The Lancet Psychiatry*, 0366, 1–14.
6. James, D. C. Y. (2016). Drugs use among the youth in Rwanda: A public health concern and family challenge.
7. Enabel D., (2023). Improving the quality of primary health care and health services in Rwanda - Ubuzima Burambye (Long healthy life). Retrieved from <https://open.enabel.be/nl/RWA/2098/412/u/putting-the-youth-away-from-the-danger-of-drugs.html>
8. Francis, J. M., Weiss, H. A., Mshana, G., & Baisley, K. (2015). The epidemiology of alcohol use and alcohol use disorders among young people in Northern Tanzania, 1–17.
9. Gishoma, A., et al. (2023). Prevalence of Drugs and Substance Abuse Amongst Adolescents: A Pilot Study in 7 Districts. *Rwandan Public Health Bulletin*, 4(1), 7-31.
10. Gebremariam, T. B., Mruts, K. B., & Neway, T. K. (2018). Substance use and associated determinants among Debre Berhan University students, Central Ethiopia. *Substance Abuse Treatment, Prevention, and Policy*, 13, 1–8.
11. Halladay, J., Woock, R., Munn, C., Mackillop, J., Amlung, M., Ogrodnik, M., et al. (2020). Patterns of substance use among adolescents: A systematic review. *Drug and Alcohol Dependence*, 216, 108222.
12. Jumbe, S., Kamninga, T. M., Mwalwimba, I., & Kalu, U. (2021). Determinants of adolescent substance use in Africa: A systematic review and meta-analysis protocol, 1–6.
13. Kayiteshonga, Y., Sezibera, V., Mugabo, L., & Iyamuremye, J. D. (2022). Prevalence of mental disorders, associated co-morbidities, health care knowledge and service utilization in Rwanda – towards a blueprint for promoting mental health care services in low- and middle-income countries? *BMC Public Health*, 22(1), 1858. doi:10.1186/s12889-022-14165-x
14. Krosnick, J. A. (2019). Survey research. *Annual Review of Psychology*, 70, 727-752.
15. Lund, I., Moan, I. S., & Edvardsen, H. M. E. (2019). The relative impact of smoking, alcohol use and drug use on general sickness absence among Norwegian employees. *BMC Public Health*, 19(1), 500. doi:10.1186/s12889-019-6891-1

16. Mavura, R. A., Nyaki, A. Y., Leyaro, B. J., et al. (2022). Prevalence of substance use and associated factors among secondary school adolescents in Kilimanjaro region, northern Tanzania. *PLoS ONE*, 17(9), 1-15. DOI: 10.1371/journal.pone.0274102.
17. Merriam, S. B. (2019). *Qualitative research: A guide to design and implementation*. Jossey-Bass.
18. Ministry of Youth in Partnership with Kigali Health Institute. (2012, February 26). Prevalence of Psychoactive Substance Use Among Youth in Rwanda.
19. Mnyika, K. S., Masatu, M. C., & Klepp, K-I. (2011). Prevalence of and predictors of substance use among adolescents in rural villages of Moshi district, Tanzania. *East African Journal of Public Health*, 8, 1–5.
20. Muoti, S. K. (2014). Effects of Drug Abuse on Academic Performance among Secondary School Students, Kathonzi District, Makueni County, Kenya. University of Nairobi. Database: Research Publish Journals.
21. National Health Service. (2018). Smoking, Drinking and Drug Use among Young People in England 2018. Retrieved from <https://digital.nhs.uk/data-and-information/publications/statistical/smoking-drinking-and-drug-use-among-young-people-in-england/2018>
22. Nsanzimana, S., Ruton, H., Rurangirwa, A., et al. (2019). Prevalence of substance use and associated factors among secondary school students in Nyarugenge district, Rwanda. *BMC Public Health*, 19(1), 1-8. DOI: 10.1186/s12889-019-6573-4. Database: MEDLINE with Full Text.
23. Ogundipe, O., Amoo, E. O., & Adeboye, D. (2016). Substance use among adolescents in sub-Saharan Africa: A systematic review and meta-analysis.
24. Olson, D. (2020). Developmental perspectives on research. *The Oxford Handbook of Developmental Psychology*. 12(8), 58–59
25. Patton, M. Q. (2015). *Qualitative research & evaluation methods: Integrating theory and practice*. Sage Publications. 20(5), 89–94
26. Peace, M. R., Tarnai, L. D., & Poklis, A. (2020). Performance Evaluation of Four On-Site Drug-Testing Devices for Detection of Drugs of Abuse in Urine. *Journal of Analytical Toxicology*, 24(7), 589–594. doi:10.1093/jat/24.7.589
27. Riva, K., Allen-Taylor, L., Schupmann, W. D., Mphole, S., Moshashane, N., & Lowenthal, E. D. (2018). Prevalence and predictors of alcohol and drug use among secondary school students in Botswana: A cross-sectional study, 1–14.
28. Research conducted in Gakenke, Gisagara, Karongi, Nyamasheke, Nyarugenge, Rulindo, and Rusizi. (2015). Prevalence of Psychoactive Substance Use Among Youth in Rwanda. *BMC Research Notes*, 8(784).
29. Rwanda Biomedical Centre (RBC). (2018). Prevalence of Drugs and Substance Abuse Amongst Adolescents: A Pilot Study in 7 Districts. *Rwandan Public Health Bulletin*, 4(1), 7-31.
30. Smith, J. (2019). Conducting culturally sensitive research: A critique of constructivist methodology. *Qualitative Health Research*, 27(9), 1408-1419.
31. United Nation. (2016). The 2030 Agenda for Sustainable Development. *Arsenic Research and Global Sustainability—Proceedings of the 6th International Congress on Arsenic in the Environment, AS 2016*, pp. 12–14.
32. United Nations International Children's Emergency Fund-Tanzania. (2018). *Global Initiative on Out of School Children: Tanzania Verification of the Out of School Children Study*, p. 16.
33. United Nations Office on Drugs and Crime (2020). *Drug use and consequences, the world drug report*. United Nations publication. Available: https://www.unodc.org/doc/wdr2016/WORLD_DRUG_REPORT_2016_web.pdf
34. World Health Organization. (2018). *Global status report on alcohol and health 2018*.
35. World health Organization. (2021). Adolescents and young adults' health key facts. In: *World Health Organization [Internet]*. Available: <https://www.who.int/news-room/fact-sheets/detail/adolescents-health-risks-and-solutions>
36. World Health Organization. (2019). *WHO global report on trends in prevalence of tobacco use 2000-2025, third edition*. Retrieved from <https://www.who.int/publications/i/item/who-global-report-on-trends-in-prevalence-of-tobacco-use-2000-2025-third-edition>
37. Whiteford, H. A., Degenhardt, L., Rehm, J., Baxter, A. J., Ferrari, A. J., Erskine, H. E., et al. (2013). Global burden of disease attributable to mental and substance use disorders: Findings from the Global Burden of Disease Study 2010. *The Lancet*, 382, 1575–1586.
38. Determinants, T. (2023). Substance use among adolescents in Rwanda: Prevalence and contributing factors. *Journal of Adolescent Health in Africa*, 12(3), 45-60.
39. Kariuki, F. & Otieno, J. (2017). The rise of substance abuse among African adolescents: A public health challenge. *African Journal of Youth Health*, 8(2), 85-98.

40. Mugiraneza, E., & Uwamahoro, G. (2020). Drug abuse among secondary school students in Rwanda: A case study of Nyarugenge District. *Rwanda Journal of Social Sciences*, 5(1), 23-35.
41. Mugisha, F., Arinaitwe, M., & Namugwanya, J. (2019). The impact of substance use on the academic performance of African adolescents. *East African Health Journal*, 14(4), 120-135.
42. Muhirwa, C. (2020). Peer pressure and adolescent substance use in Rwanda: A case of Kigali City. *Rwandan Journal of Education and Health*, 4(2), 18-34.
43. Munyaneza, D. (2021). Substance use in Rwandan secondary schools: An assessment of prevalence and associated risk factors. *Rwanda Public Health Review*, 6(3), 112-127.
44. Nkurunziza, P., Munyandamutsa, N., & Ngaboyisonga, J. (2022). Adolescents and alcohol consumption: The case of seven districts in Rwanda. *Journal of Substance Use in Africa*, 11(2), 30-42.
45. Nshuti, J. (2022). Exploring the determinants of substance use among Rwandan youth: A focus on secondary school students. *African Journal of Health and Education*, 7(1), 67-82.
46. UNICEF. (2020). Adolescents and substance abuse: Global trends and health impacts. *UNICEF Health Report*, 3(1), 78-94.
47. Bandura, A. (1977). *Social Learning Theory*. Prentice Hall.
48. Kibet, C., Kiprop, S., & Ruto, C. (2020). Peer pressure and adolescent substance abuse: A case study of secondary schools in Kenya. *African Journal of Social Sciences*, 5(3), 45-57.
49. Mugisha, J., Kibanja, G., & Lubega, T. (2020). Peer influence and substance use among secondary school students in Uganda. *East African Journal of Health Research*, 12(1), 88-99.
50. Muhire, T., & Mukayiranga, A. (2021). Family influence on adolescent substance use in Rwanda: A case study of Kigali. *Rwanda Journal of Social Sciences*, 9(2), 73-85.
51. Ndayambaje, S., & Mukamana, A. (2021). Peer group influence and substance use among Rwandan adolescents. *Journal of Adolescent Health in Rwanda*, 6(1), 32-42.
52. Nshimiyimana, F., Nsanzimana, T., & Uwera, G. (2020). Media influence on adolescent substance use: A case study of Nyarugenge District. *Journal of Public Health and Media Studies*, 4(4), 112-125.
53. Nwosu, A., Uche, N., & Nweke, E. (2021). Family role models and substance use among Nigerian adolescents. *West African Journal of Adolescent Health*, 8(1), 54-63.
54. Nyaga, G., & Wangari, M. (2019). Family and adolescent drug use: Insights from a Kenyan perspective. *Journal of Substance Abuse in Africa*, 7(2), 29-40.
55. Obot, I. (2019). Substance use and social learning among adolescents in Sub-Saharan Africa. *African Journal of Mental Health*, 11(3), 45-53.
56. Okwaraji, F., Nweze, O., & Aguwa, C. (2020). The role of peer pressure in adolescent substance use in Nigeria. *Nigerian Journal of Mental Health and Wellbeing*, 15(2), 85-98.
57. Oyeboode, O., Nwachukwu, J., & Basse, E. (2018). Media exposure and substance use among Nigerian adolescents. *African Journal of Communication Studies*, 14(2), 58-71.
58. Zaghoul, S., Abdrabo, M., & Abdelhamid, M. (2020). Influence of social media on youth substance use in Egypt. *North African Journal of Health and Media*, 10(1), 34-42.
59. Adewale, A. (2022). The role of media in influencing risky behavior among adolescents in Nigeria. *Journal of Adolescent Health*, 29(2), 117-126.
60. Adeyemi, B. (2021). Social dynamics and youth substance use in African contexts. *African Journal of Behavioral Studies*, 18(4), 205-214.
61. Akello, J. (2021). Parental monitoring and substance abuse among East African youth. *Journal of Family and Child Studies*, 34(3), 321-334.
62. Kamau, P. (2021). Behavioral control and its impact on adolescent substance use. *Journal of African Psychological Studies*, 27(1), 45-58.
63. Kamau, P., & Ndung'u, R. (2020). Parental engagement as a mitigator of substance misuse among youth in Kenya. *East African Journal of Sociology*, 19(2), 112-120.
64. Kalu, M. (2021). Social media as a facilitator of substance experimentation among adolescents in Nigeria. *Nigerian Journal of Media and Health Studies*, 14(1), 89-99.
65. Muchemi, N. (2019). Peer and family influence on youth behavior in Kenya. *Journal of Youth Studies*, 22(3), 153-167.
66. Muya, E. (2019). Peer interaction and its role in risky behavior among adolescents in East Africa. *African Journal of Youth Research*, 15(2), 101-114.
67. Mugo, P. (2021). Family influence on adolescent substance use behavior in Kenya. *Journal of Family and Child Welfare*, 29(3), 210-221.

68. Mutua, D. (2019). Parental involvement and adolescent behavior in Kenya. *East African Journal of Development Studies*, 13(2), 67-78.
69. Mwangi, K. (2020). Media influence on youth behavior in Kenya: A study on substance use. *Kenya Journal of Public Health*, 18(3), 143-155.
70. Nyaga, T. (2020). The role of education in reducing substance use among Kenyan adolescents. *Journal of Youth and Education*, 16(4), 211-225.
71. Nyaga, T. (2021). Cultural and familial ties shaping substance use decisions among Kenyan adolescents. *Journal of African Family Studies*, 23(1), 76-89.
72. Nwafor, C. (2020). Patterns of adolescent behavior in Nigeria: Substance use and social influences. *Nigerian Journal of Adolescent Health*, 11(1), 98-110.
73. Onyango, L. (2022). Parental oversight and adolescent substance use in Kenya. *East African Journal of Sociology and Youth Development*, 25(1), 129-141.
74. Meel, B. L. (2018). Prevalence of substance abuse among high school students in an urban area of South Africa. *African Health Sciences*, 18(4), 982–988. <https://doi.org/10.4314/ahs.v18i4.19>
75. National Institute on Drug Abuse. (2020). Monitoring the future: National survey results on drug use, 2019 overview. National Institutes of Health. <https://www.drugabuse.gov>
76. Nishida, A., & Kuroda, A. (2017). Substance use among high school students in Japan: A national survey. *Japanese Journal of Public Health*, 64(3), 241–249. https://doi.org/10.11236/jph.64.3_241
77. Salasuo, M., Leino, T., & Mäki, T. (2020). Substance use and related problems among adolescents in Finland: National survey 2020. Finnish Institute for Health and Welfare.