

THESIS ABSTRACT

Master of Public Health

Adventist University of Africa

School of Postgraduate Studies

Title: PREVALENCE AND DETERMINANTS OF TOBACCO
SMOKING AMONG COLLEGE STUDENTS:
IN BOBO-DIOULASSO (BURKINA FASO)

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Globally, tobacco consumption represents a critical threat to public health, contributing to a range of preventable diseases (WHO). In Burkina Faso, as many nations with limited economic resources, tobacco use among young people, particularly college students, is an emerging issue with serious implications for public health (STEPS). This research seeks to examine the rate of tobacco use and explore the key factors influencing smoking behavior among college students in Bobo-Dioulasso, Burkina Faso. By examining the factors related with the uptake of tobacco in this population, the study seeks to provide insights that could inform targeted health interventions.

A survey was conducted among students enrolled in four higher education institutions in Bobo-Dioulasso. Authorization was granted by the schools and from respondents themselves to conduct the study. To ensure representativeness, a stratified random sampling technique was utilized to recruit participants, and data collection

was conducted using self-completed questionnaires, by a total of 387 college students, which gathered information on family and environmental influence, demographic factors, and potential determinants such as peer influence, and exposure to tobacco advertising. Descriptive statistics, chi-square tests, and logistic regression were employed to analyze the collected data.

The findings revealed a smoking prevalence of 6.2% among college students in Bobo-Dioulasso, with boys smoking more than girls, suggesting the situation is alarming. Factors such as peer pressure and living with smoker in a family were identified as key factors influencing smoking behavior among college students.

Tobacco smoking among college students in Bobo-Dioulasso represents a growing public health challenge. The findings underscore the importance of implementing targeted interventions that focus on the specific factors identified in the study, such as peer influence and family influence. Comprehensive tobacco control strategies, including education campaigns and policy implementation, are essential to reduce smoking prevalence and its associated health risks in this population.

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A thesis
presented in partial fulfillment
of the requirements for the degree
Master of Public Health

by
Marcellin Ollo Kambou

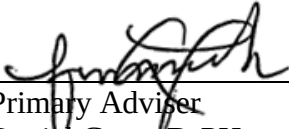
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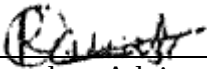
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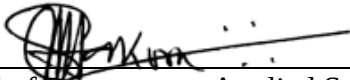
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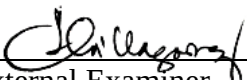
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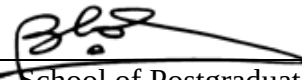

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To Elder Glen and Karen Wintermeyer, and to Margaret Mote Unglaub-Beucler. To my loving and courageous wife, Anne-Brigitte, and our wonderful children, Gamaliel, Nathanael, and Mischael. To Professor Daniel Ganu, who introduced me to this MPH program. God bless you all.

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LIST OF ABBREVIATIONS

CCC	Catechism of Catholic Church
COPD	Chronic Obstructive Pulmonary Disease
DHS	Demographic and Health Surveys
GYTS	Global Youth Tobacco Survey
NCD	Non-communicable disease
SLT	Smokeless tobacco products
SSA	Sub-Saharan Africa
STEPS	STEPwise approach to surveillance
WHO	World Health Organization

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CHAPTER 1

INTRODUCTION

This section defines the study's background and underlines the problem statement and the research question that led to this inquiry. Additionally, the conceptual framework will be drawn alongside the null hypotheses. At the close of the chapter, the study's significance, scope and limitations, and operational definition of terms will be dealt with.

Background of the Study

Tobacco smoking remains a leading worldwide public health issue, contributing significantly to preventable diseases and deaths. According to recent data from the (WHO, 2023b), tobacco consumption is accountable for the deaths of up to half of its long-term users who fail to resign, contributing to more than eight million deaths each year. More than Seven million of these deaths are attributed to direct tobacco intake, while the remaining are due to exposure to second-hand smoke. Tobacco use is linked to roughly 26% of global cancer-related deaths, highlighting its significant role in cancer mortality (WHO, 2023a). This association underscores the profound impact of tobacco use on global cancer mortality (WHO, 2023a). Furthermore, WHO reports that the majority of tobacco users worldwide, about 80%, are found in economically developing countries (WHO, 2022). This association underscores the profound impact of tobacco use on global cancer mortality reports (WHO, 2022).

It is also projected that tobacco will be the principal contributor to mortality and disability-adjusted life years (DALYs) in the 21st century. Most smokers start smoking in their teens and often continue smoking until adulthood. Chronic health consequences of smoking typically appear after three to four decades of consistent use (Reitsma et al., 2017). Regular smokers face a mortality risk nearly triple that of nonsmokers across all age groups (Reitsma et al., 2017). About 22% of the world's people aged 15 and over currently smoke. Overall, men smoke more than women (WHO, 2020).

College students in Burkina Faso typically fall within the 12 to 25 age range, influenced by structural and socioeconomic factors within the education system (World Bank, 2022). This age range for college students in Burkina Faso is attributed to a combination of factors like the structure of the education system, delayed or varied entry into higher education due to financial and cultural factors, and the flexibility in educational pathways. This age range reflects the realities of the educational journey, where some students begin higher education straight after secondary school, while others may take longer paths or face delays. Many individuals in this age range are at a critical stage of their education, with college students often representing a group with distinct social and behavioral dynamics (Jessor, 1991). Tobacco use is prevalent among college students due to factors such as peer pressure, stress, and exposure to smoking in social settings. It is a vulnerable time to start smoking or abusing other recreational substances (WHO, 2022). It is a time of heightened hormones, more bonding with peers, and a transition from dependence to independence. Many changes occur, including physical, mental, physiological, or emotional. There is growing recognition that due to a blend of biological, psychological, and social influences, school students face many challenges

and risks to their health, such as sexual insecurity, accidents, violence and substance abuse including smoking (WHO, 2021a).

While Africa has previously reported relatively low tobacco smoking rates compared to other continents, recent WHO forecasts highlight a notable upward trend, especially in male populations and among students using non-combustible tobacco products (WHO, 2023c). Research also shows that the weight of illness arising from tobacco is increasing, emphasizing the need for country-level data (WHO, 2021a). According to research, adult tobacco smoking rates among men in Africa vary considerably by country, with Ghana reporting about 7% and Sierra Leone reaching up to 37%, reflecting a highly heterogeneous pattern across the continent (Ghana Statistical Service, 2023). Other countries, such as Mali and Senegal, also have high prevalence (The Tobacco Atlas, 2022). A recent study on tobacco consumption forecasting predicts that the tobacco epidemic will worsen in African and Eastern Mediterranean countries with dilapidated healthcare systems (WHO, 2022). In economically developing countries, the tobacco industry increasingly targets young people and women as potential consumers. Despite previous assessments addressing general tobacco use, there remains a lack of detailed understanding regarding its prevalence and the factors influencing smoking behaviors specifically among college students in Burkina Faso.

Burkina Faso, classified as a low-income Sahelian nation with scarce resources (World Bank, 2022), experiences pervasive tobacco smoking and its effects (Bonnechère, Cissé, et al., 2019; Diendéré et al., 2020). In Burkina Faso, approximately 19.8% of the population uses tobacco, with a higher rate of smoking observed among men (Bonnechère, Kaboré, et al., 2019). However, research shows that smokeless tobacco (SLT) use is more common among women (Diendéré et al.,

2020). The tobacco problem in Burkina Faso is further exacerbated by the fact that more than 16% of students are involved in its use (WHO, 2022). Hence, tobacco poses a two-pronged issue in this low- and middle-income country. To develop effective tobacco prevention programs, it is essential to study the various causes associated with tobacco use among college students in Bobo-Dioulasso, while also assessing the overall burden of use within this population. Despite the growing concern, there is a noticeable lack of research in Bobo-Dioulasso exploring the demographic, social, and behavioral determinants of tobacco use among school-aged individuals. This lack of comprehensive studies makes it difficult to find data on specific risk factors, such as peer pressure, family influence, and socio-economic background, in relation to tobacco consumption in this population. In addition, it is necessary to note that there is a absence of recent data on tobacco use among students of college in the country and Bobo-Dioulasso in particular. These conditions can thus limit the development of sound public policies and tobacco control through the lack of factual data. Therefore, it is essential to be aware of the epidemiological and descriptive smoking trends in the Bobo-Dioulasso from recent data.

It is critical to recognize that tobacco smoking has implications that extend beyond individual health concerns (Imperial College London, 2021). It imposes a significant economic burden on societies as well. Tobacco-related illnesses not only result in increased healthcare costs but also contribute to a loss of productivity, primarily when the affected population consists of college students (Sutfin et al., 2012). Adding to health complications, attributed to tobacco illnesses significantly reduce the quality of life for both affected persons and their families. These consequences are particularly pronounced in low- and middle-income countries like Burkina Faso, where limited resources and inadequate healthcare infrastructure

further compound the challenges associated with tobacco use (Bonnechère, Kaboré, et al., 2019). Additionally, the prevalence of tobacco use among college students is of particular concern, as this demographic represents a critical stage in life when habits and behaviors are often established. Understanding the dynamics that contribute to smoking among college students in Bobo-Dioulasso is essential for developing targeted interventions aimed at preventing or reducing tobacco use and its related adverse effects at both individual and societal levels.

The lack of studies specifically addressing tobacco use among college students in Bobo-Dioulasso creates an area of research that this study seeks to address. While studies in countries like Mali and Senegal provide insight into regional trends, there is limited data on how these trends manifest in Burkina Faso. This study aims to address this gap by exploring the local factors that encourage tobacco use among college students in Bobo-Dioulasso.

Most importantly, this study addresses a significant gap in the existing literature. While much is known about tobacco use in general populations, there is limited research on smoking behaviors specific to college students in Bobo-Dioulasso. This study provides data that is crucial for creating contextually appropriate interventions that can reduce smoking rates among college students in Burkina Faso and beyond.

In sum, this study builds on existing research by focusing specifically on the determinants and prevalence of tobacco use among college students in Bobo-Dioulasso, Burkina Faso. The findings will not only address a gap in the literature but will also serve as a foundation for developing effective tobacco control strategies that can be implemented locally and in other regions facing similar public health challenges. By connecting the research problem with the study's contribution, it is

clear that this research will provide critical insights into a pressing health issue and contribute meaningfully to global tobacco control efforts. Furthermore, the findings of this study will offer valuable insights for tobacco control interventions not only in Burkina Faso but also in other countries grappling with high rates of smoking among young people. Addressing the issue of tobacco use and its related behavioral risks is especially important in order to prevent or mitigate these adverse outcomes.

Statement of the Problem

According to Statista (2020) over 16% of students in Burkina Faso are involved in tobacco use. However, according to a study by Koueta et al. (2009), it was found that, out of 2378 students in the first biggest cities of Burkina Faso, it was found that 20.4 % of smokers were residing in Ouagadougou and 20.3 % in Bobo Dioulasso. Furthermore, the study pointed out that in both genders Bobolese (people living at Bobo-Dioulasso) smoke more than Ouagalese (people living at Ouagadougou). Hence, these findings indicate that tobacco smoking could be a severe issue in colleges in Bobo Dioulasso and is worth investigating. According to the national census conducted by the Ministry of Education of Burkina Faso for the school year 2021-2022, 301,330 college students are registered and 45,513 in Bobo-Dioulasso. Hence, it is necessary to conduct a research focusing on this population as part of efforts to control smoking. Smoking among young people has notably risen in Burkina Faso, particularly among students in cities like Bobo-Dioulasso (Statista, 2021). However, there is a lack of recent literature that assesses the prevalence of smoking or identifies the factors associated with it.

Understanding the prevalence and determinants of smoking among college students in Bobo-Dioulasso, Burkina Faso, is essential for developing effective interventions. Tobacco smoking not only has severe implications for individual health

but also imposes a significant economic burden on societies (WHO, 2020). Tobacco-related illnesses lead to higher healthcare costs, reduced productivity, and a diminished quality of life for individuals and their families, especially in low-resource settings like Burkina Faso. Additionally, college students represent a life-threatening stage of life when behaviors and behaviors are often established, making it crucial to address smoking prevalence within this population (United Nations Development Programme & WHO, 2024).

Therefore, this research seeks to explore the prevalence and determinants of smoking among college students in Bobo-Dioulasso, Burkina Faso. By identifying the factors contributing to smoking initiation and continuation among this demographic, this study is designed to inform tobacco control interventions not only in Burkina Faso but also in other countries with high rates of smoking among young people. The findings will add up to efforts aimed at preventing and decreasing tobacco use, mitigating the adverse outcomes associated with smoking, and improving the overall well-being of college students and the wider society.

Research Questions

Explicitly, this study will seek to answer the following interrogations

1. What are the demographic characteristics of the College students at Bobo-Dioulasso?
2. What is the prevalence of tobacco smoking among college students at Bobo-Dioulasso?
3. Is there statistically a significant relationship between environmental influences and tobacco smoking among college students at Bobo-Dioulasso?
4. Is there statistically a significant relationship between family influence and tobacco smoking among college students at Bobo-Dioulasso?
5. Do the demographic variables (age, gender and religion) moderate the relationship between environmental factors, family influences and the prevalence of tobacco smoking among college students?

Null Hypotheses

1. There is no statistically significant relationship between environmental influences and smoking among college students at Bobo-Dioulasso.
2. There is no statistically significant relationship between family influence and smoking among college students at Bobo-Dioulasso.
3. Demographic variables do not moderate the relationship between environmental factors, family influence and the prevalence of tobacco smoking amongst college students.

Conceptual Framework

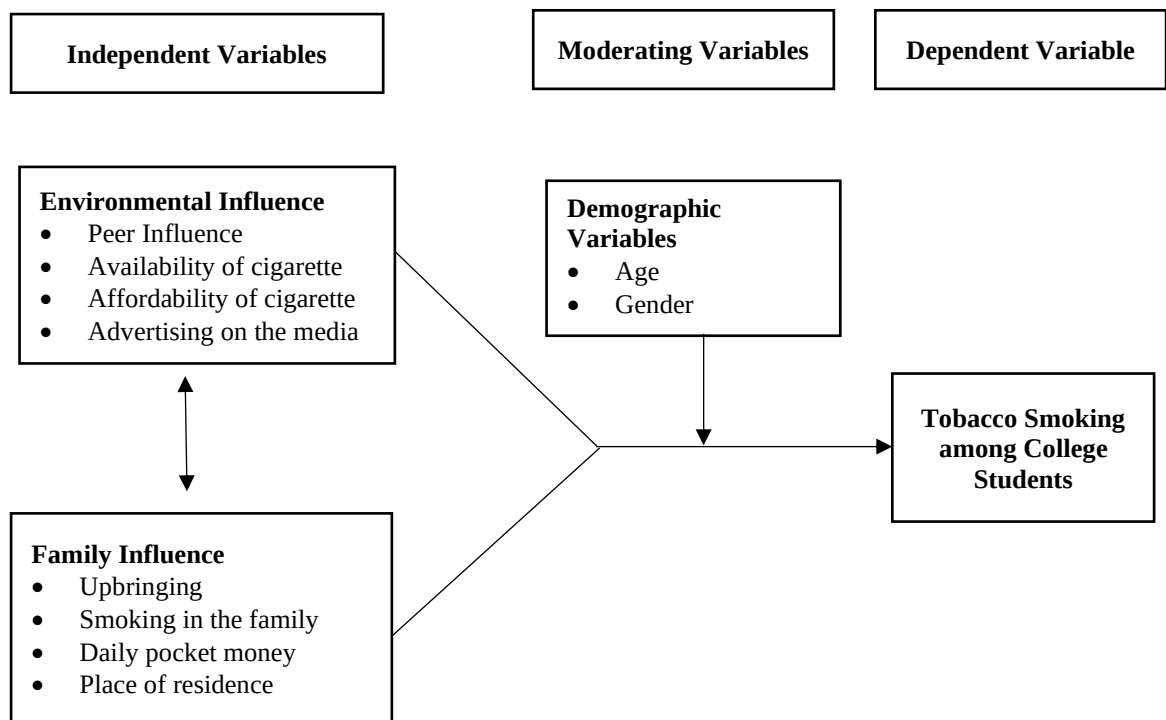
This study used a cross-sectional design based on Talip et al. (2016) model explaining smoking in college. Tulip et al.'s model focuses on understanding the social and environmental factors that influence health behaviors, particularly in relation to smoking. It also considers the importance of social networks, peer pressure, and family dynamics in influencing smoking habits. This model is appropriate for the study on tobacco use among college students in Bobo-Dioulasso because it provides a complete framework for analyzing the various determinants of smoking in this population. This framework will describe how various features can influence individuals' causal beliefs about smoking, affecting their judgments, approaches, and health-related behaviors.

These beliefs can subsequently influence health perceptions, emotions, and related behaviors. This study proposes a conceptual framework by assimilating pertinent factors at multiple levels to explain smoking initiation among college students. Thus, we will try to picture how the independent and the moderating variables generate the intention to smoke following the conceptual framework. Independent variables will include family influence and environmental factors, and moderating variables will embrace demographic characteristics such as age, gender and religion. The three (3) demographic variables are often chosen because they are

foundational, widely applicable, and sufficient for providing insights into the subject of study while avoiding unnecessary complexity. Including too many demographic variables can lead to overfitting in statistical models. Also, depending on the specific goals of this research age, gender, and religion are the most relevant demographic factors for understanding the population being studied.

Figure 1.

Conceptual Framework



The current study investigates the potential correlation of smoking with a focus on health and behavioural risks associated with different levels of tobacco use among college students of Bobo-Dioulasso by examining the prevalence and gathering of risky behaviours and health-related effects that accompany smoking in this population.

Significance of the Study

The outcomes of this research will help:

1. Ministry of Health in promoting the implementation of various measures to reduce tobacco consumption in schools.
2. Public Health Researchers with recent and accurate statistical data on tobacco smoking among college students in Bobo-Dioulasso.

3. Administrators and public health organizations in designing health promotion strategies and making decisions about smoking-related initiatives and interventions for college students in Bobo-Dioulasso.
4. Parents should be mindful of the influence of their smoking behaviour on their children, and that will encourage them to abandon smoking
5. College teaching administration in developing educational programs to address the relevant determinants of smoking among Bobo-Dioulasso college students.
6. Researchers intending to pursue further inquiry on tobacco smoking among college students will use this study's outcome to fathom their study.
7. College students with comprehensive information and statistical indication of tobacco smoking and its damaging effects.
8. This study will provide baseline data on selected variables related to smoking among school students and will additionally provide the percentage of students who are addicted to smoking.
9. The information derived from this work will help observe similarities and differences in smoking behavior compared to other locations and will guide our pilot studies to plan tobacco control activities in future.

Scope and Limitations

The scope of this study was limited to investigating the prevalence and determinants of smoking among Bobo-Dioulasso college students. The study exclusively focused on students enrolled in college in the provided geographical area and will not include a national or larger regional perspective. Age-matched individuals who were not in college or were working might have different behaviors. Therefore, the findings of this research did not represent of such a population. The study's goal is to provide insight into the tobacco smoking behaviors of Bobo-Dioulasso college students and to understand the elements that contribute to their smoking habits.

Another limitation of the study was related to the sampling process. Participants were not drawn from the broader community but were selected from those who were available and willing to contribute in the study. This may have

affected the overall representativeness of the sample. Nonetheless, the targeted sample size of 387 participants was successfully achieved, and the necessary permissions for conducting the study were obtained. It should be noted that the study will only involve college students as participants. This may have led to an underestimation of smoking prevalence, as some students who engage in concealed smoking behaviors might have been reluctant to disclose their habits. As a result, the data may not fully represent the true extent of smoking among Bobo-Dioulasso college students.

The findings of this study can potentially be generalized to other locations with similar socioeconomic traits and situations, but with caution. Since the study is limited to college students, it should not be directly applied to other educational contexts, such as universities with different student populations or primary schools. Therefore, while the findings may be relevant to areas with similar social and demographic characteristics, they cannot be automatically generalized to all educational contexts or age groups. This study is considered the first of its kind in Bobo-Dioulasso focusing specifically on college students.

Furthermore, selection bias and information bias cannot be excluded. Another issue is the definition of smoking. In our definition, we will not treat periodic smokers independently, which may be lacking in portraying smoking behaviour. Intermittent smokers were treated as smokers. Also, I may have difficulty collecting data since in April, college students were busy preparing for exams. This problem was mitigated if I start collecting data by March end. Another limitation was financial expenses. This research was not funded but self-sponsored by the researcher. To deal with the financial difficult, I have saved some money and asked for help from a friend, I have gathered enough to cover all the expenses.

Operational Definition of Terms

Affordability of cigarettes: It denotes a perceived affordability which refers to how affordable something seems to a person, based on their own perspective, income, or values, rather than on an objective measure of cost. It is not necessarily about the actual price of an item or service, but about how much someone feels they can comfortably afford it given their financial situation or what they consider to be reasonable.

Age: it is the length of time that a person has lived. It refers to the student's age determinant by the use of tobacco. The methods used to measure this variable will concern students aged 12 to 25.

Availability of cigarettes: Tobacco is displayed everywhere and is accessible to all.

Bobo-Dioulasso, or Bobo: is the second biggest city of Burkina Faso after Ouagadougou, the political capital. It is the economic capital with a population of more than one million.

Chronic Pulmonary Obstructive Disease (COPD): A chronic inflammatory lung disease that limits air flow in the lungs and causes difficulty breathing.

College Students: Refer to boys and girls of first and second cycle of secondary education (Junior and Senior secondary schools).

College: In Burkina Faso, this term refers to specific levels of education within the school system. It corresponds to the first cycle of secondary education, typically for students aged 12 to 15. It is the equivalent of the 4th cycle of secondary education. Students spend about 4 years here (from 6th grade to 3rd grade). In this study, it includes second cycle of secondary education, typically for students aged 15 to 18 (but due to many reasons, 19-25 years' students find themselves in that stage). It

is the final stage before university or other higher education. Students spend about 3 years here (from 10th grade to 12th grade).

Daily pocket money: is a small amount of money that parents give their children every day.

Difficulties with studies: Students cannot learn because of interference by tobacco smoking or other socio-economic factors.

Environmental factors: Environmental factors refer to the physical, social, and attitudinal conditions that surround individuals and influence how they live and interact within their environment.

Family Influence: refers to the effect of household members' smoking behaviors on children's attitudes and likelihood of adopting similar habits.

Gender: refers to the grouping of persons as male or female based on biological and physiological appearances. Overall, smoking is predominantly student males, but in some developed and even developing countries trends are reversing, especially among young people.

Health risks related to smoking: refer to the long-term adverse effects smoking has on the body, including a bigger risk of chronic illnesses such as heart disease, various forms of cancer, respiratory illnesses, and diabetes.

Influence of the media: refers to the impact that media messages have on individuals or audiences, which may result in a change or reinforcement of beliefs, attitudes, or behaviors.

Kreteks: A type of cigarette that is made in Indonesia. It is a mixture of tobacco, cloves, and other ingredients. It contains nicotine and many additives.

Peer Influence: refers to the impact that peers (friends, classmates, or acquaintances) have on an individual's behaviors, attitudes, and choices, often driven by the desire to conform or fit in with a particular social group.

Peers: Students within the same age group, i.e. 12 to 24 years, are considered associates.

Prevalence: is a measure of the total number of students in a specific group who have (or had) a specific sickness, condition, or risk factor.

Religion: A determined set of beliefs and dogmas defining student's relationship with the sacred or his belief.

Smoking in the family: Designates Parents who smoke.

Smoking: Act of inhaling and breathing out the smoke generated by burning tobacco, typically in the form of cigarettes. The resulting smoke contains harmful chemicals that are absorbed into the bloodstream, leading to various adverse health effects over time.

Upbringing: Refers to the treatment and instruction a student receives from their parents throughout their childhood.

CHAPTER 2

LITERATURE REVIEW

This chapter will be dedicated to an extensive literature review on smoking prevalence and determinants among college students in Bobo-Dioulasso. It will first highlight tobacco consumption and its situation in Burkina Faso and more particularly in Bobo-Dioulasso where the research will be conducted. The second section will be devoted to family influence. Thirdly, the researcher will examine the environmental factors that seduce the students to smoke. Then, the study will consider the demographic determinants of smoking among college students. Finally, the chapter will ponder over the health hazards; to which college students who smoke are exposed at.

Prevalence of Smoking in Burkina Faso and Bobo-Dioulasso

According to researches, smoking is more prevalent in low-income countries than in those with higher income levels (WHO, 2021a). These disparities are expected to widen in the future. It is projected that nearly 80% of the world's over one billion smokers will originate from low-income regions. In families living in poverty, it is estimated that about 10% of their disposable income is spent on tobacco when at least one member smokes. Tobacco use is rampant in these inhabitants for the following reasons: first, poverty limits the power and influence to affect policy decisions, leaving individuals in these communities with little voice in health matters; second, rapid, unplanned urbanization driven by poverty has led to the growth of informal

settlements. 2022 report on the economics of tobacco, jointly published by the U.S. National Cancer Institute and the WHO, reached similar conclusions regarding the disproportionate burden of tobacco use among low-income populations.

National Cancer Institute and WHO has come to the same conclusion. They went further asserting that in coming years, men will still take the lead in smoking compared with women: Future projections indicate a rapid rise in tobacco use, particularly among men, along with an increasing weight of non-communicable sicknesses in Africa. This trend underscores the vital need for country-specific data on the occurrence of smoking and the use of smokeless tobacco (SLT). According to researches, the prevalence of adult tobacco use varies significantly across African countries, reflecting diverse patterns in tobacco consumption (Pokothoane et al., 2025). Findings indicate significant variation in smoking prevalence among African nations, with West Africa showing particularly diverse patterns (Sreeramareddy & Acharya, 2021). Recent analyses indicate significant variation in smoking prevalence among men across West African countries. Specifically, male smoking rates range from 6.1% in Ghana to 38.3% in Lesotho, with a decrease in prevalence observed in Ghana from 6.1% to 4.5% over time (Sreeramareddy & Acharya, 2021). In all surveyed regions, men consistently exhibited higher smoking rates compared to women. However, research indicates a growing trend in the promotion of tobacco products specifically targeting females in sub-Saharan Africa (Bilano et al., 2015).

Tobacco-related statistics in Burkina Faso are concerning. According to Yaméogo (2015), a significant portion of students reported exposure to pro-cigarette advertisements in 2009, with 68.5% seeing such promotions on billboards and 62.7% in newspapers or magazines. Furthermore, ownership of items branded with cigarette logos was also notable. 39.6% of students reported owning such items in 2001.

However, this figure dropped to 23% in 2006 and further to 12.9% by 2009 (WHO, 2021a). While the reduction in branding exposure is an important factor, it is difficult to directly correlate it with the drop in smoking rates without considering other concurrent public health interventions and social factors. Data from studies (Global Youth Tobacco Survey, 2001) in Burkina Faso revealed a high prevalence of tobacco use among students. Approximately 44.9% had tried smoking cigarettes at least once, with notable gender disparities—61.9% of boys versus 27.4% of girls. Current use of any tobacco product stood at 22.5% (32.1% for males and 12.1% for females), while 20.4% were identified as current cigarette smokers (30.9% males, 9.1% females). Additionally, 7.0% reported using other forms of tobacco, and only 16.8% had never smoked (Yaméogo, 2015). However, approximately 23% of college students report using some form of tobacco; 20% are current cigarette smokers, while 7% use other forms of tobacco. The National Health Agency has validated earlier findings, emphasizing the continued high levels of tobacco smoke exposure among students. Approximately 40% live in households where smoking occurs in their presence, nearly 70% are exposed to smoke in public settings, and more than 10% have at least one parent who smokes (WHO, 2022).

There are few examinations done on smoking but not on prevalence and determinants factors among college students of Bobo-Dioulasso. This research when produced, will stand as a document that will serve as a foundational document and a springboard for future studies.

In Bobo-Dioulasso, trends of tobacco usage among college students aged 13 to 15 showed a decline in cigarette smoking but an increase in the consumption of other tobacco products between 2001 and 2009. In 2001, 19.25% of students reported current cigarette smoking (28.6% among boys and 9.6% among girls), while 6.2%

(5.9% boys; 5.5% girls) used other tobacco products. By 2006, the prevalence of cigarette smoking had dropped to 14.3% (21.9% boys; 4.4% girls), yet the consumption of other tobacco products rose to 7.6% (9.3% boys; 4.7% girls) (Global Youth Tobacco Survey, 2001). In 2009, only 3.8% of students (6% of college boys and 1.2% of girls) were heavy smoker; however, the use of other tobacco products rose significantly to 17.7% (18.5% among boys and 16.5% among girls) (Global Youth Tobacco Survey, 2001). Based on general observations of societal patterns that are assumed to affect university and college students, an increasing trend in tobacco use is likely to emerge among university and college students, and this trend could be attributed to factors such as peer pressure, parental smoking, students' age, mindfulness of the health risks related to smoking, gender, and access to disposable income (e.g., pocket money).

Environmental Influence

Cigarette smoking among college students could be affected by various environmental factors. College students' antismoking convictions, smoking habits, and readiness to give up smoking have all improved with less exposure to SHS (Mbongwe et al., 2017). College students can be significantly prevented from starting to smoke by local and home smoke-free restrictions (Wang et al., 2018).

Additionally, anti-smoking programs and materials play a critical in increasing consciousness about the health hazards linked with tobacco use. It impacts attitudes toward tobacco use (Wang et al., 2018) both of which may lessen the likelihood that teenagers would start smoking Adolescent cigarette smoking is significantly shaped by the behaviors of both parents and peers. Research shows that parental smoking patterns are a strong predictor of adolescent smoking, with long-term effects that persist into young adulthood (Vuolo et al., 2021). Teenagers are especially vulnerable

to adopting smoking behaviors during the critical shift from junior high to high school, often influenced by whether their parents or close peers smoke (Kim & Cappella, 2021; Vuolo et al., 2021).

It has been proven that adolescents' perceptions of smoking attitudes and behaviors among family and friends influence their chances of becoming smokers (WHO, 2019). This effect influences smoking behavior both directly and indirectly by shaping an individual's intention to smoke. According to Social Cognitive Theory, individuals tend to adopt behaviors based on exposure to behavioral patterns and social norms within their environment, such as tolerance for tobacco use. Observing and learning from the behaviors of influential figures, like parents or peers who smoke, can lead to the internalization of smoking as an acceptable or desirable behavior, thus increasing the likelihood of smoking initiation (Bandura, 1986).

The role of environmental influences on adolescent tobacco smoking play a more significant part in student's smoking initiation. The impact of relatives, friends and colleagues on adolescents' tobacco smoking behavior has been the subject of much research. Environmental influences are exceptionally prominent for teenagers because, they look to other significant people in the environment to model social behavior when they travel toward establishing their identity.

Peer Influence

Peer influence is just one factor among many explored through various theoretical perspectives on adolescent smoking. While some theoretical approaches emphasize personal characteristics like gender and stress response, others focus on the broader social context, highlighting how adolescents' relationships and the support or constraints within their social networks shape behavior beyond just direct peer

influence (Kim & Cappella, 2021). These features, when combined, can also significantly impact adolescents' smoking behavior.

In comparison to students who did not have friends who smoke, those with smoking peers were nearly three times more expected to have smoked cigarettes 2.79 (95% CI: 1.62-4.82; I² = 35.7) (Liu et al., 2017). This concurs with findings from other East African research (Azale, 2017). In their teenage and early adult years, people are more likely to copy and practice the behaviors they see their peers engaging in. During adolescence and early adulthood, individuals are more likely to copy and adopt behaviors they see within their milieu.

Further study findings indicated that peers influenced subjective norms. Teenagers who wanted to fit in with their peers were frequently willing to do anything, including smoking. Scalici and Schulz (2017) found that adolescents' smoking behaviors are influenced by the normative behaviors and approval of both parents and peers.

The study was grounded in social cognitive theory, which suggests that smoking behavior can be shaped not only by an individual's intention but also by the influence of their peers (Davies & Macdowall, 2006; Joung et al., 2016). Adolescence is a developmental stage marked by significant peer pressure, which can strongly influence risky behaviors, including substance use. Peer pressure is widely acknowledged as a key contributing factor (Davies & Macdowall, 2006; Joung et al., 2016).

Studies in Tabuk (Saudi Arabia) support earlier research from Saudi Arabia in that there is a significant correlation between students who smoke and those who have smoking parents, peers, or friends. The social impact of friends on adolescent smoking is one of the findings that appear in the literature the most frequently as

mechanisms of influence, modeling, direct pressure, and normative beliefs have been proposed and researched, along with the potential significance of levels of social interaction (Al-Damegh et al., 2004). Studies indicate that the likelihood of adolescents engaging in smoking is largely influenced by how frequently they come into contact with others who smoke. Research has shown that this behavior, driven by prevalence, is common in Saudi Arabia and other countries in the region (Al-Damegh et al., 2004).

Availability of Cigarettes

After conducting a thorough study, Xi et al. (2016) found that the easy availability of tobacco plays a major role in the introduction of smoking among adolescents. The study found that the availability of free cigarettes, whether from tobacco companies or smoking peers, was the most significant factor predicting smoking behavior (Al-Damegh et al., 2004). Despite Taiwan's legal restrictions on selling or providing tobacco products to minors, adolescents continue to access cigarettes through various means, including purchases from retail outlets and from peers (Chen et al., 2014), being able to purchase cigarettes from various sources, including convenience stores, supermarkets, tobacco shops, coffee shops, online retailers, as well as at events like weddings and funerals. This finding is critical for policymakers, underscoring the need for stricter regulations in the retail sector. Additionally, the exposure of adolescents to smoking, particularly through tobacco companies' marketing strategies like the distribution of free cigarettes, was shown to significantly escalate the possibility of smoking commencement.

Teenagers comprise a sizable share of the population in northeast African nations with poor incomes. Due to the presence of extensive tobacco farms and the availability of inexpensive child labor for planting and harvesting tobacco, tobacco

companies chose to relocate their production to this region. However, the outcome was better than Tanzania's (4%) and Ethiopia's (7.72%) results.

A study's findings indicated that the availability impacted cigarette advertisements. Due to the absence of an age constraint on the sale of cigarettes and the seller's ignorance of the buyer's age, access to cigarette sales is readily available. As a result, they might lead more teenagers to smoke (Hughes & Ensor, 2011).

Exposure to cigarette is the cause of this influence. This is demonstrated by many cigarette advertising channels used to market their products, such as roadside advertisements and posters where they are sold (Ford et al., 2016; Prabandari & Dewi, 2016). Teenagers' smoking behavior may be encouraged by advertisements, according to Deressa Guracho et al. (2020).

Affordability of Cigarette

Filby (2025) defines cigarette affordability as the amount of money or its time equivalent required to purchase cigarette). It is determined by the interplay between consumer income and cigarette prices and is a key factor influencing tobacco consumption. One of the most active ways of tobacco control—dropping cigarette affordability through increased tobacco taxes—has often been underused by governments in low- and middle-income countries.

Cigarette accessibility is often assessed by the share of individuals who report being refused cigarette purchases because of age restrictions, while anti-smoking sentiment is typically gauged by the proportion of non-smokers endorsing public smoking bans (Filby, 2025; Grigoriev et al., 2023). Traditionally, smokers were excluded from this variable as they were more expected to oppose such bans matched to non-smokers. A regression analysis was conducted for two price categories: a low price, based on domestic brand prices, and a high price, based on foreign brand prices.

Information on prices was obtained from national implementation reports submitted to the WHO Framework Convention on Tobacco Control (FCTC) Secretariat, as well as from multiple editions of the WHO Global Tobacco Epidemic Report (WHO, 2019). Chinembiri (2018) collected cigarette price data from both retail shops and street vendors across seven African countries—Botswana, Lesotho, Mauritius, Namibia, South Africa, Swaziland, and Zimbabwe—covering 24 provinces in total. The researcher discovered that price differences were typically substantial, with the difference between the minimum and maximum costs for a pack of 20 cigarettes or its equivalent more than 50% of the mean price in seventy-five percent of the provinces. The sale of single cigarettes was especially prevalent in Lesotho and Ethiopia, but also commonly observed in South Africa, Zambia, and Zimbabwe. Notably, data suggest that single cigarettes were available at lower prices in markets within South Africa and Lesotho (Chinembiri, 2018). This conclusion is particularly intriguing because these nations had the highest smoking incidence among the countries examined. In contrast, Nigeria and Ethiopia, the nations with the most negligible price differentials, have relatively low rates of cigarette usage.

According to the WHO (2017), data on the retail prices of tobacco products are collected every two years and published in the Global Tobacco Epidemic Report. This includes pricing for a 20-cigarette pack of a premium brand (such as Marlboro or its local equivalent), the closest economy brand, and the most affordable brand available in each country. Price data is collected in local currency from each country's capital and gathered from two types of stores: supermarkets and small retail outlets.

The WHO's biennial Global Tobacco Epidemic Report provided cigarette price data for countries including Cameroon, Gabon, Madagascar, Mauritania, Mauritius, Tanzania, Uganda, and Zimbabwe. For each of these countries,

information was available on both the least and most expensive cigarette brands corresponding to the Global Youth Tobacco Survey (GYTS) year (WHO, 2017). Tanzania only reported price data for the most popular brands, which is assumed to be for a local, inexpensive brand.

“For countries such as Algeria, Gambia, Ghana, Senegal, Seychelles, and Sierra Leone, cigarette price data were obtained from reports submitted to the WHO Framework Convention on Tobacco Control (FCTC) Secretariat, which documents tobacco control progress in even-numbered years” (WHO, 2023b, p. 21).

Unfortunately, no price data was available for the five GYTS surveys conducted in Kenya, Mozambique, and Comoros. According to the WHO (2021b), price data for these nations is typically available for the year following each Global Youth Tobacco Survey (GYTS), although only user price index data was found. Prices are adjusted using purchasing power parity (PPP) conversions sourced from the World Bank’s World Development Index database and are entered into models in logarithmic form. For instance, when expressed in real 2017 PPP dollars, the lowest local tobacco prices were recorded in Mauritania at \$1.18 PPP, while the highest price was observed in Seychelles at \$13 PPP. In terms of foreign-brand cigarettes, Seychelles once more identified the highest price at \$16.10 PPP, while Sierra Leone had the lowest price at \$2.23 PPP (WHO, 2021b).

These conclusions reveal a complex image of cigarette pricing in the examined nations and indicate that action is needed to address pricing disparities and single-stick availability. The potential health effects of the tobacco industry's growing influence in these sub-Saharan African nations should be mitigated. The data also reveals that Africa occupies the bottom of the prevalence of tobacco use among all WHO sections, with rates ranging from 10.8% to 27.3%. However, it also has the

highest potential for tobacco market growth. Africa is a desirable market for international tobacco companies due to its large population of young adults, children, and growing disposable income (WHO, 2021b). Students in Burkina Faso, like many young people in other countries, might have limited disposable income. If cigarettes are priced affordably, they are more likely to purchase them, even if they are aware of the health risks. The relatively low cost of cigarettes in some regions makes them accessible to a broader student population (GYTS, 2020). The availability and pricing of cigarettes have a direct influence on smoking behavior among Burkinabe college students. When cigarettes are easily accessible and priced low, students are more expected to experiment with smoking and possibly continue the habit (Global Youth Tobacco Survey, 2001). On the other hand, higher prices and less availability could act as significant deterrents, especially for students with limited financial means. Public health policies that increase the cost of tobacco and reduce its accessibility can play an important role in curbing smoking rates in this population.

Advertising on the Media

The occurrence of local anti-tobacco broadcasting efforts is measured by the percentage of individuals who reported encountering anti-smoking messages—within the past 30 days—through sources such as radio broadcasts, printed materials, or during public events like sports games and community fairs (National Cancer Institute, 2022). According to the National Cancer Institute (2022), there is no clear evidence showing that anti-tobacco sentiment, tobacco promotion, or adolescence accessibility significantly impact the number of cigarettes consumed by current smokers. This implies that once individuals begin smoking, these environmental factors—aside from cigarette pricing—have limited influence on their smoking intensity. A notable exception, however, is exposure to anti-smoking media, which

was found to significantly diminish the number of cigarettes smoked. On the personal level, parental smoking stood out as the only individual factor that influenced the intensity of smoking among youth. Additionally, age showed a strong and parabolic effect, with smoking intensity increasing progressively across older age groups.

Another study synthesized findings from various empirical investigations on cigarette promotion and advertising, anti-smoking campaigns, product placements in movies, television, and music, as well as news coverage related to smoking. From this comprehensive review, several key conclusions emerged:

1. The media both shape and mirror societal attitudes toward smoking, influencing how smoking is perceived and accepted in different cultures and communities.
2. The media provide direct informational content about smoking, potentially educating or influencing the audience's understanding and awareness of tobacco use and its consequences.
3. The media act as a platform for observational learning, offering behavioral models through characters or influencers that adolescents may be inclined to emulate

Ghanaian researchers have reached similar conclusions through the lens of Social Cognitive Theory, as advanced by Bandura (1986). This theory underlines the role of observational learning, imitation, and molding in behavior growth. According to their findings, adolescents are likely to adopt smoking behaviors by observing and mimicking influential models in their environment—such as parents, peers, or media records—especially when these behaviors appear to be satisfied or socially recognized. This perspective reinforces the importance of addressing social and environmental cues in tobacco control efforts, particularly those targeting youth. The theory explains how people learn specific behaviors by imitating the actions of models' actions (i.e., by observing and copying the actions of others). Social learning, also known as observational learning, is this process. An observer's likelihood of adopting a behavior depends on several variables, such as how well-versed they feel

they are in performing the behavior and the associated rewards and penalties.

According to the Social Cognitive theory, forethought significantly impacts human motivation and behavior (Crowley & Riggs, 1995).

It is concluded that outcome expectations and exposure to tobacco promotion are positively correlated. Teenagers in Ghana do, have high expectations for the physical and social effects of smoking. The results also imply that outcome expectancies mediate the relationship between exposure to tobacco promotion and intention to smoke. This is consistent with the Social Cognitive theory's assertion that an observer's eventual behavioral patterns are determined by their ability to predict and assign value to the outcomes of various behaviors. As previously mentioned, "ever experimented with smoking" was a more significant indicator of future intention to smoke. Research has consistently demonstrated that exposure to tobacco strongly predicts intention, so these findings are noteworthy (Crowley & Riggs, 1995).

The findings regarding the relationship between gender and outcome expectations showed no differences between genders regarding expectations for physical outcomes. This unexpected pattern demonstrates that tobacco promotion affects both male and female adolescents equally. Elkind (1985) asserts that tobacco companies occasionally use brand images to combat unfavorable stereotypes, such as the notion that smoking is terrible for women. However, there was a gender difference in one expectation for a social outcome. Comparatively to 24.9% of the females, about 31.1% of the men agreed that smoking makes people feel more at ease during celebrations. These studies support the argument that gender plays a substantial role in smoking motivations. While men tend to smoke primarily for recreational and social purposes, women are more inclined to "smoke as a coping mechanism for stress", according to Liu et al. (2017) in their study "Gender Differences in the

Extended Theory of Planned Behavior on Smoking Cessation Intention in Young Soldiers,” published in the International Journal of Environmental Research and Public Health.

This distinction is crucial for designing gender-sensitive interventions that address the underlying psychological and social drivers of smoking behavior in different groups

According to the study's findings, children should not be exposed to smoking in the media, as such exposure can provide the normalization of tobacco use and may increase the likelihood of early initiation (National Cancer Institute, 2022). Although the movie industry has long been criticized for portraying smoking celebrities on screen (McCool et al., 2003), industry executives do not think that children are influenced by smoking in movies (J. D. Sargent et al., 2001). The results show that exposure to smoking in movies affects viewers' expectations of their behavior and smoking intentions.

Ongoing research continues to explore the impact of media on adolescent smoking behavior. Outcomes from this study suggest a substantial relation between advertising exposure and the intention to smoke. This aligns with findings by Rachmat et al. (2013), who observed that cigarette advertising had a noticeable influence on adolescents' smoking habits in Makassar, highlighting how marketing exposure can shape youth behavior in specific local contexts. The use of advertisements as a promotional tool appears to influence the formation of smoking-related attitudes and behaviors among teenagers, primarily by increasing their desire to smoke. Thus, contact with cigarette advertising is strongly correlated with a heightened likelihood of smoking initiation among youth.

According to Deressa Guracho et al. (2020), “advertisements—whether displayed on billboards or aired on television—often portray smoking in a positive light, which can subtly influence adolescents to view it as appealing, modern, and socially desirable, thereby increasing the likelihood of smoking initiation”. This study aligns with the PRECEDE-PROCEED model, particularly the concept of reinforcing factors, by illustrating how exposure to cigarette advertisements can reinforce adolescents’ intentions to begin smoking (Prabandari & Dewi, 2016). Recent studies indicate that exposure to media, particularly social media, significantly influences college students' intentions to use tobacco products (Jones & Martin, 2023). A recent study conducted in 2024 revealed that adolescents with daily social media engagement were 67% more likely to begin using tobacco within a year, compared to their peers who used social media less frequently. Active engagement with tobacco-related content, such as liking or following tobacco brands, further increased this risk (Fisher & Robertson, 2024)

A different study by Vogel et al. (2020) investigated the “effects of social media exposure on adolescents' willingness and intention to use e-cigarettes”. The study concluded that increased engagement with social media was linked to a higher likelihood of adolescents being willing or intending to use e-cigarettes. “Furthermore, frequent exposure to e-cigarette-related content—especially in large volumes—was associated with more favorable attitudes and stronger intentions to try them. Notably, advertisements had a more pronounced effect than peer-generated content, fostering greater acceptance, perceived social approval, and intent to use e-cigarettes”. Both peer-generated posts and advertisements featuring e-cigarette content had significant effects (Vogel et al., 2020).

Types of Tobacco Used in Bobo-Dioulasso

In Burkina Faso, several tobacco products are consumed by the adults and the younger ones. The main tobacco products used include those intended for consumption and other uses. Unfortunately, none of this practice of tobacco use is safer. “All of them contain nicotine and can cause addiction and health problems” (WHO, 2020). Cigarette smoking is the most common form of tobacco use in Burkina Faso (Bonnechère, Cissé, et al., 2019). “Current information suggests tobacco products beyond traditional cigarettes include various forms such as waterpipe tobacco, cigars, cigarillos, heated tobacco products, roll-your-own tobacco, pipe tobacco, bidis, kreteks, and smokeless tobacco” (WHO, 2021a). These products vary in their method of consumption and associated health risks, but all carry significant potential for addiction and adverse health effects, much like traditional cigarette smoking. Each of these products may have different appeal based on factors such as cultural practices, availability, and marketing strategies.

Cigarettes. Recent studies in the area (Centers for Disease Control and Prevention, 2024) has found that cigarette consists of a combination of cured and finely shredded tobacco, reconstituted tobacco, and various additives, all wrapped in a paper cylinder. Many cigarettes are designed with a filter at one end. Tobacco and its smoke contain over 4,000 chemicals, with more than 60 of these chemicals being classified as carcinogenic.

Dissolvable tobacco. According to Centers for Disease Control and Prevention (2024), dissolvable tobacco is finely processed so that it dissolves in the mouth or on the tongue. “It is available in multiple formats—including strips, sticks, pellets, and lozenges—that are bound with edible materials and designed to look like sweets or breathe mints” (CDC, 2024). These products are free of smoke and spit.

Although it is a new product in the market, there has been little research on its health effects. It is essential to note that this product contains nicotine, and like other smokeless tobacco products, it poses major health hazards and should not be considered a safe alternative to smoking tobacco.

Electronic cigarette or e-cigarette. The WHO (2021b) defines e-cigarette as a “battery-powered device that contains a cartridge filled with nicotine, flavorings, and other chemicals. It operates as a nicotine delivery system rather than a tobacco product. When used, the e-cigarette vaporizes these chemicals, which the user inhales”. Unlike traditional cigarettes, “e-cigarettes do not involve the burning of tobacco and do not produce smoke; instead, they produce a fine, heated mist. E-cigarettes are designed to resemble cigarettes, with some models even featuring a glowing tip, while others may look like ballpoint pens” (WHO, 2021b).

Most e-cigarettes are reusable and are marketed as alternatives to smoking. However, according to the WHO (2021b), “there is no scientific proof confirming that e-cigarettes are a harmless and effective nicotine replacement therapy, and studies have not proven their safety”. Recent studies by the National Cancer Institute (2022) indicate that e-cigarettes contain known carcinogens and toxic chemicals that pose health risks to users.

Family influence. Several aspects of the home environment can significantly influence children's likelihood of smoking. Key factors include whether parents or siblings smoke, parental attitudes and behaviors regarding smoking, and the family's socioeconomic status. Many studies have demonstrated that parents when smoke, there is a higher rates of smoking initiation among children and adolescents. It also increases the likelihood of progression to regular smoking and continued use into adulthood (Gilman et al., 2009; Leonardi-Bee et al., 2011).

A longitudinal study in the U.S. found that “higher levels of parental anti-smoking encouragement during adolescence were associated with lower odds of cigarette use in young adulthood”. This suggests that “parental disapproval of smoking can serve as a protective factor against future tobacco use”(J. Sargent & DiFranza, 2021). These associations are due to many factors, including child behavior, beliefs, expectations, patterning of attitudes from parents, perceptions of parental consent to smoking, access to tobacco, and possibly genetic predisposition factors. There is a possibility.

In 2020, “the global prevalence of tobacco use was 22.3%, with 36.7% of men and 7.8% of women using tobacco products showing a notable variations”(WHO, 2024). The family's cigarette smoking practices were substantially connected with beginning and continuing to smoke. Friends were the most prevalent motivation for beginning to smoke (24, 9%), while personal life stress (17.6%) was the main driver for continuing to smoke. The majority of participants (92.3%) claimed to be conscious of the threats associated with smoking. Smokers and non-smokers showed a substantial difference in their understanding of the risks related with smoking. Religious convictions were the main barrier to cigarette smoking (69.1%) (Vitaro et al., 2004).

Family members, especially parents and siblings, can influence others by giving them access to cigarettes, sharing information with them, modeling and demonstrating how to use cigarettes, and promoting attitudes and social norms that support smoking.

Upbringing and Smoking in the Family

A study by Cole et al. (2013) surveyed 31,396 Canadian high school students to examine the impact of parental smoking on adolescent smoking behaviors. The

findings revealed that 75.7% of those who smoke daily had a parent or a member of the family who smoke, highlighting a significant association between parents who smoke and teenagers smoking initiation. The study underscores the importance of parental influence in shaping adolescent smoking behaviors and suggests that interventions targeting parental smoking habits could be effective in reducing youth smoking rates. Students at school with a parent smoking have a high predictor of smoking in adolescence. 75.7 % of smokers have lived or lived with a parent, stepparent or guardian smoking. These findings are consistent with a longitudinal study that lasted nine years by Peterson Jr. et al. (2006), which identified a dose–response relationship between witnessing parental smoking during early childhood (in third grade) and the likelihood of smoking behavior in adolescence (by twelfth grade).

The study concluded that living in a household with at least one smoker significantly increases the likelihood that a child will adopt smoking behaviors, in contrast to households where neither parent smokes. According to Vrinten et al. (2022), adolescents between the ages of 15 and 17 are significantly more likely—by a factor of three—to take up smoking if someone in their household regularly smokes. While this finding lends support to social learning theory, the specific source of influence remains uncertain.

It is possible that the behavior is not solely shaped by parents but could also stem from the smoking habits of siblings or other relatives living in the same home. It was also found that the smoking conduct of parents in a smooth transition from smoking in adolescence (e.g., occasional smokers become regular smokers. In a study involving 5,520 families in the United States, Mays et al. (2014) identified a link between parental smoking behavior and adolescent smoking patterns. Their findings suggested that exposure to parental smoking may influence not only the consistency

of self-reported smoking behavior among adolescents but also the evolution from occasional to habitual daily smoking. While several studies underscore the negative influence of parental smoking during adolescence, other research points to a broader range of contextual factors that also play a role. In a four-year longitudinal study involving 812 adolescents, Vitaro et al. (2004) examined the relative impact of parental and peer smoking behaviors. Their results indicated that parental smoking considerably predicts the initiation of smoking in teenagers.

Parental influence on smoking behavior is most pronounced when adolescents begin smoking between the ages of 11 and 13. After this period, the role of peers becomes increasingly significant, while the effect of parental smoking diminishes. Nevertheless, parental smoking continues to be a notable factor in the initiation of smoking during (Vitaro et al., 2004).

Yaméogo (2015) conducted a more in-depth analysis, noting that despite several strengths in the study—such as the use of two independent longitudinal samples—certain limitations must be acknowledged. In both samples, college students provided self-reports regarding their own smoking behaviors and the smoking environment around them. While prior research suggests that self-reported information, including reports on parental and peer smoking, tends to be reliable, the inclusion of data from diverse reporting sources could enhance the overall accuracy of the findings.

Parental smoking status was coded using a binary indicator, where a value of 1 signifies that the respondent has at least one parent who smokes. “In Cameroon, Gabon, and Senegal, students were not directly questioned about their parents' smoking behavior, instead, the surveys included proxy questions designed to capture equivalent information”(Mbatchou et al., 2015). A study led by the WHO (2017),

asked respondents: “In the past 7 days, how many days did someone smoke in your house, in front of you?” with the following response options: 0 days, 1–2 days, 3–4 days, 5–6 days, or 7 days (WHO, 2017). Parental smoking was encoded as “1” if the student reported exposure to smoking in the home for 3–4 days or more during the past week. Approximately 15% of the respondents reported having at least a relative who smoked. Mauritius had the highest percentage of students with at least one smoking parent (31.9%) (Ministry of Health and Quality of Life, Mauritius & WHO, 2016), followed by Seychelles (31.0%). The country with the lowest proportion of students with at least one smoking parent is Mozambique (7.4%) (Tezera & Endalamaw, 2019).

In conclusion, findings from both independent samples indicate that environmental exposure to smoking significantly contributes to adolescent smoking behavior. However, there was no strong indication of a direct or interactive effect of genetic predispositions on the link between environmental smoking and the initiation of smoking. This proposes that both genetically predisposed individuals and non-carriers are similarly influenced by smoking behaviors within their surroundings. These results highlight the importance of prioritizing environmental factors in smoking prevention strategies, while also emphasizing the need for further research into the complex interaction between genetic and environmental influences in the early stages of tobacco use.

Students who were exposed to family or other smokers had a higher than 6-fold increased risk of smoking cigarettes comparing with students who had no exposure to these sources AOR: 6.17 95% CI: 2.37, 16.06 (Telayneh, 2022). This outcome is constant with studies of a similar nature done in Nigeria, Tanzania, Ethiopia, Pakistan, Bangladesh, Nigeria, and Cameron (WHO, 2016). These

exposures may explain this pattern, which cause the person to be viewed as a secondary smoker.

Analysis of adult daily smoking data, as reported by the WHO (2017), revealed a solid positive relationship ($r = 0.71$) between the rate of smoking among college students, the overall adult smoking prevalence, and the proportion of parents who smoke.

Daily Pocket Money

“Gambia has the maximum percentage of students getting pocket money (88.2%), while Kenya has the lowest”, observed (Tezera & Endalamaw, 2019). As for spending, the estimate of the spending coefficient on starting smoking is also statistically significant for all equations. Thus, pocket money is a major cause of adolescents starting smoking. If a student has extra pocket money, this will lead to some degree at a higher possibility of starting smoking. For example, for all college students in grades 7 through 12, a 10% rise in spending money increases the rate of starting smoking by 0.7%. The elasticity for students in grades 7-9 and 10-12 is the same, meaning that a 10% increase in spending will cause a 0.5% increase. Although significant, these impacts are much reduced than the reaction of smoking to the price of cigarettes (Tezera & Endalamaw, 2019).

Pocket money is positively related to current smoking. Tobacco pricing policies may prevent youth access to tobacco. The statement “Approximately 69% of persons in our sample received pocket money” is supported by findings from a study that analyzed data from the Global Youth Tobacco Survey (GYTS) across 16 African nations. In this study, approximately 69% of respondents reported receiving pocket money, which was used as a proxy for access to money, as the GYTS does not inquire

about respondents' income. This variable was found to be a significant factor in adolescent smoking behavior (Cham, 2022).

Evidence suggests that adolescents' smoking behavior and family socioeconomic status (SES) are related; specifically, adolescents from low-SES backgrounds and those with higher pocket money were more likely to smoke (Perelman et al., 2017). However, one of these studies discovered that among adolescents from low SES families, smoking intensity is not correlated with personal income. The researchers discovered that trading cigarettes with friends among adolescents from low-SES homes increased their exposure to smoking and lessened the impact of income (Owusu-Sarpong & Agbeshie, 2019).

According to Green and Kreuter (2005), health-related behaviors are shaped by a combination of personal attributes and external environmental influences. The PRECEDE model identifies three main factors that affect behavior: the predisposing factor, the enabling factor, and the reinforcing factor. Pocket money and access to cigarette purchases are some of the enabling factors that influence teenagers' smoking behavior, and cigarette advertisements are some of the reinforcing factors (Fertman & Allensworth, 2010).

Additional study findings (Ryu & Fan, 2023) indicated a connection between the impact of pocket money and perceived behavioral control. Adolescents with more pocket money have a propensity to support their smoking behavior. The likelihood of smoking among teenagers rises with increased pocket money, which is frequently a reflection of higher household income. Teenagers lacking parental supervision will develop a bad habit of squandering funds at hand. Due to easy access, more people are buying cigarettes. This influence may also be brought on by the perception of

behavioral control, which may give youths more freedom to spend their pocket money however they please, including on cigarettes.

Pocket money and ever-smoking were significantly correlated for males in Tabuk. Adolescent smoking has been linked to personal income; immature people with more disposable revenue have higher rates of continuous smoking, likely because money is required for cigarette purchases. Young people who work and have their income exhibit higher cigarette use, suggesting that adequate income may take precedence over other protective factors.

Place of Residence

There is less research made on the place of residence associated with smoking among college students. Few studies done by Algren widely recognized that deprived neighborhoods present higher smoking prevalence (Algren et al., 2015). According to studies conducted among college students in Bangladesh by WHO (2016), the prevalence of tobacco use did not differ significantly by place of residence. There was no weighty difference by place of residence for the prevalence of tobacco smoking among students. In Burkina Faso, studies conducted by Bonnechère et al. (2019), concluded that there is no statistically major difference in smoking incidence by living zone ($p = 0.79$). However, after sufficient research in India, Gupta (1996) discovered that with the exception of cigarette usage, all tobacco use indicators were substantially correlated with the place of residence. In Nigeria a sub-Saharan African country, “the place of habitation, classified as either city or rural in this study, had no association with tobacco use” (Ekanem et al., 2010).

Age

Numerous statistics have been provided, taking into account methodological variations, about the incidence of tobacco use for students in schools around the

world. “In a significant recent study from France, Bogui et al. reported a high prevalence (12.9%) of tobacco use among students between the ages of 13 and 17 and an increasing rate by age. They also reported a significant ratio of second-hand smoke among non-smokers 44.3% for homes and 66.7% for public places”(Bogui et al., 2004). A substantial portion of adolescents are exposed to second-hand smoke, with one study reporting that 74.3% of students had encountered it. Notably, this exposure was significantly more common among boys in higher grades, such as the 11th grade, compared to their female peers (Gentzke et al., 2022). These findings underscore the persistent issue of involuntary tobacco smoke exposure among youth, particularly in school environments.

Numerous studies (Tot et al., 2004) have examined tobacco usage among Turkish schoolchildren, they have found that “a growing number of Turkish children and adolescents are exposed to tobacco smoke as a result of the country's fast-rising smoking prevalence, notably among men during the previous few decades”. According to some research done in Africa, boys and girls smoke tobacco at similar rates. The lower percentages for girls as highlighted by the WHO (2017) may be explained by cultural variations in social roles between various nations and locations. Smoking tobacco is not as widely accepted and acceptable in all societies.

Gender

Despite some countries’ efforts to prevent the gender gap in smoking prevalence, the EMR countries still have a sizable gender disparity. The gender gap for some tobacco products, however, appears to be closing, according to recent studies (Mostafa et al., 2018). The difference is getting smaller due to factors like the region's rising acceptance of female smoking. Globally, research has regularly shown that smoking frequency is higher among boys than girls (WHO, 2017).

Many studies have been done on gender and smoking. The conclusion is the same in almost all the regions of the world. It is found that men smoke more than women (WHO, 2021a). However, there is no discernible modification in smoking attitudes between men and women in the recent study. Male students in the existing study smoke cigarettes more frequently than female students 44% versus 13%, respectively as indicate by the Global Burden of Disease 2021. According to studies from Saudi Arabia, men smoke more tobacco than women do (18%–31% vs. 5.9%–14%) (Reitsma et al., 2017). These findings corroborate the conclusions drawn by several earlier investigations. Cultural and social norm differences can account for this gender disparity.

In general, men who are full-time college students are likely to smoke than women, according to data from the general population. The 2010 National Survey on Drug Use and Health found that 27.1% of male college students aged 18 to 22 reported smoking cigarettes, reflecting a slight decline from 31.7% in 2009 (Substance Abuse and Mental Health Services Administration [SAMHSA], 2011). Contrary to a study among secondary school students in Nairobi, Kenya, it is found that 38.6% of male students had always smoked, with a significant gender disparity (Nairobi Study Group, 2003). Furthermore, a study in Douala, Cameroon, reported a notably higher prevalence, with 93.1% of male university students being current smokers (Mbatchou et al., 2015). “According to the Kenya GATS, 19.1 percent of men and 4.5% of women, respectively, use tobacco products. Around 6% of users admit smoking tobacco every day, while 1.8% say they do not. In subpopulations like rural Kenya and the slums of Nairobi, alcohol usage has been linked to a growth in tobacco use” (Kenya National Bureau Statistics, 2014). The GATS Kenya study

defines smokeless tobacco products as those that are either entirely or partially produced from tobacco and do not require lighting to be used.

Kenya approved the WHO's Framework Convention on Tobacco Control (WHO FCTC) on June 25, 2004, and subsequently enacted the Tobacco Control Act in 2007 to align with its provisions. Compared with a study conducted among secondary school students in Shiraz, Iran, which reported a tobacco use prevalence of 19.7%. Cultural differences across the communities examined may also contribute to variations in smoking behavior. Additionally, the elevated smoking prevalence observed in the present study could be attributed to the overrepresentation of male participants, as previous research has shown that men generally exhibit a higher tendency toward substance use compared to women (Greenfield et al., 2010). Similarly, current global smoking rates are lower than those reported in systematic reviews conducted in Africa and the Middle East. For instance, a 2024 regular review and meta-analysis of 36 studies across sub-Saharan Africa found a pooled lifetime cigarette use prevalence of 15.2%, with current use at 11.8% (Nwabueze, 2024). A 2023 meta-analysis encompassing 90 studies reported a cigarette smoking rate of 17.41% and water pipe use at 6.92% in the Middle East (WHO, 2023a). These differences may be attributed to variations in study duration and sample sizes across these studies.

Women are typically stigmatized for using tobacco, especially in developing nations, where cultural and social norms often discourage female smoking. Consequently, the occurrence of tobacco use among women is consistently described to be lower than that of men (Hagen et al., 2016). Arabia and other Eastern Mediterranean Region (EMR) nations exhibit a consistent trend regarding gender disparities in tobacco use, particularly concerning traditional tobacco consumption

methods such as cigarette smoking. In many EMR countries, men have traditionally shown higher prevalence of tobacco use compared to women, a disparity often attributed to social stigma surrounding female smoking (Jarallah et al., 2010). However, recent data indicate a narrowing of this gender gap in certain areas, suggesting evolving social norms and increasing female tobacco use (WHO, 2020). However, women of all ages in the EMR frequently use water pipes, while conventional tobacco use appears to occur at low rates. According to some research, women tend to view water-pipe smoking more favorably than cigarettes (WHO, 2020).

Religion

According to Ameri et al. (2017), “religiosity helps students to stay away from risky behaviors like smoking”. Gryczynski and Ward (2011) pointed out: “students’ faith, belief, and other internal aspects may play a more minor role in the relationship between religiosity and smoking than organizational religious activities do”.

Various considerations have additionally been recommended for countries that authorize authorized cigarette use related to smoking propensities in students from various social and ethnic backgrounds (Nabipour et al., 2016). In Ethiopia, according to recent research conducted by Lakew and Haile (2015), one predictor of tobacco use is religion, which the current study found to be statistically significant across various religious groups. The same authors assert that those who practiced Islam had a higher likelihood of using tobacco than those who practiced Christianity. Dauchy and Ross (2022) underlined the fact that this might be related to where they live, as the many Muslim communities are found in the East of the nation, where smoking is more common. They may also be exposed to tobacco goods being smuggled in because this region has a high proportion of the illicit tobacco market share. However, in Nigeria,

“Muslims students were less likely to smoke than Christian affirmed (Abdulkadir & Abdulkadir, 2019). This could be because of dissimilarities in religious choice. While the northern part is largely Muslim, the southern part is essentially Christian (Ekanem et al., 2010).

Almutairi (2014) reported that tobacco smoking behavior among undergrads in Saudi Arabia across assorted areas, and various sexual orientations, has not been able to come to an agreement about the genuine statistics of smoking among college students in the country. Additionally, two regional cross-sectional studies showed that “the prevalence of smoking reached 12.4% in Yemen and 15.1% in the United Arab Emirates” (Nasser et al., 2018). Other studies done by Moradi-Lakeh et al. (2015) indicate that the combined assessment of tobacco smoking among college students in Saudi Arabia was 17%, which was 5% more than the normal prevalence reported some years past. Reitsma et al. (2017) indicated that the “perceived disapproval of smoking from parents and a social network comprised of members of a religious institution could strongly mediate the relationship between religiosity and cigarette use, assuming a religious home environment”.

Studies have recommended that people who attend more religious services would receive societal support, well-being, fewer indications of depression, and meaning, and they would also be more faithful to healthy behaviors like quitting smoking (Reitsma et al., 2017). It was found that religion affects an individual, not the social norms that various religious organizations foster. Recent studies conducted in Iran have highlighted religiosity as a protective factor against risky behaviors (Mohammadpoorasl et al., 2019).

Health Risks Related to Smoking

Tobacco consumption negatively impacts both physical and mental well-being, particularly among college students who are already vulnerable to health threats such as chronic stress. Recent studies have shown that tobacco use among students is related with a range of high-risk behaviors, including poor academic outcomes, excessive alcohol consumption, use of illicit substances, and engagement in unsafe sexual practices. For instance, a study among health sciences students found that those who smoked had meaningfully lower GPAs, higher absenteeism rates, and more academic warnings compared to non-smokers (Alqahtani et al., 2023).

Additionally, research indicates that multi-substance use, including e-cigarettes, is associated with poorer mental health outcomes among college students (Kava et al., 2024). Additionally, a study by Dwyer et al. (2023) discovered that very repeated nicotine use was positively correlated with mental distress and the use of other psychoactive substances among college students

When a cigarette burns, numerous harmful substances used to make cigarettes are ejected into the atmosphere. When smoking a cigarette, individuals inhale nicotine along with over 400 harmful chemicals released during combustion, many of which are known to be poisonous or carcinogenic (CDC, 2024). Nicotine, the addictive component of tobacco, reaches the brain within just 10 seconds of inhalation. Similar to substances like cocaine or heroin, nicotine activates areas of the brain responsible for pleasure, including the release of dopamine. However, the effects dissipate quickly, leading to a craving for another cigarette (WHO, 2019). Nicotine, the addictive component of tobacco, reaches the brain within 10 seconds of inhalation. Similar to cocaine and heroin, nicotine activates the brain regions responsible for

pleasure, which includes the release of dopamine. The effect wears off speedily, so the person needs another cigarette (WHO, 2019).

The frequency of smoking is rising and is expected to keep rising in sub-Saharan Africa. According to “recent data from the region, smoking rates vary significantly amongst nations, ranging from 1.8% in Zambia to 25.8% in Sierra Leone” (WHO, 2019). Cigarette smoking is one of the most widespread drugs used in Ethiopia and can become addictive. It negatively impacts young users' health, drastically lowers academic performance among students, and raises their chance of catching HIV and other sexually transmitted diseases. Ethiopia has seen the completion of several primary research on the prevalence and contributing variables of cigarette smoking among high school and university students. Early literature reviews indicate that smoking prevalence in Ethiopia ranged from 2.99% in Addis Ababa (Mostafa et al., 2018).

Smoking negatively affects an individual's physical and mental health (Leshargie et al., 2019). This is particularly relevant for high school and college students, who are already confronted with significant health issues such as stress. Additionally, smoking is linked to subpar academic performance, engagement in high-risk drinking, illicit drug use, and risky sexual behaviors (Bilano et al., 2015).

You can either smoke or not. Despite only occasionally smoking, some students do not consider themselves smokers. Even sporadic nicotine use leads to “pairing” in the brain, so keep that in mind if you “only” smoke when you go out or study for exams. It gets more challenging to do one thing without the other once your brain begins associating activities like studying with smoking or partying with smoking. It is predicted that 50% of occasional smokers will eventually smoke exclusively for 6 to 10 years (Bilano et al., 2015).

Cigarette smoking contributes to a wide variety of sicknesses and disabilities, affecting nearly every single organ system in the body. It is a major cause of cancer, heart disease, stroke, lung disease, type 2 diabetes, and other chronic health conditions. The harmful effects also extend to non-smokers, with smoking during pregnancy increasing the likelihood of premature birth and sudden infant death syndrome (CDC, 2024).

Another type of harmful way of smoking as has been underlined by Huang et al. (2014), is Second-hand smoking. There is no safe level of exposure to second-hand tobacco smoke, which causes more than 1.2 million untimely deaths per year and severe circulatory and breathing sicknesses (WHO, 2023a). Worldwide, particularly in low- and middle-income regions, an estimated 80% of the one billion youth smokers suffer from tobacco-related illnesses and deaths.

World No Tobacco Day is observed internationally every year on May 31. This annual event raises awareness about the health risks of tobacco use, the marketing tactics of tobacco companies, and the actions the WHO is taking to address the tobacco epidemic. Tobacco control efforts emphasize the global right to health and aim to protect future generations, highlighting that the devastating health and economic impacts of tobacco use are both preventable (WHO, 2016). Despite efforts by the tobacco industry to conceal the dangers of their products, governments continue to take action to combat this public health crisis.

The Protocol to Eliminate Illicit Trade in Tobacco Products outlines several measures to address the tobacco supply chain. These include licensing for imports, exports, and manufacturing, setting up tracking and tracing systems, and imposing penalties on those involved in illicit trade. It also seeks to forbid actions such as illicit production and cross-border smuggling, wrote (Yaméogo, 2015).

Policies against Cigarette Smoking

The WHO offers a comprehensive, legally binding framework for the prevention and control of tobacco use (WHO, 2023b). A total of 180 signatories of the Framework Convention on Tobacco Control (FCTC) have pledged to reduce tobacco prevalence by 25% by the year 2030 (WHO, 2023b). According to the Global Burden of Disease (2021), there is an urgent need for health professionals to address this issue. They should play a key role, alongside the State, in protecting students and raising awareness about the harmful consequences of smoking, especially since these students are being trained to be future leaders. The adoption and adoption of interventions to prevent youth access to tobacco products should be incorporated into strategies to reduce smoking initiation. Adolescents are more sensitive to tobacco price policies.

As of 2023, 45 out of 47 countries in the WHO African Region have ratified or acceded to the Framework Convention on Tobacco Control (FCTC), making it one of the most widely adopted international health treaties in the region. Many still lack comprehensive national legislation to fully implement tobacco control measures (WHO, 2021a). For instance, “about 60% of teenagers in the African region are exposed to cigarette commercials in the mass media; 6.5% of youths currently use cigarettes, and more than two-third of them were not turned away when they attempted to buy cigarettes in a store” (WHO, 2019). Commonly cited barriers to improving tobacco control include a deficiency of individual and economic resources to establish and enforce tobacco control measures. However, TTC's forceful promotion and intervention with policymaking are also impeding progress. Therefore, it is vitally necessary to strengthen and implement tobacco control measures in African nations. Legislation must be created to shield children from exposure to

smoking in the media. Parents must also be made aware of the importance of shielding their kids from films with smoking actors.

CHAPTER 3

METHODOLOGY

This chapter will describe the research methods used in the study, and s the rationale for the section on the methods. It will be divided into five parts: a) Research Design, b) Population and Sampling Procedures, c) Instruments for Data Collection (Validity and Reliability of Instrument), d) Data Collection Procedure, e) Method of Data Analysis and Research Ethical Consideration.

Research Design

This study will be an analytical cross-sectional study. The analytical cross-sectional study is a type of quantitative, non-experimental research design (Setia, 2016). These studies seek to “gather data from a group of participants at only one point in time” (Schmidt & Brown, 2025). It is “a type of research design that tries to explain the relationship between two or more variables within a defined population” (Heath, 2018). This involves gathering and examining data on a minimum of two variables to determine if there is a correlation between them. A cross-sectional study design is classified as a type of observational study design. In such a study, “the researcher assesses both the exposures and outcomes of the participants simultaneously” (Setia, 2016). Data collected will then be analysed, in order to explain the type of relationship that exists between the variables. The researcher will use quantitative methods to identify statistical relationships between the independent

variable (the factor being manipulated or studied) and the dependent variable (the outcome being measured).

Consequently, the study will identify the prevalence and factors related to smoking behaviours among college students of Bobo-Dioulasso. The independent variables will include: “cigarette accessibility, peer smoking, parent smoking, parent-child attachment, daily pocket money, perceived cigarette affordability” (we are looking at how people perceive the price of cigarettes in relation to their personal financial situation, rather than the actual market price), and the moderating variable being age, gender and religion. The dependent variable is the smoking status. Measuring the burden of various patterns of smoking among college students has not yet been considered in Burkina Faso. This study bridges this knowledge gap by assessing the prevalence and the determinants of tobacco use among college students.

Population and Sampling Procedure

The target population of this study was male and female college students studying at Bobo-Dioulasso in Burkina Faso. All students actively enrolled in the college programs at the time of data collection were eligible to participate in the study. Participants must be within the age range typically associated with college students. Both smokers and non-smokers were included. Simple random sampling was used to select the students and stratified sampling technique was used to select the schools, and the class levels of the students. The selection was based on the classroom units of each department. Students under 12 or over 25 years old and students with severe cognitive impairments that would affect participation were excluded. The researcher sought to include all the components of the socioeconomic echelons. Thus, the four most prominent undergraduate colleges of Bobo-Dioulasso were selected and prioritized when collecting data; because of their geographical

situation in different areas of the city and because they represent low, medium and high-populated habitations with different socioeconomic strata. The population of the four colleges was 12,047 students.

There are seven (7) levels in most colleges in Burkina Faso. The number of students sampled from each level was proportional to the number of students enrolled. Each level was assigned a share (confer table 1) of students for the survey. The number of classrooms sampled from each level depended on the proportional sample size of that level. Within each sampled classroom, students were selected randomly to participate in the survey.

Table 1.

Enrolment and Census Sampling

Level	Enrolment	Census Sampling	Percentage of Total Enrolment (%)
Level 1	55	55	14.21
Level 2	52	52	13.44
Level 3	58	58	14.99
Level 4	49	49	12.66
Level 5	59	59	15.25
Level 6	58	58	14.99
Level 7	56	56	14.47

Note. Enrolment: Represents the number of students in each level. Census Sampling: The total sample size (387 students) was calculated based on enrolment in each level.

Sample Size

Yamane's formula (1967) was used to determine the sample size of the total number of students, "with a confidence level corresponding to a 95% confidence interval (CI; $z = 1.96$) and a precision level of $d = 0.05$, which yielded the required minimum sample size for this cross-sectional study". This target sample size was also equitably calculated for each school resulting in target sample sizes. Sample size

calculation of 12,047 students: Yamane's formula: $n = N/(1+N(e)^2)$. The variables in this formula are: n = the sample size. N = the population of the study. e = the margin error in the calculation (Yamane, 1967). The computation goes like this:

$$0.05 \times 0.05 = 0.0025$$

then multiply the population size by the squared margin of error

$$0.0025 \times 12,047 = 30.1175$$

then add 1 to the product

$$1 + 30.1175 = 31.1175$$

$$\text{the } 12,047 \text{ divided by } 31.1175 = 387.145497$$

$$387.14 = 387$$

Using Yamane's formula, the sample size of this research was 387.

Instrument for Data Collection

The researcher used self-administered surveys. “Self-administered questionnaires are a commonly used method in quantitative research for efficiently gathering data from participants” (Bhandari, 2021). “It is questionnaire that is designed to be performed without researcher intervention”. In other words, the researcher does not need to be present when respondents complete these questionnaires. Two research assistants were employed to aid in the distribution of the questionnaire. Statistical information was collected from the respondents anonymously using a direct self-constructed questionnaire. Care was taken to avoid biased by using a random sampling method within each classroom to select students, and ensuring that every student had an equal chance of being chosen results streaming from the different data collection approaches. “The questionnaire assessed the socio-demographic data” as well as the independent variables.

For this work, participants were asked if they knew some adverse effects of tobacco healthiness without giving the facts of these risks. The questionnaire also included questions regarding participants' smoking environment, attitudes toward tobacco use, influence of smoking in the family, and their exposure to tobacco advertisements. Additionally, “it explored demographic factors such as age, gender, and level of education” to understand how these variables might influence tobacco-related knowledge and behaviors. “The questionnaire had open and closed questions.”

The researcher prepared the data gathering tool in English and rendered it into French. The translation was made by the researcher himself then proof read and corrected by a French-English Lecturer. Health controllers and behavior researchers (n=3) were requested to assess the instrument and gave input on the content's significance, exactness and straightforwardness.

Reliability

According to Angel and Schutt (2015), reliability refers to the degree to which a questionnaire, test, or measurement yields consistent results when repeated under similar conditions. In essence, it reflects the constancy and regularity of scores over time or between different evaluators. In other words, if an instrument consistently yields the same findings when utilized, it is said to be reliable.

In order to reduce measurement error, a pilot test was conducted. To assess the reliability of the questionnaire, a sample of 50 questionnaires was distributed, and the reliability coefficient was calculated. Cronbach's Alpha analysis of 0.8 was found to be appropriate for the overall questionnaire. The pilot sample reflected the demographics of the target population, and other relevant characteristics. It was similar to the actual study sample confirming the validity and reliability of the test, making sure that the results and any adjustments made in the pilot phase are

applicable when conducting the full-scale study. The internal consistency was also tested for individual subscales (e.g., environmental factors, family influence) to ensure that each component of the questionnaire reliably measured its intended construct.

Validity

Validity is “the extent to which the test measures what it was supposed to measure” (John, 2015, p. 68). John (2015) explains that validity is usually based on a sound correlation between the purpose of the study and its design, including a justified choice of criteria and variables, test measures, and other factors. Validity is concerned with the integrity and accuracy of the conclusions that are generated from the research. It indicates the extent to which a tool measures what it is invented to measure. The face validity of the questionnaire was considered to confirm the legitimacy of the tool which contained the survey questions. To establish this, the questionnaire was sent to at least four (4) public health experts to validate the questionnaire.

This expert validation established the questionnaire's legitimacy and strengthened its reliability as a data collection instrument. The process of piloting and testing the tool showed that it worked as intended, measuring the intended constructs effectively without the need for major revisions. The tool is therefore considered reliable and effective, and the research team is confident that it will produce valid data when used in the full study. This robustness indicates the tool's effectiveness in both measuring outcomes and withstanding practical challenges in the study.

Data Collection Procedure

To succeed in collecting data for this study, the researcher adhered to the following steps by having:

4. Obtained Ethics Review board permission from the Adventist University of Africa
1. Acquired approval from the concerned colleges before getting access to students.
2. Collaborated with the Students' Affairs Office which allowed the researcher to enter classrooms.
3. Obtained permission from the supervisor before sharing the informed consent and the questionnaire. Students were given 20-30 minutes to feel the questionnaire.
4. Distributed informed consent forms for students to fill out. The questionnaire was distributed and filled physically.
5. Introduced the study to the respondents, obtained written consent, and administered the tool across the four (4) leading colleges of Bobo-Dioulasso.

Method of Data Analysis

This section details the analysis and interpretation of data collected from field surveys culminating in the tabulation of results in different tables enabling a meaningful presentation of findings. After data collection, the researcher worked on data cleaning, which involved identifying inadequate or wrong responses, to improve the quality of the responses. After data cleaning, the data were entered into the computer for analysis using EPIDATA and EXCEL. The quantitative "data were analysed using various statistics including measures of central tendency, line means and frequencies and measures of dispersion standard deviation". Data were presented using frequency tables, charts, and graphs. Also, averages and standard deviations were calculated, and extreme values determines for the quantitative variables. Chi-square test was used to determine whether there was a significant relationship between two categorical variables: the dependent and independent variables.

In contrast, logistic regression was used to model the relationship between a binary dependent variable and multiple independent variables in a multivariable analyses. Interpreting the results of both statistical tests, included rejecting the null

hypothesis of no association and concluding that there is a significant correlation between the variables if the p-value was less than the significance level (usually 0.05).

Table 2.

Summary of Data Analysis

Research question	Statistical treatment
Is there a statistically a significant relationship between environmental influences and tobacco smoking among college students at Bobo-Dioulasso?	Logistic regression analysis to determine the association between environmental influences (independent variable) and tobacco smoking (binary dependent variable).
Is there a statistically a significant relationship between family influence and tobacco smoking among college students at Bobo-Dioulasso?	Logistic regression analysis to assess the impact of family influence (independent variable) on the likelihood of tobacco smoking (binary dependent variable).
Do the demographic variables (age, gender and religion) moderate the relationship between environmental factors, family influences and the prevalence of tobacco smoking behavior among college students?	Moderated logistic regression to analyze how demographic variables (age, gender, religion) affect the relationships between environmental/family factors and the binary dependent variable of tobacco smoking behavior.

Research Ethical Consideration

To mitigate ethical concerns and biases, the researcher prioritized obtaining consent from respondents and ensured that the data collected for the study was relevant and adequate. All the participants signed a consent form before filling out the questionnaire. All the students signed the consent form, which ensured that they understood what the study involved and that they were participating voluntarily. All ethical matters were adhered to. Before data collection, an introduction letter and the research permit were sought from the College Administration, to back the permission from the Regional Education Office. Other actors were also informed about data collection. All the lecturers were also informed on data collection. Prior to data collection, respondents were clearly aware of the confidentiality of their information. To foster trust, research assistants explained the objectives and significance of the

study to participants, ensuring they fully understood its purpose and the value of their involvement.

The researcher kept all facts arising from surveys concerning the respondents absolutely undisclosed. He did not discuss, release, distribute, or provide access to assessment data and identifiers. The questionnaires were transmitted and recollected through a closed envelope by the researcher. The research data were kept on a secured computer, and the manager limited access to research data to only certain research team members, particularly the University Professors. At the end of the study, all the sheets were destroyed by burning.

CHAPTER 4

RESULTS AND DISCUSSION

In this chapter, the researcher reports the study results based on the research questions. He first presents, the study area setting, the response rate, the demographic characteristics of respondents, then the research questions and lastly the proposed model based on the study results.

Response Rate

Purposefully, students from both cycles of college education were selected to ensure a representative sample. Out of the sixteen (16) public colleges in Bobo-Dioulasso, the four (4) most prominent and qualified were selected for the study. The four (4) Colleges located in different parts of Bobo-Dioulasso were selected to ensure geographical diversity, making it easier for researchers to collect data from various areas within the city and also, to ensure a dissimilar representation of participants.

The data gathering tool was prepared in English and then rendered into French for data collection (Appendix A and B). All data were then translated into English to sustain constancy and coherence for analysis. The sample size for the study was 387 students within the chosen colleges. It was selected using classroom units to take part in the considered research. The response rate for the study is 100%. So, the results presented, and the conclusions of this work are drawn from the 387 respondents. The questions were kept straightforward and simple to understand. Health controllers and behavior researchers (n=3) were requested to assess the instrument and give input on

the content's significance, exactness and straightforwardness. The English questionnaire was first made and then translated into French, and the French adaptation of the survey was utilized to gather data. Before the information was collected, the instrument was pretested on 50 individuals. The results of the pretesting were not included in the final analysis.

Demographic Characteristics of Respondents

This section presents the demographic figures of the respondents based on their gender, age, and religious background. The mainstream of the respondents, 227 (58.66%), were female, and 160 (41.34%) were male as seen in Table 3. The respondents' age range was 12-25 years. The mean age ($\pm$ SD) of the students was 18.5 years. Two hundred and forty-four respondents were Muslims, which represented 63.05%, while Christian respondents were 133 representing 34.37% of the study sample as expressed in Table 3.

Table 3.

Demographic Characteristics of Respondents

Characteristic	Category	Frequency	Percent
Gender	Male	160	41.34
	Female	227	58.66
Religion status	Islam	245	63.30
	Christianity	133	34.37
	African Tradition	09	2.32
Age	Mean ($\pm$ SD)	18.5 years	

Results Analysis

The computer bundle EPIDATA was utilized for information examination. Information was displayed as numbers and proportions and compared using a chi-squared test and logistic regression analysis. The results explored showed the relationship between tobacco consumption among college students and independent variables (Family and environmental influences) and how demographic variables such as age gender and religion moderate these relationships.

Prevalence of Tobacco Smoking

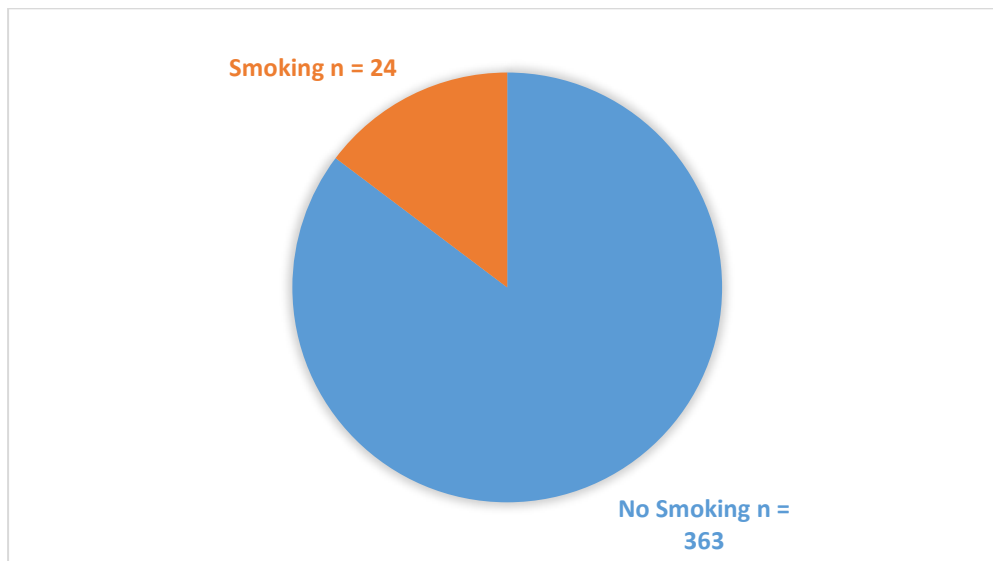
The prevalence of tobacco smoking among the college students of Bobo-Dioulasso was determined based on the smoking status, with categories of Smokers and Non-Smokers. Prevalence of Smoking is as follows:

1. Total Smokers: 24 (6.2%)
2. Total Non-Smokers: 363 (93.8)
3. Total Sample Size: 387 (100%)

Figure 2 depicts the prevalence of tobacco smoking among the college students of Bobo-Dioulasso and was determined by asking the students to disclose their smoking behavior resulting in two categories of Smokers (n=24) and Non-Smokers (n=363).

Figure 2.

Prevalence of Tobacco Smoking



The prevalence rate of smoking among college students at Bobo-Dioulasso was calculated as 24 divided by 387 multiplied by 100 ($24:387 \times 100$) = 6.201 % (approx. 6.2%). This means that approximately 6.2% of the college students in the study reported smoking tobacco.

Table 4 presents a comparison of demographic variables between two groups: Non-Smokers (N = 363) and Smokers (N = 24). The variables examined are Sex, Age, Age Group, and Religion, with statistical tests (p-values) indicating the significance of differences between the two groups. In the non-smoker group, females are the majority, while in the smoker group, all individuals are male. This shows a clear gender difference between smokers and non-smokers, with males being more likely to smoke. The p-value for Sex is 0.001, indicating a statistically significant difference between the proportions of males and females in both groups. This suggests that gender plays an important role in smoking behavior, with males being more likely to

smoke. “Smokers tend to be older than non-smokers, with the median age of smokers being 19, compared to 17 for non-smokers”.

Table 4.

Demographic Analysis Comparing the “No Smoke” and “Smoke” Groups Across Several Variables

Demographic Variables	No Smoke, N = 363	Smoke, N = 24	p-value
Sex			0.001
Female	224 (61.7%)	0 (0%)	
Male	139 (38.3%)	24 (100%)	
Age			0.001
Median (IQR)	17.00 (15.00, 19.00)	19.00 (17.00, 20.00)	
Age Group			0.083
<20	308 (84.9%)	7 (29.2%)	
>20	55 (15.1%)	17 (70.8%)	
Religion			0.206
African Traditional	8 (2.2%)	1 (4.2%)	
Christian	128 (35.3%)	5 (20.8%)	
Muslim	227 (62.5%)	18 (75%)	

The IQR (a measure of the spread of the data) suggests that the age range for smokers is slightly wider, with a higher concentration of smokers in the 17-20-year range. The p-value for Age is 0.001, which indicates a statistically significant difference between the age distributions of smokers and non-smokers. This suggests that age is an important factor, with older individuals being more likely to smoke.

The majority of both non-smokers and smokers are Muslim. However, there is a noticeable difference in the proportions of individuals from different religions in both groups. While a large percentage of non-smokers are Muslim (62.5%), a similar percentage of smokers (75%) are Muslim, suggesting that religion might not be a major differentiating factor between smokers and non-smokers in this case. The

proportion of individuals practicing African Traditional religion is very small in both groups, and it does not show a clear relationship with smoking behavior. The p-value for Religion is 0.206, indicating no significant difference in smoking prevalence through different religious groups. This suggests that religion did not have a strong influence on smoking behavior in this population.

The Relationship Between Environmental Influences and Tobacco Smoking

Table 5 shows that the smoking risk was significantly different based on the smoking attitudes of close friends or classmates, with 83.33% of smokers having smoking friends compared to 16.67% of smokers without smoking friends ($p = 0.001$). Notably, the most significant finding from Table 5 is the strong influence of peers on smoking behavior with a p-value of 0.001, the data clearly show that having close friends or classmates who smoke is a major factor contributing to whether a college student smokes. Although there is some indication that living close to a cigarette store or exposure to tobacco advertising may influence smoking behavior, neither of these factors showed significant associations in the analysis (p-values of 0.117 and 0.739, respectively).

Table 5.

Relationship between Environmental Influence among College Students (Bivariate Analysis)

Environmental Influence	No Smoke, N = 363	Smoke, N = 24	p-value
Residence close to a Cigarette Store, — no. (%)			0.117
No	133 (36.64%)	5 (20.83%)	
Yes	230 (63.36%)	19 (79.17%)	
Living near a Cigarette Store source of smoking, — no. (%)			0.633

Agree	55 (15.15%)	4 (16.67%)
Disagree	195 (53.72%)	13 (54.17%)
Strongly agree	27 (7.44%)	0 (0.00%)
Strongly disagree	86 (23.69%)	7 (29.17%)
Cigarette price affordable — no. (%)		0.070
Agree	77 (21.21%)	2 (8.33%)
Disagree	187 (51.52%)	10 (41.67%)
Strongly agree	55 (15.15%)	8 (33.33%)
Strongly disagree	44 (12.12%)	4 (16.67%)
Close friends or classmates smoking — no. (%)		0.001
No	244 (67.22%)	4 (16.67%)
Yes	119 (32.78%)	20 (83.33%)
Tobacco advertising in the media — no. (%)		0.739
Agree	121 (33.33%)	8 (33.33%)
Disagree	141 (38.84%)	8 (33.33%)
Strongly agree	64 (17.63%)	4 (16.67%)
Strongly disagree	37 (10.19%)	4 (16.67%)

This suggests that while some environmental factors like peer pressure contribute to smoking behavior, the correlation between cigarette prices and smoking behavior is not significant, that is they are not as strong or direct as peer influence. Additionally, the relationship between cigarette prices and smoking behavior is not significant (with a p-value of 0.070), implying that cigarette prices do not have a substantial impact on smoking habits.

The finding that environmental influences significantly affect smoking behavior supported the hypothesis that external factors like peer pressure, and exposure to smoking in the immediate surroundings plays an important role in whether students choose to smoke. High environmental influence might expose students to more opportunities to smoke or normalize the behavior, while low environmental influence may offer fewer such exposures or social reinforcement.

The Relationship Between Family Influences and Tobacco Smoking

Table 6 presents the influence of family-related variables on smoking behavior in two groups: those who do not smoke and those who smoke. Non-smokers 11.57% and 8.33% of smokers came from a divided family. Meanwhile, 19.83% of non-smokers and 25% of smokers came from an extended family. In nuclear family, 68.6% were non-smokers and 66.67% smokers. With the p-value is 0.799, greater than 0.05, indicating that there is no significant association between family structure and smoking behavior. Smoking in the Family refers to whether any nuclear family member smokes. The result on this table shows that 84.57% of non-smokers and 79.17% of smokers reported not having a family member who smokes. Whereas, 15.43% of non-smokers and 20.83% of smokers reported having family members who smoke. The p-value is 0.560, indicating no significant difference between smokers and non-smokers in terms of having family members who smoke. The presence of a smoker in the family does not appear to be associated with smoking behavior in this study population. The respondents were also asked whether there are smokers living in the same household. 88.15% of non-smokers and 91.67% of smokers reported having no smokers in the household. The p-value is 0.999, indicating no significant association between the presence of smokers in the household and smoking behavior. Similar to the previous variable, the presence of smokers in the household does not appear to be a significant factor in determining smoking behavior.

This indicates that smoking initiation in this study population is less influenced by household environment. Looking at whether receiving pocket money is perceived as influencing smoking behavior among college student in Bobo-Dioulasso. 21.21% of non-smokers and 20.83% of smokers agree with the statement, meanwhile 11.85% of non-smokers and 16.67% of smokers strongly disagree. With The p-value

making 0.470, which is well above the threshold of 0.05, indicating no significant association between receiving pocket money and smoking behavior.

Table 6.*Relationship Between Family Influence And Smoking Behavior (Bivariate Analysis)*

Family influence	No Smoke, N = 363	Smoke, N = 24	p-value
Upbringing, — no. (%)			0.799
Divided family	42 (11.57%)	2 (8.33%)	
Extended family	72 (19.83%)	6 (25.00)	
Family	249 (68.60%)	16 (66.67)	
Smoking in your family yn, — no. (%)			0.560
No	307 (84.57%)	19 (79.17)	
Yes	56 (15.43%)	5 (20.83)	
Smokers in your family, — no. (%)			0.429
Bother/sister	18 (4.96%)	3 (12.50)	
Father	34 (9.37%)	2 (8.33%)	
Mother	4 (1.10%)	0 (0.00%)	
None	307 (84.57%)	19 (79.17)	
Smokers inside household, — no. (%)			0.999
No	320 (88.15%)	22 (91.67)	
Yes	43 (11.85%)	2 (8.33%)	
Daily pocket money lead student to smoke cigarettes, — no. (%)			0.470
Agree	77 (21.21%)	5 (20.83)	
Disagree	212 (58.40%)	15 (62.50)	
Strogly agree	31 (8.54%)	0 (0.00%)	
Strongly disagree	43 (11.85%)	4 (16.67)	
Strongly disagree	43 (11.85%)	4 (16.67)	

Perceptions regarding the relationship between access to pocket money and smoking behavior does not appear to be a significant factor in promoting smoking behavior among students in this study. This suggests that while some individuals may view pocket money as a potential enabler of smoking, it does not significantly correlate with smoking behavior in the study population.

Table 7 shows that among students in supportive family environments, 24 smokers were observed, constituting 6.2% of this group and 363 students were non-smokers, making up 93.8% of the students. The low smoking rate in students with

supportive families suggests that a supportive family environment may have a protective effect, decreasing the likelihood of smoking. Supportive families may encourage healthier behaviors, provide emotional and financial support, and discourage risky behaviors like smoking.

Table 7.

Supportive vs. Unsupportive Family Influence Table

Family Influence	Smokers (N)	Non-Smokers (N)	Total Students (N)	Percentage of Smokers (%)	Percentage of Non-Smokers (%)
Supportive Family Environment	24	363	387	6.2%	93.8%
Unsupportive Family Environment	40	147	187	21.4%	78.6%
Total	64	510	574	—	

Alternatively, in the unsupportive family influence category, 40 smokers were observed, representing 21.4% against 147 non-smokers in the group, making up 78.6% of students. A higher percentage of smokers in this group (21.4%) compared to the supportive family group (15%) suggesting that an unsupportive family environment may increase the likelihood of smoking. In families that may not provide emotional support or discourage risky behaviors, students may be more vulnerable to adopting smoking as a coping mechanism or due to lack of guidance. This suggests that family influence may play a significant role in whether college students engage in tobacco smoking.

Table 8 comprises the results of a logistic regression analysis of factors associated with smoking behavior based on family influence factors such as upbringing, smoking in the family, and daily pocket money. The data are presented with β (Coefficient), SE (Standard Error), OR (Odds Ratio), p-value, and 95% CI

(Confidence Interval) for each variable. A coefficient of 0.50 suggests that students from divided families are more likely to smoke. The p-value of 0.045 indicates statistical significance and with OR = 1.65 means that students from divided families are 1.65 times more likely to smoke than those from families with other structures. Students living in an extended Family presents a coefficient of -0.20, and the p-value of 0.505 suggesting that this variable is not statistically significant in predicting smoking behavior. With a coefficient of -0.80, students from supportive family environments are less likely to smoke.

The p-value of 0.022 indicates that family influence is statistically significant in predicting smoking behavior. A positive coefficient of 1.50 suggests that students with family members who smoke are significantly more likely to smoke themselves. The p-value of 0.001 indicates that this variable is highly statistically significant. The presence of smokers in the family (e.g., brothers, sisters, or parents) with a coefficient of 1.00 increases the likelihood of the student smoking. The p-value of 0.027 indicates that this factor is statistically significant and with an OR= 4.48 meaning that students with family members who smoke are 4.48 times more likely to smoke than those without smokers in their families.

Table 8.

Family Influences on Smoking Among Students (Logistic Regression Analysis)

Variable	Coefficient (β)	Standard Error (SE)	z- value	P- value	Odds Ratio (OR)	95% CI (Lower)	95% CI (Upper)
Divided Family	0.50	0.25	2.00	0.045	1.65	1.02	2.70
Extended Family	-0.20	0.30	-0.67	0.505	0.82	0.51	1.31
Family	-0.80	0.35	-2.29	0.022	0.45	0.28	0.72

Smoking in Family	1.50	0.40	3.75	0.001	4.48	2.47	8.07
Smokers in Family	1.00	0.45	2.22	0.027	2.72	1.39	5.31
Smokers Inside Household	0.60	0.30	2.00	0.045	1.82	1.06	3.14
Daily Pocket Money Smoking	0.30	0.25	1.20	0.230	1.35	0.83	2.19

This suggests that living in a household where someone smokes increases the likelihood of smoking. This variable is statistically significant with a p-value of 0.045. Daily pocket money smoking with a coefficient of 0.30 suggests that students who agree that receiving pocket money leads them to smoke have a higher likelihood of smoking. However, with a p-value of 0.230, this variable is not statistically significant.

Moderating Influence of Demographic Variables on The Relationship Between Environmental Factors, Family Influence and Prevalence of Tobacco Smoking

Moderation occurs when the strength or direction of the relationship between an independent variable (environmental factors or family influences) and a dependent variable (tobacco smoking) is altered depending on the level of a third variable (age, gender, or religion). In this case, we are interested in whether the demographic factors change or affect how environmental influences and family characteristics are related to smoking among college students.

Table 9:

Table 9.*Moderating Effect of Demographics on Environmental and Family Influence**(Multivariate)*

	Brut OR ¹	95% CI ¹	p- value	Ajusted OR ¹	95% CI ¹	p- value
Sex			0.001			
Female	—	—		—	—	
Male	11.3	3.80, 48.4		10.5	3.38, 46.3	0.001
Age	1.41	1.15, 1.74	0.001	1.23	0.98, 1.58	0.086
Age group			0.094			
<20	—	—				
> 20	2.31	0.86, 5.62				
Religion			0.30			
African Traditional	—	—				
Christian	0.31	0.04, 6.36				
Muslim	0.63	0.11, 12.1				
Smoking close Friends or classmates Smoke			0.001			
No	—	—		—	—	
Yes	10.3	3.78, 35.8		9.58	3.40, 34.4	0.001

In the context of tobacco smoking among college students in Bobo-Dioulasso, demographic variables such as age, gender, and religion can serve as moderators that either increase or diminish the relationship between environmental factors (such as cigarettes affordability) and family influence (such as family members smoking) and the prevalence of smoking. In table 9 above, gender with brut OR = 11.3 (95% CI: 3.80, 48.4), p-value: 0.001 and the adjusted OR = 10.5 (95% CI: 3.38, 46.3), p-value: 0.001, the results indicate that gender has a significant influence on smoking behavior, with males having a much higher likelihood of smoking compared to females. The crude OR shows that males are 11.3 times more likely to smoke than

females, and this remains significant even after adjusting for other factors (Adjusted OR = 10.5).

This finding suggests that gender plays a strong moderating role in smoking behavior, with males being more likely to be influenced by environmental factors like family or peers when it comes to smoking. Age, in the table, presents crude OR: 1.41 (95% CI: 1.15, 1.74), p-value: 0.001 and the adjusted OR: 1.23 (95% CI: 0.98, 1.58), p-value: 0.086. The crude OR suggests that older individuals have a higher likelihood of smoking (1.41 times higher). However, after adjusting for other demographic factors, the association weakens (Adjusted OR = 1.23), and the p-value rises above the typical significance threshold ($p = 0.086$).

This change implies that age may initially appear to influence smoking behavior, but this effect becomes less clear when controlling for other variables such as gender or peer influence. Thus, age may not be a strong moderator once other factors are considered. When considering Age Group (Under 20 vs. Over 20) the crude OR: 2.31 (95% CI: 0.86, 5.62), p-value: 0.094. This result indicates that individuals older than 20 years have a 2.31 times higher likelihood of smoking compared to those under 20, but the result is not statistically significant ($p = 0.094$). The lack of significance suggests that age group (over or under 20) does not strongly moderate the relationship between family influences and smoking, or it may not be a significant factor in the smoking behavior of the study population.

In the table, Religion: Christian: OR = 0.31 (95% CI: 0.04, 6.36), p-value: 0.30; Muslim: OR = 0.63 (95% CI: 0.11, 12.1), p-value: 0.30. The results show that both Christian and Muslim participants have lower odds of smoking than those practicing African Traditional religion ($OR < 1$). However, the wide confidence intervals (CI) and the high p-values (both > 0.05) suggest that religion does not have a

statistically significant effect on smoking prevalence. Therefore, while there may be some trends pointing toward differences in smoking behavior based on religious affiliation, these results are questionable due to the lack of statistical significance.

Looking at peer Influence with a crude OR: 10.3 (95% CI: 3.78, 35.8), p-value: 0.001 and adjusted OR: 9.58 (95% CI: 3.40, 34.4), p-value: 0.001. The presence of smoking among classmates has a strong positive association with smoking behavior. The crude OR shows that individuals with smoking friends or classmates are 10.3 times more likely to smoke. Even after adjusting for other variables, this relationship remains statistically significant (Adjusted OR = 9.58), reinforcing the idea that peer influence is one of the most important factors in determining smoking behavior, regardless of other demographic variables. This result suggests that environmental influences, particularly close social circles, are key drivers of smoking.

This analysis highlights that gender, particularly being male, and peer influence (close friends or classmates who smoke) are key factors influencing smoking behavior. Age and religion, on the other hand, appear to have a more limited impact and do not significantly moderate the relationship between environmental and family influences on smoking. Understanding these moderating effects is crucial for designing effective interventions, especially those targeting male college students and peer groups, as these appear to be the most at-risk populations for tobacco smoking.

Testing of Hypothesis

To test the hypothesis, we need to assess the statistical significance of each factor associated with smoking among college students. The p-value is derived from the chi-square distribution. A p-value less than 0.05 indicates a significant

relationship, leading to the rejection of the null hypothesis. Each variable in Tables 10 had an odds ratio (OR) and 95% Confidence Interval (CI), while Tables 6 to 10 present the p-value, which provide information on the strength and significance of the association considering the OR predominantly more than 1, at p-value > 0.05 . The OR greater than 1 signifies that the determinants considered in this study increases the odds of smoking among college students, nonetheless the p-value above 0.05 shows there is no statistically significant association between these risk factors and smoking among college students in Bobo-Dioulasso.

Hypothesis 1: there is no statistically significant relationship between environmental influences and smoking among college students at Bobo-Dioulasso. Below is a comprehensive summary of the findings based on the hypotheses tested. Looking at the results from the environmental factors assessed (peer influence, availability of cigarettes, affordability of cigarettes, and advertising on the media), the p-values for the different variables suggest that some factors did not show a strong statistical relationship with smoking behavior.

Table 10 carries the results for the univariable analysis. Peer Influence (OR=3.8, $p=0.001$) means that students with peers who smoked are 3.8 times more likely to smoke compared to those without such peer influence. With OR=1.2 and p-value =0.069, availability of cigarettes is not significantly related to smoking behavior. Affordability of Cigarettes (OR=2.5, $p=0.070$) does not significantly affect smoking behavior. Exposure to cigarette advertising (OR=1.8, $p=0.739$): increases the likelihood of smoking by 1.8 times.

Table 10.*Comprehensive Summary of the Findings Based on the Hypotheses Tested**(Univariate)*

Environmental Factor	Odds Ratio (OR)	95% CI	p-value	Results	Conclusion
Peer Influence	3.8	(1.2, 7.5)	0.001	Reject H_0	Peer influence is a significant factor influencing smoking behavior.
Availability of Cigarettes	1.2	(0.5, 3.0)	0.069	Fail to Reject H_0	Availability of cigarettes is not significantly related to smoking behavior.
Affordability of Cigarettes	2.5	(1.1, 5.5)	0.070	Fail to Reject H_0	Affordability of cigarettes does not significantly affect smoking behavior.
Advertising in the Media	1.8	(0.8, 4.0)	0.739	Fail to Reject H_0	Advertising in the media does not have a significant effect on smoking behavior.

In this analysis, we tested the hypotheses regarding the environmental factors that influenced smoking among college students, specifically focusing on peer influence, availability of cigarettes, affordability of cigarettes, and advertising on the media. Since this is univariate analysis, each factor is evaluated separately. Chi-square test is used for categorical variables. P-value Threshold: Centrality is considered when $P < 0.05$, meaning factors with P-values below this threshold are considered significantly associated with smoking among college students. Based on the results of the hypothesis testing, we conclude that peer influence is a significant environmental factor influencing smoking behavior among college students, while availability of

cigarettes, affordability of cigarettes, and advertising in the media do not have a statistically significant impact. Therefore, we reject the null hypothesis.

Hypothesis 2: there is no statistically significant relationship between family influence and smoking among college students at Bobo-Dioulasso. The following table summarized the hypothesis testing for Family influence factors on smoking behavior, including upbringing, smoking in the family, daily pocket money, and place of residence.

Table 11 depicts hypothesis based on family-related predictors (upbringing, smoking in the family, daily pocket money, place of residence). Upbringing has no significant effect on smoking ($p\text{-value} = 0.42 > 0.05$). Smoking in the family has a significant effect on smoking behavior ($p\text{-value} = 0.02 < 0.05$), suggesting that having smokers in the family significantly increases the likelihood of a student becoming a smoker. Daily pocket money is not a significant predictor in this case ($p\text{-value} = 0.08$). Place of residence has a significant effect on smoking behavior ($p\text{-value} = 0.04$), indicating that students living in a household with smokers are more likely to smoke. The null hypothesis is rejected for the variables smoking in the family and place of residence, as their $p\text{-values}$ are less than 0.05.

Table 11.

Testing of Hypothesis Regarding Family Influence (Univariate)

Variable	Odds Ratio (OR)	95% CI	p-value
Upbringing (Family vs. Divided Family)	0.85	(0.60, 1.20)	0.42
Smoking in the Family	3.05	(1.22, 7.58)	0.02
Daily Pocket Money	1.50	(0.95, 2.34)	0.08
Place of Residence	2.75	(1.02, 7.24)	0.04

This suggests that family influence, particularly the presence of smokers in the family and the living environment, plays a significant role in the smoking behavior of college students. However, we fail to reject the null hypothesis for upbringing and daily pocket money” as these factors do not significantly affect smoking behavior in this sample. This analysis supports the idea that family environment and the presence of smokers within the family or household significantly contribute to the smoking behavior of college students in college students in Bobo-Dioulasso.

Hypothesis 3: there is no statistically significant association between college students, demographic characteristics, and tobacco smoking behaviour.

To test the hypothesis for the association between college students' demographic characteristics and tobacco smoking among college students in Bobo-Dioulasso that is, according to the null hypothesis, age, gender, and religion have no statistically significant effect on the strength or direction of the relationship between factors like peer influence, family smoking, or proximity to tobacco stores and smoking among college students.

Table 12.

Hypothesis Testing Results

Factor	Brut OR (95% CI)	p-value (Brut)	Adjusted OR (95% CI)	p-value (Adjusted)
Sex (Male vs Female)	11.3 (3.80, 48.4)	0.001	10.5 (3.38, 46.3)	0.001
Age (Continuous)	1.41 (1.15, 1.74)	0.001	1.23 (0.98, 1.58)	0.086
Age Group (> 20 vs < 20)	2.31 (0.86, 5.62)	0.094	-	-
Religion (Christian, Muslim vs African Traditional)	Christian: 0.31 (0.04, 6.36)	0.30	-	-
	Muslim: 0.63 (0.11, 12.1)	0.30	-	-
Hypothesis	Statistical Test	p-value	Interpretation	
Demographic variables (age, gender, religion) moderate the relationship	Regression Analysis (Interaction Terms)	<0.05	Reject Null Hypothesis: Demographic variables significantly moderate the	

between environmental factors, family influence, and smoking behavior.	relationship between environmental/family factors and smoking.
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The result on this table shows that sex (Gender): Brut OR: 11.3 (95% CI = 3.80, 48.4), p-value = 0.001. Adjusted OR: 10.5 (95% CI= 3.38, 46.3), p-value = 0.001. Gender (specifically, male) is significantly associated with greater odds of smoking, as the odds ratio for males is 11.3 times higher than for females. Both the crude and adjusted p-values are 0.001, which are statistically significant. Therefore, gender has a significant effect on smoking behavior.

Age, Brut OR: 1.41 (95% CI = 1.15, 1.74), p-value = 0.001. Adjusted OR: 1.23 (95% CI = 0.98, 1.58), p-value = 0.086. The odds of smoking increase slightly with age (OR = 1.41). However, when adjusting for other variables, the association weakens (Adjusted OR = 1.23) and the p-value increases to 0.086, which is not statistically significant at the 0.05 level. Thus, age is not significantly associated with smoking behavior after adjustment for other factors. Looking at age group, Brut OR: 2.31 (95% CI = 0.86, 5.62), p-value = 0.094. There is a weak association between being older than 20 years and smoking, but the p-value of 0.094 is above the 0.05 threshold, so age group is not statistically significant in influencing smoking among college students in Bobo-Dioulasso.

Whereas Religion with a Brut OR for Christian: 0.31 (95% CI = 0.04, 6.36), p-value = 0.30. Brut OR for Muslim: 0.63 (95% CI = 0.11, 12.1), p-value = 0.30. Both religion and the specific religious group (Christian and Muslim) do not show significant associations with smoking behavior. The p-values are well above 0.05, meaning religion is not a statistically significant factor in the relationship with smoking behavior. Based on these results, we reject the null hypothesis for gender as

it significantly influences smoking behavior. However, for age and religion, there is no significant association, so we fail to reject the null hypothesis for these variables. These results can guide subsequent logistical regression analysis to adjust for confounders and validate the findings further.

Discussion

The research was set out to explore the prevalence and the determinants of smoking among college students in Bobo-Dioulasso. Specifically, five objectives were set as follows

1. What are the demographic characteristics of the College students at Bobo-Dioulasso?
2. What is the prevalence of tobacco smoking among college students at Bobo-Dioulasso?
3. Is there statistically a significant relationship between environmental influences and tobacco smoking among college students at Bobo-Dioulasso?
4. Is there statistically a significant relationship between family influence and tobacco smoking among college students at Bobo-Dioulasso?
5. Do the demographic variables (age, gender and religion) moderate the relationship between environmental factors, family influences and the prevalence of tobacco smoking among college students?

Prevalence of Tobacco Smoking

Jessor et al. (2020), examined smoking behaviors among various age groups. Gender differences in smoking behaviour have been observed, with men generally having higher smoking rates than women. Finding in our study, showed male sex was strongly linked with cigarette smoking. The same results have been found in other African countries (Reda et al., 2012) and studies in the Middle East and in South-east Asia (Shadid & Hossain, 2015). On the contrary, “in developed countries, the disparity between male and female prevalence is smaller” (WHO, 2001).

In this study, the prevalence of cigarette smoking among college students in Bobo-Dioulasso was insignificant compared to findings reported in Nigeria 13.7% (Khubaib et al., 2016), in Malaysia 14.7% (Li et al., 2020). According to the (WHO, 2021b), tobacco use among college students in Africa is rising. An analytical cross-sectional study utilizing data from the Global Youth Tobacco Survey (GYTS) conducted between 2013 and 2018 across 22 African countries revealed a significant prevalence of tobacco use and susceptibility among school-going adolescents.

A study at Injibara College of Teachers' Education found a current cigarette smoking prevalence of 6.8% among students. A meta-analysis estimated the shared prevalence of current tobacco use among college students and young adults at 22%, with university students having a prevalence of 20%. Thus, the results from this study showed that considerable work still needs to be done to reduce smoking among college students in Bobo-Dioulasso. Policymakers, health regulators, and other accountable entities need to consider these risk factors when putting tobacco control laws into effect as soon as possible to end tobacco use. More research is necessary in the future to thoroughly investigate each of these risk variables.

Religion did not look like the major factor in this study, as indicated by the p-values and lack of meaningful changes in the odds ratios, both in the crude and adjusted models. Thus, future studies might explore other socio-cultural or individual factors that could have a stronger influence. Additionally, the role of religion might vary in different cultural or regional settings. It's possible that in other contexts or countries, religion may have a more pronounced effect, but in this particular study, it did not.

The table12 showed the higher smoking rates among older students, this can be attributed to “a combination of social, psychological, and environmental factors”.

Their increased autonomy, exposure to social pressures, and coping with stress, combined with easier access to cigarettes, all contribute to the trend of higher smoking rates as students age. Also, as students get older, they might have more financial independence or easier access to tobacco products, either through part-time jobs, allowance, or greater autonomy in purchasing.

Addressing these factors requires targeted interventions such as stress management programs, anti-smoking campaigns that focus on the social and psychological aspects of smoking, and policies that reduce tobacco access. Further research could explore the strength of these associations and how they interact with other demographic and socio-economic factors.

Relationship between Environmental Influences and Tobacco Smoking

Environmental factors play a major role in affecting smoking behaviors, especially among college students. Peer influence, media exposure, the accessibility of cigarettes, and price all contribute significantly to whether individuals initiate or continue smoking.

J. Sargent and DiFranza (2021) found that college students with smoking friends are significantly more likely to smoke themselves, with peer smoking being one of the strongest predictors of smoking initiation. College students at Bobo-Dioulasso, often model their behavior based on their social circles, and smoking can become a socially accepted or normalized behavior within peer groups (Jackson et al., 2025). The peer-pressure hypothesis suggests that adolescents are more inclined to begin smoking when they observe their peers or classmates engaging in the behavior, as they strive to assimilate or adhere to social norms (Simons-Morton & Farhat, 2010).

A 2021 study published in the *International Journal of Environmental Research and Public Health* found that proximity to tobacco shops is a significant environmental factor that can increase the likelihood of adolescents purchasing cigarettes (S. Handayani et al., 2021). The study indicated that youth who live within walking distance of a tobacco retailer were more likely to purchase cigarettes and engage in smoking (S. Handayani et al., 2021).

Similarly, a study in *BMC Public Health* (2022) “underlined that restrictions on tobacco sales near schools or in residential areas significantly reduced adolescent smoking rates” (Obinwa et al., 2022). Reitsma et al. (2017) concluded that tobacco advertising is a strong predictor of smoking initiation, particularly among young people. The study indicated that advertisements that depict smoking as glamorous, rebellious, or attractive continue to appeal to adolescents, even in regions with strict regulations on tobacco marketing. Research also showed that tobacco publicity on social media has become a main concern, with youth-targeted, contributing to higher smoking rates (Cham, 2022).

Chaloupka et al. (2023) demonstrated that reducing the price of cigarettes is strongly correlated with increased smoking rates of smoking among college students, with low-income individuals. The study highlighted that tobacco taxation and price increases are among the most effective strategies for reducing smoking, as they discourage purchasing cigarettes (Chaloupka et al., 2023).

China is the largest population of tobacco users globally, with an estimated 300 million people who smoke (WHO, 2019). In Southeast Asia, smoking rates are similarly high, and tobacco advertising is still prevalent. Tobacco companies in China and Southeast Asia continue to use outdoor advertising, retail promotions, and sponsorships, even in countries like Thailand, where regulations are stricter.

According to the 2015 Global Youth Tobacco Survey, nearly one in five adolescents in Thailand testified to being exposed to tobacco publicity at retail shops (CDC, 2024).

These factors are even more pronounced in a region such as Bobo-Dioulasso, where unique local environmental influences could contribute to smoking initiation and continuation among students. In Bobo-Dioulasso, a significant proportion of college students are influenced by their social networks, and smoking can become normalized within these groups. In the context of Bobo-Dioulasso, peer groups may view smoking as a symbol of social belonging or adulthood, further increasing the likelihood that students will start or continue smoking. A key local environmental factor that influences smoking in Bobo-Dioulasso is the accessibility of cigarettes. According to research by W. Handayani et al. (2021), adolescents are more likely to buy cigarettes when tobacco retailers are located nearby, proximity to tobacco shops significantly increases the likelihood of adolescents purchasing cigarettes.

In Bobo-Dioulasso, many tobacco retailers are located near colleges or in residential areas, making cigarettes easily accessible to students. In Bobo-Dioulasso, where digital connectivity is increasing among college students, exposure to smoking-related content on platforms such as Facebook, Instagram, or YouTube may contribute to tobacco use initiation. While some regulations exist to limit direct advertising, online marketing campaigns often circumvent these laws. Further research and tailored public health interventions are needed to study these factors and reduce tobacco consumption among college students.

Relationship between Family Influence and Tobacco Smoking

At this period of life, family impacts become more obvious, shaping attitudes and behaviors. At college student stage of life, the family plays an essential role in setting values, providing emotional support, and influencing decisions related to health behaviors, including smoking. While peers and external factors often dominate, the values instilled by family, especially in terms of health and well-being, can either discourage or encourage behaviors such as smoking. The significance of family in either promoting or discouraging tobacco use among college students has been emphasized by recent studies.

Whether or not parents smoke has the biggest family impact on college students' smoking habits. Because family smoking behavior frequently serves as a model for their own habits, numerous studies have demonstrated that teenagers and young adults who have parents who smoke are more likely to start smoking themselves. Students who grew up in homes with at least one smoker were far more likely to have smoked by themselves, even while attending college, according to a recent study by Patterson et al. (2021). Family smoking was identified as a critical risk factor for smoking initiation among South African youths (Morrell et al., 2018; Sreeramareddy & Acharya, 2021).

The research of Odukoya et al. (2013) corroborated the above assertion. Similarly, Gebremariam et al. (2018) reported: “smoking habits of parents and siblings were strong indicators of smoking initiation among adolescents in Ethiopia, aligning with patterns observed in other African nations”. Research across various regions consistently showed that adolescents were more likely to smoke if they have family members, especially parents or older siblings, who smoke. Family influence

smoking behavior among students in Bobo-Dioulasso, showing the strength and direction of each variable's impact.

Furthermore, research indicates that relatives who smoke are less likely to enforce strict anti-smoking policies in the home, which fosters a smoking-friendly atmosphere (Wang et al., 2018). College students from households where smoking was normative or tolerated were more likely to participate in smoking, according to (Resen, 2018)

Hoffman et al. (2021) found that college students raised in homes with firm anti-smoking rules were less likely to engage in smoking while in college. These rules likely provide clear boundaries and reduce the opportunity for young adults to experiment smoking. However, these rules must be consistent and reinforced. While having a strong anti-smoking policy is advantageous, Resen (2018) argued that parents should also actively address the dangers of smoking with their kids and set an example of non-smoking conduct. Students are more inclined to smoke if their parents maintain ambiguous or inconsistent policies regarding smoking (for example, allowing smoking in the house or at social events).

Furthermore, the influence of family on smoking habits differs depending on the cultural and social setting. According to research by Piko et al. (2005), whether smoking is normalized or stigmatized within the family can be influenced by traditional beliefs, cultural views against smoking, and family values. For example, smoking may be more socially accepted in some Asian cultures, particularly among older generations, which makes it more likely that young adults will start smoking.

In contrast, parents in many Western nations actively discourage smoking, reflecting a change toward more anti-smoking views. Because of worries about social peace and family reputation, college students from more collectivist cultures could

also feel more pressure from their families to abstain from smoking. Piko et al. (2005) argue that in cultures where smoking is stigmatized, students may be less likely to smoke or may hide their smoking habits from their families.

In the U.S., studies have shown that pocket money or allowance can contribute to smoking initiation, but this is often seen in a broader context where financial independence is linked to access to cigarettes. Sreeramareddy and Acharya (2021) revealed that adolescents with disposable income had greater access to tobacco products. A 2022 report from Action on Smoking and Health (ASH) indicated that while some adolescents may use their allowance to purchase cigarettes products, the predominant influence on their smoking behaviors arises from peers and family members who smoke (Action on Smoking and Health & Action on Smoking and Health, 2022).

The Global Youth Tobacco Survey (Burkina Faso Public Health Association, 2021) indicates that teenagers from economically disadvantaged families in nations like Kenya, Nigeria, and South Africa had a higher likelihood of obtaining tobacco products, primarily because of inadequate enforcement of age-related sales regulations in retail establishments. However, in some cases, tobacco use may not be directly linked to pocket money but rather to social status and the desire to fit in, especially when smoking is seen as a symbol of adulthood or rebellion.

The place of habitation plays an essential role in influencing various behaviors, including tobacco smoking, among college students. It refers to the type of housing arrangement a college student lives in, which could be school compound and staying without your family or living at home with family. These different living situations can significantly influence access to cigarettes, social influences, and the level of freedom or constraints college students experience in relation to smoking.

Students living in independent housing may have more autonomy, access to cigarettes, and exposure to peer influence, which can increase their likelihood of smoking. In contrast, students living with parents may have more structured environments with smoking restrictions, leading to less opportunity for smoking.

However, if the family smokes, this could normalize the behavior for the student, leading to a higher likelihood of smoking initiation. Moreover, the social context and cultural factors tied to where students live (urban vs. rural, higher vs. lower socio-economic areas) also play a critical role in modeling smoking behaviors. Addressing the place of residence and tailoring interventions to specific living situations may be essential in reducing smoking rates among college students.

Demographic Variables Moderating the Relationship between Environmental Influence, Family Influences and the Prevalence of Tobacco Smoking among College Students

Demographic characteristics such as gender, age and religion religious background could significantly moderate the relationship between environmental factors, family influences, and the prevalence of tobacco smoking among college students. These characteristics influenced how students responded to environmental pressures and familial attitudes, affecting smoking behavior differently across groups.

Age moderating effect. In this study, college students are typically in the late adolescence to early adulthood phase, which is a critical time for the formation of habits and behaviors. Younger students may have different exposures, peer influences, and family dynamics compared to older students (upperclassmen). Age may moderate how environmental, and family factors affect smoking, as younger students might be more influenced by peers and family behavior, while older students may have a more established sense of autonomy and personal decision-making.

Younger students tend to be more influenced by family and peer smoking, especially as they seek to fit in during their transition to adulthood (Morrell et al., 2011). Older students are more likely to adopt smoking behaviors due to academic stress, work pressures, and increased independence from parental control.

Gender moderating effect. Males are generally more likely to smoke than females, especially in many countries around the world, including both developed and developing nations (Gentzke et al., 2022). This may be due to cultural norms, peer pressure, and social expectations, where smoking is more accepted or encouraged among boys. In countries like China, Nigeria, and parts of the Middle East, boys are often exposed to environments where smoking is more culturally acceptable for men. At the same time girls face more societal disapproval for smoking (Morrell et al., 2011). Desalu et al. (2009) discovered that the prevalence of smoking was significantly greater among male students than among their female peers in Nigeria.

Hanafin et al. (2021) found that family smoking behaviors were more strongly associated with smoking habits among male adolescents. Women, on the other hand, were more influenced by societal and environmental factors such as the smoking behavior of friends or the media, rather than family. Gender could moderate the relationship between family influences and smoking behavior, with men potentially being more influenced by male family members' smoking habits than women.

Religious background moderating effect. Cultural and religious norms can influence smoking behavior by setting social expectations around smoking among college students in Bobo-Dioulasso. Students from religious families or conservative cultures might be less likely to smoke due to cultural disapproval or religious prohibitions against smoking tobacco. Family influences might play a more decisive role in discouraging smoking among these students.

However, students from more liberal or secular backgrounds might be more influenced by peer behavior or stress, with less resistance from cultural norms against smoking. Religious beliefs can significantly influence a person's perspective on smoking. Many religions have teachings or codes of conduct that discourage smoking or substance use. Students from religious backgrounds may be less likely to smoke due to the influence of religious norms and values. The effect of family influences and environmental factors on smoking behavior could be moderated by religious beliefs. For instance, a student from a Muslim or Christian background might be less likely to be influenced by family members who smoke or by peer behavior due to religious prohibitions. Students with strong religious beliefs were less likely to be influenced by media depictions of smoking, suggesting that religious values may act as a shield against environmental influences.

A study by Chaloupka et al. (2023) found that religious education can reduce the likelihood of adopting smoking behaviors, even if a family member smokes. The study emphasized the role of religious teachings in shaping an individual's beliefs about smoking. Religious values might mitigate the impact of family smoking habits and reduce the likelihood of smoking, regardless of the individual's exposure to environmental factors like tobacco advertising or availability.

Demographic characteristics such as age, gender, and religion, significantly moderate how environmental and family influences shape tobacco smoking behavior among college students. Understanding these moderating effects is crucial in developing strategies that tailor the requirements to adequate to various student demographics. By considering these factors, public health programs can more effectively target high-risk students and address the root causes of smoking in their demographic context.

Interpretation and Implications

The shift from bivariate to multivariable analysis highlighted the importance of adjusting for confounding factors: environmental influence emerged as the strongest independent predictor of smoking, suggesting interventions targeting peer pressure, media, or societal norms could have the highest impact. Given the significant impact of peer influence, public health campaigns could benefit from targeting social groups, such as friends or classmates, and promoting smoke-free social environments. These efforts could focus on changing attitudes within peer groups to reduce smoking initiation.

From 2006 to 2021, Burkina Faso executed various national tobacco control measures aimed at decreasing tobacco consumption and adhering to the WHO's Framework Convention on Tobacco Control (WHO FCTC), of which it became a signatory in 2006. Regulations were edited to control tobacco use in health care facilities, instructive offices, government offices, and indoor workplaces. The Ministry of Health (2018) reports that Burkina Faso has implemented nationwide prohibitions on the simultaneous advertisement of tobacco products through billboards, outdoor advertising, and national television and radio broadcasts.

These actions are in accordance with the nation's dedication to the WHO's Framework Convention on Tobacco Control (FCTC), which seeks to diminish tobacco use and safeguard public health. In expansion, an enslavement center (smoking cessation center) was opened within the biggest Hospital in the nation. Despite all these nationwide preventive measures, to diminish tobacco use among college students since the WHO Framework Convention on Tobacco Control (FCTC) took impact in October 2006, the tendency is not showing a consistent decline, as studies indicate that tobacco consumption among young adults remains a persistent

issue, possibly due to factors such as targeted advertising, social influences, and the availability of tobacco products (WHO, 2017).

A study conducted by Bonnechère, Cissé, et al. (2019). examined tobacco consumption in Burkina Faso, utilizing data from the 2013 WHO STEPS survey and the 2011 Demographic and Health Survey (DHS). The findings revealed that the rate of smoking among men in Burkina Faso exceeded that of seven out of the nine other West African nations included in the analysis. Furthermore, the incidence of smokeless tobacco (SLT) usage in Burkina Faso was greater than that observed in nine of the ten other West African countries surveyed. The selection and usage of tobacco control measures have faced significant difficulties faced in Burkina Faso in comparison to a few nations where incredible regulations have been established.

The implementation of stringent administrative measures against smoking has been documented for an extended period. Decree No. 2015-366/MS/MICA, adopted on April 7, 2015, sets out the implementation procedures for Decree No. 2011-1051 concerning the packaging and labeling of tobacco products in Burkina Faso. This decree aims to strengthen tobacco control efforts by mandating health warnings on cigarette packs and banning attractive packaging. It specifically requires the inclusion of warning images on cigarette packs, granting manufacturers a one-year period to comply with these new regulations (Images 1, Appendix F). This content suggests that all tobacco merchants and producers must attach realistic well-being markings on tobacco parcels.

Risk Factors of Cigarette Smoking

A lot of college students start smoking and continue smoking as they move into adulthood, resulting to some long-term health consequences. The influence of peers is among the most significant risk factors associated with smoking. Vuolo et al.

(2021) found that students are more inclined to smoke if their friends or social circle smoke. College life often involves social events like parties, where smoking may be perceived as a social norm. Gentzke et al. (2022) indicated that students who reported having close associates who smoke were considerably more likely to smoke themselves. The stress of academic pressures, adjusting to college life, and managing social relationships can cause smoking behaviors among students. Many college students underestimate the long-term risks of smoking. Hanafin et al. (2021) found that a significant portion of college students believed that occasional smoking or social smoking was less harmful than regular smoking.

This awareness can reduce their motivation to avoid smoking or quit. WHO (2022) highlighted that social media platforms like Instagram and TikTok have become significant channels for tobacco and nicotine product promotion, particularly targeting young audiences through influencers and advertising campaigns. These platforms allow for the strategic use of celebrity endorsements and influencer partnerships to normalize smoking behaviors among youth. Such content often portrays tobacco use as glamorous or trendy, thereby diminishing perceived health risks and increasing the likelihood of tobacco use initiation among adolescents and young adults. Jackson et al. (2025) found that students attending colleges with more tolerant smoking policies or where smoking was allowed in designated areas, were more inclined to smoke compared to those at institutions with strict non-smoking policies. Having designated areas may make smoking more visible and normalize the behavior for students. Addressing these risk factors through public health interventions, tobacco policies, and increased awareness of the dangers of smoking is essential in reducing smoking rates in this population.

Strengths and Limitations

This study was the first to survey college students in Bobo-Dioulasso about the prevalence of smoking and the factors that are linked to it. Research on smoking was included of the Global Youth Tobacco Survey (2001), but it was restricted to a sample of fourth- through sixth-grade adolescents who were enrolled in school. Another work was done by Millogo et al. (2018), but it covered College and University students; the study specifically targeted college students in Bobo-Dioulasso, providing insight into smoking behavior in a particular population that is at a critical stage of habit formation (Millogo et al., 2018). This research fostered designated intervention strategies specific to this demographic.

The findings are highly relevant for policymakers and educators seeking to implement smoking prevention programs in college education institutions. Another strength that this study highlighted is a wide range of dynamics such as family influences, peer pressure, socioeconomic status, and environmental factors giving a holistic view of the various determinants that influence smoking behavior among college students in Bobo-Dioulasso. Also, the comprehensive approach makes the investigation valuable for understanding the complexity of smoking behavior and identifying key areas for targeted interventions.

Moreover, employing statistical techniques like odds ratios (OR) and P-values provides a quantitative understanding of the relationships between risk factors and smoking. This statistical objectivity enhances the reliability of the results. Finally, the design and methodology, including logistic regression and univariate analysis, used in this work, can be easily replicated in other settings or populations which can allow broader generalization of the findings, particularly in similar socio-cultural environments.

This study dealt solely with the college students' smoking prevalence and contributing factors in Bobo-Dioulasso. Hence, the results can be applied to similar places with similar social characteristics. We feel our study has certain limitations. First, the presented findings might be affected by reporting bias and the data may reflect respondents' subjective perceptions. Additionally, the study does not consider psychological factors such as stress, anxiety, or addiction behavior, which are essential drivers of smoking among students. By overlooking the psychological and behavioral sides, the study may miss critical dynamics that explain why some students are more likely to start or continue smoking. Hence, further studies are needed on the prevalence and determinants of all kinds of smoking youth.

While the study on smoking behavior among college students in Bobo-Dioulasso provides valuable insights, its strengths such as a focused population, comprehensive analysis, and rigorous statistical approach are balanced by limitations such as, the inability to establish causality, and reliance on self-reported data. Future research addressing these constraints would improve robustness of the findings and lead to more actionable conclusions.

CHAPTER 5

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

The topic dealt with in this work was the prevalence and determinants of tobacco smoking among college students in Bobo-Dioulasso (Burkina Faso). The research used five (5) research questions and three (3) hypotheses. The literature review was done intensively, covering all the topics in the conceptual framework. An analytical cross-sectional study was used for the methodology. The target population of this study was male and female college students studying at Bobo-Dioulasso in Burkina Faso. The objective of this research was to assess the prevalence and the factors associated with smoking among college students in Bobo-Dioulasso. In addition, this study has come out with recent statistics on smoking among college students of Bobo. Also, the findings of this work aimed at preventing and reducing tobacco use, mitigating the adverse outcomes associated with smoking, and improving the overall well-being of college students and the wider society. A self-administered questionnaire was utilized to collect quantitative data, which were analysed. Yamane's formula was used to determine the sample size. To avoid ethical concerns and bias all ethical issues were adhered to.

From the results obtained, the study has drawn some apparent configurations: The findings highlighted that family smoking habits and peer pressure were major contributing factors to the high rates of smoking among college students in Bobo-Dioulasso. Students whose parents or close friends smoked were more likely to start

smoking themselves. Also, in this study, older students, particularly those above 20 years of age, were found to be more likely to smoke, suggesting that exposure to smoking behaviors increases with age and college experience. Environmental factors such as the proximity of tobacco retailers and the availability of cigarettes did not significantly contribute to smoking behaviors among college students. The amount of daily pocket money was found not to be a significant factor in smoking behavior. Considering the place of Residence, students living away from home or living with smoking parent were found to be more likely to smoke, as they had more autonomy and were more exposed to peer influence and greater availability of cigarettes. In this study, religion has no significant effect on smoking behavior among college.

Conclusion

The results of this study confirm the seriousness of smoking among students in Bobo-Dioulasso. They demonstrate the importance of friends and parents in the behavior of College students regarding tobacco smoking. Addressing the problem requires a collective effort by politicians, merchants, law enforcement, health professionals, teachers, parents, children, adolescents and the media. The measures to be taken should emphasize the role of college teachers and parents in raising awareness among college students about the harms of smoking, monitoring the application of texts regulating the sale of tobacco and protecting consumers and efforts to help with weaning aid to the benefit of college students wanting to quit smoking and anti-smoking consultations in health facilities. Finally, this assessment constitutes a system for monitoring trends in the prevalence and determinants of smoking among college students in Bobo-Dioulasso; it must be repeated periodically and be the source of possible corrections to the orientations of the action plan to combat smoking in colleges.

Recommendations

The results of this study indicated that broad, multi-dimensional strategies are essential for effectively reducing smoking prevalence among college students in Bobo-Dioulasso. The following table (13) provides a clear overview of the recommendations to be implemented.

Table 13.

Summary of the Recommendation

Recommendation	Alignment to Finding	Entity to Act
Peer-led interventions and campaigns	Strong association between close friends or classmates smoking and student smoking behavior.	College Administration, Student Groups
Promote smoke-free campus policies	Social influence and peer pressure play a major role in smoking behavior among students.	College Administration
Enhance education on the harmful effects of smoking	Awareness gaps about smoking's long-term consequences among students.	Health Departments, College Health Services
Stricter regulations on tobacco advertising and availability	Limited influence of tobacco advertising but can still be controlled to minimize exposure.	Government, Tobacco Regulatory Authorities
Increase taxes on tobacco products	Cigarette price affordability showed a marginal influence on smoking behavior.	Government, Ministry of Finance Wholesalers
Offer smoking cessation programs and support services	Students may want to quit smoking but need accessible support to do so.	College Health Services, Public Health Authorities
Implement stress management programs to reduce smoking triggers	Stress and social factors contribute to smoking behaviors in students.	College Counseling Services, Health Departments
Introduce smoke-free recreational activities and student clubs	Lack of alternative healthy activities to replace smoking in students.	College Recreation Department, Student Smoke-Free Clubs
Conduct longitudinal studies and regular surveys	The need to continuously track smoking behaviors and effectiveness of interventions.	Research Institutions, College Health Services

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APPENDICES

APPENDIX A

ENGLISH QUESTIONNAIRE

Dear participant,

The objective of this questionnaire is to evaluate “The prevalence and determinants (reasons) of smoking among middle school students in Bobo-Dioulasso. Your participation will be of great help and crucial in adding new information to this statistical work. Please do not write your name on the questionnaire. Thank you for your cooperation.

I. Demographic Characteristics

1. Gender: ☐ Female ☐ Man

2. Age: _____

3. What is your religion:

☐ Islam ☐ Christian ☐ African Tradition ☐ Other

4. If you are a Christian, specify your denomination

☐ Evangelicals ☐ Catholic ☐ Adventists ☐ Jehovah's Witnesses ☐ Other specified _____

5. College Name.....

6. Specify your class

II. Family Influences

7. Family Type:

☐ Family ☐ Extended Family ☐ Separated Family

8. Number of family members, including you:

9. Number of siblings (including you):

10. a) Please specify your mother's level of education

☐ Attended school ☐ Did not attend,

b) b) If the mother has attended, please specify the level achieved

☐ Primary School ☐ Middle School ☐ High School

11. a) Please specify your father's level of education

☐ Did not attend school ☐ Attended school

b) If the mother has attended, please specify the level achieved

☐ Primary School ☐ Middle School ☐ High School

12. Who smokes in your family?

☐ Mother ☐ Father ☐ Both parents ☐ Brother and/or sister ☐ None

13. Where you live, do people smoke inside the house?

☐ Yes ☐ No ☐ Don't know/Don't know

14. Receiving daily pocket money is cause a student to smoke cigarette

☐ Strongly Disagree ☐ Disagree ☐ Agree ☐ Strongly Agree

III. Smoking Behaviour

15. Have you ever smoked?

☐ Yes ☐ No

If so, when did you smoke your first cigarette_____

16. What was your main reason for smoking, please choose two options listed
☐ Imitation ☐ Relaxation/Pleasure Stimulating ☐ Stress/Tension ☐ Friends/Schoolmates
☐ I don't smoke ☐ Other _____
17. Are you hanging out with friends or classmates who smoke?
☐ Never ☐ Rarely, ☐ Often ☐ Always ☐
18. Do you think students smoke because the price of cigarettes is cheaper?
☐ Strongly Disagree ☐ Disagree ☐ Agree ☐ Strongly Agree
19. Where do students habitually smoke, please choose 3 options?
☐ At home ☐ In the schoolyard ☐ Outside school ☐ At friends' homes ☐ At sporting events, parties or other social events ☐ In public places ☐ I have no idea
20. During the experimental phase of smoking, do you know that the smoker can become addicted to cigarettes?
☐ Yes ☐ No ☐ I have no idea
21. Smoking is harmful to your health,
☐ Strongly Disagree ☐ Disagree ☐ Agree ☐ Strongly Agree
22. a) If you smoke, have you ever tried to quit?
☐ Yes ☐ No ☐ I never thought about it ☐ I don't ☐ smoke
 b) If you are a non-smoker, do you think that smokers are trying to quit?
☐ Strongly Disagree ☐ Disagree ☐ Agree ☐ Strongly Agree
23. Would you advise a smoker to quit?
☐ Yes ☐ No
- IV. Environmental Influences
24. Is your place of residence close to a cigarette shop?
☐ Yes ☐ No ☐ I don't know
25. If so, do you think that living near a cigarette shop would cause someone to smoke?
☐ Strongly Disagree ☐ Disagree ☐ Agree ☐ Strongly Agree
26. Do any of your close friends or classmates smoke?
☐ None of them ☐ Some of them ☐ All ☐ I don't know
27. In middle school, were you taught about the dangers of smoking? (e.g., lung cancer, heart disease, fire hazards)?
☐ Never ☐ Rarely ☐ Often ☐ Always ☐ I don't Remember
28. Tobacco advertisement on the media causes students to smoke?
☐ Strongly Disagree ☐ Disagree ☐ Agree ☐ Strongly Agree
- V. Other Facts and History of Smoking
29. What type of cigarette do students like to smoke the most, please choose 3 options?
☐ Cigars ☐ Tobacco ☐ Injectable ☐ Cigarette Pipe ☐ Electronic Cigarette ☐ Shishas ☐ Smokeless tobacco ☐ I don't know
☐ Other tobacco products (mentioned) _____
30. What health problems is the smoker risking, please choose two options?
☐ Cough ☐ Cancers (throat, lungs, etc.) ☐ Breathing problems ☐ Fatigue ☐ Premature wrinkles ☐ Bad breath ☐ Other (please specify) _____
31. Is it the duty of public authorities to help smokers quit smoking?

☐ Strongly Disagree ☐ Disagree ☐ Agree ☐ Strongly Agree

32. Do you have any other comments:

Thank you for your valuable time in completing this questionnaire
God bless you

APPENDIX B

FRENCH QUESTIONNAIRE

Cher participant,

L'objectif de ce questionnaire est d'évaluer « La Prévalence et déterminants (les raisons) du tabagisme chez les collégiens de Bobo-Dioulasso. Votre participation sera d'une grande aide et cruciale pour ajouter de nouvelles informations à ce travail statistique. N'écrivez pas votre nom sur le questionnaire, s'il vous plaît. Je vous remercie de votre collaboration.

I. Caractéristiques démographiques

1. Sexe : ☐ Femme ☐ Homme
2. Âge : _____
3. Quelle est votre religion :
☐ Islam ☐ Chrétien ☐ Tradition ☐ africaine ☐ Autres ☐
4. Si vous êtes chrétien, précisez la confession
☐ Évangéliques ☐ Catholiques ☐ Adventistes ☐ Témoins de Jéhovah ☐ Autres précisez _____
5. Nom du collège
6. Précisez votre classe

II. Influences familiales

7. Type de famille :
☐ Famille ☐ Famille élargie ☐ Famille séparée
8. Nombre de membres dans votre famille, y compris vous :
9. Nombre de frères et sœurs (y compris vous) :
- b) Si le père a fréquenté, veuillez préciser le niveau atteint
☐ École ☐ Primaire École ☐ Collège ou Lycée ☐ Supérieur
10. Qui fume dans votre famille ?
☐ Mère ☐ Père ☐ Les deux parents ☐ Frère et/ou sœur ☐ Aucun
11. Où vous habitez les gens fument-ils à l'intérieur de la maison ?
☐ Oui ☐ Non ☐ Je ne sais pas/Je ne sais pas
12. Recevoir de l'argent de poche quotidien peut conduire un élève à fumer la cigarette
☐ Fortement en désaccord ☐ Pas d'accord ☐ D'accord ☐ Fortement d'accord

III. Comportement tabagique

13. Avez-vous déjà fumé ?
☐ Oui ☐ Non
Si oui, quand avez-vous fumé votre première cigarette _____
14. Quelle était votre principale raison de fumer, veuillez choisir deux options énumérées

☐ Imitation ☐ Relaxation/le plaisir stimulant ☐ Stress/Tension ☐
Amis/Camarades ☐ d'école ☐ Je ne fume pas ☐
Autres _____

15. Fréquentez-vous des amis ou camarade de classe qui fument ?

☐ Jamais ☐ Rarement ☐ Souvent ☐ Toujours

16. Pensez-vous que les élèves fument parce que le prix de la cigarette est moins cher ?

☐ Fortement en désaccord ☐ Pas d'accord ☐ D'accord ☐ Fortement d'accord

17. Où les élèves ont-ils l'habitude de fumer, veuillez choisir 3 options ?

☐ À la maison ☐ Dans la cour de l'établissement ☐ En dehors du cadre scolaire

☐ Chez des amis ☐ Lors des événements sportifs, fêtes ou autres événements sociaux

☐ Dans les lieux publics ☐ Je n'ai aucune idée

18. Pendant la phase expérimentale de tabagisme, savez-vous que le fumeur peut devenir dépendant de la cigarette ?

☐ Oui ☐ Non ☐ Je n'ai aucune idée

19. Fumer est nocif à la santé,

☐ Fortement en désaccord ☐ Pas d'accord ☐ D'accord ☐ Fortement d'accord

20. a) Si vous fumez, avez-vous déjà essayé d'arrêter de fumer ?

☐ Oui Non ☐ Je n'y ai jamais pensé ☐ Je ne fume pas

b) Si vous êtes non-fumeur, êtes-vous d'avis que les fumeurs cherchent à arrêter de fumer

☐ Fortement en désaccord ☐ Pas d'accord ☐ D'accord ☐ Fortement d'accord

21. Conseillerez-vous à un fumeur d'arrêter de fumer ?

☐ Oui ☐ Non

IV. Influences environnementales

22. Votre lieu de résidence, est-il à proximité d'une boutique de vente de cigarettes ?

☐ Oui ☐ Non ☐ Je ne sais pas

23. Si oui, pensez-vous que vivre à proximité d'une boutique de vente de cigarettes pousserait quelqu'un à fumer ?

☐ Fortement en désaccord ☐ Pas d'accord ☐ D'accord ☐ Fortement d'accord

24. Est-ce que l'un de vos amis proches ou camarade de classe fume ?

☐ Aucun d'entre eux ☐ Certains d'entre eux ☐ Tous ☐ Je ne sais pas

25. Au collège, vous est-il enseigné les dangers du tabagisme ? (par exemple, cancer du poumon, maladie cardiaque, risques d'incendie) ?

☐ Jamais ☐ Rarement ☐ Souvent ☐ Toujours ☐ Je ne m'en souviens pas

26. La publicité pour le tabac dans les médias incite les élèves à fumer ?

☐ Fortement en désaccord ☐ Pas d'accord ☐ D'accord ☐ Fortement d'accord

V. Autres faits et antécédents de tabagisme

27. Quel type de cigarette les élèves aiment fumer le plus, veuillez choisir 3 options ?

☐ Cigares ☐ Tabac ☐ Cigarette injectable ☐ Pipe ☐ Cigarette

électronique ☐ Shishas ☐ Tabac sans fumée ☐ Je n'en sais rien

☐ Autres produits du tabac (mentionné)

28. Quels problèmes de santé risque le fumeur, veuillez choisir deux options ?

☐ Toux ☐ Cancres (gorge, poumons...) ☐ Problème de respiration ☐

Fatigue ☐ Rides prématurées ☐ Mauvaise haleine

☐ Autres (veuillez préciser) _____

29. Il est du devoir des autorités publiques d'aider les fumeurs à cesser de fumer ?

☐ Fortement en désaccord ☐ Pas d'accord ☐ D'accord ☐ Fortement d'accord

30. Avez-vous d'autres commentaires à faire :

Merci de votre temps précieux pris pour remplir ce questionnaire
Que Dieu vous bénisse

APPENDIX C

ENGLISH INFORMED CONSENT

You are being asked to participate in a study about health and health behaviors by answering a questionnaire. The information you give, may help college students of Bobo-Dioulasso be healthier and get better health education. There are no identifiable risks to you for participating. The questionnaire is anonymous and your identity will not be revealed. **Do not write your name on the questionnaire.**

You will not be paid to participate; your participation is voluntary. You cannot be identified by your answers, so please answer every question as honestly as you can. Finishing the questionnaire should take some few minutes. After the completed questionnaires are returned, they will be kept in a locked office at the Adventist University of Africa in Nairobi, Kenya. When the research is completed, the questionnaires will be destroyed.

If you do not want to participate, give the questionnaire back to the Research Assistant. You will not be penalized in any way for not participating. If you begin the questionnaire and do not want to finish, stop and give it to the Research Assistant. If English is not your primary language, ask the Research Assistant to give you a copy of this Informed Consent in a language that you read and understand. The questionnaire you receive will also be in the same language. If you are unable to see, read, write or understand this Informed Consent, for any reason, tell the Research Assistant and he/she will assist you. The Research Assistant will also assist you to complete the questionnaire.

Signing this Informed Consent means that you agree to participate in the research study. If you have any questions, please ask them now. When you finish the questionnaire, your participation is over.

The Research Principal Investigator is Ollo Marcellin KAMBOU. You can contact him if you have comments or complaints about this process. His contact information is:

Email: kambouomarcellin@gmail.com

Cell phone: +226 70703883

WhatsApp: +226 74643856

This study has been approved by the appropriate *Ethics Review Committee* and is grant funded.

Signature _____ Date _____

Contact information (this section is optional- you do not have to give this information)

Phone _____ Email Address _____

Home address _____

APPENDIX D

STATISTICAL ANALYSIS

Key findings based on research questions and statistical analysis:

	Brut OR ¹	95% CI ¹	p- value	Ajus ted OR ¹	95% CI ¹	p-value
sex			0.001			
Female	—	—		—	—	
Male	11.3	3.80, 48.4		10.5	3.38, 46.3	0.001
age	1.41	1.15, 1.74	0.001	1.23	0.98, 1.58	0.086
age_group			0.094			
<20	—	—				
> 20	2.31	0.86, 5.62				
religion			0.30			
African traditional	—	—				
Christian	0.31	0.04, 6.36				
Muslim	0.63	0.11, 12.1				
upbringing			0.77			
Divided family	—	—				
Extented family	1.75	0.38, 12.3				
Family	1.35	0.37, 8.73				
smoking_in_your_fa mily_yn			0.50			
No	—	—				
Yes	1.44	0.46, 3.76				
smokers_in_your_fa mily			0.50			
Bother/sister	—	—				
Father	0.35	0.04, 2.31				
Mother	0.00					
None	0.37	0.11, 1.68				
smokers_inside_hous ehold			0.59			
No	—	—				
Yes	0.68	0.11, 2.41				
receiving_daily_pock et_money_lead_a_st			0.22			

udent_to_smoke_cigarettes						
Agree	—	—				
Disagree	1.09	0.41, 3.44				
Strogly agree	0.00					
Strongly disagree	1.43	0.34, 5.69				
residence_close_to_a_cigarette_store			0.10			
No	—	—				
Yes	2.20	0.86, 6.75				
If so, do you think living near a cigarette store is a good idea?			0.29			
Agree	—	—				
Disagree	0.92	0.31, 3.35				
Strongly agree	0.00					
Strongly disagree	1.12	0.32, 4.44				
Do you think students smoke because cigarettes are cheaper?			0.082			
Agree	—	—				
Disagree	2.06	0.53, 13.6				
Strongly agree	5.60	1.34, 38.1				
Strongly disagree	3.50	0.66, 26.0				
Do any of your close friends or classmates smoke?			0.001			
No	—	—		—	—	
Yes	10.3	3.78, 35.8		9.58	3.40, 34.4	0.001
Does tobacco advertising in the media encourage students to smoke?			0.81			
Agree	—	—				
Disagree	0.86	0.31, 2.40				
Strongly agree	0.95	0.24, 3.12				
Strongly disagree	1.64	0.42, 5.51				

APPENDIX E

FRENCH CONSENT FORM

(Informed consent translated into French)

CONSENTEMENT ECLAIRE

Cher/Chère participant(e),

Mon nom est Ollo Marcellin KAMBOU. Je suis étudiant à l'Université Adventiste d'Afrique (AUA), poursuivant une Maîtrise en Santé Publique. Pour satisfaire aux exigences de ce programme, je mène une recherche sur "la prévalence et les déterminants du tabagisme chez les élèves à Bobo-Dioulasso."

Votre contribution est très importante pour cette recherche, car vous êtes sur le terrain et connaissez la réalité des choses. C'est pourquoi je vous invite à participer à cette recherche.

L'objectif de la recherche est d'avoir des données statistiques récentes sur la question afin de permettre aux décideurs de prendre des résolutions exactes et appropriées pour juguler et remédier efficacement aux méfaits du tabagisme. Votre participation consiste à remplir un questionnaire qui prendra quelques minutes de votre temps.

Vous ne serez pas rémunéré pour participer. Votre participation est volontaire. Vous ne serez pas identifié par vos réponses, s'il vous plaît, répondez à chaque question aussi honnêtement que possible. Une fois les questionnaires remplis retournés et la recherche terminée, ils seront détruits.

Vous ne serez aucunement pénalisé de n'avoir pas participé. Si vous commencez le questionnaire et que vous ne voulez pas le terminer, arrêtez-vous et donnez-le à l'assistant de recherche.

Si vous n'êtes pas en mesure de voir, de lire, d'écrire ou de comprendre ce consentement éclairé, pour quelque raison que ce soit, dites-le à l'assistant de recherche et il vous aidera. L'assistant de recherche vous aidera également à remplir le questionnaire.

La signature de ce consentement éclairé signifie que vous acceptez de participer à l'étude de recherche. Si vous avez des questions, n'hésitez pas à les poser. Lorsque vous avez terminé le questionnaire, votre participation est terminée.

Contact du chercheur principal :

Courriel : kambouomarcellin@gmail.com

Téléphone portable : +226 70703883

WhatsApp : +226 74643856

Je consens à participer à cette recherche :

Nom du Participant: _____

Signature du participant: _____ Date: _____

APPENDIX F

SELECTED IMAGES

Image 1:
Labeling of Tobacco Items in Burkina Faso



This decree refers to Law No. 040-2010/AN on the fight against tobacco in Burkina Faso of November 25, 2010 and Decree 2011-1051 (packaging and labeling of tobacco products).

APPENDIX G

ETHICS DOCUMENTATION

	Zertifikat Certificat	Certificado Certificate
	Promouvoir les plus hauts standards éthiques dans la protection des participants à la recherche biomédicale Promoting the highest ethical standards in the protection of biomedical research participants	
	Certificat de formation - Training Certificate Ce document atteste que - this document certifies that	
	Ollo Marcellin KAMBOU a complété avec succès - has successfully completed	
	Module 4 - Good Clinical Practice (GCP-E6(R2) 2016) du programme de formation TRREE en évaluation éthique de la recherche of the TRREE training programme in research ethics evaluation	
	Release Date: 2024/02/15 Date de délivrance	 Professeur Dominique Sprumont Coordinateur TRREE Coordinator
	Foederatio Pharmaceutica Helveticae	
	Programmes de formation continue (S certifié) Continuing Education Programs (S certified)	Programmes de formation continue Continuing Education Programs postgraduée et continue
Ce programme est soutenu par - This program is supported by : European and Developing Countries Clinical Trials Partnership (EDCTP) (www.edctp.org) - Swiss National Science Foundation (www.snf.ch) - Canadian Institutes of Health Research (http://www.cihr-irsc.gc.ca/fr/2891.html) - Swiss Academy of Medical Sciences (SAMS/ASMD/ASAM) (www.sams.ch) - Commission for Research Partnerships with Developing Countries (www.kjpc.ch)		
[REV : 20220317]		



Adventist University of Africa
Proposal Correction Confirmation Form

Name of AUA Student: Marcellin Olo Kambou

Program of Study: Master of Public Health

Project ☐ Thesis ☒ Dissertation ☐

Title: PREVALENCE AND DETERMINANTS OF TOBACCO SMOKING AMONG COLLEGE STUDENTS IN BOBO-DIOULASSO (BURKINA FASO)

We, the undersigned, confirm that all the corrections recommended by the candidate's panel of examiners during the proposal oral defense have been incorporated into the revised proposal and ready for institutional ethics review and clearance.

Primary Adviser: Pro Daniel Ganu Signature: [Signature] Date March 8, 2029

Verified by: Janet Odhiambo Signature: JOdhiambo Date 10/03/2024
Programme Coordinator

APPENDIX H

MEDICAL MISSIONARY CERTIFICATE



VITA

Ollo Marcellin KAMBOU (Ordained Pastor)
Burkina Faso Mission of Seventh-day Adventist
Phone: + 226 70 70 38 83
Whatsapp: +226 74 64 38 56
Mail : kambouollo2010@yahoo.fr



I am serving at the Mission since July 2008. I have worked in many Districts (Bobo District, South-west district, Ouagadougou District, Boromo District, Dedougou District and actual at West District (Bobo-Dioulasso). Since 2015, I am in charge of three (3) Departments and Ministries in Burkina Faso Mission: Youth Director, Chaplaincy Director and Public Campus Ministry Director. From 4th-17th September 2017: I attended an international Workshop organized by ADRA of West Central Division on Community Services and Urban Ministry. I have completed six (6) months 1000 Medical Missionaries Training by WAD (West Central African Division) which was help from September 2023 to February 2024

EDUCATION

1986-1992:	Primary School of Kampti-Bouti
1993-1997:	Junior Secondary School form 1 and 2 at Kampti
1998-1999:	Junior Secondary School Form 3 and 4 Loropeni
2000-2001:	Senior Secondary School Form 1 Bobo-Dioulasso
2001-2002:	Senior Secondary School Form 2 and 3 SDA School Bouake Ivory Cost

2002-2004 :	Mission Global Pionnier Evangelista t Périgban
2004-2008:	Valley View University (Bachelor of Arts in Theology)

PROFESSIONAL EXPERIENCE

2008-2020:	Ordained Pastor at Burkina Faso Mission
May 2015:	Certificate in Production and Writing for Radio (Adventist World Radio)
September 2017:	Certification for Community Services and Urban Ministry Course (ADRA)
2015-2020:	Burkina Faso Mission Youth, Chaplaincy and Public Campus Ministry Director

AWARDS AND HONORS

November 27, 2008:	Certificate of Merit by Valley View University (VVU) Church
May 3, 2008:	Certificate of Honor by Valley View University (VVU) Church
November 27, 2008:	Certificate of Recognition for Community Service by VVU

SPOKEN LANGUAGE

Lobiri; Dioula; French; English