

UNIVERSITY OF EDUCATION, WINNEBA

**KNOWLEDGE OF SENIOR HIGH SCHOOL STUDENTS ON
HIV/AIDS IN THE LOWER MANYA KROBO MUNICIPALITY OF
THE EASTERN REGION OF GHANA**



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DECLARATION

Student's Declaration

I, Maxwell Ofori, hereby declare that this thesis, with exception of quotations and references contained in published and unpublished works, which have been identified and acknowledged, is entirely my original work, and that it has not been submitted, either in part or whole, for another degree in this University or elsewhere.

Signature:

Date:

Supervisor's Declaration

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of thesis as laid down by the University of Education, Winneba.

Supervisor's Name: Prof. Augustine Yao Quarshigah

Signature:

Date:

DEDICATION

I dedicate this work to my late parents; Mr. Aaron Asiedu Ofori and Madam Rose Ama Adoma.



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GLOSSARY

AIDS	:	Acquired Immune Deficiency Syndrome
ARRM	:	AIDS RISK Reduction Model
ART	:	Antiretroviral Therapy
ARVs	:	Antiretrovirals
CSWs	:	Commercial Sex Workers
CDC	:	Centre for Disease Control and Prevention
CD4	:	Cluster of Differentiation 4
FSWs	:	Female Sex Workers
GDHS	:	Ghana Demographic and Health Survey
GES	:	Ghana Education Service
GHS	:	Ghana Health Service
GoG	:	Government of Ghana
HAART	:	Highly Active Antiretroviral Therapy
HIV	:	Human Immunodeficiency Virus
HBM	:	Health Belief Model
KDHS	:	Kenya Demographic Health Survey
KAP	:	Knowledge, Attitude and Practices
LMKM	:	Lower Manya Krobo Municipality
MARPS	:	Most at Risk Populations
NACC	:	National AIDS Control Council
NACP	:	National AIDS Control Programme
PLWHA	:	People Living with HIV/AIDS
PMTCT	:	Prevention of mother to child Transmission
SPSS	:	Statistical Package for Social Scientists
STD/I_s	:	Sexually Transmitted Diseases/Infections
UNGASS	:	United Nation General Assembly Special Session

ABSTRACT

The HIV/AIDS menace has been a major source of concern to everyone, particularly, the people of Lower Manya Krobo Municipality as the area has always recorded higher rate of infections compared with other districts in Ghana. The study sought to assess HIV/AIDS knowledge of Senior High School students in the Lower Manya Krobo Municipality of the Eastern Region of Ghana. The simple random sampling technique was adopted to select 300 students, comprising 120 boys and 180 girls proportionately selected from the four Senior High Schools in the Municipality. A 37 item questionnaire adapted from Wanjiru Helen Wairimu was used for the data collection. The obtained data were analysed using descriptive statistics (means, standard deviations, frequencies, and percentages). The study found that; majority of the senior high school students in the LMKM of Ghana have high knowledge about HIV/AIDS. It was again found out that HIV/AIDS knowledge they have does not have much impact and influence on their sexual behaviour. Finally, it was revealed that the students in the LMKM are not applying their knowledge in HIV/AIDS due to certain inhibiting factors such as religion, limited recognition of personal risk of HIV infection, difficulty in procuring condoms, and the pandemic being a curse from the gods are the factors that inhibit the application of HIV/AIDS knowledge of the SHS students in LMKM of the Eastern Region. Several recommendations were suggested which include; the fact that the Ministry of Health in collaboration with important educational agencies should intensify sex education to the students and the community members in order to strengthen their awareness of HIV/AIDS.



CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

One disease that has threatened the existence of the human race for some time now is the HIV/AIDS. Globally, HIV/AIDS has spread to virtually every region of the world and has affected people of diverse status and backgrounds. Men, women, young people, children and even conceived babies are all at risk. The phenomenon hampers human resource development and undermines the skills base of countries, as most infected people are part of the labour force. It has, therefore, become a major public health concern with about half of new infections occurring among young people (UNAIDS, 2010).

The impact of HIV/AIDS has caused great consternation among policy-makers, as it threatens to erode socio-economic development by increasing morbidity and mortality among people of working age (Barnett & Whitehead, 2002). According to the World Health Organization (WHO, 2017), an estimated 36.7 million people worldwide are living with HIV, with 2.1 million new cases registered by the end of 2015, while an estimated 35 million people have also died from the disease. The UNAIDS (2018) reported that in 2017, 1.8 million adolescents aged 10-19 were living with HIV. New HIV infections among adolescents are projected to decrease by 29% between 2018 and 2030, which is not enough to meet global targets. The global targets are that 90% of people living with HIV know their status, of whom 90% are on treatment; of whom 90% are virally suppressed (90-90-90). Rapid population growth in many low- and middle-income countries has created a growing cohort of adolescents and young adults, and combined with slow progress in HIV prevention among young people, the

epidemic appears far from over. Projections show the current rate of HIV incidence. Without accelerated efforts and investments, a total of 2.0 million adolescents could become newly infected with HIV between 2018 and 2030. The situation is particularly serious for adolescent girls, who are part of key populations. Worldwide, one adolescent girl (15-19 years) became infected every three minutes in 2017. Adolescent girls account for two out of every three new HIV infections in the 15-19 age groups. Adolescents in general and adolescent girls and boys in key populations in particular, tend to be the groups most at risk of HIV infection.

Sub-Saharan Africa, with only ten per cent (10%) of the world's population, remains the most severely affected region (UNAIDS 2010). Approximately seventy per cent (70%) of people infected with HIV worldwide reside in Sub-Saharan Africa, which remains the most affected region in the world (WHO, 2017). Katjavi and Otaala (2003) report that 85% of teachers who died between 1996 and 1998 were HIV-positive in the Central African Republic. Also in Zambia, the number of teachers who died of HIV/AIDS in 1996 was greater than the number of teachers that the country's teacher training colleges produced in that year. In addition, a 20% drop in school enrolment in South Africa has also been attributed to HIV/AIDS (UNAIDS, 2005). Sibanda (2003) added that in the poorest households in South Africa, AIDS takes a greater share of available resources and limits access to food and health care. A staggering per cent (60%) of hospital beds were occupied by patients with HIV/AIDS related illnesses. Ghana, also a Sub-Saharan African country, has been experiencing an increase in the infection rate for some time. For example, the prevalence for 2016 was 2.4%, up from 1.8% in 2015 and 1.6% in 2014 (Ghana AIDS Commission, 2017).

What makes the situation even more worrying are the increasing infection rates among adolescents in the sub-region. According to UNICEF, the 15-24 age group is the group most infected with the virus. This high-risk group accounts for sixty per cent (60%) of all new infections in many countries. Young adults are particularly vulnerable to HIV infection because of the physical, psychological, social and economic characteristics of adolescence (Albarracín et al., 2005). Young adults are, again, at risk because of the high-risk sexual behaviours, attitudes and constraints of the societies in which they grow up (Ashford, 2007). It should be noted that from its discovery in 1981, HIV/AIDS was perceived as a disease defying science, and was wrongly associated with immoral behaviour. Scientists first sought out the agent responsible for HIV transmission by focusing on the biological mechanisms of the virus' action, the natural history of the disease and the epidemic, and the means of prevention, care and treatment. Ulasi et al. (2009) state that in Ghana and many other countries in Sub-Saharan Africa, HIV transmission is mainly through heterosexual intercourse. In these countries, HIV and AIDS are widely seen as a consequence of sexual immorality or immoral behaviour, so that infection is seen as God-given punishment for sins such as prostitution, promiscuity, drug use, or homosexuality (Ayranci, 2005).

In the particular case of Ghana, HIV prevention and treatment programmes have been put in place to combat the AIDS epidemic. However, reports from the United Nations Integrated Regional Information Networks (IRIN) on Africa indicate that the Ghanaian government's AIDS programme is at risk of failure, mainly due to stigma and a weak health system (Ghana AIDS Commission, 2014b). Since the beginning of the epidemic, much progress has been made in preventing new HIV infections and delaying the progression of the disease (Groce et al., 2006). According to Fiona,

Katie, Eric, Marlise, Prince, Sian and Mathew (2013), people who engaged in sex work or solicited sex for money (prostitutes) in Côte d'Ivoire were the pioneers who first contracted HIV and AIDS in Ghana. Mill (2003) reports that globally, forty-five per cent (45%) of people who contract HIV/AIDS are adolescents aged 15-24 years.

This finding is corroborated by other researchers who have also found that adolescents aged 15-24 years constitute the largest population of HIV-infected individuals (Coates & Szekeres, 2004; Ebeniro, 2010, Milanzi & Komba, 2005; Weeks et al., 2004). Szekeres (2004) stated that in the United States, adolescents are the largest group infected with HIV/AIDS. Figures presented by Naswa and Marfatia (2018) suggest that 11.3 million adolescents aged 15-24 are infected with the virus the world over. It has been shown that increased knowledge of HIV/AIDS is not a predictor of behaviour change (Onah, Mbah & Chuckwuka, 2004), although knowledge of the disease is a prerequisite for change (Avornyo & Amoah, 2014).

1.2 Statement of the Problem

The 2018 national estimates and projections of HIV/AIDS show an increase in the prevalence rate for the country. The adult HIV/AIDS prevalence rate was 1.69%. While the Ahafo Region had the highest rate at 2.66%, the North-East had the lowest prevalence rate at 0.39%. Among the districts, LMKM in the Eastern Region had the highest rate of 5.6%. It is also estimated that 334,713 people are currently living with HIV; 117,199(35%) men and 217,514(65%) women. Again, in 2018, an estimated 19,931 people were infected with the virus. Of these, 5,532 (28%) were between the ages of 15 and 24 (National AIDS Control Programme, 2019).

It should be acknowledged that, studies have been conducted on knowledge of students on HIV/AIDS from international and local perspectives. For example, in

South Delhi, India, McManus and Dhar (2008) reported using a sample of 251 adolescent girls that when we talk about protection against sexually transmitted infections, including HIV/AIDS, "use of protection" may have a different meaning for some sexually active adolescents. The authors further indicated that the adolescent may choose pill over condom, thinking that the former could protect them from HIV. The authors concluded that the girls did not know whether the contraceptive pill could protect them from HIV/AIDS or not. Also, in Nairobi, Mayosiet al. (2012) reported from a sample of 3,612 adolescents aged 12 to 25 years that knowledge of the adolescents about prevention of transmission of HIV/AIDS was high, but was not applied to their sexual behaviour practices, although a small number of them transferred this knowledge. Again, the authors reported that one-fifth of sexually active boys used condoms regularly; one-third used them irregularly, while others did not see the need for condom use. It was therefore concluded that there was a need for comprehensive sexuality education programmes, which should aim to equip adolescents with the knowledge necessary to enable them to protect themselves from the scourge of HIV/AIDS.

Again, in Kenya, Njogu and Martin (2003) concluded from a study, that adolescents who are at the most reproductive stage of their human development are at greater risk of HIV/AIDS than any other population group. In this study, the authors indicated that the level of knowledge of students on HIV/AIDS was low. For this reason and more, the authors concluded that students deserve greater attention in the fight against HIV/AIDS infection and transmission. Arguably, research findings such as the aforementioned on the current study variables are contradictory and inconsistent, which demands further investigations.

In Ghana, Oppong and Oti-Boadi (2013) reported from a study that sought to test the knowledge of HIV/AIDS among undergraduate university students, that the students' level of knowledge about HIV/AIDS was high, although there was no transfer of learning regarding their sexual practices. Appiah-Agyekum and Suapim (2013) concluded from a sample of 260 female students in senior high schools that, when adolescents receive HIV/AIDS education, they benefit from it because they become aware of the factors that predispose them to the disease.

Given the challenge that HIV/AIDS poses to adolescents, it is essential to intensify the awareness about the risks associated with sexual behaviour and the importance of applying this knowledge to real-life experience (Njogu & Martin, 2003). Kabiru and Orpinas (2009) support this assertion and argue that, given the high rate of HIV in Sub-Saharan Africa, it is important understand the forces that influence adolescent sexual behaviour because knowledge of HIV/AIDS is insufficient among Senior High School students in Ghana (Gordon & Inusah, 2003; Tagoe & Aggor, 2009). There is a geographical gap in the study of HIV/AIDS in Ghana because the studies so far conducted in Ghana such as zxzxzxzx were limited to universities and senior high schools in regions other than the Eastern Region of in Ghana. Hence, the current study sought to assess the knowledge of senior high school students on HIV/AIDS in the Lower Manya Krobo Municipality of the Eastern Region of Ghana.

1.3 Purpose of the Study

The study aimed at assessing the sexual practices and knowledge on HIV/AIDS of Senior High School students in the Lower Manya Krobo Municipality of the Eastern Region of Ghana.

1.4 Objectives of the Study

The overall objective of the study was to assess the knowledge of HIV/AIDS among SHS students of LMKM in the Eastern Region of Ghana.

The study, specifically, sought to:

1. Assess the knowledge level of SHS students in LMKM of the Eastern Region of Ghana on HIV/AIDS.
2. Examine the influence of HIV/AIDS knowledge on the sexual behaviour of the SHS students in the LMKM of the Eastern Region of Ghana.
3. Explore the factors that inhibit the application of HIV/AIDS knowledge of SHS students in LMKM of the Eastern Region of Ghana.

1.5 Research Questions

The following research questions guided the study.

1. What is the knowledge level of SHS students in LMKM of the Eastern Region of Ghana on HIV/AIDS?
2. What is the influence of HIV/AIDS knowledge on the sexual behaviour of the SHS students' in the LMKM of the Eastern Region of Ghana?
3. What factors inhibit the application of HIV/AIDS knowledge of SHS students in LMKM of the Eastern Region of Ghana?

1.6 Significance of the Study

The information obtained from the study will be useful in addressing the incidence of HIV transmission among adolescents in Ghana. In addition, the findings of the study will be useful to the Lower Manya Krobo Municipal Health Directorate in their quest to implement measures to control the rate of transmission of the disease in the municipality.

The outcome of the study could help in the formulation of policy on access to HIV counselling and testing for Senior High School students in Ghana. It will also give policy makers a very useful insight as to the effective strategies to adopt in controlling the rate of HIV infections among adolescents.

The outcome of this study is intended to become an important document that will contribute to existing literature on the knowledge of HIV/AIDS and sexual behaviour of Senior High School students. It will serve as a reference material for other researchers who would like to learn more about HIV/AIDS in the country.

1.7 Scope of Study

According to McInnes and Rushton (2013), the delimitations of a study are those characteristics that arise from limitations in the scope of the study that define the limits of the study. This study focuses HIV/AIDS knowledge of students in the four public Senior High Schools in the Lower ManyaKrobo Municipality of the Eastern Region of Ghana, namely Krobo Girls_ Presbyterian Senior High, Akro Senior High/Technical, Manya Krobo Senior and Akuse Methodist Senior High Schools.

1.8 Operational Definitions

1. **Human Immunodeficiency Virus (HIV):** It is a virus that attacks cells that help the body fight infection, making a person more vulnerable to other infections and diseases.
2. **Acquired Immune Deficiency Syndrome (AIDS):** It is the late stage of HIV infection that occurs when the body's immune system is badly damaged because of the virus.
3. **UNAIDS:** This Stands for the Joint United Nations Programme on HIV/AIDS. It is an innovative joint venture of the United Nations family which brings together

the efforts and resources of eleven (11) United Nation System Organizations to unite the world against AIDS.

4. **World Health Organization (WHO):** It is a specialized agency of the United Nations that is concerned with international public health.
5. **The United Nations Children's Fund (UNICEF):** This agency was originally known as the United Nations International Children's Emergency Fund. It was created by the United Nations General Assembly to provide emergency food and healthcare to children and mothers in countries that had been devastated by the Second World War.
6. **Key populations:** This refers to men who have sex with their fellow men, injecting, drug users, sexually exploited youth, commercial sex workers and adolescents identified as gays, lesbians, bisexuals, transgender or intersex.
7. **HIV antigen:** It is a part of a virus that triggers an immune response. That is, if you have been exposed to an HIV, antigen will show up in your blood before HIV antibodies are made.
8. **HIV antibodies:** They are disease –fighting proteins that the body produces in response to HIV infections.
9. **HIV seropositive:** It means a person has detectable antibodies to HIV.
10. **HIV seronegative:** It means a person does not have detectable antibodies to HIV.
11. **Seroconversion to HIV:** This is where after a person contracts HIV; their immune system begins to develop HIV antibodies. It is the period during which these antibodies first become detectable.
12. **Serologic test:** They are blood tests that look for antibodies in your blood. They can involve a number of laboratory techniques.

1.9 Organization of the Study

This study has been organized into five chapters. The study starts with Chapter One which presents the introduction and provides a background to the study and then discusses key research issues such as statement of the problem, purpose of the study, research objectives, and research questions, significance of the study, the scope of the study and definition of terms. Chapter Two covers the literature review. The literature discusses theoretical and conceptual frameworks about Senior High School students' knowledge on HIV/AIDS.

In Chapter Three, the research methods were outlined including the research paradigm, research approach, research design, study setting, sampling techniques and procedures, population, instrumentation, ethical concerns and the method for data analysis were also discussed. Chapter Four was devoted to the presentation, analysis and discussion of the data. Chapter Five finally presents a summary of findings, conclusions, recommendations, suggested area for further studies and limitations to the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presents a review of literature related to the study. The review of literature focuses on the following themes:

1. The Concept of HIV/AIDS
2. Assessment of the knowledge level of HIV/AIDS of students.
3. Factors that inhibit the application of HIV/AIDS knowledge among adolescents
4. The influence of HIV/AIDS knowledge on adolescents' sexual behaviour.
5. Theoretical framework
6. Conceptual framework
7. Summary of literature review

2.1 The Concept of HIV/AIDS

The etiological agent of AIDS was identified as HIV in the early 1980s (Barré-Sinoussi et al., 1984). Since then, the disease has continued to spread throughout the world, causing the death of many people. Since the beginning of the epidemic, about 75 million people worldwide have been infected with the disease, about 32 million have died from it, while an estimated 37.9 people were living with the virus at the end of 2018 (UNAIDS, 2019). The majority of HIV infections are known to occur in Sub-Saharan Africa, where an estimated 22.9 million people are living with HIV. The Epidemic in Asia has remained relatively stable and is still largely concentrated in high-risk groups.

2.1.1 Types of HIV

Two types of HIV are known to cause AIDS. Human Immunodeficiency Virus (HIV-1) is responsible for the majority of HIV infections worldwide; while Human Immunodeficiency Virus Type 2 (HIV-2) is mainly found in the West African sub-region, but sparingly in parts of Europe (Ho et al., 1995; Temin & Bolognesi, 1993). Both HIV-1 and HIV-2 cause AIDS, the rate of disease progression of HIV-2 is much slower than that of HIV-1 (Grewe et al., 2016).

2.1.2 Stages of HIV in the human body

There are three stages of HIV. The first stage is the acute phase of HIV, during which a person is infected with the virus. At this stage, symptoms may or may not be present. Some people have flu-like symptoms two to four weeks after the initial infection, while others have no symptoms at all. At this stage of the infection, the viral load is high and the HIV-positive person is incredibly contagious whether or not they have symptoms.

The second stage of HIV is also known as clinical latency stage, asymptomatic infection stage and chronic infection stage. This stage occurs when the virus is barely detectable and reproduces only at very low levels. The reason the virus becomes latent is to avoid detection by the host immune system. The virus uses its latency as a survival mechanism of some sorts. Even if the virus remains weak during the latency phase, it can still be transmitted from person to person. The duration of the latency phase is variable. If the right medication is taken, this phase can last several years or decades, but without treatment, the virus will move much more quickly to the next phase. Once the latency period is over, the virus quickly becomes active again, infecting and killing many CD4 cells. Without treatment, the CD4 count can drop to

dangerously low levels. The normal CD4 count in a person not infected with HIV is between 500 and 1600 cells/mm³.

The third stage of HIV officially begins as soon as the CD4 count is below 200 cells/mm³. At this stage, the infection is clinically considered to be AIDS. People with AIDS who are not treated should not live longer than three years (Selik et al., 2014).

Most people living with HIV/AIDS do not die from the virus, but rather from opportunistic infections. Opportunistic infections are diseases that are not normally a problem because the immune system is able to defend the body against them. However, when the immune system is weakened, such as when CD4 counts are below 200 cells/mm³, the body cannot fight off these infections (Baggaley & Alary, 2006).

2.1.3 Types of opportunistic diseases

There are many different types of opportunistic diseases. Those most commonly associated with AIDS include candidiasis of the bronchi, trachea, oesophagus, or lungs, encephalopathy, rare cancers such as Kaposi's sarcoma, tuberculosis, and *Pneumocystis carinii* pneumonia (Cohen et al., 2014).

2.2 Modes of Transmission

Modes of transmission of the virus include unprotected sex with an infected person, transfusion of contaminated blood, sharing of contaminated needles and sharps, and from an infected mother to her child during pregnancy, delivery and breastfeeding. The clinical symptoms of HIV infection are mainly due to the presence of other pathogens that take advantage of the weakened immune system to cause the disease. These vary according to the stage of infection, ranging from no symptoms to an influenza-like illness including fever, headache, rash or sore throat a few weeks after initial infection with the virus. As the infection progresses, other signs and symptoms

develop, such as swollen lymph nodes, weight loss, fever, diarrhoea and cough. Without treatment, serious illnesses such as tuberculosis, cryptococcal meningitis and cancers such as lymphoma and Kaposi's sarcoma, among others, can also develop. These symptoms tend to recur as the infection progresses to AIDS and eventually cause death (Février, Dorgham &Rebollo, 2011).

2.3 Theoretical Framework

2.3.1 The Health Belief Model (HBM)

The Health Belief Model was developed to explain health, illness or sickness behaviours (Resenstock, 1974). This model argues that individuals who engage in healthy behaviour, such as safe sex, individuals perceive themselves as vulnerable or susceptible to a health threat. They also perceive the protective action available as outweighing the perceived cost of the action. However, even when individuals perceive that they could adopt a particular course of action, some trigger might be required to nudge them into action (Juczyński, 2016).

2.3.2 Social cognitive theory

Social Cognitive Theory also provides a means to understand knowledge and explain behavioural change (Iqbal et al., 2019). The knowledge acquired about a disease can lead to a behavioural change such as engage in preventive measures and (Bandura, 2004; DiClemente & Peterson, 1994). The severity of risks and capability to perform certain behaviour to avoid negative attitudes, or stigmatization may compel to engage in the preventive measures (Bandura, 2004; DiClemente & Peterson, 1994, Munro, Lewin, Swart & Volmink, 2007).

2.3.3 Information Motivation Behavioural skills (IMB) theory

IMB theory asserts that health-related information, motivation and behavioural skills are essential to perform health behaviours (Fisher & Fisher, 1992; Fisher, Misovich, & Bryan, 2002). The IBM theory also suggests that perception of HIV risks is not only inclined to the individual to acquire accurate HIV knowledge, but also socio-economic and autonomy related characteristics, affecting HIV prevention and high-risk behaviours to fight against HIV/AIDS.

2.3.4 AIDS Risk Reduction Model (ARRM)

The AIDS Risk Reduction Model (ARRM) provides a framework for explaining and predicting behaviour change (Catania, Kegeles & Coates, 1990). The model identifies three stages of behaviour change:

Stage 1: Recognition and labelling of one's behaviour as high risk: This is based on the knowledge of sexual activities associated with HIV transmission, belief that one is personally susceptible to contracting HIV and belief that HIV/AIDS is undesirable.

Stage 2: Making a commitment to reduce high-risk sexual contacts and to increase low risk activities. The main assumptions in this stage include cost and benefit analysis of the risk, importance of sexual practice as seen by the individual and its potential risk, and knowledge of the healthy utility as well as social factors (group norms and social support), are believed to influence an individual's cost and benefit and self-efficacy beliefs.

Stage 3: Taking action: This stage is broken down into three phases: a) Information seeking; b) Obtaining remedies and c) enacting solutions. Depending on the individual, phases may occur concurrently or phases may be skipped. The main areas that are of importance in this stage are the place of social networks and problem solving choices; prior experiences with problems and solutions; level of self-esteem;

resource requirements of acquiring help; ability to communicate verbally with sexual partner; and sexual partner's beliefs and behaviours.

Other internal and external factors that may motivate individual movement across stages. For instance, aversive states may facilitate or hinder the labelling of one's behaviour. An External motivator such as public education campaigns can change their sexual activities.

2.4 Empirical Review

2.4.1 Factors that inhibit the application of HIV/AIDS knowledge of adolescents

Young people's egocentricity, belief in their invincibility, the need to express themselves and to seek sensations, which peaks in late adolescence and early twenties, make young people inclined to engage in risky physical and social behaviours (Plattner, 2010). These behaviours are often part of the transition from childhood to adulthood, which is characterized by the learning of self-awareness, while there is generally a lack of information, willingness, and skills that would enable young people to avoid high-risk behaviours (Odu et al., 2008). Various factors make young people particularly vulnerable to HIV infection. Some of these are discussed below:

2.4.2 Limited recognition of personal risk of HIV infection

In studies conducted in nine African countries among sexually experienced adolescent girls and boys aged 15 to 19, between 40 and 87 per cent of respondents in seven countries believed that they were at little or no risk of contracting HIV/AIDS. In most cases, having only one partner is thought to be safe because of knowledge of other risk factors such as sexual history and partners with other sexual partners (Reif, Geonnotti & Whetten, 2006).

2.4.3 Biological factors

Women are more vulnerable to HIV/AIDS because of their biological condition as receptive partners. Women's biological characteristics, which consist of a larger soft body surface area exposed during sexual intercourse, allow for greater exposure of mucous membranes to seminal fluids. In addition, male seminal fluid contains a higher concentration of HIV than vaginal fluid and remains in the vaginal canal for a relatively longer period of time. Tuju (1996) pointed out that men transmit HIV more efficiently to women than women to men. Other biological factors include mother-to-child transmission of HIV during pregnancy, birth or after birth through breastfeeding.

During adolescence, sexuality becomes the biggest factor in the process of body and mind development. Human sexuality, and young people's sexuality in particular, involves inevitable and irresistible biological impulses that always demand to be satisfied. For young people, the onset of menstruation and sperm development often marks the initiation of sexual activity, in an attempt to satisfy newly discovered sexual urges and curiosity (Moletsane et al., 2007).

2.4.4 Sexual health behaviours among the youth

Early initiation of sexual activity puts the adolescent at health risk. Young people are less likely to require a commitment with or from a partner before having sex. As a result, young people report having frequent sexual intercourse with casual contact, meaning that they often have multiple relationships. They frequently change partners and are therefore at high risk of HIV infection (Kiragu et al., 1996).

2.4.5 Inadequate youth health services

Reproductive health services have been largely oriented towards the needs of pregnant married women. As a result, young people, especially sexually active youth, do not seek these services for reasons such as inconvenient hours and locations, lack of privacy and confidentiality, fear of social stigmatization, judgmental attitudes of service providers and unaffordable fees. Lack of access to health services becomes a serious threat to young people's reproductive health (Caldwell et al., 2004)

2.4.6 Inadequate sexual health information and education

Many young people cite lack of knowledge, inaccessibility and safety issues as the main reasons for not using contraceptives. One study showed that less than 50% of young people in Madagascar and Nigeria are aware of contraception (Caldwell et al. 2004). In Sub-Saharan Africa, as in other parts of the world, a culture of silence surrounds most reproductive health issues. Many adults are uncomfortable talking about sexuality with their children. Others lack specific knowledge about sexual health.

Many Africans feel unable to discuss sexuality despite perceived barriers related to gender and age differences. In many African countries, some people believe that men are biologically programmed to need sex with more than one woman. Polygamy is a central social institution and reinforces this belief. In addition, some men believe that this "biologically programmed need" makes high-risk sex unavoidable (Buckley & Ribstein, 2001). In some poor communities, high rates of HIV infection may be partly explained by early, consensual or forced sexual initiation (UNAIDS & WHO, 2002).

2.4.7 Cultural and social factors

Young people who are socially and economically disadvantaged are most at risk of HIV infection. Lack of education, untreated STIs and sexual exploitation exacerbate the vulnerabilities of young people living in poverty. Some African religions and traditions teach that AIDS is a shameful disease and a punishment for those who have had sex, and many adults are reluctant to admit to a disease that involves promiscuity (Buckley, 2001).

2.4.8 Alcohol and drug abuse

Around the world, young people have high rates of tobacco, alcohol and other hard drug abuse. This is often accompanied by early sexual experiences among young people, which increases the risk of HIV infection (WHO, 2000). A person under the influence of drugs and alcohol loses their inhibitions and are more likely to engage in risky sexual behaviour. These behaviours include casual sex with multiple partners, sex without a condom, or incorrect condom use. Injecting drug use is "the most effective means of acquiring infection" using contaminated injection equipment and is emerging as a major vector of HIV transmission in Kenya (Muturi, 2005). Drinking alcohol before or during sex can contribute to risky sexual behaviour (NACC, 2012). In a 36-month study of agricultural workers in rural Kenya, study participants who consumed alcohol during sex were 2.4 times more likely to be infected with HIV (Shaffer et al., 2010).

2.4.9 Economic factors

A study by Forsyth and Rau (1996) showed that the economic factor plays a major role in the spread and control of HIV/AIDS. For example, with the movement of large numbers of people involved in both the informal and formal sectors and including

mobile work in the transport, entertainment, fishing and tourism industries, child migrant workers are particularly vulnerable to casual sexual relations, many of whom may be away from their regular partners for long periods of time (Wairimu & Theuri, 2014).

The lack of employment for young men and women has led them to engage in sex work for money, putting them at risk of contracting HIV. In Kenya, homosexuality has developed and men in legal heterosexual unions tend to seek sex with male prostitutes, putting them at risk of contracting the disease and passing it on to their legal partners (Buckley & Ribstein, 2001).

2.4.10 Influence of knowledge of HIV/AIDS on adolescent sexual behaviour

The important role of knowledge in addressing the HIV/AIDS pandemic has been recognized. Increased knowledge about HIV/AIDS is considered an important step in behaviour change, while misconceptions can prevent individuals from making informed choices and taking appropriate action (Population Council, 2006; Awusabo-Asare et al., 1999). Knowledge is an important foundation for positive sexual health, since effective protection against HIV/AIDS and other STIs requires an understanding of disease transmission, prevention and prognosis (Boyce et al., 2003, p. 55). Lal et al. (2000, p. 1) have also commented that knowledge about the spread of HIV and safe sexual practices has a critical impact on the prevention of HIV/AIDS”.

A Joint United Nations Programme on AIDS (UNAIDS, 2005) report revealed that countries that had significantly reduced rates of new HIV/AIDS infections were those that typically invested heavily in AIDS education and awareness initiatives. Commenting on the links between behavioural change and the decline in HIV/AIDS prevalence in Zimbabwe, the report further said that such changes in

behaviour...reflect a combination of knowledge of the basic modes of HIV transmission linked to a growing personal experience of the realities of AIDS morbidity and mortality (UNAIDS, 2005, p.5).

Other studies have shown that young people who have been exposed to appropriate sex education tend to delay sex or use condoms (UNESCO, 2005a; University of Arizona, 2004; UNAIDS, 2003; UNFPA, 2003a). Contrary to the fear that sex education leads to greater sexual activity or experimentation, a review of sixty-eight reports on sexual health education found that HIV and/or sexual health education either delayed the onset of sexual activity, reduced the number of sexual partners, or reduced unplanned pregnancy and STD rates (UNAIDS, 1997). An analysis of 250 North American programmes found that among sexually active young people, AIDS education programmes were effective in decreasing the number of sexual partners and increasing condom use (Kirby, 2002, cited in UNAIDS, 2004).

In Nigeria, a study among unmarried male youths in the University of Ibadan (Adewole & Lawoyin, 2004) found that students who had obtained knowledge on HIV/AIDS early at the secondary school level were less likely to have multiple sexual partners, compared with those who acquired the knowledge later. In a study in Uganda, students who reported that they had taken precautions about AIDS were less likely to have ever had sexual intercourse (Twa-Twa, 1997), while in a Kenyan study, lack of factual knowledge on HIV/AIDS was among the factors found to be responsible for sexual intercourse among adolescent girls (Lema, 1990).

Using data from anonymous self-administered survey of military personnel in northern Thailand, London, VanLandingham and Grandjean (1997) found that men who had sex with other men were less knowledgeable about HIV/AIDS. In Ghana,

knowledge about HIV/AIDS was found to be lower among students who currently had a sexual partner (Apoya, Ayugane & Balhara, 2004). Using Demographic and Health Survey data from 23 lowand-middle-income countries, Snelling et al. (2007) also found an association between increased knowledge of HIV/AIDS and condom use. In a study among men in Bangladesh, respondents who had heard of AIDS were less likely to have had sex with prostitutes than those who had not (Caldwell & Indrani, 1999).

Anarfi and Appiah (2004) have emphasized that since there is yet not cure for HIV/AIDS, education then becomes the only social vaccination against the disease. They defined education to include everything done to increase and sustain people's awareness and knowledge of HV/AIDS towards staying away from risky sexual behaviours. Their analysis went on to discuss the role of both formal and informal education as tools in fighting the disease. Commenting on the kind of information that adolescents need, McIntyre (2004, p.12) has said: All adolescents need information on how HIV spreads, how it can be prevented and how you cannot tell when someone is infected... After a review of numerous data on knowledge, behaviour, life skills, access to services and HIV prevalence among young people from several sources, Monasch and Mahly (2006, p.25) concluded that an important, but not sufficient, foundation for any prevention effort aimed at young people is to provide them with basic information on how to protect themselves and their partners from acquiring the virus.

According to Auerbach, Hayes and Kandathil, (2006, p.46) behaviour change interventions to reduce the risk of HIV/AIDS are based on social science theories that emphasize the importance of knowing about the risks of HIV transmission, instilling

motivation to protect oneself and others, changing expectation of outcomes, developing skills for engaging in protective behaviours and the ability to maintain protective behaviours, and to providing social support for protective actions. In a study on the mass media and HIV/AIDS in Ghana, Benefo (2004) reported that HIV/AIDS information had caused behaviour change among 57% of women and 58% of men. In Uganda, more than 44% of respondents agreed that people had changed their behaviour due to their knowledge of AIDS (Ntozi & Ahimbisibwe, 1999).

Other studies similarly report of positive influence of knowledge of HIV/AIDS on sexual behaviour, including delaying sexual intercourse, using condoms, stopping sex with prostitutes, etc. (Anarfi & Antwi, 1995; Araoye & Adegoke, 1996; Bankole, 2004; Camlin & Chimbwete, 2003; Fayorsey, 2002; Magnani et al., 2002; Ocran & Harlow, 2004; Uwalaka & Matsuo, 2002). On the contrary, other studies indicate low levels of knowledge of HIV/AIDS among young people coupled with misconceptions about the disease (UNGASS, 2001). Generally, knowledge of HIV/AIDS is higher among young men than women (Aluede et al., 2005; UNAIDS, 2003). It is also higher among people in urban areas than rural areas (UNAIDS, 2005; UNAIDS, 2003). Others have also warned that knowledge about HIV/AIDS does not automatically lead to responsible sexual behaviour (Adedimeji, 2005; Anarfi, 1997), and that knowledge must be complemented by attitudes and values that will lead to appropriate decisions (Coombe & Kelly, 2001). For example, an analysis of the communication strategies used in HIV/AIDS/STI campaigns in Jamaica during the period 1999-2003 revealed that in spite of the increased level of awareness about HIV/AIDS and its transmission, little desirable behaviour changes had occurred (White, 2005).

In Ghana, it has been observed that the expected behavioural changes have not occurred in spite of the several programmes that have been undertaken to create awareness of the disease (Anarfi, 2005; Kates & Leggoe, 2005). Several other studies have observed high-risk sexual behaviours among young people in spite of their good knowledge and awareness of HIV/AIDS (Adedimeji, 2005; Afenyadu & Goparaju, 2003; Anderson & Beutel, 2004; Braithwaite & Thomas, 2001; Ikamba & Ouedraogo, 2003; Meekers, Klein & Foyet, 2001; Odirile, 2000). A study among college students in the United States of America also found a mismatch between knowledge about sexual issues and sexual behaviour (Castora, 2005). Low levels of condom use in spite of awareness of the risks have also been reported (Karim et al., 2003; Winfield & Whaley, 2002).

2.4.11 The socioeconomic impact of HIV/AIDS

The epidemic continues to have far-reaching social, economic, health and demographic effects. In addition to the direct harm inflicted on people infected with HIV and the households in which they live, AIDS has had indirect yet real and substantial effects on communities and society as a whole. According to the National AIDS Control Council (NACC, 2012), it is widely recognized that HIV/AIDS has a major economic and social impact on individuals, families, communities and society as a whole. In Kenya, AIDS threatens personal and national well-being by negatively affecting the health, life span and productive capacity of the individual and critically affecting the accumulation of human capital and its transfer between generations. Research conducted in low-income and severely affected countries clearly indicates that HIV/AIDS is the most serious obstacle to economic growth and development in those countries, and Ghana is no exception.

The impact of HIV/AIDS on economic growth and development, coupled with the direct impact of increased mortality on the lives of the poor, makes HIV/AIDS a particularly corrosive threat to poverty reduction efforts. This impact has posed major challenges to society as it has affected the productivity of the agricultural sector on which the majority of Kenyans depend for their livelihoods. The sector has been undermined by negative effects on labour supply, agricultural production, agricultural extension services, loss of knowledge and skills and, at the personal level, trauma related to death. Consequences include reduced household and community food security. Commercial agriculture, a major source of foreign employment and income, is affected by rising health costs and prolonged mortality of key workers (Xiaoyan & Sato, 2011).

Education services are suffering from the loss of teachers due to AIDS and the dropping out of school of children due to the death of parents and lower household incomes. Health services are losing qualified staff and have to cope with the increasing burden of HIV-related infections. The direct costs and social problems associated with caring for a growing number of orphans, combined with existing high levels of poverty, place a heavy burden on family and societal structures. Awareness of HIV, understanding of its modes of transmission and perception of individual risk are essential for reducing sexual risk, although they are often insufficient on their own to prevent transmission. Young people are less likely than adults to demonstrate an accurate and comprehensive understanding of how to prevent HIV transmission (Tegang et al., 2010).

Knowledge of HIV/AIDS is relatively high in Kenya, with 75 per cent of women and 81 per cent of men aged 15-49 years knowing that using a condom can prevent HIV

transmission. HIV testing and counselling is provided through both voluntary and provider-initiated sites, with 73 per cent of health facilities currently offering provider initiated HIV testing and counselling. Mobile outreach sites target most-at-risk populations (MARPs) and other vulnerable populations, according to the Kenya Demographic and Health Survey (KDHS 2008-2009). Widespread availability of counselling and testing services through multiple outlets led to a significant increase in the number of people tested for HIV between 2003 and 2009. In 2003, 14.3% of adult men and 13.1% of adult women were tested for HIV.

In 2009, the proportion of adult men and adult women tested increased to 40.4% and 56.5% respectively. Stigmatization of people living with HIV/AIDS (PLWHIV) has decreased significantly in recent years, although it remains a challenge. The 2003 and 2008-2009 KDHS surveys asked whether respondents would be willing to care for an HIV-positive family member at home, whether they would buy fresh vegetables from an HIV-positive vendor, whether they would feel that an HIV-positive teacher who is not ill should be allowed to continue teaching, and whether they would not want to keep it a secret that a family member has been infected with the AIDS virus. The proportion of men and women who answered “yes” to all four questions increased from 39.5 and 26.5 per cent in 2003 to 47.5 and 32.6 per cent, respectively. Over the same period, there has been a decline in the proportion of respondents willing to disclose the HIV status of a family member, and the number of Kenyans with a general acceptance attitude towards HIV-positive people remains low. KDHS also found that stigma towards people living with HIV decreases as education levels and wealth quintiles increase (Musyoki et al., 2015).

2.5 History of HIV/AIDS in Ghana

Ghana ranks first among Sub-Saharan African countries in reducing HIV prevalence (Gisslen et al., 2017). Various techniques including enzyme linked immune sorbent assay, western blot, particle agglutination test, polymerase chain reaction (PCR) and rapid HIV test (U.S. Department of Health and Human Services, 2017) are used in testing for the presence of the HIV/AIDS virus. A national HIV testing algorithm consisting of sequentially testing plasma, serum or whole blood using the First Response HIV1-2-0 rapid test kit and, if a reaction occurs, re-testing using the Ora Quick HIV type 1/2 rapid antibody test (Tenkorang et al., 2019) is also used in Ghana.

2.5.1 HIV/AIDS epidemic in Ghana

The epidemic in Ghana is characterized by the co-circulation of both types of HIV. The first case of HIV infection in Ghana was reported in 1986 (Burgoyne & Tan, 2008). The case has been on the ascendance for over three decades now. It is estimated that 217,428 people, representing 1.42% of the adult population, were infected with the virus in 2011 (Nachega et al., 2012). The HIV prevalence is estimated to be around 1.57% in 2009 but decline by 0.08 in 2010. HIV-1 accounted for 98% of the infection, while HIV-2 accounted for 0.7%. HIV-1/HIV-2 co-infection accounted for 1.3% (De Cock, Mbori-Ngacha & Marum, 2012). Currently, the HIV prevalence in Ghana is 1.6% with regional variation (Ali et al., 2019).

2.5.2 Diagnosis of HIV/AIDS

Reliable and accurate laboratory diagnosis of HIV is necessary for early initiation of treatment and case management. HIV testing is also essential for screening donated blood, epidemiological surveillance of HIV or trends and diagnosis of infection in

individuals (UNAIDS, 1997). Centre for Disease Control and Prevention (CDC, 2010), has shown that viral transmission can peak immediately after infection and that people who learn they are infected significantly reduce behaviours that can transmit HIV. Testing can help more people know as soon as possible after exposure whether they are infected, to help reduce the spread of HIV (UNAIDS, 2017).

However, during the "window period" of 3 to 12 weeks, the period between infection and detection by a test, infection can occur. It is possible to test negative for HIV antibodies during this period, even though infection may have occurred with the incubating virus. It is recommended that the test be repeated after three months to check a person's status. HIV testing is voluntary, so appropriate pre- and post-test counselling should be provided to all persons undergoing the test. HIV test results are confidential. Follow-up care, treatment and preventive measures are provided appropriately. Three main types of tests are available to detect antibodies. These are the Enzyme-linked Immunosorbent Assay (EIA), Immunoblot tests and rapid tests. EIA is both time consuming and labour intensive and cannot be performed routinely in resource-limited settings.

Rapid HIV tests are single-use enzyme immunoassays that contain all necessary reagents and provide results in less than 30 minutes. They usually contain antigens made from whole viruses and therefore can detect antibodies to both types of HIV. These tests are useful for screening individuals and making results available quickly to improve treatment decisions. Rapid tests can be used to determine the HIV status of pregnant women in labour in order to decide whether to initiate antiretroviral therapy to prevent mother-to child transmission. They are also used to test a reference patient or sample after an occupational exposure, to enable the health care worker or

researcher to begin post exposure prophylaxis quickly (Simonds, 1993). In emergency departments in high prevalence settings, rapid tests can make screening more feasible and generate results quickly enough to influence clinical management (Lyss et al., 2007).

Private people are trained to perform the test at approved private facilities. This has increased the rate of testing (Baiden et al., 2007). The turnaround time for obtaining results has significantly reduced, so that more people receive their results on the same day of testing. The reliability of results is, however, influenced by the accuracy of the test, the testing algorithm used, and the provision of the counselling and testing service as a whole (World Health Organization, 2004). The World Health Organization (WHO) therefore recommends enforcing standards to ensure the quality of test results and appropriate documentation at all testing sites by implementing a quality assurance programme.

A variety of other tests are essential to confirm positive antibody test results (Western Blot, Polymerase Chain Reaction [PCR]), to complement antibody tests (p24 antigen, PCR) or to provide additional information to the clinician treating HIV-positive patients (qualitative and quantitative PCR and genotyping). The western blot is the standard confirmatory test that should only be used to resolve indeterminate results or to diagnose HIV-2 infection (WHO, 2015). The western blot (WB) generally detects antibodies against p24 (gag gene, core protein) and gp 120, gp 41, gp 160 (env gene, envelope protein). False positive and indeterminate results are avoided because these tests do not contain contaminating cellular components (Joshi & Chipkar, 1997).

In infancy and up to 18 months of age, placental transfer of HIV antibodies from the mother prevents diagnostic testing. Although p24 can be used, its sensitivity in

children over one month of age is 89% suboptimal, even after immune complex dissociation procedures in which the p24 antibody is dissociated from the antigen (WHO, 2010).

Virological tests provide a definitive diagnosis of HIV in most infants at 1 month of age and almost all at 6 months of age. For example, through the use of HIV DNA PCR, 38% of infected children tested positive within 48 hours of birth, and 93% within 14 days (UNAIDS, 2016). However, this test is not routinely available. Instead, the HIV RNA viral load test is more conveniently used for clinical diagnosis in infants (Schneider & Fassin, 2002). It is as sensitive as HIV DNA PCR and is commonly performed by PCR or DNA in Hong Kong. However, in people with a low viral load, false positives are possible (Rich et al., 1999).

Infants who test negative repeatedly should always be re-tested until HIV infection is ruled out by two or more negative virological tests after 1 month of age, one of which should be done after 4 months of age (Oleske & Scott, 2001).

Serial testing refers to the use of two screening tests used in sequence to test for HIV antibodies. If the initial test is negative, no further testing is required. If the initial test is positive, it must be followed by another test. The first test must be the most sensitive and the second must be highly specific, and be based on a different antigen source than the first test. Samples that produce discordant results in the two tests shall be subjected to further testing, whereas parallel testing involves the use of two screening tests performed simultaneously. Samples reacting to both tests are considered positive. However, those with discordant results must be subjected to further testing.

Parallel testing is performed to minimize the risk of false negative results and to avoid technical errors. It is often used when a highly sensitive test is not available for initial screening, and when the agreement of two tests needs to be assessed. HIV infection can be detected by testing for the presence of HIV-specific antibodies (Sepkowitz, 2001). HIV-specific antibodies are present in almost 100% of HIV-infected individuals. Their presence is equivalent to the diagnosis of chronic active HIV infection.

A direct diagnosis of HIV infection is also possible by detection of the infectious virus, using cell culture, or by identification of the viral antigen (p24 antigen) or viral nucleic acid (by NAT, nucleic acid test). In addition to these qualitative tests, tests for the quantitative detection of the virus have become very important: the concentration of viral RNA in the plasma, called "viral load", has become an indispensable tool for guiding antiretroviral therapy (Kramer & Krickeberg, 2010).

Objectives of HIV/AIDS Test

There are a number of rapid HIV tests, also known as rapid/simple test (R/S) devices. These tests are based on one of the four principles of immunodiagnosics: particle agglutination, immunodot (gauge), immune-filtration, and immunological chromatography (Centre for Disease Control and Prevention, 2003). In most cases, either whole blood or capillary blood (obtained from a fingertip) can be used. This avoids the need to centrifuge a venous blood sample obtained by venipuncture, and test results are normally available within 15 to 30 minutes. Immunoglobulin can also be eluted from blood spots deposited on filter paper and dried (WHO, 2015). These dried blood spots can be used for anonymous unlinked testing and in developing countries where cold storage and transport facilities are inadequate. Once completely

dried, the blood of HIV infected patients does not pose a significant risk of infection and dried blood is stable over long periods of time. Urine or oral fluid (that is, "saliva") can also be used for some tests (WHO, 2017).

Cases of false positives using rapid tests have also been reported, particularly in countries with a high prevalence of HIV infection. From 2003 to 2004, rapid tests were included in an algorithm to initially screen HIV-negative adult male volunteers in two randomized trials of male circumcision for HIV prevention in a rural population in the Rakai District of Central Uganda. The 94.1% of specimens with low positive results were negative or indeterminate after confirmation by enzyme immunoassay or western blotting (Sharp & Hahn, 2011). In a study of more than 6,000 volunteers in voluntary counselling and testing in East Africa, 24 results were recorded as "low positive" in rapid tests. However, only two of these results were confirmed by a conventional EIA (Gallo, 2006).

The use of rapid tests has been authorized in some countries, such as the United States. They can be useful if the result is needed quickly, for example in emergency rooms, before emergency operations, after needle-stick injuries, and to minimize the rate of "unclaimed" test results (if the result is only available after a few days, some of the people tested will not return to receive it). Rapid tests, which are easy to perform and require little equipment, may be useful in developing countries (WHO, 2018), as a result, these tests still represent a technical challenge for many laboratories. NAT can complement antibody detection tests for the diagnosis of HIV infection in special situations, such as in cases of suspected acute infection, where antibodies are still undetectable in new-borns of HIV-infected mothers in whom maternal antibodies are still present. The quantitative detection of HIV RNA in plasma ("viral load" test) is

used as a prognostic marker, to monitor antiretroviral therapy and to estimate infectivity (UNAIDS, 2016).

Today, "highly sensitive" tests that detect as few as 50 copies of RNA per cubic millimetre of plasma are commercially available. Viral load testing is therefore an indispensable clinical tool. Unfortunately, due to the need for trained personnel and expensive specialized instruments, as well as the lack of organization to follow up HIV-positive people on ART, many developing countries cannot routinely use currently available NAT tests (Rubin et al., 2013).

The risk of HIV transmission through blood transfusion has decreased dramatically after the introduction of highly sensitive fourth generation screening tests. However, to further reduce the latency period, several countries now prescribe HIV NAT in addition to antibody testing, for screening HIV negative patients in high-risk groups and in certain situations, such as suspicion of primary infection and screening of babies born to HIV-infected mothers. In fact, it has been found that the risk of acquiring HIV through transfusion is reduced by approximately 50% with NAT (Harden & Fauci, 2012).

Theoretically, HIV RNA is present in the blood throughout the course of the disease, from sero-conversion to AIDS. However, its level is often lower, dropping to less than 400 copies per ml, especially during the asymptomatic period. One study showed that in a panel of 35 samples from HIV-positive individuals with low viral load (< 400 RNA copies/ml), NAT failed to detect 4 of these samples (Rubin et al., 2013).

2.6 Knowledge Level of SHS Students about HIV/AIDS Contraction

HIV/AIDS has spread rapidly to many countries over the years since 1981 and is becoming a global health challenge (Nubed & Akoachere, 2016). Sub-Saharan Africa (SSA) is the most affected region in the world, with about two-thirds of the world's infected people living here (Bahrin Azman et al., 2018). According to UNAIDS (2018a), the majority (approximately 80%) of the 1.8 million adolescents living with HIV live in SSA (Nubed & Akoachere, 2018, UNAIDS 2018). Even in the general population, the majority (71%) of people living with HIV (PLHIV) as well as new HIV infections (70%) and AIDS-related deaths (74%) worldwide are registered in SSA (Kharsany & Karim, 2016). The HIV/AIDS is among the leading causes of death in Africa, accounting for one in five deaths in SSA (Adeleke et al., 2015).

Ghana recorded 250,232 cases of PLWHIV between 2006 and 2014 (Ghana AIDS Commission, 2014a). Of these, 92% were adults (15-49 years for women and 15-59 years for men) and 8% were children (6-59 months) (Ghana AIDS Commission, 2014b). Adult HIV incidence is estimated at 0.07 per cent, with 11,356 new infections and 9,248 AIDS related deaths recorded. HIV prevalence in Ghana is described as widespread over the years, with a prevalence rate of over 1% in the general population (Ghana AIDS Commission, 2017). Young adults, particularly those aged 15-24 years, are the group most vulnerable to HIV infection (Agyemang, Buor & Tagoe-Darko, 2012). This may be due to their engagement in risky living practices due to lack of adequate information (Huda & Amanullah, 2013). Similarly, Ghanaians have their first sexual intercourse when they are in high school or of age (Nubed & Akoachere, 2016). A study conducted in the Ashanti region of Ghana found that people have premarital sex when they are young (Neupane & Doku, 2012). In addition, young people present specific challenges that predispose them to HIV, some

of which include lack of correct health information, lack of access to adequate reproductive health services, economic exploitation, changing lifestyles, global conflicts, (Masood & Alsonini, 2017) exchange of sex to meet their needs, and substance use (Chen, 2011).

Knowledge, Attitudes and Practices (KAP) about HIV/AIDS are the cornerstones of the fight against HIV. Adequate knowledge about HIV/AIDS is an effective way to promote positive attitudes and safe practices (CDC, 2012). Attitudes towards HIV/AIDS should in turn determine people's sexual behaviour (CDC, 2013). Many prevention programmes have focused on improving knowledge about transmission, with the goal of overcoming misconceptions that may prevent behavioural change toward safe practices and also reduce stigmatization of PLHIV, (CDC, 2013).

Several studies have been carried out in Africa and beyond to study KAP levels among students. These studies found that students' knowledge about HIV was low to medium, with misconceptions about high-risk practices among participants and negative attitudes towards PLWHIV. Misconceptions were also found in most KAP studies conducted among young people in different regions of Africa (Nigeria, Botswana, Gabon and other African countries) and beyond (Nubed & Akoachere, 2016).

A study conducted in Nigeria to determine knowledge of HIV infection among secondary school students in Port Harcourt revealed that only 7.1 per cent of participants listed the four modes of transmission: sexual intercourse, blood transfusion, mother-to-child (vertical) transmission and intravenous drug use. The four above-mentioned modes of transmission were identified by only 31%, 14.4%, 9.1% and 8%, respectively. Only 0.7% identified all preventive measures. Another

survey conducted in western Nigeria to assess the level of awareness, knowledge and attitude towards HIV/AIDS among secondary school students in the local administrative area of Atisbo, Nigeria, showed that the participants had a relatively good knowledge of HIV/AIDS, reasonable knowledge of safe sex practices and a positive attitude towards sex, HIV/AIDS and people living with HIV. But another study in Gabon, which assessed the knowledge and attitudes of secondary school students about HIV, showed that students were not sufficiently informed about HIV/AIDS transmission and prevention. Half of the respondents were aware of HIV transmission through sexual intercourse (55.7%), from mother to child (48.3%) and through needle or syringe sharing (51.8%), and 25% used condoms, while 15% were aware of unsafe HIV transmission practices (Netshivhuyu, 2017).

Studies in India (Kumar, Pore & Patil, 2012) have also revealed misconceptions. In a similar study in Afghanistan, while 21% of respondents thought, for example, that HIV could be transmitted through toilet seats, 21% also said that people could become infected with the virus through mosquito bites (Kumar et al. 2012). A negative attitude towards PLWHAs was also reported in another study (Kumar et al., 2012).

A good knowledge of HIV does not always translate into good behaviour and/or safe practices. In Botswana, for example, a previous study showed that half of the students could be perceived as being at risk of HIV, while the same participants believed that every sexually active student should be informed of his or her HIV status through regular testing (Stephens et al., 2012).

From the above discussions, it is obvious that the prevalence of HIV/AIDS is high in Sub-Saharan Africa because of the poor knowledge about the disease,

This is in consonance with USAID (2011), for example, who lamented that comprehensive knowledge of HIV/AIDS remains low in Sub-Saharan Africa and is an obstacle to reducing HIV/AIDS incidence rates. For example, approximately 2 million PLWHA in South Africa do not know they are infected, believe they are not in danger of becoming infected, and are unaware they can transmit the virus to others.

2.6.1 Knowledge on HIV/AIDS prevention

Knowledge of HIV/AIDS is one of the most important tools for combating the epidemic, especially among young people (Kiragu, 2001). According to Kiragu (2001), many young people may not have the level of knowledge to understand why people engage in unprotected sex, and the serious consequences of the global spread of HIV. In West Africa, the number of women with comprehensive knowledge of HIV/AIDS is 10 to 20 per cent lower than that of men (Kiragu, 2001). This is probably due to the fact that the majority of these women are very poor and are also illiterate and cannot read and understand any information related to the disease (Kiragu, 2001). Koenig, Larson and Larson (2001) concluded that until people are informed about HIV/AIDS and its devastating consequences, all efforts to curb its rapid spread will be in vain.

Bosu (2010) opined that comprehensive knowledge about HIV/AIDS is the first step towards the adoption of behaviours that reduce the risk of HIV/AIDS transmission among young people in Ghana because the knowledge and behaviour of most-at-risk and vulnerable populations such as young people play an important role in the spread of the HIV epidemic in Ghana.

UNESCO (2011) has also affirmed that globally, while knowledge about HIV/AIDS and safer sexual behaviour among young people has improved, only 34% of young people have comprehensive and accurate knowledge about HIV/AIDS. This highlights the need for further research to understand why new infections continue to occur despite this knowledge. Although condoms are the best weapons against HIV transmission, studies continue to show limited use of this barrier method in sexual intercourse in Sub-Saharan Africa (Wodi, 2005).

Condom use among young people plays an important role in reducing the transmission of HIV and other sexually transmitted infections, as well as unwanted pregnancies. Although condom use can reduce the risk of sexually transmitted diseases, most sexually active young people in Sub-Saharan Africa do not consistently use condoms because they are too expensive for young people and they do not know where to get them, among other reasons (Petersen & Swartz, 2002). Accordingly, the Kenya government has been very active in the promotion of condom use. Since 2001, when it was identified that an estimated 12.8 per cent of the population was infected with HIV, the government has not relented in its efforts to reduce the infection. In 2001 imported about 300 million condoms to distribute to citizens. Since then, condom distribution has been radically scaled up (National AIDS Control Council, 2008).

Studies have shown that the disease is due to high involvement in unsafe sexual behaviours, such as sex with multiple partners, sex with strangers, negative views on condom use, and a low rate of behaviour change even after being informed about HIV/AIDS (Agyei-Mensah, 2001).

2.6.2 Knowledge on treatment of HIV/AIDS

Although there is no cure or vaccine for HIV infection, significant progress has been made in recent years in the treatment of HIV, which is known to slow or even stop the progression of the disease that would otherwise lead to AIDS. This means that HIV is no longer a fatal disease and is now considered a manageable chronic condition. Multiple treatment options are available for people living with HIV. Treatments vary from person to person depending on disease progression, drug resistance and other health conditions.

For most people, treatment is as simple as taking one pills a day, with few or no side effects. In Australia, it is recommended that HIV treatment be started as soon as possible after diagnosis. Antiretroviral treatment in HIV-positive individuals with C cells/ μL is a highly effective way to prevent their partner's HIV infection (a strategy known as Treatment as Prevention, or TASP) (Anglemyer et al., 2013). TASP is associated with a 10 to 20 fold reduction in the risk of transmission (Chou & Selph, 2012). Pre-exposure prophylaxis (PEP) with a daily dose of tenofovir, with or without emtricitabine, is effective in high-risk individuals, including men who have sex with men, HIV-positive couples and young heterosexuals in Africa (Owens et al., 2019). It may also be effective in intravenous drug users, with one study finding a risk reduction of 0.7 to 0.4 per 100 person-years (Choopanya et al., 2013). In 2019, the United States Preventive Services Task Force recommended Pre-Exposure Prophylaxis (PrEP) in high-risk individuals (Kurth et al., 2011).

Universal precautions in health care are considered effective in reducing the risk of HIV (CDC, 1987). Intravenous drug use is an important risk factor, and harm

reduction strategies such as needle exchange programmes and opioid substitution therapy appear to be effective in reducing this risk (Kurth et al., 2011).

A series of antiretroviral drugs administered within 48 to 72 hours of exposure to HIV positive blood or genital secretions is called post-exposure prophylaxis (PEP) (Staff, 2011). The use of zidovudine, a single agent, reduces the risk of HIV infection following a needle stick injury by five times (Staff, 2011). Beginning in 2013, the recommended prevention regimen in the United States includes three drugs - tenofovir, emtricitabine and raltegravir - as this could further reduce the risk (Kharsany & Karim, 2016).

PEP treatment is recommended after a sexual assault when the perpetrator is known to be HIV-positive, but is controversial when his or her HIV status is unknown (Poeta et al., 2011). The duration of treatment is generally four weeks (Young et al., 2007) and is frequently associated with adverse events - when zidovudine is used, approximately 70% of cases result in adverse events such as nausea (24%), fatigue (22%), emotional distress (13%) and headaches (9%) (Kripke, 2007). Currently, highly active antiretroviral therapies (HAART) are combinations (or "cocktails") of three or more drugs from at least two types, or "classes", of antiretroviral agents (WHO, 2010). Initially, treatment usually consists of one non-nucleoside reverse transcriptase inhibitor (NNRTI) plus two nucleoside analogue reverse transcriptase inhibitors (NRTIs) (WHO, 2016). NRTIs generally include zidovudine (AZT) or tenofovir (TDF) and lamivudine (3TC) or emtricitabine (FTC) (WHO, 2012). Combinations of agents including protease inhibitors (PIs) are used if the above regimen loses effectiveness (WHO, 2010).

2.7 The Issue of HIV/AIDS in the Lower Manya Krobo Municipality

The LMKM has always had a high infection rate compared to other districts in the country. For example, out of the 254 districts in Ghana, LMKM led the country in 2018 with an infection rate of 5.6% compared to a national average of 2.66% (Ghana AIDS Commission, 2019). The Municipal Health Directorate's statistics on the infection rate from 2012 to 2019, collected from the municipality's health facilities, are quite scary. Statistics indicating the rate of Infections of HIV in the LMKM for persons, age between 10 years to 29 years is shown in Figure 2.1 and Table 2.1.

Figure 2.1 and Table 2.1 both show that for 2012 to 2019 though both males and females have experienced swings in HIV/AIDS infections female persons in the Municipality have been more affected over the eight year period of observation. In 2013, 713 male persons were infected. Beyond that the number of infected male persons have been on the decline. Also, though both sexes have experienced a decline in the number of persons infected, it is observed the infection rate has been higher for females.

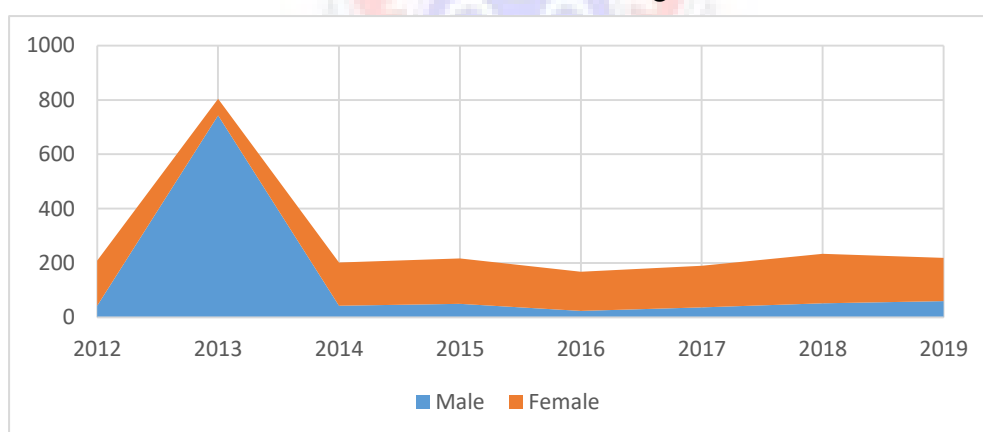


Figure 2.1: Statistics indicating the rate of infections of HIV in the LMKM

Source: LMKM Health Directorate (2020)

Statistics indicating the rate of Infections of HIV in the LMKM

Table 2.1: Statistics indicating the rate of infections of HIV in the LMKM

YEAR	Male	Female
2012	43	166
2013	743	61
2014	43	159
2015	50	167
2016	24	144
2017	37	153
2018	52	182
2019	60	159

Source: LMKM Health Directorate (2020)

2.8 The Conceptual Framework

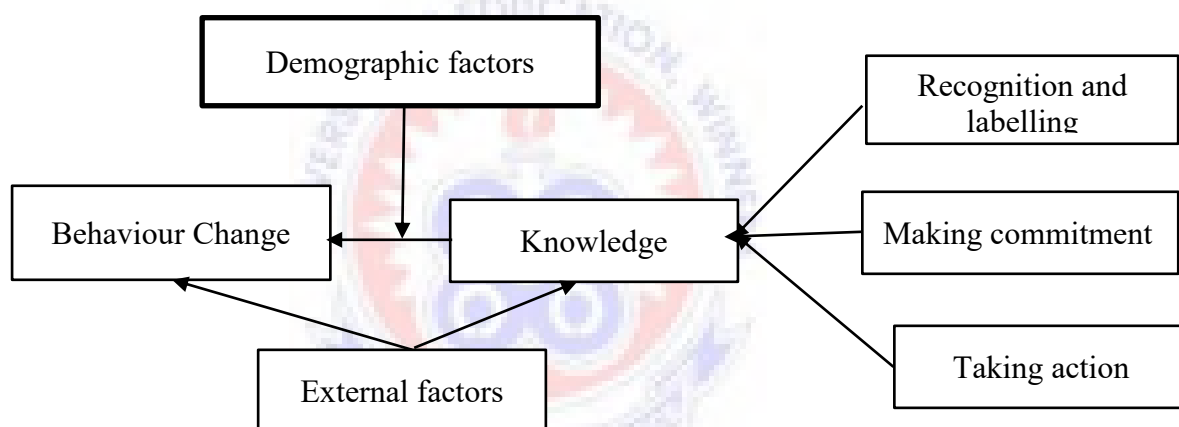


Figure 2.2: Behavioural change model

Researcher's conceptual framework

The framework above posits that behaviour is a function of knowledge and some external factors. While the external factors can directly lead to behaviour, they also affect the knowledge on HIV/AIDS. More so, the link between knowledge and behaviour change is mediated by demography of the persons involved. Using the Catania et al. (1990) theory of AIDS Risk Reduction Model, three factors affect the knowledge that an individual has about HIV/AIDS. The amount of knowledge an

individual has about HIV/AIDS and the extent to which such factors affect knowledge on HIV/AIDS and behaviour change.

2.9 Chapter Summary

This chapter examined the issue of HIV/AIDS epidemic globally, in Africa and in Ghana. It emerged from the review that about 75 million people have been infested with the HIV/AIDS; an estimated number of 37.9 million are still living with HIV/AIDS whilst about 32 million people have died of the pandemic. The literature review established the fact that HIV prevalence rates are very high in Sub-Saharan Africa in general and in Ghana in particular. It pointed out that poverty and some socio-cultural practices are major contributory factors that bring about high rate of HIV infections in Sub-Saharan Africa. Factors such as socio-cultural and traditional practices also account for the spread of the disease. In the Eastern Region for instance, it was clearly established from the literature that the high HIV/AIDS prevalence in the Lower Manya Krobo Municipality is very high compared with other districts in the country.

However, the research review identified that knowledge about HIV/AIDS is still low in the Sub-Saharan Africa. Stigma and discrimination are still major challenges against PLWHA and key populations in the sub-region, including Ghana. Non-encouragement of educators of the disease was also identified as another gap in the review because several examples in the review have shown that low HIV/AIDS prevalence rates were recorded in countries where classroom education was practiced. HIV/AIDS preventive measures have also not taken into consideration the issue of SHS students' knowledge level into mainstream HIV/AIDS programmes (DiMatteo, 2004). The conceptual framework of the study based on AIDS Risk Reduction Model,

three factors affect the knowledge that an individual has about HIV/AIDS. The review also identified the fact that the best prevention intervention approaches were the combination of independent and dependent approaches to education and knowledge. Considering these gaps, it is necessary to conduct further research to assess these issues.



CHAPTER THREE

METHODOLOGY

3.0 Overview

This chapter discusses the various methods and procedures that were employed in conducting the study. The following strands were discussed: paradigm or philosophy, research design, setting of the study, population, sample and sampling techniques, and data collection procedure, instruments for data collection, ethical considerations and data analysis.

3.1 Research Paradigm

Henn, Weinstein and Foard (2016) indicated that a paradigm is a set of philosophical assumptions about how the issue of concern to the researcher should be studied (p.10). According to Cohen, Manion and Morrison (2000), research is about understanding the world, and your understanding is informed by how you see the world, what you view understanding to be and what you see as the purpose of understanding.

The study adopted a positivist philosophy or paradigm. Positivism utilizes quantitative and experimental methods to test hypothetical-deductive generalizations. Thus, it seeks casual explanations and fundamental laws and generally reduces the whole to simplest possible elements to enable analysis (Easterby-Smith & Malina, 1999). However, positivism approach is complicated in the sense that, the approach requires independence of the observer from the subject being observed, and the need to formulate hypothesis for the succeeding verifications (Amaratunga, Baldry, Sarshar & Newton, 2002).

3.2 Research Approach

The approach of this study was quantitative which involved quantifying and analysing data using specific statistical techniques to answer specific questions (Apuke, 2017). This approach was used to identify the distinguishing features, elemental and empirical boundaries (Nau, 1995) of the problem. This approach is preferable for investigating the behavioural components of research and its design has been concerned with defining an epistemological methodology for determining the truth-value of proposition and allows flexibility in data treatment, particularly, comparative and statistical analyses and repeatability of data collection to verify authenticity/reliability (Amaratunga, Baldry, Sarshar & Newton, 2002).

It is noteworthy that different research strategies have their strength and weaknesses (McGrath, 1982) and quantitative research approach, similar to other research methods, has the strength of allowing comparison and replication, observes and studies subject independently. With quantitative research method, reliability and validity can be determined more objectively than qualitative, strong in estimating descriptive aspect of research. It emphasizes the need for the formulation of hypothesis for succeeding verification, as well as seek for casual explanations and fundamental laws and generally reduces the whole to the simplest possible elements in order to facilitate analysis (Easterby-Smith & Malina, 1999).

In addition, quantitative research approach, under a limited resource environment, allows large scale-data collection and analysis at a reasonable cost and effort, as well as providing statistical proof (Amaratunga et al., 2002). Nevertheless, the failure of quantitative research approach to ascertain deeper underlying meanings and explanations to most research, as well as its inability to measure variables at a specific moment in time, contributes to the disadvantages or weakness of quantitative approach as a research method.

3.3 Research Design

The research design for this study was the descriptive design. To be specific, the cross-sectional design was employed in carrying out this study. Descriptive survey design involves the collection of data in order to test hypothesis or answer questions concerning the current status of the subject under investigation (Gay, 1992). A survey can examine current attitudes, opinions or practices. Attitudes, beliefs and opinions are ways individuals think about issues, whereas practices are their actual behaviours (Creswell, 2012). This design was chosen because it offered the opportunity to assess the knowledge and describe the attitude towards the prevention methods of HIV and AIDS of SHS students in the Lower Manya Krobo Municipality of the Eastern Region of Ghana.

Amedahe (2002) maintains that in descriptive research, accurate description of the activities, objects, processes and persons is the focus. This design has the advantage of measuring current attitude or practices. It is also capable of receiving data in a short period of time (Creswell, 2012). However, the design has its own weaknesses as there is no manipulation of variable as in experimental designs (Shuttleworth, 2008). Cross sectional survey design fits well with this study because it was suitable for

obtaining data from a cross section of SHS students from Lower Manya Krobo Municipality.

3.4 Setting of the Study

Lower Manya Krobo is one of the thirty-three (33) districts in the Eastern Region, located in the eastern part of the region along the south-western corner of the Volta River. It lies between latitudes 6.05°S and 6.30°N and longitudes 0.08°E and 0.20°W . It is bordered to the North-West by Upper Manya Krobo, to the North-East by Asuogyaman, to the South-East by North Tongu, to the South by Yilo Krobo and Shai Osudoku Districts respectively.

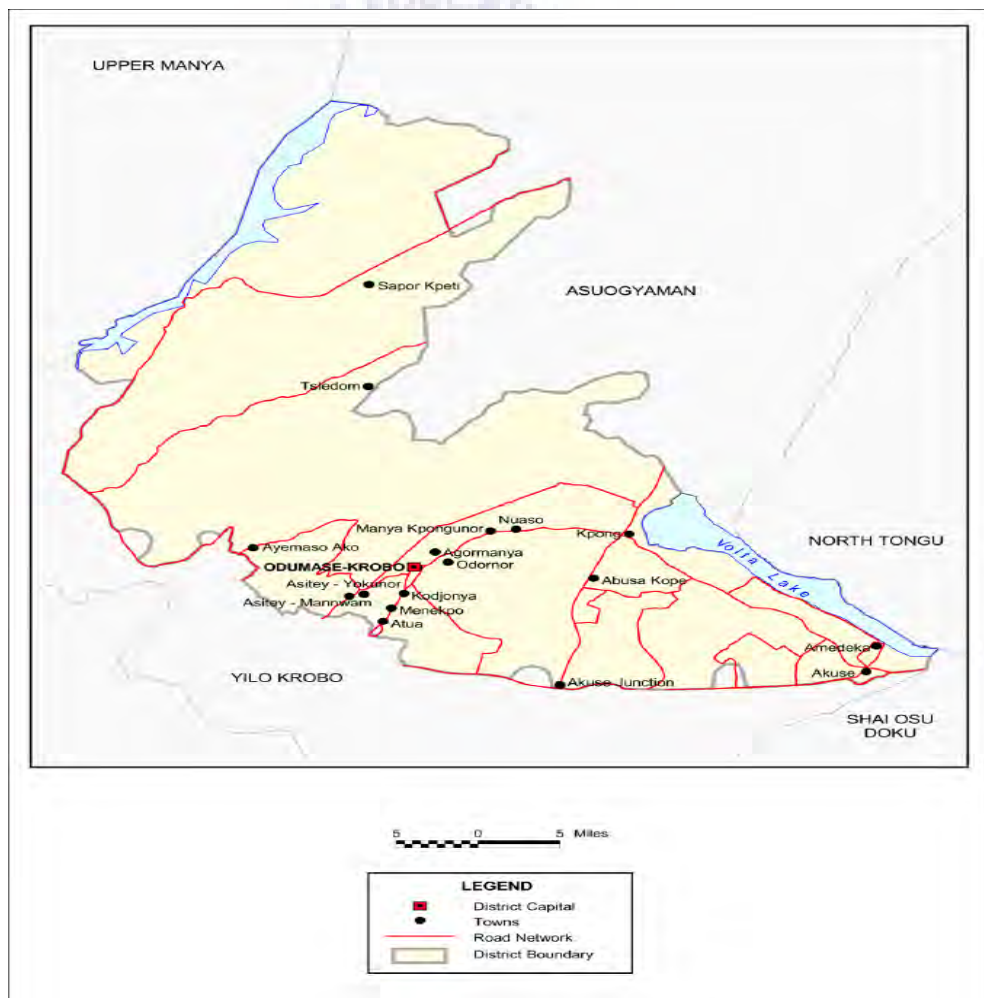


Figure 3.1: Setting of the study

Adapted from Ghana Statistical Service district analytical report (2012).

The Municipality covers an area of 1,476 square kilometres, constituting about 8.1% of the total land area within the region (18,310 km²). The major towns in the district include Odumase township (which incorporates Atua, Agormanya and Nuaso), Akuse and Kpong (Ghana Statistical Service, 2014). The total population for the municipality is 89,246 which accounted for 3.4% of the total population for the region. The male and female population is 41,470 and 47,776 respectively (Ghana Statistical Service, 2014).

The economically active population (ages 15-64) constitutes 58.5% of the total population, resulting in an age dependency ratio of 1:07 (that is, one active person to 0.7 inactive people). This means that if the active population is effectively utilized for development, the resultant effect on poverty will be positive and could reduce vulnerability to HIV due to low income especially for young girls.

There are major and minor occupations in the Manya Krobo District. Farming, which employs more than half of the work force, is the major occupation. Other major occupations include fishing and teaching. Labourers rank highest at 66.0% in the minor occupation, distilling/tapping and others are included as economic activities in the area (Ghana Statistical Service, 2014).

3.5 Study Population

Target population is a large population from which a sample population is selected. Mugenda and Mugenda (2003) define population as an entire group of individuals' events or objects having common observable characteristics. To Kothari (2004), target population is the number of respondents in the total environment who are of interest to the researcher. The target population for this study consisted of all the public Senior High Schools in Lower Manya Krobo Municipality in the Eastern

Region of Ghana. According to the statistics from Lower Manya Krobo Municipal Education Office, there are four public SHSs in the municipality. The target population for this study was 2559 form three students in the four public SHSs in the municipality.

3.6 Sample, Sampling Techniques and Procedures

Social scientists are never able to study the entire population; they depend on selected constituents to infer meanings into the larger population. These constituents are called samples (Babbie, 2010). Flick (2014) asserts that out of a research population, a sample is selected. Sample refers to any group or a sub-group of the total population. A sample is defined by Flick (2014) as representative respondents selected from a research population. The number depended on the accuracy needed, population size, population heterogeneity and resources available. According to Kothari (2004), a sample size of between 10% and 30% is a good representation of the target population for populations below 10,000. The sample size for this study was 300 students which represent 11.72% of the target population of form three students in the four public SHSs in the LMKM. The sample size was determined using the Cochran's sample size formula.

$$n = \frac{z^2 pq}{e^2}$$

where:

- i. Z^2 is the abscissa of the normal curve that cuts off an area at the tails (1 - equals the desired confidence level at 95%). The value for Z found in statistical tables the area under the normal curve is 1.96
- ii. p (0.5) is the estimated proportion of an characteristic that is present in the population,

- iii. q is 1-0.5 is the estimated proportion of an characteristic that is not present in the population,
- iv. e is the desired level of precision, in other words, it is the error level of that is like to be made in estimating the sample which is assumed to be 0.0032

Substituting the values into the formula produced a sample size of 300.125. For the purpose of simplicity, the calculated sample size which was assumed to be representative of the population was 300 SHSs students in LMKM.

Sampling is the procedure a researcher uses to select people, places, or things to study (Flick, 2014). The quality of a sample determines the quality of the research findings in large measure. It involved setting aside a unique subset of the population that has the characteristics of interest for the study. There are two ways of selecting a sample for the study. Both procedures were employed in this study. First, the researcher employed the convenience sampling to select schools involved in the study. The condition for selecting the schools regions included the fact that they were not only easily accessible to the researcher but also they offered the researcher ease of gathering data.

The simple probability sampling procedure was used to draw the sample of 300 respondents for the study. The sample was drawn in such a way that it was representative of the entire population. To draw a representative sample, the probability sampling procedure was adopted. The simple random sampling was used to select the respondents for the study. Using the lottery approach, the researcher designed ballot papers of same quantity with the inscription “yes” or “no” and they were neatly folded and placed in a box. The pieces of paper were mixed and put into a box and they were drawn out of the box in a random manner by students. With this

method, each member of the population was strategically selected to participate in the study. Persons who chose “yes” were given the questionnaire while those who chose “no” were not included in the sample.

3.7 Data Collection Instrument

The instrument used for data collection was the questionnaire.

3.7.1 Questionnaire

A 37-item questionnaire which contains both closed-ended and open-ended questions was used as data collection instrument. Babikir et al. (2012) explains questionnaire as a set of written questions answered by a large number of people that is used to provide information. A questionnaire contains a series of questions, statements or items that are presented and the respondent is asked to answer, respond to or comment on them in a way she or he thinks best. There is a clear structure, sequence and focus, but the format is closed-ended, enabling the respondent to respond in her or his own terms (Cohen et al. 2000). The first section of the questionnaire sought for demographic characteristics which included age, sex, religion and religious denomination.

According to Sarantakos (2013), close-ended items require less effort to respond to, are easy to score and promote objectivity on the part of the respondent. However, they are limited to only the areas indicated in the questionnaires, and do not give room for self-expression. Notwithstanding the lapse of close-ended items in restricting the responses of respondents, its adoption ensures effective editing and analysis of data. The close-ended items are also aimed at ensuring uniformity in the responses and thereby preventing subjectivity of any kind.

Questionnaire was used for this study because it is relatively quick and easy to create. With questionnaire, interpretation and analysis of data is easy as data entry and tabulation for nearly all surveys can be easily done with many computer software packages (Neuman, 2000). Again, questionnaires are familiar to many people, nearly every educated one has had some experience completing one and they do not make people apprehensive (Tuckman, 1992). Above all, questionnaire is easy to standardize therefore reducing the amount of bias in the results as there is uniform question presentation. Kerlinger (2000) observes that questionnaire is widely used for data collection in educational research because it is developed to answer research questions. It is very effective for securing factual information about practices and conditions of which the respondents are presumed to be knowledgeable of. It is also used for inquiring into the opinions and attitudes of subjects (Neuman, 2000).

One advantage of the questionnaire is a high response rate particularly when the questionnaire design is good and appropriate follow-up mechanisms are used. Secondly, if properly understood and implemented, the technique simplifies the data analysis stage. Finally, the questionnaire has a higher degree of transparency or accountability than interview technique. However, questionnaire has some weaknesses. It is expensive both financially and in time, especially if the respondents are scattered over a large area. Respondents may also not provide appropriate answers to the questions since the method normally uses structured questions. Thus, questionnaire may yield superfluous information than an in-depth interview. Another disadvantage is that, respondents may have the tendency to look ahead, skip around or compare answers with those of their colleagues and friends when completing the questionnaire (Gay, Mills & Airasian, 2009). The table below represents the

population and the proportionate questionnaire allocated to the SHS Three students of the LMKM.

Table 3.1: Allocation of questionnaires

Names of SHSs inLMKM	Sex		Total	Questionnaire Allocated		
	Boys	Girls		Boys	Girls	Total
Manya Krobo SHS	369	324	693	44	38	82
Akro SHTS	298	245	543	35	29	64
Akuse Methodist SHS	345	322	667	41	37	78
Krobo Girls' Presby SHS	-	656	656	-	76	76
Total	1,012	1,547	2,559	120	180	300

Source: Field Data, 2020

The sample size constituted 11.72% of the target population. The proportion of the sample in the target population was used to determine proportion of each school's [population that must be included in the sample as shown in Table 2.2. The formula was used to estimate the sample proportions included the study.

$$Q = \frac{SP}{TP} \times N \text{ (Researcher's construct)}$$

Where:

N= Desired sample size, SP = Specific population per school, TP = Total population for all schools, Q= Questionnaires allocated per school

3.7.2 Validity and reliability of instrument

Validity, according to Ferretti et al. (2019), refers to the degree to which an instrument accurately measures what it is intended to measure. Validity denotes the extent to which the research instrument serves the use for which it is intended (Seidu, 2006). Yin (2003, p.34) discusses the test involved in validating any data in any social science research. He groups them under construct validity, internal validity, external validity and reliability. Content, construct and face validity were established.

Face validity of the questionnaire were carried out by giving it to colleague M. Phil Social Studies students for peer review. Their comments and suggestions were considered for review of the questions. The content validity of the questionnaire was ensured by the research supervisor who scrutinized the items for their suitability before pre-test. Construct validity was ensured by critically developing the items or questions within established theoretical framework by employing accepted definitions and constructions of concepts and terms; operationalizing the research and its measures.

Internal validity check was conducted by ensuring agreements between different parts of the questions, data, and matching patterns of results. Ensuring that findings and interpretations derived from the data are transparent and that causal explanations are supported by the evidence (alone), and that trivial explanations and inferences have been weighed and found to be less acceptable than the explanation of inference made, again based on evidence. The current research ensured concurrent validity through the use of multiple sources and kinds of evidence to address research questions and to yield convergent validity.

Golafshani (2003) defines reliability as the degree to which outcomes are reliable in a period of time and if the outcomes in a research can be replicated using the same method, and then the research instrument is reliable. To ensure reliability of the questionnaire, a pilot test was carried out on 40 SHS 3 students from Yilo Krobo Senior High School which has almost the same characteristics as those of Manya Krobo, but was not included in the main data. Reliability analysis was done using Cronbach's alpha reliability model. A reliability coefficient (r) of equal to or more than 0.70 threshold is acceptable as a measure of reliability as noted by Tavakol,

Mohagheghi and Dennick (2008) who have stated that the acceptable values of alpha, ranges from 0.70 to 0.95. These ranges of reliability coefficient values are deemed as an acceptable measure of reliability because 0.70 is the threshold value of acceptability (Dörnyei, 2010). The reliability co-efficient for this study is 0.772.

In any systematic enquiry into the human condition, it is important to establish the truth value of the study. The study must be judged against certain criteria so as to ensure that the findings are a true reflection of the participants or reality (De Vos, Graafmans, Keesman, Westert & van der Voort, 2007). Through criteria such as validity and reliability, the accurateness and completeness of a study can be ascertained. Guba (1981) proposed trustworthiness as a surrogate measure for validity and reliability in naturalistic inquiries.

3.8 Data Analysis and Presentation

Yin (2003) states that before interpretation take place, data should be analysed statistically and presented. Responses from respondents on the questionnaire were tallied in order to get the number of respondents who answered each set of items. The quantitative data were fed into the Statistical Product for Service Solutions (SPSS) version 25.0 software and they were analysed. Frequency count, percentage distributions, means and standard deviations of responses were generated according to each research question raised, and these were presented in tables.

3.9 Ethical Considerations

In conducting a study, Creswell (2008) advises researchers to seek and obtain permission from the authorities in charge of the site of the study because it involves a prolonged and extensive data collection. For ethical reasons, a letter of introduction from the Head of Department of Social Studies Education of the University of Education, Winneba, was obtained to introduce the researcher during data collection. The administration of the questionnaire was done after consent was sought from the heads of the various SHSs in the Lower Manya Krobo Municipality.

After permission was granted, the study participants were informed of the impending administration of the questionnaire and assured them of confidentiality of whatever information they provide. Shamoo and Resnik (2009) define ethics in research as the discipline that studies standards of conduct, such as philosophy, theology, law, psychology or sociology. In other words, it is a method, procedure or perspective for deciding how to act and for analysing complex problems and issues. Protection of participants and their responses were ensured by obtaining informed consent, protecting privacy and ensuring confidentiality. In doing this, the description of the study, the purpose and the possible benefits were communicated to participants. Participants were permitted to freely or voluntarily withdraw or leave at any time if they deemed it fit. As a way of preventing plagiarism, all ideas, writings, drawings and other documents or intellectual property of other authors were referenced indicating the authors, title of publications, year and publishers.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Introduction

In the preceding chapter, the methodology used for the study was presented in line with the study. This chapter presents the results of the analysis of the questionnaire. The chapter focuses on presenting results that reflect HIV/AIDS knowledge of Senior High School students in the LMKM of the Eastern Region of Ghana. The number of the questionnaire administered was 300 for a population of 2559 form three students in the four public SHSs in the municipality. Out of the population, 1012 were males and 1547 were females. At the end of the data collection, 298 questionnaires were obtained for the study. That is, 2 of the questionnaires got missing from the girls in the process of the data collection. The quantitative data were analysed using descriptive statistics (means, standard deviations, frequencies, and percentages). The first part of this chapter describes the demographic characteristics of the respondents (students). In the second part, the research findings are presented based on the research questions formulated for the study.

4.1 Bio-Data of the Respondents

This section on the questionnaire (Biographical) discusses the background information of the respondents (students). These include the respondents' age ranges, gender, religion and denomination. The demographic data was analysed using graphs (bar chart and line graph).

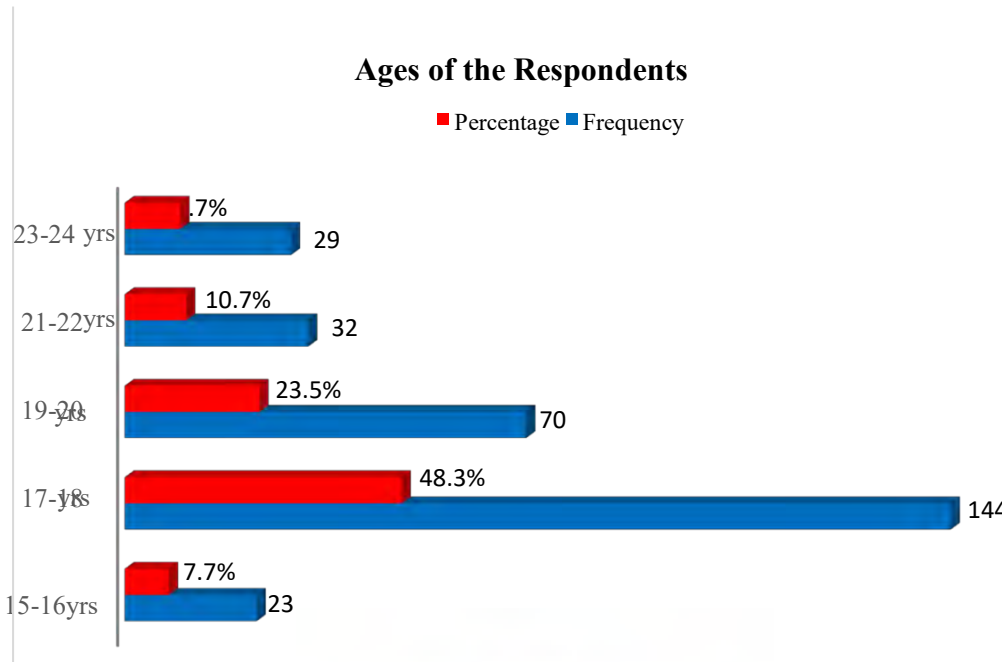


Figure 4.1: Ages of the students

Source: Field Data (2020)

As shown in the Figure 2 above, the results show that most third year students in SHSs in the LMKM of the Eastern Region of Ghana ages fall within 17 and 18(n=144 , 48.3%). Those from 19 to 20 followed (n=70, 23.5%), those 23-24 (n=29, 9.7%). Those from 15 to 16 years were the least (n=23, 7.7%).

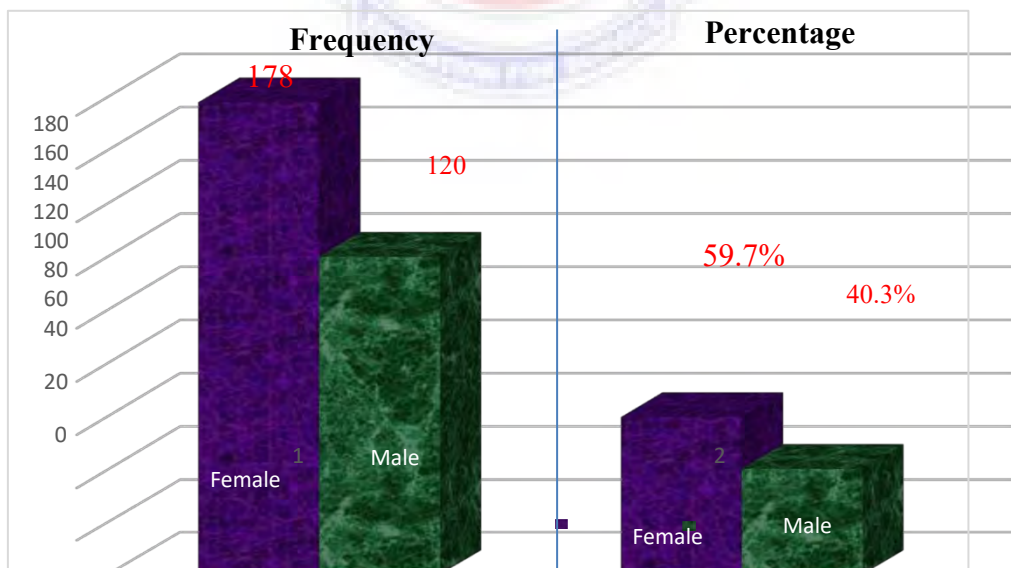


Figure 4.2: Gender of the students

Source: Field Data (2020)

Figure 2 shows the gender of the students. As shown in the Figure above, the results show that majority of the SHS three students in the LMKM of Ghana were females (n=178, 59.7%) The males on the other hand were the least represented (n=120, 40.3%). This is because one out of the four schools, that is, Krobo Girls' Presbyterian SHS is an all-female school.

4.2 Analysis and Discussion of Data

Descriptive statistics are brief descriptive coefficients that summarize a given data set, which can be either a representation of the entire or a sample of a population. Descriptive statistics are broken down into measures of central tendency and measures of variability (spread). Descriptive Statistics are used to present quantitative descriptions in a manageable form. Descriptive statistics help us to simplify large amounts of data in a sensible way. In the work of Gujarati (2013), it is asserted that descriptive statistics utilize statistical, numerical and graphical methods to look for patterns in a data set. It usually provides the information in a data set by revealing the average indicators of the variables used in the study and conveniently present that information. This section therefore offers some descriptive statistics of the study variables which helps to understand the distribution of the variables in line with Adam's (2015), assertion that the central purpose of descriptive statistics is to summarize or reduce data. Thus, descriptive statistics describes what the data shows based on the sample.

The research questions (Q1, Q2 & Q3) were analysed using descriptive statistics (means, standard deviation, frequencies and percentages). Using the standard deviations, a relatively standard deviations, the respondents' responses were believed to be homogeneous (similar responses). On the other hand, a relatively large (within 1), the respondents' responses were believed to be heterogeneous (dissimilar

responses). A mean of 2.50 and above indicates that SHS students' in the LMKM of Ghana have higher knowledge about HIV/AIDS whilst a mean of 2.49 and below indicates low knowledge of students about HIV/AIDS.

Research Question One: What is the knowledge level of SHS students in the LMKM on HIV/AIDS?

The main goal of this research question was to assess the knowledge level of SHS students in LMKM of the Eastern Region on HIV/AIDS. The knowledge level of respondents was assessed through their application of HIV/AIDS information. According to Trevethan (2017), there is no clear distinction between knowledge and awareness; any attempt to distinguish between the two concepts will be elusive. In reference to Trevethan (2017), awareness is equated to knowledge. Therefore, the extent of awareness determines the knowledge of the individual. The accrued data was analysed using descriptive statistics.

Table 4.1: The level of awareness of SHS students about HIV/AIDS

Statement	YES N (%)	NO N (%)
Are you aware of HIV/AIDS?	294(98.7%)	4(1.3%)
Have ever received information on HIV/AIDS?	291(97.7%)	7(2.3%)
Source: Field Data (2020)	n=298	

The results displayed in Table 4.1 indicate the level of awareness of students about HIV/AIDS. The results show that generally the majority of the students were aware of HIV/AIDS (n=294, 98.7%). Only few confirmed not to be aware of HIV/AIDS (n=4, 1.3%). In addition, they respondents intimated that their level of awareness was the result of information received on HIV/AIDS. Of the number that indicated that they were aware of HIV/AIDS, n=291, representing 97.7% of the sample said their level of awareness was facilitated by the information they received through various sources.

Seven of the students representing only 2.3% asserted that they have not received information on HIV/AIDS.

Table 4.2: Information on HIV/AIDS and how much information about HIV/AIDS do students get from selected sources

Items	A lot	Little	No
Television			
Frequency	106	180	12
Percentage	35.6	60.4	4.0
Radio			
Frequency	59	208	31
Percentage	19.8	69.8	10.4
Newspapers			
Frequency	36	189	73
Percentage	12.1	62.9	24.5
Pamphlet/posters			
Frequency	71	179	48
Percentage	23.8	60.1	16.1
Healthcare workers			
Frequency	122	151	25
Percentage	40.9	50.6	8.4
Campaigns			
Frequency	53	169	76
Percentage	17.8	56.7	25.5
Religious leaders			
Frequency	39	196	62
Percentage	31.1	65.8	20.8
Internet			
Frequency	52	200	45
Percentage	17.4	67.1	15.1
Sexual partners			
Frequency	41	147	109
Percentage	13.8	49	36.6

In class/at school			
Frequency	87	170	28
Percentage	33.6	57.1	9.4
School health education			
Frequency	113	158	27
Percentage	37.9	53	9.1
Peers			
Frequency	44	205	49
Percentage	14.8	68.8	16.4
Family members			
Frequency	46	167	85
Percentage	15.4	56	28.5

Table 4.2 shows results of the information on HIV/AIDS and how much information about HIV/AIDS students gained from selected sources. A comparative analysis of Table 4.11 shows that the print media and the audio (radio) and audio visual media (television) are not very effective means of relating HIV/AIDS information to students in the senior high schools. The analysis shows that the majority of the students (n=122, 40.9%) relied a lot healthcare workers for information on HIV/AIDS. The television is the second source of information to the students. The study showed that (106, 35.6%) of the students received information on HIV/AIDS from it. Again, the study showed that the least relied source of information is sexual partners. The results showed that many students (n=109, 36.6%) have never received information from this source.

Table 4.3: Transmission sources of HIV AIDS

	Minimum	Maximum	Mean	Std. Deviation
Sexual intercourse	1	5	4.73	.667
Contact with blood	1	5	4.68	.616
Casual contact with infected person	1	5	2.54	1.436
Not using condoms	1	5	4.52	.788
Contact with toothbrush	1	5	4.39	.934
During pregnancy	1	5	3.57	1.118
During birth	1	5	3.80	1.042
True breast milk	1	5	3.90	1.064
Blood transfusion	1	5	4.65	.695
Sharing Needles (drug use), razor blades]	1	5	4.73	.589
Unclean Medical Equipment	1	5	4.49	.775
[Kissing]	1	5	3.82	1.088
Mosquito/Insect bites	1	5	2.19	1.391

Source: Field Data, 2020 Max=5.00, Min=1.00 Std. D*=Standard Deviation

As presented in Table 4.3, the results on the transmissions sources of HIV/AIDS are depicted. From the analysis, the maximum score on the questionnaire was 5.00 (max. =5.00) and the minimum score was 1.00 (min. =1.00). This implies that mean values must fall within the minimum and the maximum range (1.00-5.00). Inferring from the results show that the variables follow a normal distribution. This is based on the reason that the values were within the acceptable limit indicating that the data was normal. The results in Table 4.3 give evidence to believe that generally, SHS students are aware of some of the Transmissions Sources of HIV/AIDS.

For example, most of the SHS students pointed out that sexual intercourse is one of the transmissions Sources of HIV AIDS (M=4.73 SD=0.667). Contact with blood of infected person was also found as one of the transmissions sources (M=4.68 SD=0.616).

On the issues of casual contact with infected person (i.e. sharing food, cup, glass, handshake, hugging, clothes, most of the students were aware that cannot be one of the transmissions sources of HIV AIDS (M=2.54 SD=1.436). The practice of having sex without using condoms was found to be one of the transmissions sources of HIV AIDS among SHS students in the LMKM of the Eastern Region of Ghana (M=4.52, SD=0.788).

In a related result, it was revealed by most SHS students in the LMKM of the Eastern Region of Ghana that contact with infected person's toothbrush/shaving material serves as one of the transmissions sources of HIV AIDS (M=4.39, SD=.934). The results further show that during pregnancy a partner can contract HIV/AIDS. Most of the students agreed to the fact during pregnancy, HIV/AIDS can be transmitted (M=3.57, SD=1.118).

During child birth, most of the students agreed to the fact that during child birth (labour), HIV AIDS can be transmitted (M=3.80, SD=1.042). Again, most of the students of the LMKM agreed that HIV can be transmitted through breast milk (M=3.90, SD=1.064). In furtherance to the above, blood transfusion was agreed by most Senior High School students in the LMKM of Ghana that it can transmit HIV AIDS (M=4.65, SD=0.695). Sharing syringes (during drug use), razor blades were found as one of the modes of transmission of HIV AIDS (M=4.73, SD=0.589).

Unclean Medical Equipment was not left out as one of the sources which SHS students in the LMKM of the Eastern Region of Ghana cited that it can transmit HIV AIDS (M=4.49,SD=.775). Finally, deep kissing was found to be one key means by which HIV AIDS can be transmitted (M=3.82, SD=1.088).

As already stated in the literature, Knowledge, Attitudes and Practices (KAP) about HIV/AIDS are the cornerstones of the fight against HIV. Adequate knowledge about HIV/AIDS is an effective way to promote positive attitudes and safe practices (CDC, 2012). Many prevention programmes have focused on improving knowledge about transmission, (CDC, 2013).

The findings of the study show that students have on HIV/ AIDS is in contrast with some studies conducted around the world. That is, whilst the level of knowledge on HIV/AIDS of SHS students in the LMKM of the Eastern Region of Ghana is high, the same cannot be said of other countries. For example, a study conducted in Nigeria to determine knowledge of HIV infection among secondary school students in Port Harcourt revealed that only 7.1 per cent of the participants had adequate knowledge of HIV/AIDS. Apart from this, some other studies have been carried out in Africa and beyond to study KAP levels among students. These studies found that students' knowledge about HIV was medium to low, with misconceptions about high-risk practices among participants and negative attitudes towards PLW HIV. Misconceptions were also found in most KAP studies conducted among young people in different regions of Africa (Botswana, Gabon and other African countries) and beyond (Nubed & Akoachere, 2016). A study in Gabon which assessed the knowledge and attitudes of secondary school students about HIV showed that students were not sufficiently informed about HIV/AIDS transmission and prevention. Half of the respondents were aware of HIV transmission through sexual intercourse (55.7%), from mother to child (48.3%) and through needle or syringe sharing (51.8%), and 25% used condoms, while 15% were aware of unsafe HIV transmission practices (Netshivhuyu, 2017).

Studies in India (Kumar, Pore & Patil, 2012) have also revealed misconceptions. In a similar study in Afghanistan, while 21% of respondents thought, for example, that HIV could be transmitted through toilet seats, 21% also said that people could become infected with the virus through mosquito bites (Kumar et al., 2012). Netshivhuyu (2017) again reports that a survey carried out in western Nigeria to assess the level of awareness, knowledge and attitude towards HIV/AIDS among secondary school students in the local administrative area of Atisbo, Nigeria, found out that secondary school students have reasonable knowledge of safe sex practices and a positive attitude towards sex.

What has been the greatest challenge in reducing the prevalence of HIV/AIDS?

The aim of HIV prevention programme is to change the behaviour of those at risk of infection. This study considered students at the SHS level as very highly exposed to HIV/AIDS infection because of the high drive for sex among them. Secondly, examined the effort to change the behaviour Poor surveillance systems and the lack of access to quality voluntary counselling and testing services, means prevalence figures are likely to be a gross under estimate. While it was acknowledged that the HIV/AIDS prevalence in the general population was, but the tendency for it increase among students in SHSs is high. The study has shown that to secure a change in behaviour among the SHS students would require an enormous effort from government, reduce stigmatization, improve condom use, improve counselling, and improve surveillance. These are five priority measures required to be instituted to improve he level of HIV/AIDS knowledge among SHS students as well as a behavioural change. Figure 4.xx shows the pie chart distribution of the five measures. Condoms are considered best weapons to fight HIV/AIDS transmission therefore their availability of condom to sexual active youth will go a long way change behaviour.

Many of these students cannot gather the courage to walk into a pharmacy to want to buy condom. People might feel embarrassed about buying condoms from pharmacies. Studies overwhelmingly demonstrate that condoms are highly effective in preventing HIV transmission but availability and regular use is found a big issue.

A number of HIV/AIDS prevention and treatment programmes including interventions for vulnerable groups, condom promotion, STI testing, behaviour change communication, volunteer counselling and testing services and providing antiretroviral drugs are not enough to address the pertinent cultural issues in grass-root level and management issues in service provider level. These should be clearly identified otherwise the problems will continue unless the root causes of these issues and challenges are identified.

Monitoring and evaluation Programmes must be monitored and evaluated in order to determine intervention implementation integrity, effectiveness, and cost-effectiveness.

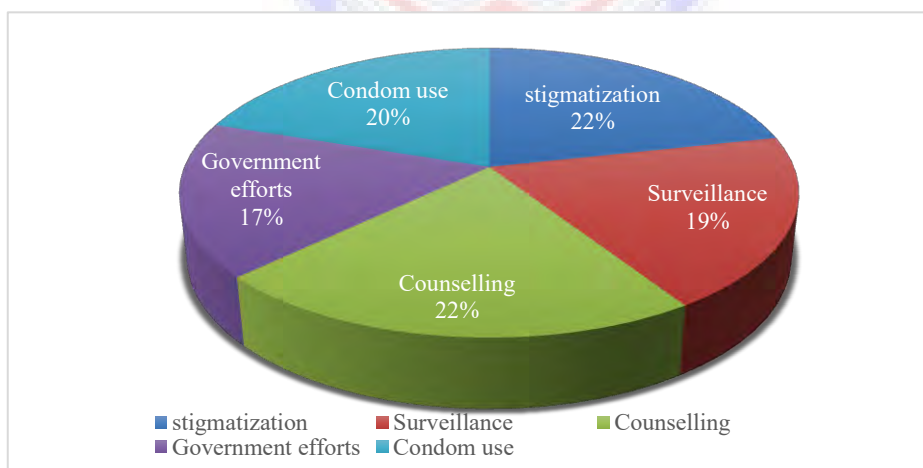


Figure 4.3: Reducing the rate of HIV AIDS contraction

Source: Field Data, 2020

Research Question Two: What factors inhibit the application of HIV/AIDS knowledge of SHS students in LMKM?

The second research question was to find out the factors that inhibit the application of HIV/AIDS knowledge of the SHS students in LMKM of the Eastern Region. In measuring this, questions like—“Do you think religion is the cause of students’ failure in applying their knowledge in HIV/AIDS”, —“Do you think the youth have limited recognition of personal risk of HIV infection”, —“Do you support the view that the youth are more vulnerable to HIV/AIDS due to their biological condition”, —“Do your friends request for the HIV/ AIDS status of their partners before sex”, —“Is your school, church, community or peers giving you sexual health education”, —“Do you support the view that HIV/AIDS is a curse from the gods”, —“What do you think would make the HIV/AIDS awareness programmes more effective for young people were posed”. A likert scale was used and the results are presented in Table 4.4.

Table 4.4: Factors that inhibit the application of HIV/AIDS knowledge of SHS students

Statement	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
Religion	47(15.8)	107(35.8)	84(28.3)	40 (13.3)	20 (6.7)
Frequent change of partners	64(21.7)	93(31.7)	89 (30.0)	35 (11.7)	15 (5.0)
Exchange of sexual partners	73(24.5)	89(30.0)	99(33.3)	27 (9.2)	10 (3.3)
Peer pressure	7 (2.5)	20 (6.7)	67 (22.5)	109(36.7)	93(31.7)
Unprotected sex	57(19.2)	109(36.7)	82 (27.5)	37(12.5)	13 (4.2)
Difficulty in procuring condom	13 (4.2)	60(20.0)	99 (33.3)	80(26.7)	46(15.8)

Source: Field Survey, 2020

A number of factors that could inhibit the application of knowledge of HIV/AIDS prevention strategies have been examined from the perspective of the senior high students. In the table 4.4, it can clearly be seen that, all the options are clearly

represented. The data show that 107(35.8%) of the entire sample agreed to the statement that religion could influence senior high school students' application of knowledge on HIV/AIDS, while 84(28.3%) of the sample are uncertain whether religion influenced one's application of knowledge acquired about HIV/AIDS. On the contrary, 40(13.3%) of the sample disagreed with the statement that religion influenced senior high school students' application of HIV/AIDS knowledge. Many young people cited lack of knowledge, religious issues as the main reasons for not using contraceptives (for example the Catholics). One study showed that less than 50% of young people in Madagascar and Nigeria are aware of contraception (Caldwell et al. 2004). In Sub-Saharan Africa, as in other parts of the world, a culture of silence surrounds most reproductive health issues. Many adults are uncomfortable talking about sexuality with their children due to issues of religion. Others lack specific knowledge about sexual health. Polygamy is a central social institution and reinforces this belief (Buckley & Ribstein, 2001).

The next variable is whether students in the senior schools exchanged sexual partners. The data revealed that 93(31.7%) of the entire sample agreed while 89(30.0%) of the sample were uncertain about the statement. 35(11.7%) of the entire sample disagreed with the statement that students in the senior schools exchanged sexual partners while 64(21.7%) of the entire sample strongly agreed with the item that students in the senior schools exchanged sexual partners. Though 99(33.3%) of the sample were uncertain that students in the senior schools exchanged sexual partners but an equally huge number of 89(30.0%) of the sample agreed that students in the senior schools exchanged sexual partners. Also, 73(24.5%) of the entire sample strongly agreed that students in the senior schools exchanged sexual partners a small number of informants 27(9.2%) of the entire sample disagreed that students in the senior schools

exchanged sexual partners. Responses from these respondents buttress the findings of Odu et al. (2008) and Plattner (2010) that the youth express themselves and seek sensations in late adolescence and early twenties. Surely, many of the students in senior high schools are in their late adolescence and early twenties hence exhibit these characteristics.

Another variable that was looked at was whether peer pressure influenced students' application of HIV/AIDS knowledge. 20(6.7%) of the sample agreed peer pressure influenced students' application of HIV/AIDS knowledge while 27(22.5%) of the sample were uncertain whether peer pressure influenced students' application of HIV/AIDS knowledge. A huge number of 109(36.7%) of the entire sample disagreed with the statement that peer pressure influenced students' application of HIV/AIDS knowledge while 7(2.5%) of the entire sample strongly agreed that peer pressure influenced students' application of HIV/AIDS knowledge.

Besides, 109(36.7%) of the entire sample agreed that students in senior high schools engage in unprotected sex. while 82(27.5%) of the sample were uncertain whether students in senior high schools engage in unprotected sex 37(12.5%) of the sample disagreed that students in senior high schools engage in unprotected sex while a moderate number of 57(19.2%) of the sample strongly agreed that students in senior high schools engage in unprotected sex. This finding supports the idea that lack of education, untreated STIs and sexual exploitation exacerbate the vulnerabilities of young people (Buckley, 2001).

Finally, the difficulty to procure condom was also examined. A massive number of 99(33.3%) of the entire sample were uncertain whether students in senior high schools had any difficulty in procuring condom, 80(26.7%) of the sample disagreed

that difficulty to procure condom affected the application of the knowledge on HIV/AIDS. However, 60(20%) of the entire sample agreed that difficulty to procure condom affected the application of the knowledge while 46(15.8%) of the entire sample strongly disagreed that difficulty to procure condom affected the application of the knowledge.

Several other studies have observed high-risk sexual behaviours among young people in spite of their good knowledge and awareness of HIV/AIDS (Adedimeji, 2005; Afenyadu & Goparaju, 2003; Anderson & Beutel, 2004; Braithwaite & Thomas, 2001; Ikamba & Ouedraogo, 2003; Meekers et al., 2001; Odirile, 2000). A study among college students in the United States of America also found a mismatch between knowledge about sexual issues and sexual behaviour (Castora, 2005). In studies conducted in nine African countries among sexually experienced adolescent girls and boys aged 15 to 19, between 40 to 87 per cent of respondents in seven countries believed that the amount of HIV/AIDS programmes are not enough to curb the menace (Reif et al., 2006). In Ghana, it has been observed that the expected behavioural changes have not occurred in spite of the several programmes that have been undertaken to create awareness of the disease (Anarfi, 2005; Kates & Leggoe, 2005).

What actions are needed to drive a behavioural change among SHS students?

For effective behaviour change interventions among the students the following actions should be considered. Testing is very important if prevention efforts are to be successful. Knowing their HIV status will help regulate their behaviour and also initiate the necessary care that infected persons need to prevent HIV transmission to

others. Linkage to care helps ensure people living with HIV receive life-saving medical care and treatment, and helps reduce their risk of transmitting HIV.

In order for HIV prevention efforts to work, persons who are not infected should be made to observe the prevention protocols such as condom use. Condoms are considered best weapons to fight HIV/AIDS transmission therefore their availability of condom to sexual active youth will go a long way change behaviour. Many of these students cannot gather the courage to walk into a pharmacy to want to buy condom. People might feel embarrassed about buying condoms from pharmacies. Studies overwhelmingly demonstrate that condoms are highly effective in preventing HIV transmission but availability and regular use is found a big issue.

A supportive social environment needs to be created to foster HIV-prevention interventions and reinforce individual behaviour-change efforts.

Maintenance—HIV-prevention interventions need to include strategies that will foster the maintenance of behaviour change over time.

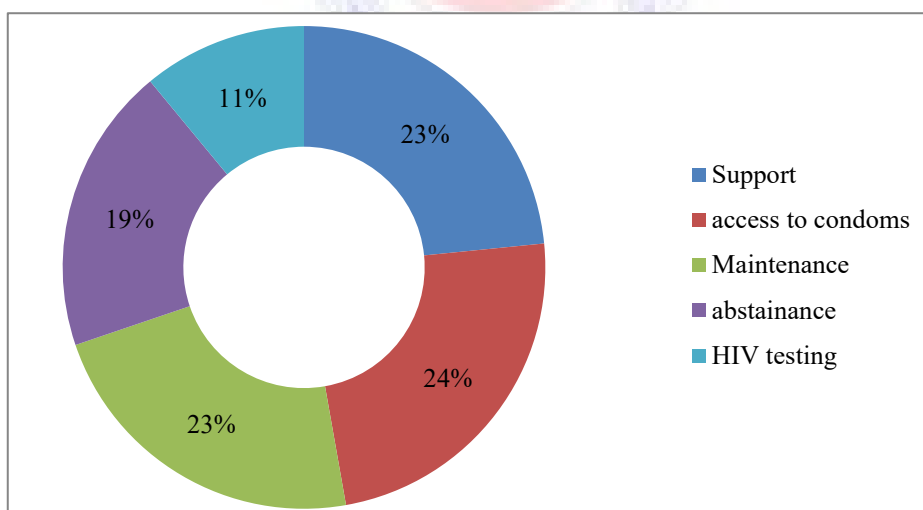


Figure 4.4: HIV AIDS intervention methods

Source: Field Data, 2020

Research Question Three: What is the influence of HIV/AIDS knowledge on SHS students’ sexual behaviour?

The thrust of this research question was to examine the extent to which students in SHS have used information acquired about HIV/AIDS to regulate the sexual behaviour.

Table 4.5: Had ever had sexual intercourse

Response	Frequency	Percentage (%)
No	142	47.7
Yes	156	52.3
Total	298	100.0

Source: Field Data, 2020

The results in Table 4.5 show that most SHS students in the LMKM of Ghana have experienced Sex (n=156, 52.3%) while 142 of the SHS students in the LMKM of the Eastern Region of Ghana representing 47.7% said they have not had sex before.

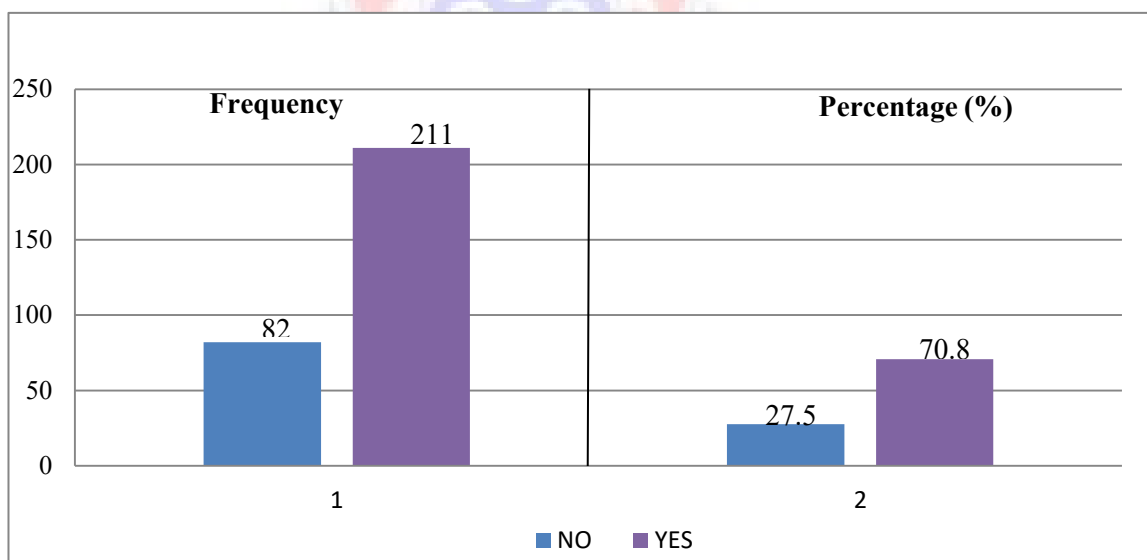


Figure 4.5: Use of free condoms

Source: Field Data, 2020

In relation to the students use of condom when they get them for free, the students indicated that most SHS students in the LMKM of Ghana will use condom when they get them for free (n=211, 70.8%) while 82 of the SHS students in the LMKM of the Eastern Region of Ghana representing 27.5% said they will not use condom even when they get them for free. Five (5) respondents representing 1.7% were, however, silent on the question.

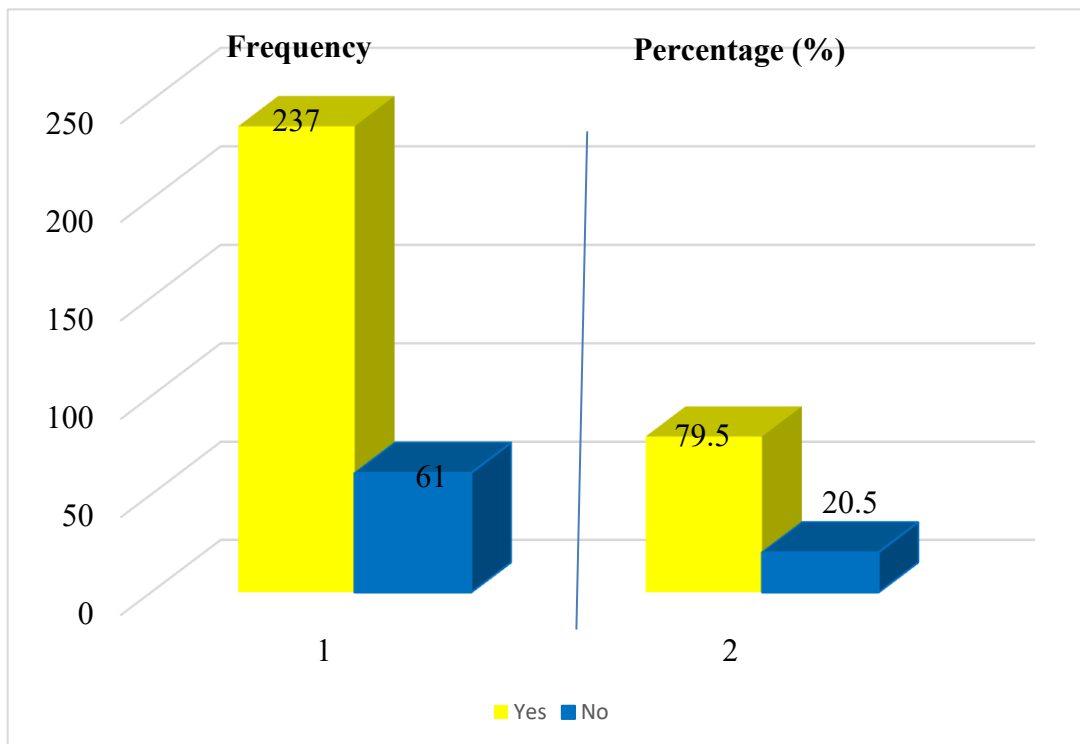


Figure 4.6: Willingness to have an HIV test

Source: Field Data, 2020

In line with whether SHS students in the LMKM of Ghana would like to have an HIV test, a greater number of the respondents expressed their preparedness to have such a test, that is, (n=237) representing 79.5%. On the other hand, 61 of the SHS students representing 20.5% said they would not like to have an HIV test.

Research results on analysis of 250 North American programmes established that among sexually active young people, AIDS education programmes were effective in

decreasing the number of sexual partners and increasing condom use (UNAIDS 2004). In Nigeria, a study among unmarried male youths in the University of Ibadan (Adewole & Lawoyin, 2004) found that students who had obtained knowledge on HIV/AIDS early at the secondary school level were less likely to have multiple sexual partners, compared with those who acquired the knowledge later. In Ghana, knowledge about HIV/AIDS was found to be lower among students who around 2004 were having sexual partners (Apoya et al., 2004). Using Demographic and Health Survey data from 23 low and middle-income countries, Snelling et al. (2007) also found an association between increased knowledge of HIV/AIDS and condom use. In a study among men in Bangladesh, respondents who had heard of AIDS were less likely to have had sex with prostitutes than those who had not (Caldwell & Indrani, 1999).

Anarfi and Appiah (2004) have emphasized that since there is yet no cure for HIV/AIDS, education then becomes the only social vaccination against the disease. Commenting on the kind of information that adolescents need, McIntyre (2004:12) has said: —All adolescents need information on how HIV spreads, how it can be prevented and how you cannot tell when someone is infected. Monasch and Mahly (2006:25) concluded that -An important, but not sufficient, foundation for any prevention effort aimed at young people is to provide them with basic information on how to protect themselves and their partners from acquiring the virus. Other studies similarly report of positive influence of knowledge of HIV/AIDS on sexual behaviour, including delaying sexual intercourse, using condoms, stopping sex with prostitutes, etc., (Bankole, 2004; Camlin & Chimbwete, 2003; Uwalaka & Matsuo, 2002).

In spite of these findings, generally, knowledge of HIV/AIDS is higher among young men than women (Aluede et al., 2005; UNAIDS, 2003). It is also higher among people in urban areas than rural areas (UNAIDS, 2005; UNAIDS, 2003). Others have also warned that knowledge about HIV/AIDS does not automatically lead to responsible sexual behaviour (Adedimeji, 2005), and that knowledge must be complemented by attitudes and values that will lead to appropriate decisions (White, 2005).

Low levels of condom use in spite of awareness of the risks have also been reported (Karim et al., 2003; Winfield & Whaley, 2002). In a study to test the usefulness of the Health Belief Model in predicting condom use among African American college students, Winfield and Whaley (2002) found that high levels of HIV/AIDS risk knowledge were not significantly correlated with condom use. In a research in Cote d'Ivoire, researchers found that accuracy of knowledge about AIDS did not significantly predict condom use (Zellner, 2003).

The Study buttresses Resenstock (1974) HMB which assert that for an individual to engage in in health sexual behaviour such as safe sex, an individual has to perceive himself being susceptible to a health threat. The SHS students in the LMKM dot not themselves as being vulnerable to HIV, hence, they engage in risky sexual behaviours.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter presents a summary of the findings of the study as well as the conclusions, recommendations and suggestions for further research. Thus, the chapter focuses on the implications of the findings from the study for policy formulation. The recommendations are made based on the key findings and major conclusions arising from the study.

5.1 Summary of the Study

The thrust of the study was to assess the HIV/AIDS knowledge of SHS students in the LMKM of the Eastern Region of Ghana. Specifically, the study sought to assess the knowledge level of SHS students in LMKM on HIV/AIDS, examine the influence of HIV/AIDS knowledge on SHS students' sexual behaviour and, finally, explore the factors that inhibit the application of HIV/AIDS knowledge of SHS students in LMKM of the Eastern Region. To materialize these purposes, the study was rooted and nested in the quantitative method. The simple random sampling technique was used to select the respondents for the study. In all, a total of 300 respondents comprising 120 boys and 180 girls answered the questionnaire of which 298 were returned for analysis. A 37 item questionnaire adapted from Wairimu Hellen Wanjiru was used for the data collection. Ethical consideration was also ensured before the actual data collection. The data collected was analyzed using descriptive statistics (means and standard deviations, frequencies and percentages). The analyses were interpreted and discussed in line with the research questions.

5.2 Summary of Key Findings

The following findings were established

1. The results show that generally the majority of the students had knowledge of the several of means of contracting or preventing HIV/AIDS. This knowledge on the causative agents and preventive measures about HIV/AIDS was transmitted to the students by healthcare workers. In addition, the television constituted the other source of information to the students. Students were able to identify the various means of transmission of HIV/AIDS. They thus found that the extent of knowledge possessed by students about HIV/AIDS helped to reduce the spread of the disease among this particular cohort of students. The finding of this particular study contradicted earlier studies to the extent that those studies found that not enough information was possessed by students about HIV/AIDS. In addition, those also established that the knowledge gained about the disease increased the misconceptions about high-risk practices among participants as well as increased negative attitudes towards PLWHIV.
2. This study also found that the particular cohort of students studied had very high drive for sexual intercourse activities. The following were identified as factors that could negatively affect the prevalence of the disease among this cohort of students. These factors include poor surveillance systems, the lack of access to quality voluntary counselling and testing services. The study has shown that to secure a change in behaviour among the SHS students would require an enormous effort from government to reduce stigmatization, improve condom use, improve counselling, and improve surveillance. Condoms are considered best weapons to fight HIV/AIDS transmission

therefore their availability of condom to sexual active youth will go long way change behaviour. Many of these students cannot gather the courage to walk into a pharmacy to want to buy condom. People might feel embarrassed about buying condoms from pharmacies.

3. A number of HIV/AIDS prevention and treatment programmes including interventions for vulnerable groups, condom promotion, STI testing, behaviour change communication, volunteer counselling and testing services and providing antiretroviral drugs are not enough to address the issue among students.
4. A number of factors that could inhibit the application of knowledge of HIV/AIDS prevention strategies have been examined from the perspective of the senior high students. Many young people cited lack of knowledge, religious issues as the main reasons for not using contraceptives (for example the Catholics). Many adults are uncomfortable talking about sexuality with their children due to issues of religion. For effective behaviour change interventions among the students the following actions should be considered. Testing is very important if prevention efforts are to be successful. Knowing their HIV status will help regulate their behaviour and also initiate the necessary care that infected persons need to prevent HIV transmission to others. Linkage to care helps ensure people living with HIV receive life-saving medical care and treatment, and helps reduce their risk of transmitting HIV. In order for HIV prevention efforts to work, persons who are not infected should be made to observe the prevention protocols such as condom use. Condoms are considered best weapons to fight HIV/AIDS transmission therefore their availability of condom to sexual active youth will go a long

way change behaviour. Many of these students cannot gather the courage to walk into a pharmacy to want to buy condom. People might feel embarrassed about buying condoms from pharmacies.

5. Though the students are aware of the dangers of reckless sexual behaviours, many of the students affirmed that they had ever engaged in sexual intercourse activity. Considering the extent of HIV/AIDS education that SHS students received it could be surmised that some of the students do not appreciate the risk they are exposed to when they engage in sexual intercourse. The majority of SHS students were willing to know their HIV status. Many of these students were not ready to buy condoms from the open market; however, they would use it if they got it for free. It was also found that the students who had had sexual intercourse would be bad influences to the few who had never engaged in sexual intercourse. We could surmise that among this sexually active young people, AIDS education programmes had been effective in decreasing the number of sexual partners and increasing condom use (UNAIDS 2004).

5.3 Conclusions

It was concluded that majority of the SHS students in the LMKM of the Eastern Region of Ghana have high level of knowledge about HIV/AIDS. Because AIDS is rooted in human behaviour, economic, cultural, and social conditions, the behavioural and social sciences are essential to identifying solutions for its control. Effective prevention of HIV/AIDS will require enormous and continued commitment in order to achieve lasting changes in human behaviour. No one set of interventions—behavioural or medical—will be sufficient by itself to combat the epidemic. More behavioural and social research is needed to develop effective and acceptable

preventive strategies to refine successful programs and to help find more effective ways of mitigating the negative impacts of the epidemic.

The study has shown that the students are in their adolescent stage and are sexually active. Their drive for sex at this stage put them at risk of contracting the disease. From what had been gathered from them; it is possible that some students are positive and they are not aware of their status. The commitment that is needed at this stage making commitment to reduce high-risk sexual contacts and to increase low risk activities is very important for the students. Commitment to ensure that the students observe the protocols will lead to reduction of HIV/AIDS prevalence among the youth. Students at the SHS level as very highly exposed to HIV/AIDS infection because of the high drive for sex among them. Poor surveillance systems and the lack of access to quality voluntary counselling and testing services, means prevalence figures are likely to be a gross under estimate. The study has shown that to secure a change in behaviour among the SHS students would require an enormous effort from government, reduce stigmatization, improve condom use, improve counselling, and improve surveillance.

For effective behaviour change interventions among the students the following actions should be considered. Testing is very important if prevention efforts are to be successful. Knowing their HIV status will help regulate their behaviour and also initiate the necessary care that infected persons need to prevent HIV transmission to others. Linkage to care helps ensure people living with HIV receive life-saving medical care and treatment, and helps reduce their risk of transmitting HIV. In order for HIV prevention efforts to work, persons who are not infected should be made to observe the prevention protocols such as condom use. Condoms are considered best

weapons to fight HIV/AIDS transmission therefore their availability of condom to sexual active youth will go a long way change behaviour. Many of these students cannot gather the courage to walk into a pharmacy to want to buy condom. People might feel embarrassed about buying condoms from pharmacies. Studies overwhelmingly demonstrate that condoms are highly effective in preventing HIV transmission but availability and regular use is found a big issue.

5.4 Recommendations

Based on the findings obtained and the conclusions reached, the following recommendations are made.

The Ministry of Health in collaboration with other relevant educational agencies should intensify sex education to students and community members in order to strengthen awareness of HIV/AIDS in the LMKM of the Eastern Region. Also, more assistance should be provided to the SHS students who live with the condition in order to strengthen their health conditions by friends and families through their interactions with them. This is to improve their emotional health which might strengthen their physical functioning.

Also, medical health practitioners, clinical health psychologists and HIV/AIDS counsellors should provide more counselling services to students on HIV/AIDS to disabuse their perception that they are not at risk of contracting the virus. This would provide a better way of helping to reduce the risky sexual behaviours among then students. The students must be engaged actively in the campaigns aimed at reducing the rate of infections among themselves. Formation of HIV/AIDS clubs in schools can be of immense benefit towards bringing down the rate of infections in the municipality

Religious leaders must take active roles in the campaigns to reduce the rate of infections among the populace. They can help demystify the belief held by some students that HIV/AIDS is curse from the gods.

Since the majority of the students at this level are sexually active, it is advised that a free condom policy is instituted to encourage them to use condom should they desire to have sex.

The conceptual framework designed for the study has demographic factors such as age of students, gender, religion, form etc. as intervening factors between the knowledge and behaviour change. In addition, the framework also makes room for external factors such as the influence of social media, internet etc. influence the information (knowledge) received on HIV/AIDS; alternatively these factors can directly influence the behaviour of students. From the perspective of risk reduction model, future studies should examine the extent to which the demographic factors as well as the external factors affect the risk exposure of students.

This particular study can best be described as cross sectional study which is largely contemporaneous. This understand the long term effect of how the knowledge received by students impact on sexual behaviour it is also recommended that future studies should consider using longitudinal data to extend the findings of this study. Finally, future studies should also consider scaling the study to the national level and other population cohorts.

5.5 Limitation of the Study

The SHS One and Two students were not included in the study because of the COVID-19 pandemic. This was because all the first years were not in school. For the second years too, only the gold track students were around. Perhaps, their participation would have brought different perspectives to bear on HIV/AIDS.

A mixed method approach for conducting this research have to be abandoned as students would not be allowed to participate in a planned Focus Group Discussion (FGD) because of the COVID-19. The verbal interviews through the FGD could have given much credence to some of the responses provided in the questionnaire.

5.6 Suggestions for Further Research

The study sought to assess the HIV/AIDS knowledge of SHS students in the LMKM of the Eastern Region of Ghana. It employed the quantitative approach. Hence subsequent research efforts should be concentrated on:

1. Determining the influence of other demographic variables such as income and social status among others, on the impact of quality of life of people living with HIV/AIDS.
2. Providing understanding into the quality of life enjoyed by people living with HIV/AIDS through the use of qualitative tools such as interview guides.
3. Extending the study to other regions in the country in order to validate the generalizability of the findings.
4. Soliciting the concerns of people living with HIV/AIDS on how they perceive their interaction with others without the condition.

REFERENCES

- Adam, A. M. (2015). *Statistics for business research, a guide for non- statisticians*. Cape Coast: Global Research.
- Adedimeji, A. A. (2005). *Beyond knowledge and behaviour change: The social-cultural context of HIV/AIDS risk perception and protective behaviour among young urban slum inhabitants in Nigeria*. Boston: Department of Population and International Health, Harvard School of Public Health.
- Adeleke, I. T., Azeez, B. A., Aliyu, D., Ogundiran, L. M., Salami, A., & Adeoye, W. A. (2015). HIV/AIDS awareness among secondary schools' adolescents in south-western Nigeria: A correlate to strengthen advocacy and strategic sexuality education programs. *AJHR*, 3(1- 1), 61-67.
- Adewole, D. A., & Lawoyin, T. O. (2004). *Knowledge, attitude to HIV/AIDS and sexual risk behaviour among unmarried male youths of the University of Ibadan, Nigeria*. International Conference on AIDS, Bangkok, 11-16.
- Afenyadu, D. & Goparaju, L. (2003). *Adolescent sexual and reproductive health behaviour in Dodowa, Ghana*. Washington, DC: Centre for Development and Population Activities.
- African Population and Health Research Center (2009). *Policy brief: Protecting in-school adolescents from HIV/AIDS, STI and unwanted pregnancy*. Retrieved from: [www.realising.rights.org/newsletter/adolescentpolicy brief final](http://www.realising.rights.org/newsletter/adolescentpolicy%20brief%20final).
- Agyei-Mensah, S. (2001). Twelve years of HIV/AIDS in Ghana: Puzzles of interpretation. *Canadian Journal of African Studies/La Revue Canadienne des Études Africaines*, 35(3), 441-472.
- Agyemang, S., Buor, D., & Tagoe-Darko, E. (2012). The extent of knowledge about HIV/AIDS among young people in Ejura-Sekyedumase district of Ghana. *Journal of AIDS and HIV Research*, 4(11), 241-247.
- Albarracín, D., Gillette, J. C., Earl, A. N., Glasman, L. R., Durantini, M. R., & Ho, M. H. (2005). A test of major assumptions about behavior change: a comprehensive look at the effects of passive and active HIV-prevention interventions since the beginning of the epidemic. *Psychological Bulletin*, 131(6), 856.
- Aluede, A., Imhonde, H. O., Maliki, A. E., & Alutu, A. N. G. (2005). Assessing Nigerian university students' knowledge about HIV/AIDS. *Journal of Social Science*, 11(3), 207-213.

- Amaratunga, D., Baldry, D., Sarshar, M., & Newton, R. (2002). Quantitative and qualitative research in the built environment: Application of 'mixed' research approach. *Work Study*, 51(1), 17-31.
- Amedahe, F. K. (2002). *Fundamentals of educational research methods*. Cape Coast: University of Cape Coast.
- Anarfi, J. K. (1997). Vulnerability to sexually transmitted disease: Street children in Accra. *Health Transition Review*, 7, 281-306.
- Anarfi, J. K. (2005). Under reaction to sexual behavioural change among the youth in Ghana in the Era of AIDS. In Agyei-Mensah, Casterline & Agyeman, (Eds.). *Reproductive change in Ghana: Recent patterns and future prospects* (pp.225-242). Legon: Department of Georgraphy and Resource Development, University of Ghana,
- Anarfi, J. K. & Antwi, P. (1995). Street youth in Accra City: Sexual networking in a high-risk environment and its implications for the spread of HIV/AIDS. *Health Transition Review*, 5, 131-152.
- Anarfi, J. K. & Awusabo-Asare, K. (2002). HIV/AIDS in tertiary institutions in Ghana (Draft). Accra: National Council for Tertiary Education.
- Anarfi, J.K., & Appiah, E. N. (2004). *Mitigating the Impact of HIV/AIDS in Ghana: The role of education*. Paper Presented at the International Conference on Ghana at Half Century. ISSER and Cornell University. M-Plaza Hotel, Accra, July 18-20.
- Anarfi, J. K., Appiah, E. N. & Awusabo-Asare, K. (1997). Livelihood and the risk of HIV/AIDS infection in Ghana: The Case of Female Itinerant Traders. *Health Transition Review*, 7, 225-242.
- Anderson, K. G. & Beutel, A. N. (2004). *Self-perceived risk among youth in Cape Town, South Africa*. University of Oklahoma, presented at the Population Association of America Annual Meeting, Los Angeles, CA. 2006.
- Anglemyer, A., Rutherford, G. W., Horvath, T., Baggaley, R. C., Egger, M., & Siegfried, N. (2013). Antiretroviral therapy for prevention of HIV transmission in HIV discordant couples. *Cochrane Database of Systematic Reviews*, 4, 66-70.
- Apoya, P.A, Ayugane, T. N., & Balhara, S. (2004). *The Knowledge, Attitude, Economic and Personality (KAEP) framework: A new approach to designing HIV/AIDS Intervention Programmes* (pp.11-13). Paper Presented at the National HIV/AIDS Research Conference (NHARCON) held at La Palm Royal Beach Hotel, Accra, Ghana.

- Appiah-Agyekum, N. N., & Suapim, R. H. (2013). Knowledge and awareness of HIV/AIDS among high school girls in Ghana. *HIV/AIDS (Auckland, NZ)*, 5, 137.
- Apuke, O. D. (2017). Quantitative research methods: A synopsis approach. *Kuwait Chapter of Arabian Journal of Business and Management Review*, 33(5471), 1-8.
- Araoye, M. O., & Adegoke, A. (1996). AIDS-related knowledge, attitude and behaviour among selected adolescents in Nigeria. *Journal of Adolescence*, 19(2), 179-181.
- Ashford, L. S. (2007). *Africa's youthful population: Risk or opportunity*. Washington DC: Population Reference Bureau.
- Auerbach, J. D., Hayes, R. J., & Kandathil, S. M. (2006). *Overview of effective and promising interventions to prevent HIV Infection*. In Ross, D. A; Dick, B. & Ferguson, J., (Eds.), *Preventing HIV/AIDS in young people: A systematic review of the evidence from developing countries*(pp. 43-78). Geneva: World Health Organisation.
- Avornyo, R., & Amoah, J. (2014). Disclosing parental Human Immunodeficiency Virus (HIV) status to children in Ghana: Reasons for and against disclosure and effects of decision. *Advances in Applied Sociology*, 4(09), 205.
- Awusabo-Asare, K., Abane, A. M., Badasu, D. M. & Anarfi, J. K. (1999). All die die': obstacles to change in the face of HIV infection in Ghana. In Caldwell, J.C., Caldwell, P., Anarfi, J., Awusabo-Asare, K, Ntozi, J., Orubuloye, I.O., Marck, J., Cosford, W., Colombo, R. and Hollings, E. (Eds.). *Resistances to behavioural change to Reduce HIV/AIDS Infection in predominantly heterosexual epidemics in third World Countries* (pp. 125-132. Canberra: Australian National University Press.
- Ayranci, U. (2005). AIDS knowledge and attitudes in a Turkish population: An epidemiological study. *BMC Public Health*, 5(1), 95.
- Babbie, E. (2010). *The basics of social research*. Athens: Thompson Wadsworth.
- Babikir, A., Gupta, R., Mwabutwa, C., & Owusu-Sekyere, E. (2012). Structural breaks and GARCH models of stock return volatility: The case of South Africa. *Economic Modelling*, 29(6), 2435-2443.
- Baggaley, R. F., Boily, M-C., White, R. G., & Alary, M. (2006). Risk of HIV-1 transmission for parenteral exposure and blood transfusion: A systematic review and meta-analysis. *AIDS*, 20(6), 805-812.

- Bahrin, F. K., Azman, A., Zainol, I. N. H., Yusof, M. M., & Shaed, M. M. (2018). The level of knowledge of secondary school students in Penang about HIV/AIDS: Pre and post intervention. *International Journal of Asian Social Science*, 8(8), 540-548.
- Baiden, F., Akanlu, G., Hodgson, A., Akweongo, P., Debpuur, C., & Binka, F. (2007). Using lay counsellors to promote community-based voluntary counselling and HIV testing in rural northern Ghana: A baseline survey on community acceptance and stigma. *Journal of Biosocial Science*, 39(5), 721.
- Bandura, A. (2004). Health promotion by social cognitive means. *Health Educ. Behav.*, 31, 143.
- Bankole, A., Singh, S., Woog, V., & Wulf, D. (2004). *Risk and protection: Youth and HIV/AIDS in Sub-Saharan Africa*. New York: The Alan Guttmacher Institute.
- Barnett, T., & Whiteside, A. (2002a). *AIDS in the twenty-first century: Disease and globalization*. New York: Springer.
- Benefo, K. D. (2004). The mass media and HIV/AIDS Prevention in Ghana. *Journal of Health and Population in Developing Countries*, 2, 33-37.
- Blankson, J. (2010). Control of HIV-1 replication in elite suppressors. *Discovery Medicine*, 9(46), 261-266.
- Bosu, W. K. (2010). Epidemic of hypertension in Ghana: A systematic review. *BMC Public Health*, 10(1), 1-14.
- Boyce, W., Doherty, M., Fortin, C., & MacKinnon, D. (2003). *Canadian youth, sexual health and HIV/AIDS study: Factors influencing knowledge, attitudes, and behaviours*. Toronto: Council of Ministers of Education.
- Braithwaite, K., & Thomas, V. G. (2001). HIV/AIDS knowledge, attitudes, and risk behaviours among African-American and Caribbean College Women. *International Journal for the Advancement of Counselling*, 23, 115-129.
- Buckley, F. H., & Ribstein, L. E. (2001). Calling a truce in the marriage wars. *University of Illinois Law Review*, 561.
- Burgoyne, R. W., & Tan, D. H. (2008). Prolongation and quality of life for HIV-infected adults treated with highly active antiretroviral therapy (HAART): A balancing act. *Journal of Antimicrobial Chemotherapy*, 61(3), 469-473.

- Caldwell, B., & Indrani, P., (1999). Continued High-risk Behaviour Among Bangladeshi Males. In: Caldwell, J.C., Caldwell, P., Anarfi, J., Awusabo-Asare, K, Ntozi, J., Orubuloye, I. O., Marck, J., Cosford, W., Colombo, R. & Hollings, E. (eds.), *Resistances to behavioural change to reduce HIV/AIDS infection in predominantly heterosexual epidemics in third world countries* (pp. 183-196). Canberra: Australian National University Press.
- Caldwell, J., Caldwell, P., Ankrah, E. M., Anarfi, J. K., Agyeman, D. K., Awusabo-Asare, K., & Orubuloye, I. O. (1993). African families and AIDS: context, reactions and potential interventions. *Health Transition Review*, 3, 1-16.
- Caldwell, L., Smith, E., Wegner, L., Vergnani, T., Mpofu, E., Flisher, A. J., & Mathews, C. (2004). Health Wise South Africa: Development of a life skills curriculum for young adults. *World Leisure Journal*, 46(3), 4-17.
- Camlin, C. S., & Chimbwete, C. E. (2003). Does knowing someone with AIDS affect condom use? An analysis from South Africa. *AIDS Education and Prevention*, 15(3), 231-244.
- Castora, M., (2005). The assessment of university students' knowledge, attitudes, and behaviours toward sex. University of Central Florida. *Undergraduate Research Journal*, 1.
- Catania, J. A., Kegeles, S. M., & Coates, T. J. (1990). Towards an understanding of risk behavior: An AIDS risk reduction model (ARRM). *Health Education Quarterly*, 17(1), 53-72.
- Center for Disease Control & Prevention (2013). Prevention and control of seasonal influenza with vaccines. Recommendations of the Advisory Committee on Immunization Practices- United States, 2013-2014, MMWR. Recommendations and reports: Morbidity and Mortality weekly report, *Recommendations and Reports*, 62(RR-07), 1.
- Choopanya, K., Martin, M., Suntharasamai, P., Sangkum, U., Mock, P. A., Leethochawalit, M. & Vanichseni, S. (2013). Antiretroviral prophylaxis for HIV infection in injecting drug users in Bangkok, Thailand (the Bangkok Tenofovir Study): A randomized, double, placebo-controlled phase 3 trial. *The Lancet*, 381(9883), 2083-2090.
- Chou, C., & Selwyn, P. A. (2011). An epidemic in evolution: The need for new models of HIV care in the chronic disease era. *Journal of Urban Health*, 88(3), 556-566.
- Coates, T. J., & Szekeres, G. (2004). A plan for the next generation of HIV prevention research: Seven key policy investigative challenges. *American Psychologist*, 59(8), 747.

- Cohen, L., Manion, L., & Morrison K. (2000). *Research methods in education* (5th ed.). London: Routledge Falmer.
- Cohen, S. M., Gray, K. M., Ocfemia, M. C. B., Johnson, A. S., & Hall, H. I. (2014). The status of the national HIV surveillance system, United States. *Public Health Reports, 129*(4), 335-341.
- Coombe, C., & Kelly, M. J. (2001). Education as a vehicle for combating HIV/AIDS. *Prospects, 31*(3), 435-445.
- Creswell, J. W. & Plano-Clark, P. V. L. (2012). *Designing and conducting mixed methods research* (2nd ed.). Thousand Oaks: Sage.
- Creswell, J. W., & Garrett, A. L. (2008). The movement of mixed methods research and the role of mapping the field of mixed methods research. *South African Journal of Education, 28*(3), 321-333.
- De Cock, K. M., Fowler, M. G., Mercier, E., De Vincenzi, I., Saba, J., Hoff, E., Shaffer, N. (2000). Prevention of mother-to-child HIV transmission in resource-poor countries: Translating research into policy and practice. *JAMA, 283*(9), 1175-1182.
- De Cock, K. M., Mbori-Ngacha, D., & Marum, E. (2002). Shadow on the continent: Public health and HIV/AIDS in Africa in the 21st century. *The Lancet, 360*(9326), 67-72.
- De Vos, M., Graafmans, W., Keesman, E., Westert, G., & van der Voort, P. H. (2007). Quality measurement at intensive care units: Which indicators should we use? *Journal of Critical Care, 22*(4), 267-274.
- Department of Health and Human Services (2014). *Integration of oral health and primary care practice*. Rockville, MD: HHS, Health Resources and Services Administration.
- DiClemente, R. J., & Peterson, J. L. (1994). *Changing HIV/AIDS risk behaviors*. New York: Springer.
- DiMatteo, M. R. (2004). Social support and patient adherence to medical treatment: A meta-analysis. *Health Psychology, 23*(2), 207.
- Dörnyei, Z., & Taguchi, T. (2010). *Questionnaires in second language research* (2nd ed.). New York, NY: Routledge.
- Easterby-Smith, M., & Malina, D. (1999). Cross-cultural collaborative research: Toward reflexivity. *Academy of management Journal, 42*(1), 76-86.

- Ebeniro, C. D. (2010). Knowledge and beliefs about HIV/AIDS among male and female students of Nigerian Universities. *Journal of Comparative Research in Anthropology and Sociology*, 1(01), 121-131.
- Fayorsey, C. (2002). *Knowledge, attitude and practice (KAP) on HIV/AIDS among students, teachers and parents in selected schools in Ghana: Key baseline findings*. Accra: World Education/Ghana.
- Ferretti, F., Pozza, A., Bossini, L., Desantis, S., Olivola, M., Del Matto, L. & Fagiolini, A. (2019). Post-traumatic stress disorder in Italy: a comprehensive evaluation of all the ICD comorbidities and gender-related differences. *BMC Research Notes*, 12(1), 747.
- Février, M., Dorgham, K., & Rebollo, A. (2011). CD4⁺ T Cell depletion in Human Immunodeficiency Virus (HIV) Infection: Role of Apoptosis. *Viruses*, 3, 586-612.
- Fiona, S. Katie, V., Eric, H., Marlise, R., Prince, N., Sian M., & Chersich, M. F. (2013). Human rights abuses and collective resilience among sex workers in four African countries: a qualitative study. *Glob Health*, 9, 33.
- Fisher, J. D., & Fisher, W. A. (1992). Changing AIDS-risk behaviour. *Psychological Bulletin*, 111(3), 455-474.
- Fisher, J. D., Fisher, W. A., Bryan, A. D., & Misovich, S. J. (2002). Information motivation-behavioural skills model-based HIV risk behaviour change intervention for inner-city high school youth. *Health Psychology*, 21(2), 177.
- Flick, U. (2014). *An introduction to qualitative research* (5th ed.). London: Sage.
- Forsythe, S. & Rau, B. (1996). *AIDS in Kenya: Socio-economic impact and policy implications*. Arlington: FHI/AIDSCAP, USAID.
- Fraenkel, J., R., & Wallen, N., E. (2010). *How to design and evaluate research in education* (7th ed.). McGraw-Hill, New York: NY.
- Fram, S. (2013). The constant comparative analysis method outside of grounded theory. *The Qualitative Report*, 18(1), 1-25.
- Freire, P. (2006). *Education for critical consciousness*. London: The Writers and Readers Publishing Cooperative.
- Gallo, R. C. (2006). A reflection on HIV/AIDS research after 25 years. *Retrovirology*, 3(1), 1-7.

- Gander, P. E., Hoare, D. J., Collins, L., Smith, S., & Hall, D. A. (2011). Tinnitus referral pathways within the National Health Service in England: a survey of their perceived effectiveness among audiology staff. *BMC Health Services Research*, 11(1), 162.
- Gay, L. R., Mills, G. E., & Airasian, P. W. (2009). *Educational research: Competencies for analysis and applications* (9th ed.). Upper Saddle River, New Jersey: Prentice Hall.
- Gay, L.R. (1992). *Education research competencies for analysis and application*. London: Charles E. Milton Keynes Philadelphia Company.
- George, D., & Mallery, P. (2011). *IBM SPSS statistics 19 step by step: A simple guide and reference*. Boston, MA: Pearson Higher Education.
- Ghana AIDS Commission (2005). *The national monitoring and evaluation plan for HIV/AIDS in Ghana, 2006-2010*. Accra: Ghana AIDS Commission.
- Ghana AIDS Commission (2014a). Status report. *Ghana Aids Commission, 1*, 122.
- Ghana AIDS Commission (2014b). *Status report*. Accra: Ghana AIDS Commission.
- Ghana AIDS Commission (2017). *National and sub-national HIV and AIDS estimates and projections: 2017 report*: Accra.
- Ghana Statistical Service (2012). 2010 population and housing census Ghana Statistical Service: LMKM district analytical report
- Ghana Statistical Service (2014). *Population and housing census: District analytical report*. Lower Manya-Krobo Municipality.
- Gisslen, M., Svedhem, V., Lindborg, L., Flamholc, L., Norrgren, H., Wendahl, S., & Sönerborg, A. (2017). Sweden, the first country to achieve the Joint United Nations Programme on HIV/AIDS (UNAIDS)/World Health Organization (WHO) 90-90-90 continuum of HIV care targets. *HIV Medicine*, 18(4), 305-307.
- Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *The Qualitative Report*, 8(4), 597-607.
- Gordon, M., & Inusah, F. (2003). Attitude and perception of university students on voluntary HIV Testing: A case of the University of Ghana. (Unpublished Bachelor of Science), School of Nursing, University of Ghana.
- Gravetter, F. J., & Forzano, L. A. B. (2006). *Research methods for the behavioural sciences* (2nd ed.). Boston: Thomson Wadsworth.

- Gravetter, F., & Forzano, L. (2006). Research methods for the behavioral sciences. *South African Journal of Psychology*, 36(2), 450.
- Gray, D.E. (2014). *Doing research in the real world*. London: Sage Publications Ltd.
- Gray, J. A. (2004). *Consciousness: Creeping up on the hard problem*. New York: Oxford University Press.
- Gray, J., Sandvoss, C., & Harrington, C. L. (2017). *Fandom: Identities and communities in a mediated world*. New Delhi: NYU Press.
- Gray, R. H., & Wawer, M. J. (2012). Probability of heterosexual HIV-1 transmission per act in Sub-Saharan Africa. *The Journal of Infectious Diseases*, 205(3), 351-352.
- Grewe, M. E., Ma, Y., Gilbertson, A., Rennie, S., & Tucker, J. D. (2016). Women in HIV cure research: Multilevel interventions to improve sex equity in recruitment. *Journal of Virus Eradication*, 2(1), 49.
- Groce, N., Yousafzai, A., Dlamini, P., Zalud, S., & Wirz, S. (2006). HIV/AIDS and disability: a pilot survey of HIV/AIDS knowledge among a deaf population in Swaziland. *International Journal of Rehabilitation Research*, 29(4), 319-324.
- Guba, E. G. (1981) Criteria for assessing the trustworthiness of naturalistic inquiries, *Educational Communication and Technology Journal*, 29, 75–91.
- Gujarati, D. N. (2012). *Basic econometrics* (4th ed.). New York: McGraw-Hill Companies.
- Hanson, W. E., Creswell, J. W., Plano Clark, V. L., Petska, K. S., & Creswell, J. D. (2005). Mixed methods research designs in counseling psychology. *Journal of Counseling Psychology*, 52(2), 224-235.
- Harden, V. A., & Fauci, A. (2012). *AIDS at 30: a history*. Los Angeles: Potomac Books, Inc.
- Hart, G. J., & Elford, J. (2010). Sexual risk behaviour of men who have sex with men: Emerging patterns and new challenges. *Current Opinion in Infectious Diseases*, 23(1), 39-44.
- Henn, M., Weinstein, M. & Foard, N. (2006). *A short introduction to social research*. London: Sage.
- Henn, P., Jandura, O., & Vowe, G. (2016). The traditional paradigm of political communication research reconstructed. In G. Vowe, & P. Henn (Hrsg.), *Political communication in the online world: Theoretical approaches and research designs* (pp. 11-25). New York: Routledge.

- Henry, J. (2008). *Kaiser family foundation: An update on the HIV/AIDS epidemic in South Africa*. Lovelife: Talk about Associates.
- Hindin, M. J., & Fatusi, A. O. (2009). Adolescent sexual and reproductive health in developing countries: An overview of trends and interventions. *International Perspectives on Sexual and Reproductive Health*, 35(2), 58-62.
- Holmes, C. B., Losina, E., Walensky, R. P., Yazdanpanah, Y., & Freedberg, K. A. (2003). Review of Human Immunodeficiency Virus type1-related opportunistic infections in Sub-Saharan Africa. *Clinical Infectious Diseases*, 36(5), 652-662.
- Huda, M. N., & Amanullah, D. A. (2013). HIV/AIDS-related knowledge among secondary school students in Bangladesh: A cross-sectional study. *Advances in Infectious Diseases*, 3(4), 7.
- Hughes, J. P., Baeten, J. M., Lingappa, J. R., Magaret, A. S., Wald, A., de Bruyn, G., & Farquhar, C. (2012). Determinants of per-coital-act HIV-1 infectivity among African HIV-1-serodiscordant couples. *Journal of Infectious Diseases*, 205(3), 358-365.
- Ikamba, L. M., & Ouedraogo, B. (2003). High-risk sexual behaviour: Knowledge, attitudes and practice among youths at Kichangani Ward, Tanga, Tanzania. *Action Research e- Reports*, 018.
- Iqbal, S., Maqsood, S., Zafar, A., Zakar, R., Zakar, M. Z., & Fischer, F. (2019). Determinants of overall knowledge of and attitudes towards HIV/AIDS transmission among ever-married women in Pakistan: Evidence from the Demographic and Health Survey 2012–13. *BMC Public Health*, 19(1), 793.
- Jansen, I. A., Geskus, R. B., Davidovich, U., Jurriaans, S., Coutinho, R. A., Prins, M., & Stolte, I. G. (2011). Ongoing HIV-1 transmission among men who have sex with men in Amsterdam: A 25-year prospective cohort study. *AIDS*, 25(4), 493-501.
- Jensen, B. B., & Schnack, K. (1994). *Action competence as an educational challenge*. New York: Routledge.
- Jin, F., Jansson, J., Law, M., Prestage, G. P., Zablotska, I., Imrie, J. C., & Wilson, D. P. (2010). Per-contact probability of HIV transmission in homosexual men in Sydney in the era of HAART. *AIDS*, 24(6), 907.
- Johnson, R. B. & Onwuegbuzie, J. A. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, 33, 14–26.
- Joppe, M. (2000). *The research process*. Bright, UK: University of Brighton Press.

- Joshi, S., & Chipkar, S. (1997). Laboratory detection of HIV infection. *Bombay Hospital J*, 39(1), 99-108.
- Juczyński, Z. (2016). Zmaganie się z nieuleczalną chorobą—mobilizacja osobistych potencjałów zdrowia. *Sztuka Leczenia*, 1, 19-29.
- Kabiru, C. W., & Orpinas, P. (2009). Factors associated with sexual activity among high school students in Nairobi, Kenya. *Journal of Adolescence*, 32(4), 1023-1039.
- Kallings, L. O. (2008). The first postmodern pandemic: 25 years of HIV/AIDS. *Journal of Internal Medicine*, 263(3), 218-243.
- Karim, A.M., Magnani, R.J., Morgan, G.T. & Bond, K.C. (2003). Reproductive Health Risk and Protective Factors Among Unmarried Youth in Ghana. *International Family Planning Perspectives*, 29(1), 14-24.
- Kates, J. & Leggoe, A. W. (2005). *The HIV/AIDS Epidemic in Ghana-fact sheet*. Washington, DC: The Kaiser Family Foundation.
- Katjavivi, P. H., & Otaala, B. (2003). *African higher education institutions responding to the HIV/AIDS pandemic*. Paper presented at the AAU conference of Rectors, Chancellors and Presidents of African Universities. Mauritius.
- Kenya National Bureau Statistics (2010). *Kenya demographic and Health Survey 2008-09*. Calverton, Maryland: KNBS and ICF Macro.
- Kerlinger, F. N., & Lee, H. B. (2000). *Foundations of behavioural research* (4th ed.). Holt, NY: Harcourt College Publishers.
- Kharsany, A. B., & Karim, Q. A. (2016). HIV infection and AIDS in Sub-Saharan Africa: current status, challenges and opportunities. *The open AIDS Journal*, 10, 34-48.
- Kickul, J., & Neuman, G. (2000). Emergent leadership behaviors: The function of personality and cognitive ability in determining teamwork performance and KSAs. *Journal of Business and Psychology*, 15(1), 27-51.
- Kinirons, M. J., & Stewart, C. (1998). Factors affecting levels of untreated caries in a sample of 14–15-year-old adolescents in Northern Ireland. *Community Dentistry and Oral Epidemiology*, 26(1), 7-11.
- Kiptoo, M., Mpoke, S., Ng'ang'a, Z., Mueke, J., Okoth, F., & Songok, E. (2009). Survey on prevalence and risk factors on HIV-1 among pregnant women in North-Rift, Kenya: a hospital based cross-sectional study conducted between 2005 and 2006. *BMC Int Health Hum Rights*, 9, 10.

- Kiragu, K. (2001). *Youth and HIV/AIDS: Can we avoid catastrophe?* Population Reports, Series L, No. 12. Baltimore, MD: John Hopkins University Bloomberg School of Public Health, Population Information Program.
- Kiragu, K., Obwaka, E., Odallo, D., & Van Hulzen, C. (1996). Communicating about sex: Adolescents and parents in Kenya. *AIDS STD Health Promote Exch.*, 3, 11-13.
- Koenig, H. G., Larson, D. B., & Larson, S. S. (2001). Religion and Coping with Serious Medical Illness. *Annals of Pharmacotherapy*, 35(3), 352-359.
- Kothari, C. R. (2004). *Research methodology: Methods and techniques* (2nd ed.). New Delhi: New Age International Limited.
- Krämer, A., Kretzschmar, M., & Krickeberg, K. (2010). *Modern infectious disease epidemiology: Concepts, methods, mathematical models, and public health*. New York: Springer-Verlag.
- Kripke, C. (2007). Antiretroviral prophylaxis for occupational exposure to HIV. *American Family Physician*, 76(3), 375.
- Kumar, P., Pore, P., & Patil, U. (2012). HIV/AIDS-related knowledge, attitudes and practices among high-school students of municipal corporation school in Pune. An interventional study. *Natl J. Community Med.*, 3(1), 74-79.
- Kurth, A. E., Celum, C., Baeten, J. M., Vermund, S. H., & Wasserheit, J. N. (2011). Combination HIV prevention: Significance, challenges, and opportunities. *Current HIV/AIDS Reports*, 8(1), 62-72.
- Lal, S.S, Vasan, R.S., Sarma, P.S., & Thankappan, K.R. (2000). Knowledge and attitude of college students in Kerala towards HIV/AIDS, sexually transmitted diseases and sexuality. *The National Medical Journal of India*, 13(5), 231-236.
- Leber, A., MacPherson, P., & Lee, B. C. (2008). Epidemiology of infectious syphilis in Ottawa. *Canadian Journal of Public Health*, 99(5), 401-405.
- Lehman, D. R., Davis, C. G., Delongis, A., Wortman, C. B., Bluck, S., Mandel, D. R., & Ellard, L. V.M. (1990). The determinants of sexuality among adolescent school girls in Kenya. *East African Medical Journal*, 67(3), 191-200.
- Likoye, F. (2004). Knowledge and praxis: The implication of Freire's concept of critical consciousness for HIV and AIDS Awareness. (Unpublished Master Thesis), Kenyatta University.
- Lower Manya Krobo Municipal Health Directorate (2019). *Annual health report*. Unpublished.

- Lyss, S. B., Branson, B. M., Kroc, K. A., Couture, E. F., Newman, D. R. & Weinstein, R. A. (2007). Detecting unsuspected HIV infection with a rapid whole-blood HIV test in an urban emergency department. *JAIDS Journal of Acquired Immune Deficiency Syndromes*, 44(4), 435-442.
- Magnani R. J., Karim, M., Weiss, L., Bond, K., Lemba, M., & Morgan, G. (2002). reproductive health risk and protective factors among youth in Lusaka, Zambia. *Journal of Adolescent Health*, 30(1), 76-86.
- Malta, M., Strathdee, S. A., Magnanini, M. M., & Bastos, F. I. (2008). Adherence to antiretroviral therapy for human immunodeficiency virus/acquired immune deficiency syndrome among drug users: A systematic review. *Addiction*, 103(8), 1242-1257.
- Markson, L. E., Turner, B. J., Houchens, R., Silverman, N. S., Cosler, L., & Takyi, B. K. (1996). Association of maternal HIV infection with low birth weight. *JAIDS Journal of Acquired Immune Deficiency Syndromes*, 13(3), 227-234.
- Masood, M. S., & Alsonini, N. A. (2017). Knowledge and attitude about reproductive health and family planning among young adults in Yemen. *International Journal of Population Research*, 2, 1-9.
- Mayosi, B. M., Lawn, J. E., Van Niekerk, A., Bradshaw, D., Karim, S. S. A., Coovadia, H. M., & Team, L. S. A. (2012). Health in South Africa: Changes and challenges since 2009. *The Lancet*, 380(9858), 2029-2043.
- McGough, L. J. (2005). Syphilis in history: A response to 2 articles. *Clinical Infectious Diseases*, 41(4), 573-575.
- McGrath, J. (1982). Dilemmatics: The study of research choices and dilemmas. In J. E., McGrath, J. Martin, & R. A. Kulka (Eds.), *Judgment calls in research*. Beverly Hills: CA: Sage.
- McInnes, C., & Rushton, S. (2013). HIV/AIDS and securitization theory. *European Journal of International Relations*, 19(1), 115-138.
- McIntyre, P. (2004). *Protecting young people from HIV and AIDS: The role of health services*. Geneva: World Health Organisation.
- McManus, A., & Dhar, L. (2008). Study of knowledge, perception and attitude of adolescent girls towards STIs/HIV, safer sex and sex education: A cross sectional survey of urban adolescent school girls in South Delhi, India). *BMC Women's Health*, 8(1), 12.
- Meekers D., Klein M., & Foyet L. (2001). *Patterns of HIV risk behaviour and condom use among youth in Yaoundé and Douala, Cameroon*. Washington, DC: Population Services International.

- Milanzi, M., & Komba, G. (2005). *HIV/AIDS in higher learning institutions in Tanzania: An assessment of attitude towards voluntary counselling and testing among university students*. Online at: Publications OSSREA net/index.php.
- Mill, J. E. (2003). Shrouded in secrecy: Breaking the news of HIV infection to Ghanaian women. *Journal of Transcultural Nursing*, 14(1), 6-16.
- Ministry of Health, (2001). *AIDS/STI surveillance report*. The United Republic of Tanzania.
- Mittal, R., Rath, S., & Vemuganti, G. K. (2013). Ocular surface squamous neoplasia—Review of ETIO-Pathogenesis and an update on clinic-pathological diagnosis. *Saudi Journal of Ophthalmology*, 27(3), 177-186.
- Moletsane, R., de Lange, N., Mitchell, C., Stuart, J., Buthelezi, T., & Taylor, M. (2007). Photo-voice as a tool for analysis and activism in response to HIV and AIDS stigmatization in a rural KwaZulu-Natal school. *Journal of Child and Adolescent Mental Health*, 19(1), 19- 28.
- Monasch, R., & Mahly, M. (2006). Young people: The Centre of the HIV Epidemic. In Ross, D.A, Dick, B, and Ferguson, J., (Eds.), *Preventing HIV/AIDS in young people: A systematic review of the evidence from developing countries* (pp. 15-42). *WHO Technical Report Series 938*. Geneva: World Health Organisation.
- Montessori, V., Press N., Harris, M. Akagi, L., & Montaner J. S. G. (2004). Adverse effects of antiretroviral therapy for HIV infection. *Canadian Medical Association Journal*, 170(2), 229-238.
- Mugenda, O. M., & Mugenda, A. G. (2003). *Research methods: Qualitative and quantitative approaches*. Nairobi: Acts Press.
- Munro, S., Lewin, S., Swart, T., & Volmink, J. (2007). A review of health behaviour theories: how useful are these for developing interventions to promote long-term medication adherence for TB and HIV/AIDS? *BMC Public Health*, 7(1), 104.
- Musyoki, H., Kellogg, T. A., Geibel, S., Muraguri, N., Okal, J., Tun, W., Fisher, H. R., Dadabhai, S., Sheehy, M., & Kim, A. A. (2015). Prevalence of HIV, Sexually transmitted infections, and risk behaviours among female sex workers in Nairobi, Kenya: Results of a respondent driven sampling study. *AIDS Behav*; 19 (1), S46–S58.
- Muturi, N. W. (2005). Communication for HIV/AIDS prevention in Kenya: Socialcultural considerations. *Journal of Health Communication*, 10(1), 77-98.
- NACC (2012). *The Kenya AIDS Epidemic update 2011*. Nairobi: NASCOP Press.

- Nachega, J. B., Uthman, O. A., Anderson, J., Peltzer, K., Wampold, S., Cotton, M. F., & McIntyre, J. A. (2012). Adherence to antiretroviral therapy during and after pregnancy in low-middle-and-high-income countries: a systematic review and meta-analysis. *AIDS*, 26(16), 2039.
- Nagelkerke, N. J., Jha, P., Vlas, S. J. d., Korenromp, E. L., Moses, S., Blanchard, J. F., & Plummer, F. A. (2002). Modelling HIV/AIDS epidemics in Botswana and India: Impact of interventions to prevent transmission. *Bulletin of the World Health Organization*, 80, 89-96.
- National AIDS Control Council, (2008). *UNGASS 2008 country report for Kenya*. Nairobi: NACC, Office of the President.
- National AIDS Control Programme (2019). *Annual report*. Accra: NACP.
- National Center for Health, S. (2015). *Health, United States with special feature on adults aged 55–64*. Hyattsville, MD: National Center for Health Statistics.
- National Council for Population and Development [NCPD] (2003). *Adolescent reproductive health development policy*. Retrieved from: http://www.africanchildforum.org/clar/policy%20per%20country/kenya/kenya_reproductivehealth_2003_en.pdf
- Nau, D. (1995). Mixing methodologies: Can bimodal research be a viable post-positivist tool. *The Qualitative Report*, 2(3), 1-5.
- Netshivhuyu, G. (2017). *Knowledge, attitudes and behaviour towards HIV/AIDS among youth in Namakgale Township in Mopani District*. Limpopo Province, South Africa.
- Neupane, S., & Doku, D. T. (2012). Determinants of time of start of prenatal care and number of prenatal care visits during pregnancy among Nepalese. *Women. Journal of Community Health*, 37(4), 865-873.
- Newell, M.-L. (1998). Mechanisms and timing of mother-to-child transmission of HIV-1. *AIDS*, 12(8), 831-837.
- Newman, W. L. (2000). *Social research methods: Qualitative and quantitative approaches*. Boston: Allyn and Bacon.
- Njogu, W. & Martin, T. C. (2003). The persisting gap between HIV/AIDS knowledge and perception among Kenyan youth. *GENUS*, 62(2)135-168.
- Ntozi, J.P.M., & Kirunga, C.T. (1997). HIV/AIDS, change in sexual behaviour and community attitudes in Uganda. *Health Transition Review*, 7, 157-174.

- Nubed, C. K., & Akoachere, J.F. T. K. (2016). Knowledge, attitudes and practices regarding HIV/AIDS among senior secondary school students in Fako Division, South West Region, Cameroon. *BMC Public Health*, 16(1), 847.
- Ocran, J.C. (2004). Socioeconomic determinants of self-reported change in sexual behaviour following knowledge about HIV/AIDS. Paper Presented at the National HIV/AIDS Research Conference (NHARCON) held at La Palm Royal Beach Hotel, Accra, Ghana.
- Odirile, L. W. (2000). HIV/AIDS: Knowledge, attitudes and beliefs among University of Botswana undergraduate students. (Unpublished Undergraduate Dissertation), University of Botswana.
- Odu, O. O., Asekun-Olarinmoye, E. O., Bamidele, J. O., Egbewale, B. E., Amusan, O. A., & Olowu, A. O. (2008). Knowledge and attitudes to HIV/AIDS and sexual behaviour of students in a tertiary institution in south-western Nigeria. *The European Journal of Contraception and Reproductive Health Care*, 13(1), 90-96.
- Ofori, R. & Dampson, D. G. (2011). *Research methods and statistics using SPSS*. Amakom-Kumasi: Payless Publications Limited.
- Olasode, O. A. (2007). Sexual behaviour in adolescents and young people attending a sexually transmitted disease clinic, Ile Ife, Nigeria. *Indian journal of sexually Transmitted Diseases and AIDS*, 28(2), 83.
- Oleske, J. & Scott, G. (2001). *Working group on antiretroviral therapy and medical management of HIV-infected children*. London: NPHRC, HRSA, NIH.
- Onah, H., Mbah, A., Chukwuka, J., & Ikeme, A. (2004). HIV/AIDS awareness and sexual practices among undergraduates in Enugu, Nigeria. *The Nigerian Postgraduate Medical Journal*, 11(2), 121.
- Opong, A. K., & Oti-Boadi, M. (2013). HIV/AIDS knowledge among undergraduate university students: Implications for health education programs in Ghana. *African Health Sciences*, 13(2), 270-277.
- Orrell, M., Spector, A., Thorgrimsen, L., & Woods, B. (2005). A pilot study examining the effectiveness of maintenance cognitive stimulation therapy (MCST) for people with dementia. *International Journal of Geriatric Psychiatry*, 20(5), 446-451.
- Owens, D. K., Davidson, K. W., Krist, A. H., Barry, M. J., Cabana, M., Caughey, A. B., & Landefeld, C. S. (2019). Risk assessment, genetic counseling, and genetic testing for BRCA-related cancer: US Preventive Services Task Force recommendation statement. *Jama*, 322(7), 652-665.

- Owusu, A. Y. (2019). Social contexts of living with HIV/AIDS in the Eastern Region of Ghana. *İstanbul Üniversitesi Sosyoloji Dergisi*, 39(2), 425–454.
- Pavljasevic, S., & Dawson, F. (2002). *Phase synchronization using zero crossing sampling digital phase-locked loop*. Paper presented at the Proceedings of the Power Conversion Conference-Osaka 2002 (Cat. No. 02TH8579).
- Petersen, I., & Swartz, L. (2002). Primary health care in the era of HIV/AIDS. Some implications for health systems reform. *Social Science & Medicine*, 55(6), 1005-1013.
- Plattner, I. E. (2010). Does testing HIV negative encourage potentially dangerous beliefs? A study with young people in Botswana. *Journal of HIV/AIDS Research*, 2, 58-65.
- Poeta, J., Linden, R., Antunes, M. V., Real, L., Menezes, A. M., Ribeiro, J. P., & Sprinz, E. (2011). Plasma concentrations of Efavirenz are associated with body weight in HIV-positive individuals. *Journal of Antimicrobial Chemotherapy*, 66(11), 2601-2604.
- Popovic, M., Sarngadharan, M. G., Read, E., & Gallo, R. C. (1984). Detection, isolation and continuous production of cytopathic retroviruses (HTLV-III) from patients with AIDS and pre-AIDS. *Science*, 224(4648), 497-500.
- Population Council (2006). *Behavioural and social theories commonly used in HIV Research*. Washington, DC: The Population Council.
- Powers, K. A., Poole, C., Pettifor, A. E., & Cohen, M. S. (2008). Rethinking the heterosexual infectivity of HIV-1: a systematic review and meta-analysis. *The Lancet Infectious Diseases*, 8(9), 553-563.
- Price, A. J., Fletcher, A. J., Schaller, T., Elliott, T., Lee, K., Kewal Ramani, V. N., & James, L. C. (2012). CPSF6 defines a conserved capsid interface that modulates HIV-1 replication. *PLoS Pathog*, 8(8), e1002896.
- Reif, S., Geonnotti, K. L., & Whetten, K. (2006). HIV infection and AIDS in the Deep South. *American Journal of Public Health*, 96(6), 970-973.
- Resenstock, I. (1974). *Why people use health services*. Milbank memorial Fund Quarterly New York
- Rich, J. D., Merriman, N. A., Mylonakis, E., Greenough, T. C., Flanigan, T. P., Mady, B. J., & Carpenter, C. C. (1999). Misdiagnosis of HIV infection by HIV-1 plasma viral load testing: a case series. *Annals of Internal Medicine*, 130(1), 37-39.

- Richters, J., Grulich, A., Ellard, J., Hendry, O., & Kippax, S. (2003). HIV transmission among gay men through oral sex and other uncommon routes: case series of HIV seroconverters, Sydney. *AIDS*, 17(15), 2269-2271.
- Rom, W. N., & Markowitz, S. B. (2007). *Environmental and occupational medicine*. Lippincott: Williams & Wilkins.
- Rosen, S., & Fox, M. P. (2011). Retention in HIV care between testing and treatment in sub-Saharan Africa: a systematic review. *PLoS Med*, 8(7), e1001056.
- Ross, D. A., Dick, B., & Ferguson, J. (2006). *Preventing HIV/AIDS in young people: A systematic review of the evidence from developing countries*. World Health Organization.
- Rubin, D. T., Huo, D., Kinnucan, J. A., Sedrak, M. S., McCullom, N. E., Bunnag, A. P., & Hart, J. (2013). Inflammation is an independent risk factor for colonic neoplasia in patients with ulcerative colitis: A case-control study. *Clinical Gastroenterology and Hepatology*, 11(12), 1601-1608.
- Sarantakos, S. (2013). *Social research* (4th ed.). New York: Palgrave Macmillan.
- Saunders, M., Lewis, P. & Thornhill, A. (2012). *Research methods for business students* (6th ed.). Boston: Pearson Education Limited.
- Scheer, S., Parks, C., McFarland, W., Page-Shafer, K., Delgado, V., Ruiz, J. & Klausner, J. (2003). Self-reported sexual identity, sexual behaviors and health risks: Examples from a population-based survey of young women. *Journal of Lesbian Studies*, 7, 69-83.
- Schneider, H., & Fassin, D. (2002). Denial and defiance: A socio-political analysis of AIDS in South Africa. *AIDS*, 16, S45-S51.
- Seidu, A. (2006). *Modern approach to research in educational administration for students*. Kumasi: Payless Publication Ltd.
- Sekyere, E.A. (2012). *Teachers' guide on topical issues for promotion and selection interviews and general professional update*. Asuoeyboa, Kumasi: Afosek Educational Consult.
- Selik, R. M., Mokotoff, E. D., Branson, B., Owen, S. M., Whitmore, S., & Hall, H. I. (2014). Revise surveillance case definition for HIV infection-United States, 2014. *Morbidity and Mortality Weekly Report: Recommendations and Reports*, 63(3), 1-10
- Sepkowitz, K. A. (2001). AIDS: The first 20 years. *New England Journal of Medicine*, 344(23), 1764-1772.

- Shaffer, D. N., Ngetich, I. K., Bautista, C. T., Sawe, F. K., Renzullo, P. O., Scott, P. T., & Robb, M. L. (2010). HIV-1 incidence rates and risk factors in agricultural workers and dependents in rural Kenya: 36-Month Follow-Up of the Kericho HIV Cohort Study. *JAIDS Journal of Acquired Immune Deficiency Syndromes*, 53(4), 514-521.
- Shamoo, A. E., & Resnik, D. B. (2009). *Responsible conduct of research*: Oxford University Press.
- Sharp, P. M., & Hahn, B. H. (2011). Origins of HIV and the AIDS pandemic. *Cold Spring Harbor Perspectives in Medicine*, 1(1), a006841.
- Shuttleworth, M. (2008). Descriptive research design. Retrieved from: <http://www.experimentresources.com/descriptive-research-design.html>
- Sibanda, A., Woubalem, Z., Hogan, D. P., & Lindstrom, D. P. (2003). The proximate determinants of the decline to below replacement fertility in Addis Ababa, Ethiopia. *Studies in Family Planning*, 34(1), 1-7.
- Sikes, P. (2004). Methodology, procedures and ethical concerns. In C. Opie (ed.), *Doing educational research*, (pp. 15-33). London: Sage.
- Simms, I., Fenton, K. A., Ashton, M., Turner, K. M. E., Crawley-Boevey, E. E., Gorton, R., & Solomou, M. (2005). The Re-emergence of syphilis in the United Kingdom: The new epidemic phases. *Sexually Transmitted Diseases*, 32(4), 220-226.
- Simonds, R. J. (1993). HIV transmission by organ and tissue transplantation. *AIDS*, 7, 35-38.
- Snelling, D., Omariba, D. W. R., Hong, S., Georgiades, K., Racine, Y., & Boyle, M. H. (2007). HIV/AIDS knowledge, women's education, epidemic severity, and protective sexual behavior in low- and middle-income countries. *Journal of Biosocial Science*, 39, 421-442.
- Staff, P. E. (2011). New drugs and indications in 2010: Inadequate assessment; patients at risk. *Prescribe International*, 20(105-107), 109-110.
- Stangl, A. L., Lloyd, J. K., Brady, L. M., Holland, C. E., & Baral, S. (2013). A systematic review of interventions to reduce HIV-related stigma and discrimination from 2002 to 2013: how far have we come? *Journal of the International AIDS Society*, 16, 18734.
- Stephens, L. L., Bachhuber, M. A., Seloilwe, E., Gungqisa, N., Mmelesi, M., Bussmann, H. & Wester, C. W. (2012). HIV-Related knowledge, attitudes, and practice among educated young adults in Botswana. *Journal of AIDS and HIV Research*, 4(6), 159-164.

- Sullivan, P. S., Salazar, L., Buchbinder, S., & Sanchez, T. H. (2009). Estimating the proportion of HIV transmissions from main sex partners among men who have sex with men in five US cities. *AIDS*, 23(9), 1153-1162.
- Tagoe, M., & Aggor, R. (2009). Knowledge, behaviour, perceptions and attitudes of University of Ghana students towards HIV/AIDS: What does behavioural surveillance survey tell us? *Journal of Health and Human Services Administration*, 51-84.
- Tashakkori, A. & Teddlie, C. (2009). *Foundations of mixed methods research*. Thousand Oaks: Sage Publications.
- Tavakol, M., Mohagheghi, M. A., & Dennick, R. (2008). Assessing the skills of surgical residents using simulation. *Journal of Surgical Education*, 65(2), 77.
- Tegang, S. P., Abdallah, S., Emukule, G., Luchters, S., Kingola, N., Barasa, M., & Mwarogo, P. (2010). Concurrent sexual and substance-use risk behaviours among female sex workers in Kenya's Coast Province: Findings from a behavioural monitoring survey. *SAHARA-J: Journal of Social Aspects of HIV/AIDS*, 7(4).
- Temin, H. M., & Bolognesi, D. P. (1993). Where has HIV been hiding? *Nature*, 362(6418), 292-293.
- Temmerman, M., Quaghebeur, A., Mwanyumba, F., & Mandaliya, K. (2003). Mother-to child HIV transmission in resource poor settings: How to improve coverage? *AIDS*, 17(8), 1239-1242.
- Tenkorang, E. Y., Owusu, A. Y., Laar, A. K., & Yeboah, E. H. (2019). Housing, psychosocial and adherence counseling among HIV+ persons in Ghana. *Health Promotion International*, 34(2), 204-214.
- Trevethan, R. (2017). Deconstructing and assessing knowledge and awareness in public health research. *Frontiers in public health*, 5, 194.
- Tuckman, B. (2006). *Motivation in learning & teaching Educ. Policy and Leadership*, 901. Columbus, Ohio: The Ohio State University.
- Tuju, R. (1996). Counseling and testing for HIV/AIDS prevention. *AIDS Captions*, 3(2), 14.
- Twa-Twa, J. M. (1997). The role of the environmental in the sexual activity of school students in Tororo and Pallisa Districts of Uganda. *Health Transition Review*, 7(Suppl), 67-81.
- Ulasi, C. I., Preko, P. O., Baidoo, J. A., Bayard, B., Ehiri, J. E., Jolly, C. M., & Jolly, P. E. (2009). HIV/AIDS-related stigma in Kumasi. *Ghana. Health and Place*, 15(1), 255-262.

- UNAIDS & WHO (2002). *Epidemiological fact sheets on HIV/AIDS and sexually transmitted infections*. Geneva: UNAIDS Manuscript.
- UNAIDS (1997). WHO: *HIV and infant feeding. A policy statement developed collaboratively by UNAIDS UNICEF and WHO*. Geneva: UNAIDS.
- UNAIDS (1997). *Impact of HIV and sexual health education on the sexual behaviour of young people: A review update*. Geneva: UNAIDS.
- UNAIDS (2003). *HIV/AIDS and youth: Hope for tomorrow*. Geneva: UNAIDS.
- UNAIDS (2004). *2004 Report on the global AIDS epidemic*. Geneva: UNAIDS.
- UNAIDS (2010). *Global report: UNAIDS report on the global AIDS epidemic 2010*. Geneva: UNAIDS.
- UNAIDS (2016). *Fact sheet*. Geneva: UNAIDS.
- UNAIDS (2018). *Global AIDS monitoring 2018*. Ukraine: UNAIDS.
- UNAIDS (2019). *Data on the state of the HIV/AIDS Epidemic*. Geneva: UNAIDS.
- UNESCO (2011). *Competency framework for teachers*. Paris: UNESCO.
- UNESCO (2005a). *Reducing HIV/AIDS vulnerability among students in the school setting: A training manual*. Bangkok: UNESCO.
- UNICEF (2011). *Opportunity in crisis: Preventing HIV from early adolescence to young adulthood*. Paris: UNICEF.
- United Nations Fund for Population Activities [UNFPA] (2003a). *State of world population 2003. Making 1 billion count: Investing in adolescents' health and rights*. New York: UNFPA.
- United Nations General Assembly Special Session [UNGASS] (2001). *Preventing HIV/AIDS among young people*. UNGASS Fact Sheet: Global Crisis-Global Action. New York: UNGASS.
- University of Arizona, (2004). *Immunology and HIV*. The Biology Project. Available at: <http://www.biology.arizona.edu>.
- USAID (2011). *HIV/AIDS health profile: Sub-Saharan Africa*. U.S. Agency for International Development Publication.
- Uwalaka, E., & Matsuo, H. (2002). Impact of knowledge, attitude, and beliefs about AIDS on sexual behavioural change among college students in Nigeria: The case of the University of Nigeria, Nsukka. *West Africa Review*, 3(2), 1-13.

- Vogel, M., Dominguez, S., Bhagani, S., Azwa, A., Page, E., Guiguet, M., & Nelson, M. (2010). Short communication treatment of acute HCV infection in HIV-positive patients: Experience from a multi-centre European cohort. *Antiviral Therapy*, *15*, 267-273.
- Wairimu, H. W. (2014). Knowledge, attitudes and practices concerning HIV/AIDS prevention among youth in Eastleigh location in Nairobi county. (Doctoral dissertation), University of Nairobi.
- Walker, B. D. (2007). Elite control of HIV Infection: implications for vaccines and treatment. *Topics in HIV medicine: International AIDS Society*, *15*(4), 134-136.
- Weeks, M. R., Mosack, K. E., Abbott, M., Sylla, L. N., Valdes, B., & Prince, M. (2004). Microbicide acceptability among high-risk urban US women: Experiences and perceptions of sexually transmitted HIV prevention. *Sexually Transmitted Diseases*, *31*(11), 682.
- White, L. (2005). *Communication strategies to promote behaviour change in HIV/AIDS/STI Programmes: A Case Study of Jamaica 1999-2003*. Mona: The Caribbean Institute of Media and Communication (CARIMAC), University of the West Indies, Jamaica.
- WHO (2000). *The world health report 2000: Health systems: Improving performance*. Geneva: World Health Organization.
- WHO (2002). *The world health report 2002: Reducing risks, promoting healthy life*: World Health Organization.
- WHO (2010). *AIDS epidemic update: December 2009*. WHO Regional Office Europe.
- WHO (2015). *Consolidated Guidelines on HIV Testing Services: 5Cs: consent, confidentiality, counselling, correct results and connection 2015*.
- WHO (2016). *Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: recommendations for a public health approach*. Geneva: World Health Organization.
- WHO (2017). *Guidelines for managing advanced HIV disease and rapid initiation of anti-retroviral therapy*. Geneva: World Health Organization.
- WHO (2018). *Meeting of the implementation core group of WHO global task force on latent TB infection and country stakeholders on implementation tools and joint TB and HIV programming to scale up TB preventive treatment*. Geneva: World Health Organization.

- WHO, (2012). *WHO, UNODC, UNAIDS technical guide for countries to set targets for universal access to HIV prevention, treatment and care for injecting drug users–2012 revision*. Geneva: World Health Organization.
- Winfield, E. B. & Whaley, A. L. (2002). A comprehensive test of the health belief model in the prediction of condom use among African American College Students. *Journal of Black Psychology*, 28(4), 330-346.
- Wodi, B. E. (2005). HIV/AIDS knowledge, attitudes, and opinions among adolescents in the River States of Nigeria. *International Electronic Journal of Health Education*, 8, 86-94.
- Xiaoyan, X., & Sato, M. K. (2011). Quality of life and related factors among people living with HIV in China. *Journal of Nursing and Healthcare of Chronic Illness*, 3(4), 513-520.
- Yin, R. K. (2003). *Case study research: Design and methods* (3rd ed.). Thousand Oaks, CA: Sage.
- Young, T., Arens, F. J., Kennedy, G. E., Laurie, J. W., & Rutherford, G. W. (2007). Antiretroviral Post-Exposure Prophylaxis (PEP) for occupational HIV Exposure. *Cochrane Database of Systematic Reviews*, 1, CD002835.
- Zellner, S. L. (2003). Condom use and accuracy of AIDS Knowledge in Cote d'Ivoire. *International Family Planning Perspectives*, 29(1), 41-47.

APPENDICES

APPENDIX A

Letter of Introduction



26th February, 2020

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

LETTER OF INTRODUCTION: MR. OFORI MAXWELL

We write to introduce Ofori Maxwell to your outfit. He is a second year M. Phil Social Studies student with registration number 8180140006 from the Department of Social Education.

As part of the requirements for the award of the M. Phil degree he is undertaking a research on the topic "*HIDAIDS Knowledge of Senior High Senior High School Students of the Lower Manya Krobo Municipality of the Eastern Region of Ghana*"

The data for the research would be collected mainly through interviews and questionnaire.

We wish to assure you that any information provided would be treated confidential.

Thank you.

Yours faithfully,

A handwritten signature in black ink, appearing to be 'M. Nyala'.

Margaret G. Nyala (Mrs.)
For: Head of Department

APPENDIX B

Questionnaire

I am a student at the University of Education, Winneba in Department of Social Studies Education conducting a research on **HIV/AIDS knowledge of Senior High School students in the Lower Manya Krobo municipality** for the attainment of a Master of Philosophy degree in Social Studies.

Your responses will be treated with utmost confidentiality and will only be used for education purposes.

Kindly put a tick (/) where appropriate.

SECTION ONE: DEMOGRAPHICS

1. How old are you (in years)?
 15-16yrs 19-20yrs 23-24yrs
 17-18yrs 21-22yrs
2. What is your gender?
a. Male b. Female
3. What is your religion?
Christian Muslim Other (Specify) _____ 4.

What is your denomination?

- a. Catholic
- b. Methodist
- c. Church of Pentecost
- d. Presbyterian
- e. Other (Specify) _____

SECTION 2: KNOWLEDGE RELATED TO HIV/AIDS

- 5) Are you aware of HIV/AIDS
a. Yes b. No
- 6) Have you ever received information on HIV/AIDS?
a. Yes b. No
- 7) If you have received information on HIV/AIDS, how much information about HIV/AIDS do you gain from following sources?

a. Television	No ()	Little ()	A lot ()
b. Radio	No ()	Little ()	A lot ()
c. Newspapers	No ()	Little ()	A lot ()
d. Pamphlet/Poster	No ()	Little ()	A lot ()
e. Healthcare workers	No ()	Little ()	A lot ()
f. Campaigns	No ()	Little ()	A lot ()
g. Religious Leaders	No ()	Little ()	A lot ()
h. Friends	No ()	Little ()	A lot ()
i. Sexual Partners	No ()	Little ()	A lot ()
j. In class at school	No ()	Little ()	A lot ()
k. School health education	No ()	Little ()	A lot ()
l. Peers	No ()	Little ()	A lot ()
m. Family members	No ()	Little ()	A lot ()
n. Internet	No ()	Little ()	A lot ()

8. Is HIV a Bacterium?

- a. Yes () b. No () c. Don't Know d. Don't Remember ()

9. Is HIV a Virus?

- a. Yes () b. No () c. Don't Know d. Don't Remember ()

10. Does HIV cause AIDS?

- a. Yes () b. No () c. Don't Know d. Don't Remember ()

11. Is HIV/AIDS a growing problem in this community?

- a. Yes () b. No () c. Don't Know d. Don't Remember ()

12. Is there a cure for AIDS?

- a. Yes () b. No () c. Don't Know ()

d) Explain your answer _____

13. A person can be infected with HIV and not have the disease AIDS

- a. Yes () b. No () c. Don't Know d. Don't Remember ()

14. Can a healthy looking person have HIV/AIDS?

- a. Yes () b. No () c. Don't Know d. Don't Remember ()

15. To what extent do you feel the following practices transmit HIV/AIDS?

(where 4 is Strongly agree, 3 is Agree, 2 is neutral, 1 Disagree and 0 Strongly Disagree)

HIV/AIDS TRANSMISSION	5	4	3	2	1
Sexual intercourse					
Contact with blood of infected person					
Casual contact with infected person (i.e. sharing food, cup, glass, handshake, hugging, clothes)					
Not using condoms					
Contact with infected person's toothbrush/shaving material					
During Pregnancy					
During Birth					
Through Breast Milk					
Blood transfusion					
Sharing Needles (drug use), razor blades					
Unclean Medical Equipment					
Kissing					
Mosquito/Insect bites					

16. Which are the symptoms of HIV/AIDS? Kindly tick the relevant ones.
- Fever ()
 - Diarrhoea ()
 - Nausea and Vomiting ()
 - Weight loss ()
 - Persistent skin rashes ()
 - Fatigue ()
17. Can a person do anything to protect him/herself from getting HIV/AIDS?
- Yes ()
 - No ()
 - Don't Know ()
 - Don't Remember ()
18. How can people protect themselves from getting infected with HIV/AIDS?
- Abstain from sex ()
 - Non penetrative sex/thigh sex ()
 - Always use condoms ()
 - Limit number of sex partners ()
 - Have only one sex partner ()
 - Avoid sex workers ()
 - Have sex with a virgin ()
 - Use sterilized needles ()
 - Require partner to take blood test()
19. In your own opinion, what is the probability that you may get infected with HIV/AIDS?
- Very high ()
 - High ()
 - Neutral ()
 - Low ()
 - Very low ()
 - ()

**SECTION 3: FACTORS THAT INHIBIT THE APPLICATION OF
HIV/AIDS KNOWLEDGE OF SHS STUDENTS**

Statement	Strongly agree N (%)	Agree N (%)	Uncertain N (%)	Disagree N (%)	Strongly disagree N (%)
20. Religion is the cause of students' failure in applying their knowledge in HIV/AIDS					
21. The youth have limited recognition of personal risk of HIV infection					
22. The youth are more vulnerable to HIV/AIDS due to their biological condition					
23. Your friends request for the HIV/AIDS status of their partners before sex					
24. Schools, churches or communities give sexual health education					
25. HIV/AIDS is a curse from the gods					
26. HIV/AIDS awareness programmes in Ghana are more effective for young people					

**SECTION FOUR: INFLUENCE OF HIV/AIDS KNOWLEDGE ON
ADOLESCENTS' SEXUAL BEHAVIOUR**

27. Have you had sexual intercourse before?
a. Yes b. No
28. In the past year have you: *please tick one response.*
a. Had sexual relations only with a regular partner ()
b. Had sexual relations with more than one partner ()
c. Had no sexual relation ()
29. Did you use a condom the last time you had sex? Yes () b. No ()
30. Would you use condoms if you get them for free?
Yes () b. No ()
31. Would you like to have an HIV test?
Yes () b. No ()
32. Have you changed your sexual behaviour/habits because of information gained from HIV/AIDS awareness campaigns or programmes?

a. Yes () b. No () c. Somewhat ()

34. Do you think that the youth should have an informative role concerning HIV/AIDS to the public?

a. Yes () b. No ()

35. Who is most suitable to give information about HIV/AIDS?

a. Doctor () b. Teacher () c. Parent () d. Fellow student ()

36. More HIV/AIDS programmes in schools and institutions are necessary.

a. Yes () b. No ()

37. Any other comment _____

Thank you very much for your time and cooperation.



APPENDIX C

CALCULATIONS INDICATING HOW THE QUESTIONNAIRE FOR EACH SCHOOL BASED ON THEIR POPULATION WERE ARRIVED

AT

Total number of the SHS Three (3) students in the LMKM.

$$\text{Boys} = \underline{1,012}$$

$$\text{Sample} = 300$$

$$\text{Girls} = \underline{1,547}$$

$$\text{Boys} = 120$$

$$\text{Total} = \underline{2,559}$$

$$\text{Girls} = \underline{180}$$

$$\text{Total} = \underline{300}$$

S/N	SHS	SEX	
		BOYS	GIRLS
1	Manya Krobo SHS	$\frac{369}{2559} \times 300$ = 44	$\frac{324}{2559} \times 300$ = 38
2	Akro SHTS	$\frac{298}{2559} \times 300$ = 35	$\frac{245}{2559} \times 300$ = 29
3	Akuse Methodist SHS	$\frac{345}{2559} \times 300$ = 41	$\frac{322}{2559} \times 300$ = 37
4	Krobo Girls' Presby SHS	—	$\frac{656}{2559} \times 300$ = 76

Formular:

$$Q = \frac{SP}{TP} \times N \text{ (Researcher's construct)}$$

Where:

N= Desired sample size

SP = Specific population per school

TP = Total population for all schools

Q= Questionnaires allocated per school