EFFICACY OF STRATEGIES USED TO MITIGATE HIV RISKY SEXUAL BEHAVIOR AMONG STUDENTS OF INSTITUTIONS OF HIGHER LEARNING IN WESTERN KENYA

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A thesis submitted in partial fulfillment of the requirements of the award of the Degree of Doctor of Philosophy in Disaster Management and Sustainable Development of Masinde Muliro University of Science and Technology

May, 2022

DECLARATION AND CERTIFICATION

This thesis is my original work and has not been presented for a degree or any other award in any other university.

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DEDICATION

This thesis is dedicated to my parents, Prof. Billy Mark Menya Kariaga and Dr Mary Goretti Ohanya Odera Kariaga.

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ABSTRACT

Researchers have confirmed that the reason for the relatively high HIV incidence among people between 15-24 years globally is Risky Sexual Behavior. Researchers subsequently identified a challenge regarding effective mitigation of the behaviour world over. They further identified Institutions of Higher Learning, which host a significant proportion of youth, as fertile breeding grounds for this behaviour. This study consequently evaluated the strategies employed in the mitigation of HIV Risky Sexual Behavior among students in these institutions in Western Kenya overall, and specifically; determined the nature and extent of HIV Risky Sexual Behavior, and further more evaluated the HIV prevention behavioural, biomedical and structural strategies in place at these institutions. HIV denial theory, process evaluation theory,UNAIDS (2010) combination HIV prevention model, and the HIV Risk taking Behaviour Scale (HRBS) model guided the study. Adopted was the cross-sectional survey design for objective one and evaluation research design for objectives 2-4. The study employed qualitative and quantitative approaches to ensure triangulation and crosschecking of the research process. Employed were probability and non-probability sampling techniques generally and specifically, cluster sampling then simple random sampling. Chosen was a sample size of 399 students from a population of 13,002 students at seven institutions. Key informants were sampled purposively as follows; 5 NGO officials, 6 county government officials, 6 officials working in health care centers and 6 dean of students and 1 student counsellor.Selection of four Focus Group Discussions was purposive with each FGD having eight purposively selected student leaders from four institutions. An interview administered semi-structured questionnaire was employed to collect data from students, an FGD guide for the FGDs and Key Informant interview guides for the key informants. Descriptive statistics, an index-score, qualitative analysis and chi-square and were done for analysis. The HIV Risky Sexual Behavior index-score revealed that a majority 269 (67.4%) of the respondents are involved in HIGH HIV Risky Sexual Behaviors. From chi-square tests, regarding behavioural strategies, information provision and counselling and other forms of psycho-social support are found to be statistically significant with p-value = 0.007 and p-value = 0.080 respectively. For the biomedical strategy, provision of ARVs and promotion of Sex and Reproductive Health services were found to be the most successful both at at p-value = 0.000. Considering structural strategies, there is a big gap in providing them. They include lack of availability of structures to address gender inequalities, violation of human rights, and homophobia related discrimination. The study concludes that HIV incidence and prevalence rates in these institutions are likely to double in the near future if stakeholders continue to apply mitigation strategies in the exact manner they are currently doing. At behavioural level, the study thus recommends enhancing counselling and other forms of psychosocial support and stigma, and discrimination reduction programmes. At biomedical level, the study recommends an enhancement of the provision of male and female condoms, HIV testing and counselling services, testing and treatment of STIs, provision of Needle and Syringe Programmes, provision of Opioid Substitution Therapy and promotion of VMMC. At structural level, the study recommends greatly enhancing; structures to address gender inequalities among the students, structures addressing violation of the students' human rights, and structures addressing HIV related discrimination of the same students.

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LIST OF ABBREVIATIONS AND ACRONYMS

AAU	Association of African Universities
ACU	AIDS Control Unit
ART	Antiretroviral Therapy
BC	Behaviour Change
BCC	Behaviour Change Communication
CBO	Community Based Organization
CDC	Centre for Disease Control
CSW	Commercial Sex Workers
FBO	Faith Based Organisation
FGD	Focused Group Discussion
GoK	Government of Kenya
HSP	Health Service Professionals
HIV	Human Immuno-Deficiency Virus
HTS	HIV Testing Services
IHL	Institutions of Higher Learning
IUCEA	Inter University Council of East Africa
KAIS	Kenya AIDS Indicator Survey
KARPR	Kenya AIDS Response Progress Report
KARSCOM	Kenya AIDS Research Coordinating Mechanism
KASF	Kenya AIDS Strategic Framework
KDHS	Kenya Demographic and Health Survey
KEMRI	Kenya Medical Research Institute

KENPHIA	Kenya Population-based HIV Impact Assessment
KEPH	Kenya Essential Package for Health
KIIs	Key Informant Interviews
KMTC	Kenya Medical Training College
KNASP	Kenya National AIDS Strategic Plan
KNBS	Kenya National Bureau of Statistics
KUCCPS	Kenya Universities and Colleges Central Placement Services
LGAs	Local Government Authorities
LG	Local government
LGBTIs	Lesbians, Gays, Bisexual, Transgender and Intersex individuals
LGBTQ	Lesbians, Gays, Bisexual, Transgender and Queer/Questioning individuals
M&E	Monitoring & Evaluation
MMUST	Masinde Muliro University of Science and Technology
MoH	Ministry of Health
MSM	Men who have Sex with Men
NACC	National AIDS Control Council
NACOSTI	National Commission for Science and Technology Innovation
NASCOP	National AIDS and STI Control Program
NGO	Non Governmental Organization
NSP	Needle and Syringe Programmes
OST	Opioid Substitution Therapy
OVC	Orphans and Vulnerable Children
PEP	Post Exposure Prophylaxis

PLHIV	People Living With HIV
PrEP	Pre Exposure Prophylaxis
PWID	People Who Inject Drugs
RA	Research Assistant
RHS	Reproductive Health Services
SDGs	Sustainable Development Goals
SH	Sexual Health
SIHL	Students in Institutions of Higher Learning
SRH	Sexual and Reproductive Health
SRHR	Sexual and Reproductive Health Rights
SRHH	Sexual and Reproductive Health and HIV
STIs	Sexual Transmitted Infections
SSWs	Student Sex Workers
SWA	Students Welfare Association
UNAIDS	Joint United Nations Programme for HIV and AIDS
UNGASS	United Nations General Assembly Special Session on AIDS
USAID	United States Agency for International Development
VMMC	Voluntary Medical Male Circumcision
WHO	World Health Organization
WHORC	World Health Organization Reference Centre
YFS	Youth Friendly Service
YPIC	Youth for Population Information & Communication
YSRH	Youth Sexual and Reproductive Health

DEFINITION OF OPERATIONAL TERMS AND CONCEPTS

Institutions of Higher Learning: In this study refers to universities and colleges that offer tertiary level or post-secondary formal education.

Interventions: In this study refer to short-term actions made by stakeholders towards the mitigation of HIV Risky Sexual Behaviour.

Mitigation: In this study means preventing, controlling, curbing and managing HIV Risky Sexual Behaviour in Institutions of Higher Learning.

Sexual relationship: In this study refers to an intimate relationship involving sexual intercourse.

Strategy: In this study refers to specific long-term measures guided by UNAIDS (2010) put in place by various stakeholders in order to mitigate HIV RiskySexual Behavior.

Student: In this study refers to someone who attends an Institution of Higher Learning for purposes of acquiring a Certificate, Diploma or Bachelors level education.

Western Kenya: In this study refers to the geographical Western region of Kenya that consists of the following counties: Kisumu, Homabay, Migori, Kisii, Nyamira, Siaya, Vihiga, Busia, Bungoma, TransNzoia and Kakamega.

CHAPTER ONE

INTRODUCTION

1.1 Background

HIV has been a challenging health issue and a leading cause of ill health and demise at a global level (WHO, 2020).By the year 2017, 76.1 million people had contracted HIV worldwide. Besides, there were also around 38 million persons infected with HIV in the world during the year 2019 alone(WHO, 2020).The disaster furthermore stands among the top 10 deadliest epidemics throughout history and has had adverse effects on the human population since its discovery (UNAIDS, 2020).HIV has particularly ravaged young people more than other age groups. In 2014 alone, 3.9 million persons who were aged between 15 and 24 years lived with the virus while HIV newly infected 620,000(UNICEF, 2016). Additionally, reported incidence among people with ages 15 up to 24 years stood at 31% of global incidence (UNAIDS 2020).Dwyer-Lindgren *et al*. (2019) also affirm both HIV incidence rates to be highest among the youth globally. In the year 2019, the African region also reported the highest incidence of HIV at 3.7% compared to a much lower average rate of 0.7% globally (WHO, 2020; UNAIDS, 2020).

Researchers have therefore over time been trying to understand why HIV mostly affects the youthful population (UNAIDS, 2018) and it is HIV Risky Sexual Behavior that has been found to be the largest impediment towards the control of the high HIV incidence rates among young people(UNAIDS, 2018).Risky Sexual Behavior refers to behavior that expose people to sexual and reproductive ill health which includes; contracting HIV, contracting Sexually Transmitted Illnesses, getting unwanted pregnancies, conducting

unsafe abortions among other conditions (Halperin & Epstein, 2004; Leclerc-Madlala, 2008; Uchudi*et al*., 2012; Berhan & Berhan 2015; Shisana *et al*., 2009; Gonzales & Kadengye, 2019). Consequently, stakeholders have employed numerous strategies in an attempt to mitigate HIV among the youth. The concern nevertheless to researchers had been that despite numerous strategies existing to address SRH and HIV challenges, youth continue to engage in HIV Risky Sexual Behavior (Chanakira *et al.*, 2015).

In USA, Caldeira *et al*. (2009) found out that 10% of female students previously involved in vaginal sex also had multiple sex partners, unprotected and intoxicated sex despite knowing that sexual contact was the most common way that HIV and Sexually Transmitted Infections were passed from person to person (UNAIDS, 2018).Moreover, a study conducted on Institutions of Higher Learning on HIV in Africa by Wegner *et al*.(2018) discovered that campus life put students risked the life of students because of their lack of ability to negotiate for safer sex or no sex. Studies done in sub saharan African countries including Kenya, Ghana and Nigeria identified students of these institutions as a group high at risk for infection of HIV because of their involvement in HIV Risky Sexual Behaviors (Oppong & Oti-Boadi 2013; Osonwa *et al*., 2013; Adam & Mutungi, 2007; Mberia & Mukulu 2011).

During academic year, 2020/21 Kenyan universities admitted at least 546.7 thousand students and in 2019; the Country admitted at least 430.6 thousand students in Technical and Vocational Education Training colleges. Furthermore, 3.5% of the country' s population were found to have a university degree as the highest educational levelwhile

another 7% percent had completed a middle level or technical training after secondary level (Faria, 2021). Institutions of Higher learning therefore offer a representative source of the Kenyan youth. That these institutions are formal also means that they help provide an organised source of the youthful population. To demonstrate the extent of the HIV crisis in Institutions of Higher Learning, Guserva (2016) revealed the HIV prevalence in the Kenya's public universities. Prevalence for University of Nairobi stood at 15% while for Kenyatta University stood at 13% and Egerton University at 11%. Kisii University reported a HIV prevalence of 10%, Jaramogi Oginga Odinga University of Science and Technology 9%, Maseno University 9%, Jomo Kenyatta University of Agriculture and Technology (JKUAT) 8%, Moi University 7%, Dedan Kimathi University (DKUST) 6% and Masinde Muliro University of Science and Technology (MMUST) 5%. The rest of the public Kenyan universities presented HIV prevalence of 5% each. All the universities had HIV prevalence above the national prevalence of 4.9% in that year (Guserwa, 2016).

Western Kenya has the highest rates of HIV in the Country. The top five HIV high-prevalent Counties in Western Kenya were Busia, Homa Bay, Kisumu, Siaya and Migori (MoH, 2020). Therefore, this study found that there was urgent need to evaluate the employed strategies towards the mitigation of HIV Risky Sexual Behavior among students of Institutions of Higher Learning in Western Kenya in order to find out what and where the strengths and weaknesses may be.

1.2 Statement of the problem

Indeed researchers have carried out studies on HIV Risky Sexual Behavior among youth in general but research specific to youth who are students of Institutions of Higher

Learning and their involvement in HIV Risky Sexual behaviour is scanty for Western Kenya. Certainly, researchers have also studied strategies used to mitigate HIV Risky Sexual Behavior. In spite of this what researchers had wanted us to know was how to mitigate the sexual behavior of students of Institutions of Higher Learning in order to be able to successfully achieve international, regional, national, local and institutional HIV incidence and prevalence targets as much as had been achieved with other age groups.

What researchers world over were failing to understand was that despite the volume of strategies dedicated by various stakeholders towards the mitigation of HIV Risky Sexual Behavior among these students, they vehemently continued to take part in HIV Risky Sexual Behavior. This has slowed down the steady progress that achieved in HIV prevention. Furthermore, most studies had focused greatly on causal factors of Risky Sexual Behaviour but there are limited studies on why youth are not taking up these strategies, and what challenges stakeholders are facing in the implementation of these strategies. Accordingly, this study sought to fill this information gap with specific focus on Institutions of Higher Learning that offer a representative source of the Kenyan youth and Western Kenya, which has the highest HIV rates in Kenya. The study therefore found it necessary to evaluate the existing mitigation strategies used towards HIV Risky Sexual Behavior among students in Institutions of Higher Learning in Western Kenya.

1.3 Research objectives

The overall objective of this study was to evaluate the strategies used to mitigate HIV Risky Sexual Behavior among students of Institutions of Higher Learning in Western Kenya.

The specific objectives of the study were to:

i. Determine the nature and extent of HIV Risky Sexual Behavior among students of Institutions of Higher Learning in Western Kenya.
ii. Evaluate the effectiveness of behavioural intervention strategies employed towards the mitigation of HIV Risky Sexual Behavior among students in Institutions of Higher Learning in Western Kenya.
iii. Assess the effectiveness of biomedical intervention strategies employed towards the mitigation of HIV Risky Sexual Behavior among students in Institutions of Higher Learning in Western Kenya;
iv. Evaluate the effectiveness of structural intervention strategies in the mitigation of HIV Risky Sexual Behaviour among students of Institutions of Higher Learning in Western Kenya.

1.4 Research questions

i. What are the nature and extent of HIV Risky Sexual Behavior among students in Institutions of Higher Learning in Western Kenya?
ii. How effective are behavioural intervention strategies in the mitigation of HIV Risky Sexual Behaviour among student of Institutions of Higher Learning in Western Kenya?
iii. How effective are biomedical intervention strategies in HIV Risky Sexual Behaviour mitigation among students of Institutions of Higher Learning in Western Kenya?
iv. How effective are structural intervention strategies fin HIV Risky Sexual Behaviour mitigation among students of Institutions of Higher Learning in Western Kenya?

1.5 Justification

Data from this study provides knowledge to researchers and stakeholder sregarding mitigation of HIV Risky Sexual Behavior among students in Institutions of Higher Learning. The findings also contribute to the ongoing debate on the Sendai Framework on Disaster Risk Reduction, the global Sustainable Development Goals (SDGs), the Kenya Government's Big Four Agenda specifically Universal Health Care; and Kenya's vision 2030. Information from this study will help various actors understand the breadth, vastness, depth and presentation of this situation that is presenting a challenge. These stakeholders include ministries of health and education within the national and county governments of Kenya, Institutions of Higher Learning, their students, HIV Non-Governmental Organizations and health care centers serving these students on HIV and Sexual and Reproductive Health issues.

1.6 Scope

The purpose of this study was to evaluates trategies used in Institutions of Higher Learning in the mitigation of HIV Risky Sexual Behavior among students in Western Kenya. Consequently, the study assessed the extent to which these strategies have been successful in mitigating HIV Risky Sexual Behavior among the target group. The study was done in the year 2020 from seven Institutions of Higher Learning in Western Kenya which are; Rongo University in Migori county; Tom Mboya University College in Homa Bay county; Great Lakes University of Kisumu and Kisumu Polytechnic in Kisumu county; Lugari Teacher Training College in Kakamega county and Kenya Medical Training College Bondo in Siaya county.

The pilot study was done in December 2019 at Masinde Muliro University of Science and Technology (MMUST).The pilot concluded that students at MMUST were engaging in Risky Sexual Behavior at a high rate. Consumption of drugs and alcohol was high and similarly was the use of sex without a condom, attending of nightclubs, watching pornography, use of emergency contraception and Early Sexual Debut. The high use of PEP denoted the enhanced use of a measure that was available to protect students from contracting HIV, which is commendable. The study data was collected from the student population; Institutions of Higher Learning, deans of students/student counselors, Institution of Higher Learning health clinic heads or health care workers, county government officials, officials, Non-Governmental Organizations officials, and health care institutions officials. The variables examined were the nature and extent of HIV Risky Sexual Behavior; and the strategies used to mitigate HIV Risky Sexual Behavior among students of Institutions of Higher Learning in Western Kenya. The study considered only students between the ages of (15-24) years.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews relevant literature on HIV Risky Sexual Behavior among students in Institutions of Higher Learning. It presents the disaster management and sustainable components of the study and then looks at the concept of youth. The chapter additionally looks at the concepts of risky behaviour and Risky Sexual Behaviour. It furthermore looks at HIV Risky Sexual Behaviour within the context of Sexual and Reproductive Health and then provides an understanding of HIV in Institutions of Higher Learning. It moreover delves into writing on the first objective being the nature and extent of HIV Risky Sexual Behavior in these institutions at global, regional and local levels; and finally presents structural, behavioral, and biomedical HIV prevention intervention strategies used towards the mitigation of HIV Risky Sexual Behavior among students in the same institutions.

2.2 Disaster management and sustainability components of the study

In Kenya HIV was declared a national disaster bythe late Mr. Daniel Toroitich Arap Moi, the former president of the republic of Kenyain 1999 (NACC, 2016). By 2015, the population of HIV infected people in Kenya were 1.5 million and the country ranked fourth regarding HIV rates in the world of whom majority (60%) of cases were of young persons between the ages of 15 and 24 years. Kenya is a very youthful County, those whose ages are between 18, and 35 years make up 75% of the Country's total population. Specifically, those aged between 15-24 years made up almost a fifth (18.83%) of Kenya's

population (OHCHR, 2015). This means that HIV can have adverse effects on the County if left unchecked.

Sustainability is the ability of Institutions of Higher Learning to continue evolving and working over the long term (Atkisson, 2011). Tilbury (2011) emphasized that the transformation of a universities towards sustainable development required the realignment of 100% of its activities with a paradigm that is critically reflective and that supports the construction of futures that are more sustainable. Indeed this realignment includes the health of students, specifically their sexual health embodied within the successful mitigation of HIV Risky Sexual Behaviour that this study seeks to achieve. In summary if, stakeholders do not address HIV incidence as adequately as they should in Institutions of Higher Learning, ultimately these universities and colleges will be unsustainable and eventually lead to their degradation and collapse.

2.3 The youth concept

It is important to be aware of what the term 'young people' mean. The UN interchangeably employs the terms 'young people' and' youth' to mean people who are aged 15-24 years (UNDP, 2018). Similarly, this study has adopted the use of these terms.

2.4 Understanding HIV in Institutions of Higher Learning

Towards the understanding of HIV in Institutions of Higher Learning, findings by Kelly (2001) offer a good base. Kelly reviewed seven case studies at University of Namibia, JKUAT and University of Nairobi in Kenya, University of Zambia, University of Benin, University of Western Cape in South Africa and University of Ghana. Kelly notably concluded that the presence of HIV within Institutions of Higher Learning was

surrounded by a thick cloak of ignorance. Kelly also confessed that there was a high level of denial, silence, secrecy, and fear of stigmatization and discrimination about HIV in Institutions of Higher Learning in Sub Saharan Africa described as piecemeal response, understanding that was inadequate and considerable disarray in its attempts on how the impacts of HIV could be managed. This provides a background as to how these Institutions of Higher Learning in Africa have processed HIV issues.

Nevertheless, over the years, much has changed. Ntata *et al*.(2008) for example carried out a cross-sectional study in Malawi among university students in their first year to determine distributions of HIV related sexual behaviours and knowledge. They discovered that levels of HIV knowledge between sexes were similar. They discovered that majority of male and female students felt that they had sufficient knowledge about HIV. Additionally majority of students were also aware of where to test for HIV on campus, but a few reported a lack of knowledge about their HIV status. The study also discovered that most of students who had never tested for HIV test had intentions to do so. Additionally, there was no association found between prior HIV testing with sex. Majority (68.4%) of students felt that they were not at risk of acquiring HIV infection. Overally, majority (66.8%) of students had knowledge on places to access condoms on campus, while over one third(38.7%)confessed to exact knowledge on use. Moreover, over half of the students had used a condom the last time they had engaged in vaginal sex while having multiple sex partners reported by 40.4% of students. Indeed the thick cloak of ignorance around HIV in Institutions of Higher Learning that Kelly (2001) mentioned

earlier was being lifted but challenges still existed on how to successfully mitigate these various HIV Risky Sexual Behaviour among the students.

Ajayi *et al*.(2019)subsequently carried out a study using a cross-sectional survey at Nigerian universities to determine how consistently condoms were used, to explore the determinants of the use of condoms and the reasons for the lack of consistency in their use.The researchers recruited 800 female and male students using stratified random sampling and discovered that sexually active participants who had used condoms consistently were 38.6% of ($n = 498$). The study found knowing their partner's HIV status, students of university located in a high HIV prevalence area, discussion of HIV and Sexually Transmitted Infections with their sexual partner, being and engaging in sex with only their steady partner to be associated with higher odds of consistent condom use. Meanwhile unavailability of condoms, trust, dislike of condoms, and a perception that condoms reduced sexual pleasure were discovered to be the main reasons found for inconsistent use of condoms.

The incidence and prevalence of HIV among students in Institutions of Higher Learning has therefore been causing much consternation among policy-makers as their occurrence threatens to degrade socio-economic development through their associated increase in illness and death of the youth who are in their productive age group (UNAIDS 2013).

2.5 The concept of risky behavior

Two concepts of risk influence this study. The first is the realist concept presented by Zinn (2008) and the second is the political legal concept presented by McCarthy

et al.(2009),which is also referred to as the neurocognitive concept by Steinberg (2009). These concepts make several basic assumptions. The first concept assumes that risk can be objectively defined and is real, and that people make choices of either safe or risky behaviour on the basis of cost-benefit (Fischhoff *et al*., 1993). The second concept assumes young adults and adolescents are proner than mature people are to risk taking and that human beings based on their perception of the likelihood of a negative outcome make rational decisions about risk(Kirch,2008).

The first concept is true for this current study as the risk of HIV is real considering that infirmity and mortality that have taken place globally because of HIV is evident as presented in section 1.1 of this thesis. Section 4.3.2 of this thesis also demonstrates that respondents of the current study made decisions on the use of condoms on a cost-benefit basis. The second concept is also true for this current study as statistics have been presented in section 1.1 of this thesis that confirm that young people proner to taking risks than older people. The current study is therefore in agreement with these concepts.

Some theorists, however, have created a socio-cultural framework and distanced themselves from the realist view of risk taking. These include Tulloch & Lupton (2003), Lupton (1999), and Tulloch (2008). They see risk taking as being shaped by socio-cultural expectations and norms. Mason *et al*. (2013) also reported that what may be viewed as a safer choice in the larger socio-cultural scheme may be viewed as a risk by society. The goal should then be to discover how young people define risk and what factors shape their perceptions of risk from a socio-cultural perspective. The faced risks are therefore culturally and socially embedded, and they take these risks partly as a way of fitting into the social and cultural context (Pilkington, 2007). This may explain the

persistent engagement of young people in HIV Risky Sexual Behaviour despite being aware of the consequences, as they may not consider the behaviour as risky as mature persons do.

On a different note, Rosenstock 1990's Health Belief Framework is one of the most well known of the frameworksfor explaining health related risky behaviour. According to this framework, raising awareness of the outcomes is the means to reduce risky or health-compromising behaviour. The reasoning is that if young people are better informed, they will be less likely to take risks and more likely to make rational decisions.

2.5.1 The concept of Risky Sexual Behaviour

There are many ways that researchers view Risky Sexual Behaviour. For example, Gonzales & Kadengye (2019) say that Risky Sexual behavior refers to those that expose a person to Sexual and Reproductive ill health. Sexual and Reproductive ill health they elaborate includes contracting HIV, contracting Sexually Transmitted illnesses, getting unwanted pregnancies, conducting unsafe abortions among others. Risky Sexual Behavior is also defined as having sex without a condom, having multiple sexual partners, and having in unprotected sex while taking drugs and or alcohol (Marlatt *et al*., 2011). Moreover, Risky Sexual Behavior is defined widely as any behavior that increases the chances of negative consequences with sex, including HIV or STDs, as well as unplanned pregnancies (Desale *et al*., 2016; Hoque, 2011). Furthermore, Risky Sexual Behavior involves engaging in sexual intercourse with multiple partners, engaging in a non-monogamous sexual relation without the use of a condom, the improper use of condoms, not using any form of contraception while engaging in sex, Early Sexual Debut and engaging in unsafe abortions (Adams, 2017).

HIV Risky Sexual Behavior is often influenced by a challenge in knowledge through the delivery of inadequate HIV educational resources for young people (Chau*et al*., 2019) including negative attitudes and poor perception about HIV and Sexual and Reproductive Health issues (Chau, 2019; Adams 2017). Generally, HIV Risky Sexual Behaviour involves engaging in sexual activities that are known or unknown by the participant to lead to contracting HIV.

2.5.2 HIV Risky Sexual Behavior in the context of Sexual and Reproductive Health

It is critical to look at HIV Risky Sexual Behavior in the context of not just HIV but also Sexual and Reproductive Health. Among other authors, Gonzales & Kadengye (2019), WHO et al. (2009), Spaulding et al. (2009), Kennedy & Spaulding (2010) report that examining HIV issues on their own without the consideration of Sexual and Reproductive Health is inefficient towards the war against HIV. Consequently, this study looked at HIV Risky Sexual Behavior in the context of both HIV and Sexual and Reproductive Health.

2.5.3 The Nature and extent of HIV Risky Sexual Behavior among students globally

To enable an understanding of student sexual risk-taking behavior, Johnson *et al*. (2018) in the UK decided to assess the factors that contributed to the decision-making process about risky sexual engagement among students in Institutions of Higher Learning. As research had earlier revealed a relationship between risk-taking sexual behaviors and alcohol use, Johnson *et al*., (2018) focused on this aspect in their study. They targeted 138 university students who consumed alcohol and were sexually active. The students

were tested on alcohol consumption, sex-related alcohol expectancies, consequences, and STI-protective and self-efficacy. They discovered that binge drinking is STI-protective self-efficacy related, that reduce condom use intentions of binge drinkers lowered self-efficacy, and that now than in the past young adults may be less fearful of STIs. The findings feed well as to the understanding of the nature and extent of HIV Risky Sexual Behaviour but what the researchers failed to reveal was how to successfully mitigate this binge drinking as regards to protection of students from STI incidence.

Ghandour *et al*. (2014) conducted an online survey from April-August 2012 on university students from the ages of 18 up to 30 attending a university in Beirut, Lebanon. They analysed the data using Pearson's chi-square and regression models and discovered that students who took drugs or alcohol before having their first sexual experience were twice as likely to engage in vaginal and oral intercourse with an unknown partner. They also found that students who had their first sexual experience while inebriated were three times more likely to have more than 11 sexual partners and engage in sexual behaviour against their will. Despite this information on the nature and extent of HIV Risky Sexual behaviour, a gap in knowledge was still left unfilled on successfully mitigation of consumption of alcohol among students in Institutions of Higher Learning.

Meanwhile Poscia *et al*. (2015) carried out a related study among university students in Italy. They found that just about a quarter of pupils had made their first sexual contact before the age of fifteen. They also discovered that over a third of women in the study had used emergency contraception, an indicator of poor condom usage or non-use, and

that the majority of sexually active students were using contraceptives, but that nearly a third of them were doing so with methods that were ineffective against STIs.It is further concerning that a majority (63.7%) of men and slightly over a third (30.9%) of women had never had urologic or gynecological examinations. These examinations are important for people to be certain of their sexual health. Despite the information from the study on the nature and extent of HIV Risky Sexual behaviour, a gap in knowledge was still left unfilled as to how to mitigate this behaviour regarding the reduction of HIV incidence among students in Institutions of Higher Learning.

Moreover, Gray *et al*. (2019) emphasized that it is widely recognized globally, that youth are at a higher risk of STIs. They acknowledged that most students in Institutions of Higher Learning in the United Kingdom are youth and thus it was essential that advice and treatment be obtained from reliable sources by them to help prevent the high Sexually Transmitted Infections incidence. They found out in their study that it was males who were more likely to report never needing advice or requiring treatment but failed to fill the gap as to how the identified challenge among the males could be mitigated.

At the University of Palermo in Italy, Provenzano *et al*. (2018)evaluated the behavioral risks and knowledge related to STIs among the students. They employed an anonymous online questionnaire and employed a cross-sectional study. They sampled 529 students with a median age of 22.65 years and reported that the risk to have unprotected occasional sex by students was related to certain circumstances at the university. These circumstances included the age of the occurrence of the first sexual intercourse, the male gender, the homosexual or bisexual status. They concluded that students in Institutions of

Higher learning engaged in high-risk sexual behavior. Nevertheless, similar to other authors, they also failed to fill the gap in knowledge as to how the challenge of HIV Risky Sexual Behaviour among these students could be successfully addressed.

In America, Hickey & Cleland (2012) carried out their study at a university in the mid-Atlantic part of the USA whose purpose was to describe the risk perceived over STIs. Data was sourced through an online, anonymous survey from women students who were sexually and between 18 and 24 years of age. It is worth noting that most female students in their study considered themselves at low risk despite their condom use being or a low level. Women with just one sex partner were found to be the ones mostly not using condoms. The study indeed revealed the nature and extent of HIV Risky Sexual Behaviour among the students but still did not fill the gap in knowledge on successfully mitigating this behaviour.

In Canada at Nova Scotia, Cassidy *et al*. (2018) with university students conducted key informant interviews and semi-structured focus groups using a qualitative descriptive design to, health care providers, and administrators at university health centers. They used inductive thematic analysis and a directed content analysis. Researchers discovered that despite the availability of SRH services in Canada, many students delayed or avoided care, hence increasing their vulnerability to HIV and STIs. Students' social opportunities, motivation, and access to sexual health treatments were found to be linked in a study. There is still a lack of information about how to successfully prevent students from engaging in risky sexual behaviour.

Reuter *et al*.(2018) in an attempt to increase understanding of the relationship between STI awareness and belief in STIs and the culture of a place of study and self-reported STI prevalence, in the study population compared students in an American Institution of Higher Learning, and students at a Madagascar Institution of Higher Learning. Survey data were collected from students studying at a university Madagascar and the USA. They discovered those in Madagascar having higher rates of disbelief in HIV; the study nevertheless failed to fill the gap in knowledge regarding providing solutions towards the mitigation of the HIV Risky Sexual Behaviour.

In the South of America, Leon-Larios& Marcais-Seda (2017)conducted their study at University of Seville in Spain. They used a cross-sectional analytical design, and collected data from University of Seville undergraduates through a self-administered questionnaire. Data was analysed was using SPSS V22. They found that a majority (93.3%) of participants had been sexually active and majority (58.3%) also had sex under the effect of alcohol while just less than one fifth (18%) had sex under the effect of drugs. Moreover a relatively high number (86.9%) had used a contraceptive method during their first sex and the male condom was the most commonly used followed by a much higher (90.6%) use of hormonal pills. The participants were weak regarding knowledge on contraceptives and STIs. Additionally, the level of knowledge was less in young people who used coitus *interruptus* or none as a contraceptive method. Researchers also found a correlation between frequency of intercourse and awareness of contraception and STIs. In addition, women were more likely than men to have a sexual partner, highlighting the

necessity of emphasising female-centric methods. Sexist views and experiences among women were shown to be more positive than those of men. They also showed a greater understanding of how to properly administer hormonal contraceptives, which is a positive sign (Leon-Larios & Marcais-Seda, 2017). Nevertheless, an unfilled knowledge gap regarding the successful mitigation of the Risky Sexual Behaviour that the students were involved in remained.

In Portugal, Santos *et al*. (2018) carried out their study to validate the Sexual Sensation Seeking Scale (SSSS) of Kalichman (2011) in Spanish samples. The study examined the factor structure of the SSSS in heterosexual undergraduate students and revealed a 2-factor structure. Related to risky sexual behaviors and physical sexual sensations was Factor 1 and related to exploratory or novel sex was Factor 2. The study also revealed that higher levels of sexual sensation seeking were associated with poorer sexual health and more frequent sexual risk behaviors. Students involved in committed relationships were also found to be at risk because of decreased condom use. The results of Santos *et al*. (2018)'s study showed that the students were exposed to sexual risks and that individual, cognitive and psychosocial factors influenced these risk-taking behaviors. Nevertheless, a knowledge gap was yet to be filled regarding the successful mitigation of the Risky Sexual Behaviour that the students were involved in.

In Peru, Bermúdez *et al*. (2018) investigated the link between sexist beliefs and sexual risk behaviors. Male students in public and private secondary schools in Spain were shown to be more hostile, benevolent, and have ambiguous sexist sentiments than female

students. Men were more likely than women to have had vaginal, anal and oral sex, to have had more sexual partners and to have had their first vaginal and oral sex at a younger age, while women were more likely than men to have used condoms in their first anal sex and to have had a higher anal sex risk index. The majority of participants had never been tested for HIV before. It was the most common reason individuals offered for avoiding being tested for HIV: they were confident that they were not infected. The researchers concluded that there was a low HIV risk perception in the participants despite the fact that they had been involved in Risky Sexual Behaviors. Nevertheless, a knowledge gap was yet to be filled regarding the successful mitigation of the Risky Sexual Behaviour that the students were involved in.

Furthermore, Gomez Camargo *et al*., (2014), in Colombia carried out a study in Institutions of Higher Learning with mainly 20 years olds, from urban areas who were predominantly heterosexual (89.7 %),with an age of initiation of sexual activity of less than 18 years old. A discovery was made that 11.8% of the respondents were promiscious and the condom was the most popular Family Planning Method used by 55 % of respondents. Even though the students knew about Sexual Health, they still engage in risky consumption of sex, alcohol and drugs. Additionally 12.3% had been pregnant, 21.6% had engaged in physical violence, 4.6% had engaged in sexual violence and that there was a predominant silence from the majority (61.8%) of the victims of sexual abuse (Gomez Camargo *et al*., 2014).Nevertheless, a knowledge gap was yet to be filled regarding the successful mitigation of the Risky Sexual Behaviour that the students were involved in.

Ewert *et al*. (2015) also conducted a study to determine the barriers that prevented male university students in Australia from getting sexual health treatment through general practitioners. They interviewed young men between the ages of 18 and 24 who were studied at the university. Analysis of data was conducted utilizing content analysis as well as thematic analysis techniques. They found that (15 – 29) year olds accounted for majority (75%) of all STI diagnoses. STIs infection rates among young men were found to be rising, General Practitioners, on the other hand, are unable to educate and screen students for STIs because the students rarely have any sexual health issues to begin with. The researchers discovered that men's self-imposed ideals of masculinity, privacy, and humiliation were major obstacles to getting sexual health treatment from their general practitioners. People who have poor understanding about STIs are more likely to be in need of medical attention, the study's authors concluded. Students' attitudes of the advantages and disadvantages of social media and text messaging for promoting sexual health were varied, even though the survey found the internet to be a popular resource for sexual health education. Ewert *et al*. (2015) indicated that the present expectations of young male students to seek sexual health care were inaccurate. They emphasised the tremendous potential that higher education institutions have to educate young men with proper sexual health information and creative treatments to assist them take care of their sexual health. Institutions of Higher Learning in Australia therefore needed to put more effort to bridge the mentioned gaps which if filled will lead towards knowledge on the successful mitigation of the Risky Sexual Behaviour that the students are involved in. Despite the wealth of knowledge contributed by the researchers regarding the nature and

extent of HIV Risky Sexual Behaviour, a knowledge gap regarding how to mitigate these risks among the students remained unfilled.

In New Zealand a study was carried out in order to understand behaviour regarding STI testing. Qualitative semi-structured interviews were administered to university students who had an STI test recently. The discovered data was analysed using a qualitative thematic analysis, which produced a final set of themes. The drivers for STI testing students were identified as; previous knowledge, clinicians, crisis, partners, and routines. A majority of participants admitted that the more knowledge they had about Sexually Transmitted Infections the more they were likely to take routine tests. Simultaneously however, majority of participants felt they had minimal HIV knowledge (Denison *et al*., 2018).Nevertheless, a knowledge gap was yet to be filled regarding the successful mitigation of the Risky Sexual Behaviour that the students were involved in.

Crossing over to Asia, a study by Caldeira *et al*.(2009) conducted a longitudinal, study of health behaviors among college students in Asia. From the pool of participants, illicit drug users were sampled purposively for the longitudinal study. During their first year, students were telephonically interviewed on sexual behavior and other sensitive topics. They were re-contacted a year later for a second assessment with a 91.1% response rate. The respondents were given $5 for completing the screener and another $50 for each interview. The findings of the researchers revealed that many females had relatively little sexual experience and 46.7% had been sexually active for less than two years (Caldeira *et al*., 2009).Despite the rich knowledge provided regarding HIV Risky Sexual Behaviour, a

knowledge gap was yet to be filled regarding the successful mitigation of the Risky Sexual Behaviour that the students were involved in.

Thongnopakun *et al*. (2016) also carried out research among students from private and government institutions in the East of Thailand in 2011 between June and September with 405 informants using self-answered questionnaires. Their study employed a cross-sectional survey. The tool of the study was. Descriptive statistics analyzed the quantitative data which were then presented as deviation standard scale, frequency, percentage, average score, which were analyzed using crude odds ratio. The researchers discovered that three out of five of the youth had sexual experience, while more than half had not used condoms during their first-time sex. Therefore, more than half of these students had been exposed to contracting HIV. Further, they found out that almost 25% of the students did not use condoms at all, and did not negotiate for safer sex. Moreover, young people with sexual experience had more chances to have unprotected sex than virgins. Furthermore, those with casual sex partners had higher chances of having unprotected sex than those who did not have casual sex partners. Additionally, those who had minimal information on HIV and STIs had more chances of having unprotected sex than those who had high level of knowledge on these topics. Finally, those who had negative safe sex attitudes had higher chances of having unprotected sex than those who had positive attitudes towards safe sex (Thongnopakun *et. al*., 2016). Indeed their study revealed the nature and extent to which students engaged in Risky Sexual Behaviour but did not provide answers as to how they could effectively mitigate this behaviour among the students.

Crossing over to India, Joseph *et al*. (2016) conducted a study to assess the attitudes and awareness regarding Emergency Contraceptive Pills (ECPs)among college students in South India after discovering that annually, there were a large number of unplanned pregnancies thus resulting in unsafe abortions. The researchers collected data using self-administered questionnaires from university students. From the findings of Joseph *et al*. (2016), out of 449 students, majority 384 (85.5 %) had heard about ECPs. The awareness level of students about ECPs was moderate among a majority 231 (60.2 %) of participants. They also found that awareness was significantly more among males with a science background and those who previously had Reproductive Health Education (RHE). In summary, the researchers found that average-to-good perception about Emergency Contraceptive Pills had significantly greater proportion of females in the study (Joseph *et al*., 2016).Nevertheless, the study still did not give mitigations as to how to address HIV Risky Sexual Behaviour. Abortions are reported to have tremendous implications on the survival of women and their health and (Adeniyi *et al*., 2018; WHO, 2014) and is reported that usage of ECPs could be a solution to this problem provided the usage is per guidelines (Hoque & Ghuman, 2012).

Moving on to the world's most populated County China; Zhang *et al*. (2013) investigated the knowledge, state of attitudes and behaviors regarding STIs among Chinese students. Students of Shantou University, Guangdong, were given a cross-sectional anonymous university intranet-based. Despite having more open attitudes and practises toward sex, the researchers discovered that students' STI awareness and knowledge was extremely restricted, raising worries about a possible increase in the frequency of STIs. It is

worrying that prior knowledge of Sexually Transmitted Infections was found to have no significant influence. This study by Zhang *et al*. (2013) also left gaps as to why students continued to engage in Risky Sexual Behaviour despite having sufficient knowledge of STIs.

The case may be explained differently for Taiwan, as Taiwan withdrawing from the UN in 1971 made the Country miss international opportunities for participating in global HIV programmes, which could have made Taiwan more vulnerable to HIV as compared to the rest of the world. Subsequently, Tung *et al*. (2015) compared and assessed male and female HIV-related attitudes, knowledge, and sources of HIV and Sexually Transmitted Infections information through the use of a questionnaire. The authors reported moderate attitudes and knowledge. Researchers discovered that women are more accepting of people living with HIV than men. Participants were asked how they learned about STIs and HIV. The majority said that they learned about them from their school teachers and the media. According to the researchers, students reported moderate knowledge, attitudes, and females had more positive attitudes toward people with HIV than males. Nevertheless, a knowledge gap was yet to be filled regarding the successful mitigation of the Risky Sexual Behaviour that the students were involved in.

The review then moved on to literature from the Arab world in which in Tehran, according Khalajabadi *et al*. (2018) about 35% of the students had ever had premarital sex. This is a lower figure compared to what was earlier presented of Europe and America. Nevertheless, similar to other populations, most (85%) of the students with

sexual experience reported having multiple sexual partners while majority (54%) also reported inconsistent condom use. Despite this exposure to HIV and Sexually Transmitted Infections risk, the respondents had a very low level of HIV and Sexually Transmitted Infections risk perception and only a few (6.5%) were really concerned about contracting HIV, and an even lower number (3.4%) were concerned about contracting Sexually Transmitted Infections. The gap in research still remained regarding how to mitigate HIV Risky Sexual Behaviour among students in Institutions of Higher Learning.

In another related study, watching pornography, Early Sexual Debut, work experience and studying in a private university, were found to highly predict having multiple sexual partners. Specifically, poor HIV knowledge, having one lifetime sexual partner and younger age at sexual debut were found to be significant predictors of inconsistent condom use (Khalajabadi *et al*., 2018).The researchers used a purposive sampling method and conducted interviews with women college students in private and government universities in Tehran between 2005 and 2006. There were three types of respondents: married women, unmarried women who had abstained from sexual relations, and unmarried women who had experienced sexual relations. Young women thought about family values and expectations, what marriage meant and why they wanted to get married, their sexual knowledge and self-efficacy, perceived gender and social norms of premarital sex, and how important religion was. Premarital sex among female college students was found to be influenced by the meaning of marriage and the incentive to engage in or avoid premarital sex. Nevertheless a knowledge gap was yet to be filled

regarding the successful mitigation of the Risky Sexual Behaviour that the students were involved in.

In Iran, Karamouzian *et al*. (2017) had observed that evidence on knowledge about STIs among Iranian nonmedical university students was low and that more was needed to inform policies and research to improve the sexual health of university students. In 2014, almost 800 male and female graduate and undergraduate students from private, public, and private universities were recruited for the study. A questionnaire was utilised to measure respondents' awareness and understanding of STIs. To compare the percentage of respondents with accurate answers across student subgroups, one-way analysis of variance, Chi-square tests, and student t tests were utilised. The researchers reported only half of their respondents having heard of STIs, while most could not correctly identify STIs in a list of diseases, which is concerning of course. A total of 49%, 9% and 42% of the respondents had low, high and moderate Sexually Transmitted Infections knowledge scores, respectively which are even more concerning. Respondents additionally reported friends (32%) and online sources (62%) as their primary sources of information on STIs, and those who had ever been married, were older, or had a higher level of education were more knowledgeable than others. Nevertheless a knowledge gap was yet to be filled regarding the successful mitigation of the Risky Sexual Behaviour that the students were involved in.

Wolfers *et al*. (2010) analysed the development of persuasive health promotion messaging. They determined the psychosocial determinants of STI testing intentions

among sexually active adolescents attending vocational schools. A web-based survey was administered to 501 vocational school students between the ages of 16 and 25 to investigate STI testing behaviour, relationships, and sexual activity. Items measuring psychosocial correlates of testing were taken from Fishbein's Integrative Model and their data were subjected to multiple regression for analysis. The researchers accounted that in Netherlands, adolescents have low intention to participate in STIs testing and confirmed that these adolescents were at risk for acquiring STIs. In addition, STI testing rates among adolescents in the Netherlands were found to be low, and effective initiatives to promote STI testing were uncommon. Adolescents who attended vocational schools were found to be particularly at risk for STIs. The researchers reported that only 39% of their respondents showed intention to engage in Sexually Transmitted Infection testing. In as much as the study revealed relevant information on the nature and extent of STI testing which includes HIV, it still left a gap in knowledge regarding how to mitigate this behaviour among this study group.

In Germany, Riemens *et al*. (2014) carried out a study in state-approved nursing schools in the state of Saxony-Anhalt. They discovered it is male than female students (59.6% vs. 44.8%) who used condoms more to prevent Sexually Transmitted Infections. Male students were therefore better at practicing condom use than female students, thereby fulfilling the C part of the ABC strategy of HIV prevention (Abstinence, Be faithful, Use a Condom). The ABC strategy is noteworthy as it is credited for bringing the HIV and AIDS epidemic under control in Countries such as Uganda (Okware *et al*., 2005). On the other hand, Riemens *et al*. (2014) added that it is more female students (58.9% vs.

43.4%) who reported constant partnership with just one partner as a Sexually Transmitted Infections prevention method, indicating better success with the B part of the ABC strategy. Furthermore in their study, almost a third, (29.6%) of the students reported having more than one sexual partner in the past 12 months thereby almost one-third were already at risk because of having multiple sex partners. As much as this study tells us that more male than female students used condoms to prevent Sexually Transmitted Infections it does not reveal what makes them more successful at doing so. It also reveals that more female students reported constant partnership with just one partner as a Sexually Transmitted Infections prevention method, but does not reveal how they successfully did this. Filling these gaps in knowledge is important in providing answers as to the successful mitigation of HIV Risky Sexual Behaviour. Moreover, according to Riemens *et al*. (2014) very few (3.9%) of the students demanded an HIV test from their partner. There was therefore risk exposure to majority (96.1%) who were not certain of the HIV status of their partners. Meanwhile, majority (69.3%) of the students had never tested themselves for HIV, leave alone not knowing the status of their partners. This low level of HIV testing among majority of the students presented a concerning risk situation, as it was a ripe opportunity for HIV incidence. It is even more concerning that just over a tenth (10.2%) of the students used no prevention against Sexually Transmitted Infections (Riemens *et al.,* 2014) posing more risk through unprotected sexual intercourse. The research indeed provides a wealth of knowledge regarding the nature and extent of Risky Sexual Behaviour but still leaves gaps regarding successful mitigation strategies towards this behaviour.

It is interesting to note that in Germany, students in Institutions of Higher Learning engage in HIGH HIV Risky Sexual Behaviour yet Germany has low HIV prevalence rates. Bremer*et al*. (2017) nevertheless explains that although HIV prevalence is relatively low in Germany compared to most other European countries, there has been a marked rise in the incidence of other STIs. Thus, this HIGH HIV Risky Sexual Behaviour is seen to impact STIs more than HIV. Riemens *et al.*(2014)'s study indeed revealed high involvement in HIV Risky Sexual Behaviour but a low HIV prevalence without explaining the reason why. This created a knowledge gap for the current study as this is opposite in occurrence in Western Kenya where involvement in HIV Risky Behaviour as well as HIV prevalence rates are high.

2.5.4 Nature and extent of HIV Risky Sexual Behavior among students in Africa

Zhang *et al*. (2017) conducted their study of students at a university in the Eastern Cape Province of South Africa. Their respondents were at least eighteen years of age and were self-selected through convenience sampling. They found that students had a tougher time abstaining from drugs and alcohol because of the dangerous environment and the influence of their peers. It was also shown that students were more likely to use condoms and limit their sexual partners if they had good communication, but those who had unstable sexual relationships were less likely to do so.As much as the study contributed relevant information regarding the nature and extent of HIV Risky Sexual Behaviour in that institution, the study still left a knowledge gap regarding successful mitigation of the behaviour.

In Tanzania, a study by Somba *et al*. (2014) which investigated contraceptive usage, knowledge, and sexual behaviour among female undergraduates at the universities of

Muhimbili and Dar es Salaam, revealed that awareness of the efficiency of condoms in preventing STIs was satisfactory. However, the researchers found knowledge and practice of correct use to be poor as just below half (49.1%) of respondents reported correctly wearing condoms use before intercourse and removing condoms correctly after use. However, more than one-fifth (24.4%) of males reported never having anal intercourse, whereas the percentage for women was greater than fifty-three percent (53.5%), indicating that a large proportion of men engage in anal sex with other men. Participants reported that just 20.6 percent had used condoms during anal sex, which was another cause for concern that prompted stakeholders to step up their efforts. According to the findings, some people believe that using condoms encourages sexual promiscuity, while others believe that condoms should only be used with long-term partners. Indeed the study added a great body of knowledge pertaining the nature and extent or HIV Risky Sexual Behaviour but the study still left a knowledge gap as regards to how to achieve the successful mitigation of this behaviour that the students are involved.

In Ivory Coast at the Houphouët-Boigny University, Abidjan, among first year women who had ever had sex, Inghels *et al*. (2017) found 38.4% of them to have unmet contraception needs while 31.2% of them had already carried an unwanted pregnancy. The researchers found impaired fertility fears to be the leading reason for not using hormonal contraception among most students. In spite of their gratitude, the major obstacles to using the university health clinic were people's beliefs about the exorbitant cost of the services provided. As a result, there was a lack of awareness about the structure's services and amenities. Indeed the study broadened the understanding of

engagement in HIV Risky Sex but nonetheless left a knowledge gap as regards to the successful mitigation of this behaviour that the students are involved.

In Ghana, Darteh & Doku (2016) underlined the significance of contraceptive use as a key approach for preventing unintended pregnancies and a way to avoid induced abortions, and acknowledged that the Emergency Contraceptive (EC) was the last opportunity to achieve this. Their study looked at how University of Cape Coast students used EC, what they knew about it, and what factors were related to it. They found that more men than women were sexually active. In addition, 57% of the respondents had ever heard of EC while 36% had ever used EC. They also revealed that although the men were more sexually active, women were more likely to have knowledge of Emergency Contraceptive use as compared to males. UNIFEM (2018) elaborates on the importance of contraception by reporting that contraception has the potential to prevent abortion, unwanted pregnancies, and STIs. Nevertheless, the study by Darteh & Doku (2016) still left a knowledge gap regarding the successful mitigation of the Risky Sexual Behaviour that the students are involved in.

Furthermore, in a study by Utoo *et al*. (2020) which intended to determine contraceptive use and sexual activities and among female students in Makurdi, North-Central Nigeria researchers used a cross-sectional design and pretested self -administered questionnaires to collect data on sexual activities, socio-demographic variables, and contraceptive use. The researchers discovered that, out of the 431 students studied, 304 (70.5%) were sexually active. Regarding multiple sex partners, 41.8% of the students had multiple sexual partners while the reason for engaging in sex was money by 37.4% of the students. Additionally, contraceptive use and knowledge among the respondents was at 96.1% and

85.0% respectively while the average age of sexual debut was 19.5 years. As in many other studies mentioned previously, the most common contraceptive used was the male condom (52.4%) and majority (65.9%) of the respondents felt that contraceptives prevent STIs and pregnancy. In addition, there was a statistically significant correlation (P =0.003) between awareness of contraception and educational level. A high degree of sexual activity, as well as understanding and use of contraceptives, were also found in the study. Finally, there was a substantial correlation between contraceptive awareness and academic level, as well as the use and protection against STIs. All these findings added to the much-needed body of knowledge on the nature and extent of HIV Risky Sexual Behaviour among students in Institutions of Higher Learning but still failed to inform on how stakeholders could successfully mitigate the behaviour among the same respondents.

Additionally, in Nigeria, Ahmed *et al*. (2016) carried out an institution-based cross-sectional descriptive study on how Bayero University undergraduate students in Kano State who were not married knew about and used birth control. Unmarried undergraduate students at the university were randomly chosen to participate in a self-administered, pretested, structured questionnaire. Students with a median age of 23 were surveyed. Male students made up 61.3% of the student body, while females made up 38.7%. Respondents had an average awareness about contraception of 87.7%, with the internet and media being the most prevalent sources of information (91% and 89%, respectively). 15.63 %of sexually active college students reported using a contraceptive method. A quarter of people had their first sexual experience before the age of 16, 68.75% did so between the ages of 16 and 20, and 12.5% did so after the age of 20. All sexually active participants engaged in vaginal sex. They checked the data with Microsoft Excel 2016

and Epi-info7 and found that even though the respondents knew a lot about how to use contraceptives, few sexually active students actually used them. This left a space for unintended and unwanted pregnancies to happen among this group of students. Once more, this study added to the much-needed body of knowledge on the nature and extent of HIV Risky Sexual Behaviour but still failed to inform on how to mitigate the risky behaviours presented.

The review also looked at research by Joda *et al*. (2013) who carried out a study in seven (7) Institutions of Higher Learning in Lagos State. Their research was a cross sectional descriptive study, which was questionnaire-based and focused of the practice and knowledge and practice of STIs among students in the chosen institutions using lists, obtained from the Lagos State Ministry of Education. The researchers sourced and surveyed thirty students conveniently selected from each school. Data was analysed using Microsoft Excel. Results were considered to be statistically significant if $p < 0.05$. The study discovered that knowledge about transmission and symptoms was higher than knowledge of drugs, prevention and consequences. Among students who were sexually active, 24% did not use condoms while 10% re-used condoms. This re-use of condoms is particularly concerning. Indeed the study added to the much-needed body of knowledge on the nature and extent of HIV Risky Sexual Behaviour but failed to inform on how to mitigate the risky behaviours at hand such as the re-use of condoms.

Meanwhile, Darré *et al*. (2018) evaluated a study of students at the University of Lomé's Faculty of Health Sciences, Togo, on sexual activity, contraception, and the risk of sexually transmitted illnesses. By administering a questionnaire, they conducted a descriptive cross-sectional study. Included were students who were consistently enrolled

in the Faculty of Health Sciences in 2017–2018. They found out that majority (51.8%) of students were sexually active, a lower result compared to what other researchers have presented. The mean age of first intercourse was 17.9 ± 3.2 years while most students (70.3%) were heterosexual. Regarding the number of sexual partners, less than half of the students (48.5%) had more than one partner, and 15.9% of them had at least five sexual partners. In addition, slightly more than twenty-one percent of these students had only one sexual encounter every month. Regarding contraception use among students, the majority (67.5%) of students employed a contraceptive method. Among those using contraceptives, majority (55.3%) had used condoms, followed by the *Ogino* (withdrawal) method at 14.1%, which is concerning due to its high HIV risk. As with earlier mentioned studies, the study added to the much-needed body of knowledge on the nature and extent of HIV Risky Sexual Behaviour but still failed to adequately inform on how to mitigate the risky behaviour that they had presented.

Meanwhile, Tiotsia *et al*. (2018) carried out a descriptive cross-sectional study, between January and February 2017. They obtained data by administering a face-to-face questionnaire to students at the University of Dschang in Cameroon. Codification, processing, and analysis of their data were performed using EPI-Info 7.3.1.1 with a significance level of 0.05. They revealed that the main mechanisms of HIV transmission stated by students were a combination of blood transfusion, unclean objects, mother-to-child transmission, and unprotected sex for 36.3% of respondents; however, 21.9% of them acknowledged to not knowing any ways of transmission of Sexually Transmitted Infections and HIV, which is quite alarming. Furthermore, majority (74.2%) of respondents were sexually active, with the estimated age of sex debut being over 18 years

for majority (53.9%) of them. Of the 36.2% respondents who reported knowing someone with a Sexually Transmitted Infection and HIV, the first feeling they had with regards to them was pity (86.6%) followed by fear (11.7%) yet 40.2% admitted they had never heard of discrimination. In comparison to earlier reviewed studies, this study added to the much-needed body of knowledge on the nature and extent of HIV Risky Sexual Behaviour but still failed to adequately inform on how to mitigate the risky behaviour that the researchers presented.

Blignaut *et al*. (2015) at the Western Cape University in South Africa carried out a study between the years of 2007 and 2012. In each of the six years, the study included students willing to submit an anonymous questionnaire. The percentage of students who reported having had vaginal intercourse prior to enrolling in college grew from 44 percent in 2007 to 51 percent in 2012, yet the consistent use of condoms declined from 60 percent in 2007 to 51 percent in 2012. This finding is troubling. In addition, between 2007 and 2012, the proportion of people who were tested for HIV climbed from 19 percent to 47 percent, although the proportion of people who intended to be tested exhibited no significant change. Despite the fact that students' HIV awareness increased from 2007 to 2012 (from 63% to 69%), over a third of students reported suffering from AIDS weariness. According to Shefer (2012), AIDS fatigue is a phenomenon in which individuals or societies who were previously concerned about the effects of HIV become desensitised to having a strong emotional response to HIV-related issues after receiving repeated messages about the danger for an extended period of time. This may account for the drop in testing intent. This study contributed to the much-needed body of knowledge

on the nature and breadth of HIV Risky Sexual Behaviour, but failed to provide information on how stakeholders might effectively mitigate the identified risky behaviours.

Hoque & Ghuman (2012) carried out a cross-sectional study among 582 females to find out the patterns of contraceptive use among students using multi-stage sampling techniques at Mangosuthu University of Technology, KwaZulu-Natal, South Africa. Multivariate logistic regression analysis was utilised by the researchers to uncover that the majority of sexually active students (90.7%) used contraception, with the majority of them using condoms (90.5%). They discovered that there was no significant association between gender and contraceptive use, but that there was a substantial association between gender and condom use, as men used condoms more frequently than women. In addition, they revealed that 81% of sexually active students reported using contraception during their most recent sexual encounter. The researchers concluded that students' utilization and knowledge of Emergency Contraception was low, that health education and promotion should be targeted towards these students, and that campuses should offer EC, but the study still failed to sufficiently inform on how to apply its recommendations.

Hoffman *et al*. (2017) also evaluated prevalence of indicators potentially linked with HIV risk, concentrating on partnership features and regular condom usage. They collected their data from a representative sample of 2nd to 4th year university students in KwaZulu-Natal, who were surveyed by an interviewer during registration. Of 576 students, 218 (83 women, 135 men) reported vaginal intercourse in the past 2 months. A

low percentage (7%) of women and 43% of males reported past-year concurrent partnerships, and 24 percent knew or suspected partner non-monogamy. Although reported condom use at last intercourse was high (90%), 2-month consistent use was at 53% for women and at 73 % for males. Reported hormonal contraceptive use was above one third (36.8%). (36.8%).Much less than one-fifth (16.7%) of women and majority (68%) of men used condoms for dual protection. Hoffman *et al*. (2017) In gender-stratified multivariable analyses, it was underlined that consistent condom use was higher among males whose partners did not use hormonal contraception and who reported using condoms for dual protection as opposed to single protection. In the meantime, they reported that consistent condom use among women was not associated with any contraception-related characteristics. The study failed to provide information on how to adequately minimise the absence of consistent condom use.

Nsubuga *et al*. (2016) In Uganda, the risk of unwanted births and unsafe abortions among students at colleges and universities remained high because of insufficient contraceptive use. In April 2014, the researchers conducted a survey on the main campus of Makerere University in Kampala, Uganda. They conducted interviews with female undergraduates who supplied information regarding socio-demographic characteristics, knowledge, perceptions, attitudes, contraceptive use, and other sexual and reproductive health practises. The prevalence of contraceptive use was calculated by dividing the total number of users by the total number of female participants. Researchers employed Prevalence Ratios (PRs) with their matching 95% confidence intervals as measures of connection between contraceptive use and associated variables. PRs were achieved

through the use of a modified Poisson regression model that utilised a generalised linear model with Poisson as the family and a log link without an offset but with resilient standard errors. They ran analysis using version 13 of Stata Contraceptive use was found to be almost universally accepted, acceptable, and beneficial by these women, but it was not carried through to their full potential. Indeed the study provided a wealth of information regarding the students' risky sexual HIV practices but failed to inform amply on how to mitigate the risky behaviour presented.

Somba *et al*. (2014) stressed that the premarital sexual activity rate, illegal abortions and unwanted pregnancies remained high among students in Institutions of Higher Learning. They conducted a survey of female undergraduates at Tanzania's Muhimbili and Dar es Salaam universities to examine their sexual habits and awareness of contraceptives. From June to October 2013, they delivered a questionnaire to 281 female undergraduates as part of a cross-sectional, analytic investigation. In addition, data was analysed with Statistical Package for Social Science (SPSS) for Windows version 17.0, descriptive statistics were reported, and the chi-square test was performed to assess the link between various socio demographic and sexual behaviours and contraceptive use. In this survey, the majority of participants admitted that they knew about contraception, but only a small percentage actually used it. The studies also found that majority of the respondents were sexually active, with the majority having started sexual activity at a young age making them more susceptible to Sexually Transmitted Infections and HIV. Similar to other reviewed studies, indeed the study provided a wealth of information regarding the

students' risky sexual HIV practices but failed to inform on how to effectively mitigate the risky behaviours at hand.

In Ethiopia, Yared *et al*. (2017) found students at Ambo University main campus to be at a high risk of STIs and SRH problems. These students did not however perceive themselves at risk of Sexually Transmitted Infections and HIV infection though they had multiple sexual partners, showed they were sexually active, and reported symptoms of Sexually Transmitted Infections. Yared *et al*. (2017) conducted a cross-sectional study in January and February of 2015 while employing a mixed approach of qualitative and methods. They further employed proportionate stratified sampling technique and selected 400 survey respondents while employing purposive sampling towards 10 in-depth interviewees. They coded and input the quantitative data into SPSS, arranged the qualitative data, then reviewed and thematically evaluated it multiple times. The results revealed that the mean age at first sexual activity was 17.29 ±SD 2.21 and the mean number of regular sexual partners in the preceding 12 months was 1.36 ±SD 0.505. Only 21.1% of responders to the poll judged themselves to be at risk for HIV. Almost all poll respondents were familiar with STIs (94.5%) and HIV (98%), and 89.4% knew about modern contraceptives such as tablets (64.8%) and condoms (56.8%). Despite awareness of STIs, including HIV, over twenty-two percent (22.8%) had contracted a STI during the past year. Although the quantitative data indicated a low prevalence of undesired pregnancy (5%) and abortion (2.5%), the qualitative data reflected significant rates of unwanted pregnancy and unsafe abortion. Although they had knowledge about STIs, the infection rate in the particular year of research was found to be extreme, as much as the

percentage of students who reported sexual activity in the previous year. Similar to other reviewed studies, indeed the study provides plenty of information regarding the students' risky sexual HIV practices but fails to inform on how to successfully mitigate the risky behaviour at hand.

Still in Ethiopia, Woldeyohannes *et al*. (2017) assessed the utilisation of voluntary HIV testing and counselling services, as well as hazardous HIV sexual behaviours, among undergraduates at Addis Ababa University of Science and Technology. Between May and June of 2013, researchers performed a cross-sectional study. To obtain data, they used semi-standard, self-administered questionnaires and a simple random sample method to select departments from each institution. They entered information into EPI-Info and examined it using SPPS statistical software. The pupils' ages ranged from 17 to 25 years old. More than a quarter (26.8 percent) had sexual interaction, with the average age of first sexual contact being 17.4 years. Seventy-six percent of students were aware that condoms prevent STIs. Among sexually active individuals, 74 (46%) had not worn a condom during their first sexual encounter, while 488 (83.4%) had heard information about HIV Counselling and Testing (HCT). Despite this, 52 percent had never utilised HCT service. The overall mean scores for attitude and knowledge on HIV risk perception were approximately 66% and 57%, respectively. It was also reported that students enrolled in health science departments had nearly two and a half times more positive attitudes and three times more knowledge regarding HIV risk reduction techniques than students enrolled in non-health related departments. Similar to other reviewed studies, indeed the study provided a wealth of information regarding the students' risky sexual

HIV practices but failed to inform on how to mitigate the risky behaviour presented effectively.

Mulu *et al*. (2014) conducted a cross-sectional study to examine sexual behaviours and associated characteristics among students at Bahir Dar University in Ethiopia from February to December 2013. Multistage sampling, self-administered questionnaires, and descriptive statistics like frequency and mean were used to define the study participants in relation to the important factors. They then used a multivariate analysis to discover the predictive variables. The researchers revealed that 36.4% of the 817 study participants had already engaged in sexual activity. Mean age at first sexual experience was 18.6 years old. Students frequently engaged in sex with commercial sex workers, unprotected sex, many sex partners, and sex for financial gain. There were 130 (15.8%) students who went to nightclubs and 534 (65.4%) students who viewed pornographic videos, respectively. In addition, the guys had strong favourable associations with pornographic film viewing and nightclub attendance. In addition, it was shown that frequent nightclub attendance, pornographic film viewing, khat chewing, and alcohol consumption were substantially related with having several sexual partners. Attending nightclubs and chewing khat were found to be statistically significant predictors of engaging in sexual activity for monetary gain and for having sex with commercial sex workers, respectively. Similar to other reviewed studies, indeed the study provided a wealth of information regarding the students' risky sexual HIV practices but failed to inform on how to mitigate the various risky behaviour revealed in the study.

A comparative study by Ngatu *et al*. (2012) in Central Africa, evaluated the attitudes, knowledge, and practices of Congolese students in comparison with Japanese students regarding risk for sexual transmission of HIV. Researchers conducted a cross-sectional study at Kochi University Medical School, Kochi University School of Agriculture, Kochi University School of Human Sciences and Economics, and Kochi National Nursing College in Japan; University Bel Campus and Songhwa University in Kinshasa; Institut Superieur de Commerce in Bas-Congo province, and University of Kisangani in northeastern Oriental province in Congo; and Institut Superieur de Commerce in Bas-Congo province and University of Kisangani in northeastern Oriental There were 1,747 participants in the survey. The percentage of Congolese respondents who did not always use condoms with an occasional sexual partner was much higher than that of their Japanese counterparts (57 %). Less than forty percent of Congolese respondents had appropriate understanding of premature sex, Commercial Sex Work, multiple sex partnerships, Men who have Sex with Men, and high-risk behaviours for sexual transmission of HIV. However, the proportion of Congolese who had been tested or were willing to be tested for HIV was substantially greater (97.2%) than that of Japanese individuals (72.4 %). In contrast to their Japanese counterparts, fewer Congolese students adhered to preventive measures such as condom use with an occasional sex partner, and a greater proportion of Congolese students had inaccurate knowledge of major risk behaviours such as Men who have Sex with Men, precocious sex, and multiple sex partnerships. The study also indicated that, despite the fact that sex remained the primary mechanism of HIV transmission in the region, Congolese students tended to have a skewed understanding of activities that expose the public to the risk of sexual

transmission of HIV. Similar to other reviewed studies, indeed the study provided a wealth of information regarding the students' risky sexual HIV practices but still failed to inform on how to mitigate the risky behaviour unearthed in the study.

2.5.5 Nature and extent of HIV Risky Sexual Behavior among students in Kenya

In 2017 alone, new HIV infections in Kenya were 52,767, with young people contributing 17,667 (33%) of these new infections (MoH, 2018). This is higher than the global average for the youthful population which stood at 31% of new infections (UNAIDS, 2020). These statistics demonstrate that not only was the contribution of new infections by the youth in comparison to the rest of the Kenyan population extremely high, but youth in Kenya were averagely more infected than youth globally. Therefore, to add to the much-needed body of knowledge on Kenyan youth and HIV, Hafsa (2012) carried out a study to determine sexual behavior among youth aged 15-24 years in two colleges and two youth centers in Mombasa, Kenya. The author used a descriptive cross sectional design to study youth aged 15-24 years and discovered that majority (70%) of youth had prior sexual experience. In addition, the majority of sexual penetration was vaginal, but significant oral (10.4%) and anal (4.4%) penetration was also observed. Significant numbers of women (16.9%) cited rape and financial gain (13.6%) as the cause for their sexual debut. 52% reported using a condom during their last sexual encounter, and 54% during sexual intercourse. Over one fifth (20.7%) of the teens reported using alcohol during their last sexual encounter. Over a third (34%) of sexually active women had gotten pregnant. Half of those pregnancies were unwanted, and a fifth (20%) of those women got an abortion. More than one-tenth (11.8%) of the teenagers, both males (4.2%) and females (7%), reported exchanging sexual favours for sexual favours. Hafsa (2012)

reported that high-risk sexual conduct was frequent among youth, with a young age of sexual debut for both genders. In addition, adolescents engaged in other high-risk activities, including non-traditional methods of penetration, intercourse in exchange for favours, and alcohol consumption. The researcher said that adolescents, particularly females, were at significant risk for rape and sexual coercion (Hafsa, 2012). Indeed the study does provide useful knowledge relevant to understanding the nature and extent of HIV Risky Sexual Behaviour among the Kenyan population but leaves knowledge gaps unfilled regarding how to mitigate this behaviour appropriately.

Mbugua & Karonjo (2018) Consequently, a study was conducted at Mount Kenya University, Main campus, Thika, to evaluate the techniques employed by university students to prevent unintended pregnancy, as well as their understanding of contraceptive methods and sexually transmitted infections. For data collection, a stratified sample strategy and a self-administered questionnaire were utilised. The data were examined, evaluated, and percentages were utilised to quantify the knowledge level. The Pearson's chi-square statistic was used to assess correlations between categorical data, whilst the independent t-test was employed to measure the means and relationships between continuous variables. The researchers determined that condom use is the most prevalent method for preventing unintended pregnancies (48.5%) and sexually transmitted infections (46.4%) and HIV (46.4%).In addition, over two-thirds of respondents (58%) expressed familiarity with only one method of contraception, 60% claimed familiarity with more than two types of Sexually Transmitted Infections (STIs), and 62.4% reported familiarity with only hospitals as providers of Reproductive Health Services.

Consequently, the pupils' HIV prevention preparation was inadequate. The study gives valuable information pertinent to comprehending the nature and scope of HIV Risky Sexual Behaviour, however it leaves knowledge gaps regarding how to minimise the same behaviour.

A study by Okoth (2006) attempted to find out what made people at the University of Nairobi use condoms. The objective was to establishing the correlation between perceived HIV threat and condom acceptability and use, as well as determining attitudes and beliefs regarding condom use. It further sought to establish if there are socio-economic and environmental differences between condom users and non-condom users. To accomplish the aforementioned goals, a descriptive cross-sectional survey including both quantitative and qualitative approaches was implemented. The study population included 89 participants. These resident students were purposively selected using convenience sampling method. To obtain additional information three focus group discussions were conducted. The findings of the study revealed that respondents' understanding of HIV was ample. Consistent with numerous other studies, the study found high awareness levels of the condom but consistent condom use was low with no more than 35% reporting to have used the condom consistently in the past month of interview. It finally emerged that the impact of condoms may be limited by low use, inconsistent use, among those at highest risk and negative perceptions. The study nevertheless leaves knowledge gaps unfilled regarding how to mitigate low consistent condom use among other risky behaviours.

A similar study by Kithuka *et al*. (2011) The survey was conducted among JKUAT undergraduate university students. The study focused on condom use and students' HIV-related knowledge, attitudes, and behaviours. A cross-sectional design was employed for the investigation. Simple random sampling was employed to generate the requisite sample size for quantitative data on 461 respondents, while snowball sampling was used for qualitative data on 64 respondents. MS Access, SPSS, and MS Excel software were utilised for data analysis. According to the findings of the survey, 66.2% have engaged in sexual activity. The condom usage rate was 72.8% (222), and there was a significant correlation between condom usage and general attitude (P0.001). The study provides provide helpful information pertinent to comprehending the nature and scope of HIV Hazardous Sexual Behaviour, however knowledge gaps remain concerning how to minimise the identified risky behaviours.

Jepkosgei (2009) investigated whether or not young people believed themselves to be at danger of HIV infection and the various preventive steps they have taken to avoid being infected In the Eldama-Ravine and Koisamo areas in the Koibatak region, 108 participants aged 15 to 24 years provided quantitative and qualitative data. The results of a typical questionnaire provided to respondents demonstrated inadequate understanding regarding general sexual behaviour and Reproductive Health concerns, including STIs. Although the majority of respondents were sexually active, 70.2% had not undergone an HIV test, and 77.3% were unaware of the HIV status of their current partners. Despite a 99 percent awareness rate among respondents, the study indicated that this awareness had not converted into proactive behaviour changes. The study therefore indeed provides

useful knowledge relevant to understanding the nature and extent of HIV Risky Sexual Behaviour but leaves knowledge gaps unfilled regarding how to mitigate the same behaviour.

Gitonga *et al.* (2012) examined the attitudes of first-year students at Kimathi University College of Technology concerning HIV, sexual behaviour, and drug usage. A cross-sectional study employing a two-stage, probability-based sampling technique was utilised. Knowledge of HIV was found to be high, however this was not reflected in behaviour. 57.9 percent of participants have engaged in sexual activity. 45.5 percent of participants reported not using condoms, and 48.3 percent had never been tested for HIV. 41.1 percent of these individuals believed they had never been exposed to the virus. 27.2 percent of participants reported having taken alcohol and other drugs, while 7.5% believed that drug or alcohol usage increased the risk of sexually transmitted disease. Alcohol consumption was also found to be substantially linked with having engaged in sexual activity ($p=0.003$) and non-use of condoms ($p=0.015$).The study indeed provides useful knowledge relevant to understanding the nature and extent of HIV Risky Sexual Behaviour but leaves knowledge gaps unfilled regarding how to mitigate the same behaviour.

Akwara, *et al*. (2003) Also conducted a study on the perception of the danger of HIV-related sexual behaviour in Kenya, which indicated that unmarried young women and men were more likely to report Risky Sexual Behavior than their married counterparts. Using data from the Kenya Demographic and Health Survey of 1998 and logistic

regression models, the researchers examined the strength and direction of the link between Risky Sexual Behaviour and perceived risk of HIV in the preceding 12 months. The researchers found a considerable positive correlation between perceived HIV risk and risky sexual behaviour among both men and women. Their findings that Risky Sexual Behaviour was more commonly reported by young unmarried women and men and that ethnicity was substantially connected with Risky Sexual Behaviour highlight a need to explore contextual and societal elements that influence behaviour in what they call to the as Kenyan system of people. The study indeed provides useful knowledge relevant to understanding the nature and extent of HIV Risky Sexual Behaviour but leaves knowledge gaps unfilled regarding how to mitigate the same behaviour.

Njoroge *et al*. (2015) studied how many undergraduates at JKUAT in Kenya use contraceptive services and what influences them to do so. Cross-sectional study design was used, with quantitative and qualitative methodologies were incorporated (through questionnaires self-administered). There were 436 participants in the quantitative study, and three members of the health centre personnel participated in the qualitative study. An internal memo was used to track down the selected students in each of their faculties, departments, and courses. The researchers also determined that the overall level of contraceptive use was low at 34.2% despite high levels of contraceptive awareness (96.1%). Student's religion, residence, parity, previous sexual experiences, previous contraceptive use, contraceptive sources, availability, costs and students attitude towards contraceptives were found to be associated with contraceptive uptake. The researchers concluded that the uptake of contraception remained relatively low despite the high level

of awareness. The study provides useful knowledge relevant to understanding the nature and extent of HIV Risky Sexual Behaviour but leaves knowledge gaps unfilled regarding how to mitigate the same behaviour.

2.5.6 HIV Risky Sexual Behavior among students in Western Kenya

According to Okiro (2019), new HIV infections among youth in Kenya in 2017 were concentrated in the Western part of Kenya with the most affected counties being Homa Bay (1,852 people), Siaya (1,641 people), Kisumu (1,630 people), Migori (1,143 people) and Kakamega (596 people). These counties contributed a majority (61%) of new infections among youth aged (15-24). This escalated in 2020 as eight Western Kenya counties made it on the top 10 list of counties with the most prevalent cases of HIV in Kenya. These included Homabay at 19.6%, Kisumu at 17.5%, Siaya at 15.3%, Migori at 13.3%, Busia at 7.7%, Vihiga at 3.4%, Kakamega at 2.5% and Kisii at 2.1% (MOH, 2020). Additionally, in Western KenyaMoH (2015) reported that a significant proportion of young people engaged in risky sex. They shared that in 2014 (30-40%) of young people in the region had not used a condom during their last sexual encounter among married young women aged (20-24) in Western Kenya, (40%) had an unmet need for contraceptives. The unmet need in this age group was two times that of the same age group at the national level.

Additionally, in Western Kenya Sexually Transmitted Infections were identified as a major issue affecting young people. It was reported that the age at sex debut in the region was as low as 15 years and that there was little awareness of the consequences of unsafe sex. Furthermore, Sexual and Gender Based Violence were also identified as Sexual and

reproductive Health issues affecting young people (NCPD, 2017). In Western Kenya the main Sexual and Reproductive Health information and services that were reported to be available and accessible to youth were contraceptives, including condoms, injectables, pills and implants. However, the young people faced a myriad of challenges in accessing these services, which included fear or embarrassment, fear of side effects, cost of services and inadequate health facilities. Other challenges mentioned were negative health provider attitude and lack of youth friendly services (MoH, 2015).These factors further exacerbated HIV Risky Sexual Behavior. In a study by Immonje (2016) which looked at students' HIV risk perception and risk behavior in universities in the counties bordering Lake Victoria, it was also revealed that majority (75%) of students had a high HIV Risk perception, associated with high risk behavior. Additionally, a strong relationship was found between HIV Risk Perception and HIV Risk Behavior of university undergraduate students in the study area and between the students HIV risk perception and their HIV knowledge. Finally, the level of association between the undergraduate students was found to be high. The study focused on Jaramogi Oginga Odinga University of Science and Technology, Great Lakes University of Kisumu, Maseno University and Rongo University College at the time, now Rongo University.

Another study was carried out at MMUST in Kakamega County, Western Kenya by Oburenyi (2017). 453 undergraduate students were surveyed using the quantitative research method and stratified random sampling. Analyses of the data used both descriptive and inferential statistical methods, where needed. A variety of descriptive statistics, such as frequencies and percentages, were employed to better arrange the data.

A logistic regression analysis was used to look for patterns in the data and find correlations. The study found that the majority of undergraduate students were using contraceptives (62.7%). Knowledge of the methods was high at 90% while the most preferred method was condoms at 75.6%. The knowledge of contraception and condoms verses the use of contraception and condoms was reported to be lacking. Once more, the study provided useful knowledge relevant to understanding the nature and extent of HIV Risky Sexual Behaviour but leaves knowledge gaps unfilled regarding how to mitigate the same behaviour effectively. The situation in Western Kenya regarding HIV incidence and prevalence among young people is thus one that needs distinct attention.

2.6 HIV prevention behavioral strategies

Many Institutions of Higher Learning across the world have employed various intervention strategies towards the mitigation of HIV Risky Sexual Behavior among their students (Wyk & Pieterse, 2006). Among the three strategies that have been employed are behavioral intervention strategies. According to Coates *et al*. (2008), behavioral intervention strategies aim to reduce the number of sexual partners individuals have; increase the consistent and correct use of condoms and improve treatment adherence among people living with HIV. UK Consortium on AIDS and interventions development (2013) gives an example of behavioral interventions as provision of information for example sex education. In this section, HIV prevention behavioral strategies are discussed as information provision, counselling and other forms of psychosocial support, stigma, and discrimination reduction programmes as summarized from various authors.

2.6.1 Information provision

At the University of Michigan, the "*Sexperteam*" programme was formed which educated campus communities about sexual health and relationships. Their interactive style demonstrated that consensual sexual activity could be healthy, positive and fun (HRCF, 2019). Newcomb *et al*. (2017) assessed the preliminary efficacy, acceptability and feasibility, and of the intervention known as "*2GETHER*". The researchers brought on board 57 male couples ($N = 114$) who were youth into a hybrid group and individual intervention and assessed acceptability through exit interviews and post-session surveys and, examined the initial efficacy at a two week long posttest. The study found out that 93% of participants said they had only positive views of "2GETHER", while all components received high ratings. Specifically they noted reduction in HIV risky behavior, information, behavioral skills, and HIV prevention-related motivation, and an increase in posttest and pretest investment in relationships. This study does provide a good basis to compare the current study with regarding the provision of HIV information to students.

In Malaysia, Soleymani *et al.* (2015) conducted a survey of postgraduate students at a Malaysian public institution to find out how much they knew about sexual and reproductive health. Between September 5, 2012 and September 15, 2012, 434 postgraduate students were randomly selected from the university's student body using a cross-sectional design and systematic random selection. The internet (78.6%) and newspapers (61.8%) were identified to be the most common sources of information in the study. Most (97.9 %) of students knew that HIV is an STD but that majority of them

believed that the spread of STDs was through shaking hands (92.1 %),is noted with heavy concern. The use of condoms was seen to be the most common way to avoid STDs (88.4 %). Furthermore, SRH knowledge was discovered to be significantly connected with the faculty, marital status and age of the students while the educational status and socio-demographic factors accounted for less than a tenth (9%) of the variability in Sexual and Reproductive Health knowledge. The study provides a good basis to compare the current study with regarding the provision of HIV information to students. In China Li *et al*. (2007) reported that 58.4% of students had ever received health education on HIV prevention at their colleges.

The University of Namibia made "Contemporary Social Issues" a required subject for first-year students, which addressed ethics, gender, and HIV. Additional courses on HIV/AIDS were also given by some departments. In 2001, the institution developed a radio station to mainstream HIV problems among young people through music, jingles, theatre, and talk shows. In addition, the University launched a "My Future is My Choice" tutoring and mentoring programme for children ages 15 to 18 through a life-skills curriculum. In addition to HIV prevention, the programme aimed to improve participants' everyday abilities. There were eleven lessons in all, and they lasted around two hours apiece. It was often spread out over a period of five weeks, with two classes every week. More than 300,000 pupils had received training by 2004 (Otaala, 2000). This programme goes to demonstrate how information provision on HIV may be done through innovation.

According to Chilisa & Bennell (2001), University of Botswana responded to the threat of HIV and HIV Risky Sexual Behavior through curriculum change. As part of their curriculum, students were taught about HIV and HIV Risky Sexual Behavior as part of a life skills programme. This programme was a direct response to the school's desire to help students better prepare for life after high school. As a supplement to other curriculum improvements, the life skills method was used to teach students how to deal with HIV in their professional lives (Chilisa &Bennell, 2001). Meanwhile in Ethiopia, behavioral strategies for Institutions of Higher Learning were organized at a National scale by National Alliance for State and Territorial AIDS Directors (NASTAD). The Alliance was successful in executing three (3) SISTA Training of Trainers (ToT) sessions, which reached 1,200 female students at six (6) universities. In addition, they held four (4) edutainment sessions and weekly mini-media programmes at six (6) institutions and distributed over ten thousand HIV prevention pamphlets and booklets. Finally, they held four (4) HIV prevention panel talks at six (6) universities (NASTAD, 2021).

Moreover, according to Otaala (2000), the University of Namibia established a programme called *'Stepping Stone.'* The programme partly focused on HIV peer education. According to Grundling & Pillay (2003), In addition, the University of Pretoria implemented an HIV peer education model in which trained student volunteers participated in community outreach programmes, media campaigns, education and awareness projects. Across the continent, as part of the Ghana Education Service's Population and Family Life Education project, some senior members of the university

developed a course on HIV and AIDS, which was made compulsory for every student (Van Wyk & Pieterse, 2006).The University of Cape Town had also been offering a student peer education programme since February 1994. This well-established programme was known as the "*Students' HIV and AIDS Resistance Programme"* and was overseen by the HIV and AIDS Unit. The programme utilized various forms of media in order to spread and maintain awareness of HIV issues. The Students' HIV and AIDS Resistance Programme aimed to contribute towards education, information and prevention (Michel & Fish, 2004). The Nelson Mandela Metropolitan University also had an established Student Peer Education programme (Crewe, 2000).

According to a study by Nzioka *et al*. (2007) that was looking at mitigating the impact of HIV in Teacher Training Colleges in Kenya, the researchers established that the three colleges in the study had carried out HIV training for teacher trainees. Migori Teachers Training College had created stronger working partnerships with agencies to support its varied training projects than the other two colleges. These included the Rural AIDS Prevention Programme (RAPP) and the United Nations Educational, Scientific, and Cultural Organization (UNESCO). It also actively participated in Primary School Action for Better Health (PSABH), a project implemented by the Center for British Teachers (CfBT) that supported short-term HIV courses through seminars (Nzioka *et al*., 2007). Through this initiative, the Dean and the Assistant Dean received HIV training. The Ministry of Education of Kenya was also reported to be providing additional funds for training activities (Nzioka *et al*., 2007).

Additionally, evangelical missionaries from Pentecostal Evangelism for Africa (PEFA), Canada, were reported to have visited the college and trained the teacher trainees and staff on HIV. Meanwhile, a study by Immonje (2016) looked at contribution of HIV curriculum mainstreaming to Kenyan university students' HIV risk perception and behavior in the Great Lake Victoria Counties revealed that for students at Jaramogi Oginga Odinga University of Science and Technology (JOOUST).The most interesting and preferred interactive sessions according to the registrar, were the video-shows and this was mainly a peer educator activity. A case in point was the "*SHUGA"* movies in which young people like Lupita Nyong'o (the famous Kenyan born 2015 Oscar laureate) acted in its season's I-III entitled "*Behavior Risk in the University."* These brought out issues of HIV, alcohol and drug-use; and sex. Nevertheless Adam & Mutungi'(2007) reported that, only 49% of Kenyan university students reported having received any HIV education.

Immonje (2016) found that the extent of HIV mainstreaming into the universities' curricula ranged from fair to reasonably high as follows; Rongo University College (now Rongo University - 40%), Maseno University (80%); Great Lakes University of Kisumu (50%) and JOOUST (80%).Nzioka *et al*. (2007), report that at Shanzu Teachers Training College, training programmes were reported to be just picking up from September 2005. However, the Canadian International Development Agency(CIDA) contributed funding to teach some college tutors on HIV prior to the launch. The tutors who had been educated were expected to pass on their skills and expertise to others and to incorporate lessons on HIV/AIDS into their curriculum. Around seventy trainees and ten (10) non-

teaching staff members were educated as peer educators through the same initiative and with additional funding from the Ministry of Education in November 2005.

The success findings of the Swedish International Development Agency (SIDA) (2010) baseline study of six East African universities included mounting of the common compulsory courses on HIV to increase awareness among other successful HIV responses. The Southern University HIV and AIDS Prevention Program (SU-HAPP) offered leadership in the coordination of campus programmes meant to enhance awareness, provide links to necessary resources, conduct HIV-related education, and create sustainable community ties with HIV pandemic affiliates. The HIV and AIDS Prevention Program at Southern University is credited with enhancing the knowledge, abilities, and resources of the campus community in order to reduce the risk of HIV infection. Participatory training and working with campus and community-based groups were used to develop the skills, talents, and resources of university students in an effort to reduce the spread of HIV (SIDA, 2010).

According to Immonje (2016), three of the four Kenyan universities studied had a common stand-alone HIV and AIDS Course. These were multidisciplinary in the sense that they contained information from various disciplines; Biology, Public Health, Geography, History, Business Studies, among others. In Maseno University, which had Health Sciences and Public Health as well, HIV was taught in Biological and the other relevant Health Sciences. Such HIV education she reports was also likely to appear on students transcripts in the respective carrier subjects. Immonje (2016) further reported

that Maseno University had designed a stand-alone common course for all students and that quite a large amount of HIV education went on during the orientation week and this included HIV instructional sessions from the peer educators. There was an HIV club at Highridge Teachers Training College, where students met on Tuesdays to discuss HIV-related concerns. Another club on campus was dedicated to raising awareness of HIV and other sexually transmitted diseases. The college's other clubs were also encouraged to educate their members about HIV and set up venues for dialogue about the disease (Nzioka *et al*., 2007).Immonje (2016) additionally discovered there was evidence of HIV curriculum mainstreaming through co-curricular activities of peer educators under the auspices of the dean of students office in their weekly counselling seminars also referred to as *coffee houses*. In essence therefore, some HIV co-curricular mainstreaming were in existence in all the four universities of the study from which it was discovered that 66% of the students had been taught HIV courses upon joining the university.

2.6.2 Counselling and other forms of psycho-social support

Beres *et al*.(2017) reports that psychosocial support interventions allow students the opportunity to make better decisions around their Sexual and Reproductive Health and that outcomes of interest include social well being, mental health, emotional health, and quality of life, Sexual and Reproductive Health decision-making and common mental health disorders. Additionally, they noted that implementation of psychosocial support interventions increases participation retention, which may be related to intervention timing, study follow-up procedures, engagement of participants with the subject matter and delivery (Beres *et al*., 2017).

Tuke *et al*. (2020) conducted a study in Uganda whereby social support was investigated as a determinant of psychosocial adjustment over 12 months in HIV-infected, HIV-exposed uninfected and HIV-unexposed uninfected youth. Researchers looked at how cumulative lifetime adversity and social support affected psychosocial adjustment (self-esteem, distress, hopefulness, a positive outlook on the future and a sense of purpose) over a period of 12 months in HIV-infected, HIV-exposed uninfected, and HIV-unexposed uninfected youth. Time-varying adversity and social support were linked to psychosocial adjustment over the course of a year using linear mixed effects models. Adversity was associated with poorer self-esteem, increased distress, and a lack of hopefulness, optimistic attitude, or feeling of purpose regardless of HIV status. Higher levels of discomfort were predicted by a lack of social support, lower positive outlook and low sense of purpose over 12 months. The researchers discovered that low social support predicted higher distress and lower positive outlook over 12 months.

According to Benevides *et al*. (2019) the "Evidence-to-Action Project's" University "Leadership for Change Initiative" in Niger, 200 students trained as peer leaders reached almost 8,000 youth and provided counselling services to students. Meanwhile, according to Otaala (2000), the University of Namibia established a programme called *'Stepping Stone.'* that partly focused on provision of counselling services. Through the programme the University of Namibia also introduced a new HIV Awareness Week prevention initiative, which took place twice annually. During HIV week, prominent speakers from government and civil society were invited to address themes including psychosocial.

According to a study by Chhim et al. (2018), the proportion of teenagers living with HIV with viral suppression was reasonably high at 76.8%, but fell short of the global goal of 90%. Researchers found that a variety of interventions, including psychosocial support and treatment literacy, targeted at younger adolescents and adolescents transitioning from paediatric to adult care improved viral suppression outcomes. Okonji et al. (2020) also reported their findings, stating that adolescents and young adults living with HIV lacked psychosocial support interventions to increase adherence and retention in antiretroviral medication. Further study and programming in the area of psychological support interventions or techniques specifically intended to meet the needs of young people living with HIV were recommended by the panelists.

Willis *et al*. (2019) additionally discovered that adolescents receiving the Community Adolescent Treatment Supporters (CATS) service, youth who had access to a psychosocial support service had increased linkage to services and retention in care, as well as improved adherence and psychosocial well-being, compared to those who did not have access to such services. Additionally, student volunteers from the University of Botswana served as health promotion assistants and peer counsellors at the Health and Wellness Centre. The "*Future Leaders @ Work*" peer education programme and a psycho-social support programme of the Centre for the Study of HIV at the University of Pretoria have been expanded to the University of Botswana as part of the Beyond Borders regional initiative, following negotiations in 2005 and continuing in 2006. (Mberia & Mukulu, 2011).

In South Africa, the non-profit organisation known as loveLife has been implementing a Youth Leadership Development programme in which young people are encouraged to avoid behaviours that are detrimental to their physical health by providing them with psychosocial support, training, and access to opportunities. On college and university campuses, the programme provides instructional materials and continuing education opportunities linked to sexual health; it also develops and implements strategic initiatives in the field of sexual health and clinical care, as well as serving as expert advisors and a resource for inquiries concerning sexual and reproductive health among college students (lovelife.org, 2021).

Copperbelt University in Zambia developed the *'In But Free'* project where they responded to Risky Sexual Behavior and HIV needs of community prison inmates some of whom had been students at the institution. Reduced risk for inmates and their families was demonstrated by this project. An important lesson from this event was that colleges and universities must be active in the world around them and sensitive to their local communities so that they can make significant contributions to real, current issues.. It was said to shatter the silence in a world where it was generally known that HIV infection flourished as a result of a variety of dangerous social and sexual practises (Chiboola, 2001). KAP investigations at the University of Zambia shed light on the extent to which HIV is stigmatised and the frequency with which people engage in HIV-risqué sexual behaviour. As a response, the University developed an educational and counselling programme tailored to the needs of students. They understood the importance of complex connections and how they made higher education institutions exciting, demanding, and

vulnerable. Institutional managers, they said, needed to be able to effectively interfere in what had traditionally been regarded as "the private life of individuals" and to be able to do so effectively in today's HIV-infected world (Mwape & Kathuria, 2000).

As presented by Hoho *et al.* (2017), Several studies on the prevention of HIV infection have been carried out in academic institutions. There remained, however, a paucity of study into the psychological and social well-being of South African university students living with HIV and AIDS. In contrast to their dormant counterparts who lacked sexual self-efficacy as a result of insufficient social support, the researchers discovered that the flourishing SLWHA tended to display self-acceptance, autonomy, and a sense of purpose in life.Han *et al*. (2018) presentedevidence of the use of Community Health Workers in promoting psychosocial outcomes in People Living with HIV. According to the authors, the Future Community Health Workers intervention should broaden its scope and incorporate fidelity metrics into its delivery to target major psychological determinants of HIV outcomes.

At the University of Botswana, Students Against HIV and AIDS was founded in 1998 and has supported several HIV-related student initiatives. Students Against HIV and AIDS promoted discussion on sexual health and HIV, encouraged cooperation among many stakeholders, and participated in national and international HIV and AIDS activities, such as the September-held Month of Prayer and World AIDS Day (Mberia & Mukulu, 2011). Moreover, according to SIDA (2010), the majority of universities in Kenya had established clear mechanisms to coordinate psychosocial support services for

HIV patients. This was accomplished by Health Units, AIDS Control Units, the Chaplaincy, and Student Deans. The Dean's office was primarily concerned with counselling and management of student initiatives. The chaplaincy offered spiritual and emotional care to all students, especially those infected with or affected by HIV. On campus, church leaders reportedly provided psychosocial assistance for the infected and the impacted by offering prayers and counselling sessions. In addition, a number of human rights organisations battled for the rights of the infected through a number of campaigns. In addition, they provided financial and emotional support to the afflicted and affected. Additionally, peer counselling was highly developed.

On the other side, Kamuzu College of Nursing, in collaboration with the University of Illinois at Chicago, managed an HIV project that focused on behavioural, cultural, social, and psychosocial aspects that influenced HIV prevention, care, and management. The initiative aims to establish an institutional programme of research excellence at Kamuzu College of Nursing in order to promote creative behavioural science research to enhance the efficacy of HIV treatment and prevention in Africa. In the meantime, both The University of Mauritius and University Eduardo Mondlane of Mozambique utilised peer educators consisting of students, teachers, and other university community members. HIV warnings were also included in the annual orientation session for freshmen (Bjarnason et al., 2001). One university utilised student organisations and/or volunteers to complete this task, whereas the other institution hired and trained student employees.

Nzioka *et al*. (2007), report also that colleges in Kenya have incorporated HIV counselling into their guidance and counselling programmes. All the colleges in their study had implemented counselling training programmes for both teacher trainees and staff. The colleges provided staff and students with workshops and seminars on counselling, health, and good parenting. In a programme funded by the College Board of Governors, Migori Teachers Training College, for instance, annually educated at least fifty students to be peer counsellors. Meanwhile at Highridge Teachers Training College, four hundred and thirty seven (437) peer counselors had been trained over three (3) academic years. Regarding the peer counselling effort at Shanzu Teachers Training College, only a small number of trainees had been taught at the time of the study, but some teaching and non-teaching staff members had been recruited for counselling. According to research conducted by Ochieng and Maiyo (2008) on the provision of psychosocial assistance for HIV-positive students in Kenyan higher institutions, 30 percent of sick college students receive inadequate care. An ill, bedridden student had no one to care for him or her, bring meals from the dining hall, and assist with bathing, feeding, medicine administration, and visits to the health clinic. Students admitted that it was distressing, unpleasant, and depressing to witness a classmate suffer and ultimately die. According to (Ochieng & Maiyo, 2008), certain colleges have built active and accessible guidance and counselling departments. Ochieng & Maiyo (2008) observed that the decreased number of students who visited the counselling facilities indicated that just 40 percent of the services were being utilised.Counseling was expanded to incorporate peer, spiritual, and individual counselling. It was also alleged that the pupils who visited the counselling centres ceased visiting before they were supposed to. In the study

conducted by Ochieng and Maiyo (2008), respondents also formed support networks via clubs and organisations. 80 percent of the students were reported to have visited each other and provided material and emotional support. Reportedly, they also appreciated one another and discussed their troubles.

According to Ochieng & Maiyo (2008) Even though more than 90 % were aware of HIV, a comprehensive behaviour change approach has yet to be implemented. Their survey-based study was conducted in five primary teacher-training institutions in the Rift Valley district of Kenya. The goal of this study was to investigate the psychological, economic, and social repercussions of HIV that have forced the introduction of psychosocial support services for HIV-positive students in postsecondary institutions. The findings demonstrated that the psychological, economic, and social repercussions of HIV are extensive and that numerous institutions have psychosocial support systems in place, while facing obstacles in their efforts to deliver these services. The study stated that psychological support systems are vital in all tertiary educational institutions and urged that the young be fully involved in the provision of these systems.

2.6.3 Stigma and discrimination reduction programmes

HIV stigma is a socially created phenomena that demeans HIV-positive individuals and deems them socially unsuitable, resulting in stigmatisation, stereotyping, and discrimination (Earnshaw & Chaudoir; King'ori *et al*., 2012; Badahdah & Sayem, 2010).As emphasized by Pulerwitz *et al*. (2010), Since the early years of the HIV epidemic, stigma has been recognised as a key obstacle to effective HIV prevention, care, and treatment. Pulerwitz et al. (2010), after conducting more than ten research in Asia, Africa, and Latin America, found that HIV-related stigma was associated with reduced

use of voluntary counselling and testing, erroneous information regarding transmission, and a lack of desire to share test results. Lessons learnt in terms of programmes include the necessity of tackling worries of spread and unfavourable societal judgments, the best way to aid institutions in detecting stigma, and how to best engage persons with HIV in programmes.

In Nikaragua, Solórzano *et al*.,(2008) looked at the use of mass media for social change among young people ages 13–24 and found that those who were exposed to the intervention the most were much less likely to have stigmatising attitudes than those who were exposed the least. Stigma and prejudice programmes that have been successfully conducted around the world could be adapted by higher education institutions. One example is the study by Chinaglia et al. (2007), which examined the provision of non-stigmatizing, holistic health services to Brazilian male truck drivers, and found that the number of truckers who took an HIV test as a result of the intervention increased significantly at the intervention location. The vast majority of people who took part in the survey said they appreciated the services and that they weren't stigmatising. Using staff training, data exchange, and participatory policy formulation for hospital workers, Mahendra et al. (2006) conducted a study in India. Health-care employees who had the least stigmatising attitudes climbed from 12% to 27%, while those who had the most stigmatising attitudes decreased from 24% to 7% when the intervention was implemented. Counseling and testing processes, patient confidentiality and universal precautions were also improved.

Van Wyk & Pieterse (2006) also did a comprehensive case study on the institutional response to HIV in the majority of Southern African Development Community higher education institutions (SADC). They stated that a culture of prejudice and stigma persisted to varying degrees in practically all of the institutions surveyed at the time. Much of the absence of data linked with the disease in SADC institutions resulted from universities failing to build effective institutionalised responses, failing to institutionalise HIV as a fundamental responsibility and business practise, and failing to mobilise sufficient resources. In Tanzania, Nyblade et al. (2008) reported that their intervention had not reduced community-wide stigma, but that stigma reduction training had a remarkable effect on those trained, notably community leaders, resulting in observable changes in their own conduct and leadership.

Furthermore in Senegal, Niang *et al*. (2003) looking at another anti stigma and discrimination intervention that at the end of the intervention period men appreciated the availability of Sexually Transmitted Infections services, which they found to be of high quality and non-stigmatizing.Meanwhile Feyissa *et al*. (2018) identified six guideline-related documents that focused on stigma and discrimination. The first was published by USAID in addition to presenting an overview of the current HIV epidemic and the effects of HIV-related stigma and prejudice (USAID, 2012). Six guiding principles were used to generate the suggestions in the guide. They included biological and informational therapies as well as those involving structural and interpersonal aspects.

Another document by Carr *et al*. (2015) was published by the USAID health policy initiative. Existing programmes, techniques and research findings were synthesised to create this new curriculum. Resources for implementation, such as tool kits, health facility and provider assessment checklists, were added to the handbook. Stigma and discrimination were addressed by the guideline's recommendations, which fell into two categories: informational and structural. In addition, seven qualitative studies by Paudel and Baral (2015) studied the feelings, experiences, and perspectives of Women Living with HIV and evaluated the role of support groups as a technique for coping. Five major topics emerged from the study: 1) Disclosure is a delicate subject for Women Living with HIV; 2) Women Living with HIV have physical, social, emotional, and spiritual challenges in coping with stigma and prejudice from family, friends, and community members, as well as health professionals; 3) Women Living with HIV are more affected by self-stigma than by actual stigma; 4) Women Living with HIV are rejected, shunned, and treated differently by doctors, family, and close friends; and 5) Support groups are one of the best ways to deal with HIV-related discrimination and stigma. On the basis of their findings, the authors advocate that support group interventions serve as the primary strategy for HIV programmes. In addition, they suggested additional Randomized Controlled Trials to prove the efficacy of support group therapies.

Moreover, Chambers *et al.* (2015) analysed and presented the findings of 55 qualitative studies into three categories. HIV-related stigma and discrimination were incorporated in the conceptualizations, which included stigmatising aspects, personal stories about HIV stigma, and strategies for dealing with HIV stigma. The review also found that

practitioners' personal stigmatising attitudes severely impacted healthcare practise. There was also a detrimental impact on health care utilisation, treatment compliance, and general health and well being for people living with HIV who felt stigmatised. HIV-related stigma and discrimination in healthcare settings is linked to other forms of marginalisation, such as racial or gender identity or affiliation. Intersectional or twofold stigma, that's what they called it. To combat HIV-related stigma and discrimination, the study recommended a variety of approaches, including social support, education, building one's own skillset, and public awareness campaigns. Furthermore, according to Henrickson et al. (2015), Black Africans in New Zealand still had a significant level of stigma around HIV and those at risk.

There was also an apparently shared belief that in a low-incidence Country with low levels of publicity about HIV directed beyond Men who have Sex with Men communities, that HIV was not an important issue. Brown *et al.* (2003) also reviewed twenty-two studies that tested a variety of interventions to decrease HIVstigma in developed and developing countries. One of the most promising techniques was to get in touch with people living with HIV, but it wasn't enough on its own, according to the authors of the study. Furthermore, Markham et al. (2000) discovered that contact alone had a short-term influence on high school pupils in Texas, USA, but that contact paired with information had a higher impact, although one that was statistically significant. Additionally, research by Scollay et al. (1992) found a substantial difference between an educational presentation given by a person who had disclosed their HIV status and one provided by the same individual who had not disclosed their status.

At St. Xavier's College in India, In order to institutionalise and sustain stigma reduction in an educational setting, the project team first obtained college administration's support. Following this, they taught a group of faculty members to become master trainers who would then train students. Seventeen faculty members from a variety of disciplines participated in a three-day training to overcome pre-training deficiencies such as a lack of HIV understanding and stigmatising attitudes. The faculty training centred on the definition, forms, causes, and effects of stigma, as well as HIV-related myths and misconceptions. The programme began with examining stigma and discrimination based on caste, gender, and socioeconomic status in order to assist the faculty in comprehending HIV-related stigma. The training exercises assisted staff members in examining their own attitudes and overcoming any reluctance to initiate dialogues with their students about delicate topics like sex, sexuality, and contraceptives. Overall, faculty members viewed the training as significant and beneficial for students (ICRW, UNDP and STRIVE, 2013).

Tanser *et al*.(2013), Cohen &Baden (2012), Grant *et al*.(2010) and Karim*et al*.(2010) All agreed that HIV stigma and discrimination research had made great strides, but that considerable work remained to enable the incorporation of proven stigma and discrimination-reduction methods into national HIV programmes. All of them underlined that complex issues, such as stigma and prejudice, demanded complex solutions. They suggested that the field of HIV-prevention research should recognise the significance of stigma in HIV response and instead of shying away from it, become more daring in the

design and assessment of interventions that target different stigma domains on numerous levels. Stangl et al. (2013) noted that funding agencies must support the comprehensive evaluation of multi-faceted stigma-reduction interventions, including interventions that evaluate the impact of stigma on behavioural and biological outcomes. They emphasised the significance of stakeholders' combined capacity to implement effective biological preventive strategies. These included antiretroviral medication, whose efficacy at the population level depended on the elimination of social and institutional hurdles to acceptance and adherence. Consequently, they observed that combating HIV-related stigma and prejudice must be at the centre of the HIV response, not on the periphery, and that this priority must be reflected in all sectors' funding, policy, research, and programming.

It was further noted by Nzioki *et al.* (2017) in Kenyan colleges showed there were measures to combat stigmatisation and discrimination against infected individuals in every institution studied. However, Highridge and Migori Teachers Training Colleges appeared to be doing more than Shanzu Teachers Training College in this regard. According to reports, the prominence of the epidemic in Migori TTC has led to an escalation of measures to combat discrimination and stigma, and more than half of respondents believe some success has been accomplished. The majority of respondents at Shanzu Teachers Training College believed that stigma and discrimination are still a significant issue. Respondents at Migori Teachers Training College reported prejudice against individuals suspected of being infected.

Additionally in Kenya, Kaai *et al*. (2007) looked at an intervention focusing on adherence counselling for people on antiretroviral therapy to address stigma and discrimination and discovered significant reductions in internalized stigma and significant increases in disclosure to a greater number of family members were observed.

2.7 HIV prevention biomedical intervention strategies

Auvert *et al*. (2005) describe the use of clinical and medical techniques to prevent HIV transmission in biomedical therapies Men's and women's condom distribution, sexual and reproductive health services, antiretroviral medication, pre-exposure prophylaxis and post-exposure prophylaxis, HIV counselling, and testing and treatment for sexually transmitted diseases are all included in the UK Consortium on AIDS and Interventions Development's (2013) list of recommended practises.

2.7.1 Male and femalecondomspromotion

Sanderson & Yopyk (2007)Students who had received one of two condom-promotion videotapes expressed stronger self-efficacy and intentions to avoid unprotected sex than those who had not received either videotape at follow-up. They were more likely to report using a condom during their last sexual encounter with their partner, and those who watched the female presenter were more likely to report using condoms consistently. To sum it up, the researchers discovered that both videos had an equally positive effect on participants' feelings of self-efficacy and intentions, although the film promoting condom use had a greater impact on men than women. The findings of this study show the necessity of educating young people about the benefits of using both male and female condoms.

Whiting *et al*. (2019) carried out a study with the purpose of identifying behavioral interventions that increased condom use behaviors and or intentions among college students. They found out that included modules to increase self-efficacy for condom use, taught participants where to get condoms and how to negotiate condom use with partners, or elicited positive associations toward condoms and saw increased condom use or intention to use condoms.

In Brazil,Moreira *et al*.(2020) reported that promoting condom use among university students may have relied on the availability of condoms, the empowerment of individuals to make decisions about their own sexual and reproductive health. Additionally there was continuous and comprehensive sexual education, as well as action against the myth of invulnerability to HIV and other Sexually Transmitted Diseases among university students of different age groups. They showed that the type of relationship that university students established with their partners had an influence on the adoption or not of condom use.

Knights*et al*.(2021) reported about "*The Kinsey Institute Home-Based Exercises for Responsible Sex* (KIHERS)" with the goal of reducing condom-related errors and issues, increasing self-efficacy and improving attitudes about condoms among young women using a pleasure-focused intervention. Testing whether or not an adapted version of KIHERS (Home-Based Exercises for Responsible Sex–UK) was effective, viable, and acceptable to young women aged 16–25 years in the United Kingdom was the goal of this

study (HERS-UK). HERS-UK was successfully deployed in a college or university setting, and the recruitment approach was successful. As the authors point out, the preliminary feasibility study provided an early indication of the intervention's effectiveness and acceptability, and its positive effects on young women.

An additional effort by Public Health England was the "Protect against STIs" campaign, which promoted the use of condoms among young people aged 16 to 24. This was the first public campaign on sexual health in the United States in eight years. Sexually transmitted diseases can cause infertility, pelvic inflammatory disease, swollen or painful testicles, and even meningitis if they are not treated. Many sexually transmitted infections, including 7 in 10 instances of chlamydia, are symptomless, and the campaign emphasised the dangers of having intercourse without a condom. An advertising campaign aimed towards young people was launched on December 15th, 2017, with the slogan "Protect Against STIs." In the new commercials, listeners will hear from real people who have been infected with a sexually transmitted diseases about their own personal experiences. Emojis were used to hide the identities of the people, but they were still able to express their feelings. The initiative had the support of a number of different organisations. A few of these include Durex, Family Planning Association, and the British Association for Sexual Health and HIV (BASHH) (www.gov.uk/, 2017).

In Italy, Ramos-Ortiz *et al*. (2020) gave suggestions on how to improve the messaging on condom vending machines so that more people may get their hands on the contraceptive and other personal care products. For women, Condom Vending Machines' prominence

was both a benefit and a hindrance, according to those who used them. Men, on the other hand, noted practical problems about Condom Vending Machines. Increasing the use of condom vending machines necessitated a focus on catering to the needs of consumers. Promoting condom vending machines necessitates a focus on gender norms and product safety, as well as establishing condom vending machines as a trustworthy source for condom purchases.

In Thailand, Pinyaphong *et al.* (2020) looked at a programme for promoting the use of condoms and other HIV and Sexually Transmitted Infection behavioral constructs in a population of high-risk heterosexual male students'. The study demonstrated the efficacy of a peer education intervention. In China, Sun *et al*. (2017) revealed their findings from a safe sex intervention that they found practicable and effective in increasing attitudes about condom usage and behavioural skills, but not significantly more effective than using a website to educate people about condom use.

In Sudan, Thorpe *et al.*(2021) reports stated that politicians and policymakers opposed condom use and resisted condom distribution programmes at campuses. There is no doubt that religious leaders have a significant impact on students' attitudes on sexual activity outside of marriage, which is why they oppose condom use and distribution. Supporters of condom use included HIV counsellors and others in the healthcare field. Many students who were sexually active spoke about how they pushed their peers to use condoms whenever they engaged in sexual activity.

Ajayi *et al*. (2019) also showed that only 38.6 percent had used condoms consistently in the preceding year among sexually active individuals. A higher likelihood of using condoms consistently was found in individuals who had higher levels of condom self-efficacy, talked about HIV and STDs with their sexual partner, knew their partner's HIV status, attended school in an area with a high prevalence of HIV, and only had sex with a steady partner. The lack of condom availability, distrust, dislike of condoms, and a sense that condoms limit sexual pleasure were the most common reasons given for irregular condom use, according to researchers. Students in South Africa showed favourable attitudes toward condom use in a study conducted by Mbelle et al. (2018). For the most part, students said they felt comfortable taking a package of condoms from a shelf that was out in the open.

While condoms were readily available on campus, some female students lacked the confidence to use or accept them. The Department of Health also provided free, unscented 'Choice' condoms, which were not associated with any particular brand. The flavoured male condoms were a popular choice among students who took the 'Choice' condoms. That's what they were saying: if the Department of Health had been hoping to get young people to use condoms more often, they would have had to compete with the branded condoms, which were more appealing and offered more possibilities than the non-branded "Choice" condoms. Another issue was the lack of condoms for LGBTI students. Some LGBTI students reported feeling left out of HEAIDS campaigns because of the lack of access to protections like dental dams and lubricants, which they needed but were not always available on campus or during campaigns. They claimed that when it

came to the distribution of condoms, government programmes failed to reach certain groups of people.

Meanwhile, Kanda & Mash (2018) indicated that the reasons young people do not use condoms are the desire to have children, an apparent lack of trust or loyalty, long-term relationships, the want to satisfy the partner, and decreased enjoyment. Other contributing variables include a lack of awareness of the advantages, a reduced fear of HIV infection due to the availability of treatment, the impact of tradition, alcohol and drug misuse, peer pressure, power and gender conflicts, and the reluctance of the partner. Because of its size and the idea that it was difficult to implant, the female condom was overwhelmingly rejected by young people in general and by women in particular. Anti-HIV prevention programmes should take into account the factors that influence the use of condoms by young adults, including a new belief that HIV is no longer a major worry.

Across the continent in Niger, Benevides *et al*. (2019) reported on the "*Evidence-to-Action Project's*" *University "Leadership for Change Initiative*" in order to ensure the distribution of almost 80,000 condoms by student leaders and clinic staff. Specific to Nigeria, Tobin-West et al. (2014) observed that the majority of students (79.2 %) consistently used condoms. Slightly more than one fifth of the students reported occasional condom use, while significantly fewer than one fifth (16.8 %) did not use condoms at all, which is cause for concern. Nonetheless, the majority of students (65.2%) had HIV tests. Although the majority (89.3 %) were aware of female condoms, less than ten percent (8.9 %) had ever used one due to its expensive price, limited availability, and

difficult insertion. As the majority of students (53.8%) indicated a desire to use female condoms if they were made available, the researchers recommended that stakeholders unite their efforts to enhance female condom use among this population. Finally, the majority of students (69.4%) reported that they would recommend condoms to friends or peers (Tobin-West *et al*., 2014).

Likewise in Nigeria, Obembe *et al*. (2017) carried out a study in several Institutions of Higher Learning in Ibadan, Southwestern Nigeria on the use of the female condom. Slightly over a tenth (10.8%) of respondents had good perceived confidence to use a female condom. Notably, Polytechnic students exhibited significantly higher mean scores compared to others types of institutions. As a result of their perception of the female condom, people had a lower level of confidence in using one. Many students (32.8% in Kline's (2002) study on condom use) didn't ask their new sexual partners how they felt about condom use prior to having intercourse.

According to SIDA (2010), there was a high rate of condom use among university students in Kenya. The condom dispensers that were set up on the grounds of numerous colleges and institutions, on the other hand, were grossly inadequate. Condoms were only accessible in dispensers at several universities during the first two weeks of the semester in some cases. Students bought them as needed for the remainder of the semester. Some students didn't know how to properly use male condoms, so their use was deemed improper. Furthermore, some men complained that male condoms were occasionally undersized and of low quality. Most students had never seen a female condom because

they weren't available at the universities where the research was conducted. Male condoms accounted for 96.5 percent of the condoms used during the most recent sexual encounter, whereas female condoms accounted for 2.8 percent. Only 0.6 percent of respondents (14 persons) used both. Two-thirds of respondents reported using condoms during their most recent sexual encounter. Last but not least, the majority of students surveyed were aware of where they could get condoms on campus (SIDA, 2010).

Immonje (2016) In Western Kenya, 61.6% of students said they used a condom the last time they had sex, and students were more likely to use condoms during casual and commercial sex/outside relationships. Despite this, the author discovered that even students in long-term relationships did not use condoms on a regular basis. Nzioka et al. (2007) also claimed that college administrators in Kenya were reluctant to sanction the distribution of condoms to students for fear that it would be interpreted as an encouragement of immorality. In one of the schools, there was a large supply of condoms in the dispensary that was ready to expire since the school's principal allegedly failed to offer clear instructions on how these condoms may be dispersed within the school. On the question of condom distribution in teachers training colleges, the Ministry of Education Sector Policy on HIV was considered to be agnostic (Nzioka *et al*., 2007).

In the study by Ochieng & Maiyo (2008),Also shown was how widely available condoms had been at Kenyan colleges, yet how poorly they were received by the student body. Female condoms had not been readily available compared to male condoms, and most

males chose not to use condoms at all because they had to get their partner's permission to use them.

2.7.2 Provision of Sexual and Reproductive Health services

Gomez Camargo *et al*. (2014) investigated the state SRHof students was in at a public university in the Colombian Caribbean, with emphasis violence, STDs, pregnancy fertility and sexuality.In 2010, the researchers carried out a cross-sectional survey among respondents who completed a self-administered survey. The respondents were on average 20 years old, and from the urban areas. They were also predominantly heterosexual (89.7 %), with a sexual debut of less than 18 years old, promiscuity level of 11.8 % and 55% use of the male condom as a Family Planning Method. Furthermore, due to low education about HIV transmission routes, high risk behavior (sex/alcohol/drugs), serological tests for sexually transmitted diseases, and despite their prior knowledge of sexual health, STDs, and FPMs, they failed to act in accordance with that knowledge. They found that 12.3 percent had been pregnant, 21.6 percent had engaged in physical violence, and 4.6 percent had been sexually abused, with the majority of victims remaining silent (61.8 percent).

Habel *et al*. (2018) reported that 70.6% of colleges in their study had reported having a health center of which 73.0% offered Sexually Transmitted Infections diagnosis, treatment and contraceptive services. They added that Health Centers less frequently offered Long-Acting Reversible Contraception (LARC), express Sexually Transmitted Infections testing and self-collection. They added that vaccination for Human papillomavirus (HPV) was also available at more colleges that had 4-year courses and

non-Minority Serving Institutions. Regarding Men who have Sex with Men-targeted services,they stated that 54.6% of clinics in Institutions of Higher Learning offered pharyngeal and 51.8% offered rectal Sexually Transmitted Infections testing. The researchers concluded that 2-year colleges required additional support with providing sexual health care to students of which possible improvements entailed increasing express testing, extra-genital Sexually Transmitted Infections testing, and Long-Acting Reversible Contraception.

On the same wavelength, Rasanathan *et al*. (2015) that programmes that integrate sexual and reproductive health rights across several platforms and sectors have showed potential in increasing the coverage of sexual and reproductive health services for young people Coor et al. (2018) did a study comparing 2001 and 2014 and found that in 2014, there were statistically significant increases in the number of people getting contraceptives (56.1% vs. 65.0%), getting tested for HIV (81.5% vs. 92.3%), and getting tested for gonorrhoea (90.7% vs. 95.8%). As a result of these findings, 65.5 percent of schools now offer health plans, which is an increase from 49.4 percent a decade ago, and specialised forms of providing sexually transmitted infection information such health fair education (82.3 percent versus 69.9 percent ; all $P < 0.001$). There have been some gains in college and university sexual health services between 2001 and 2014, but more services were needed in other places.In Ethiopia, Uruguay, and Chile, programmes were based on national policies that helped, were expanded across the health system, and used different ways to provide services to meet the needs of teenagers in each country. This was because every year, 200 million women didn't have access to modern birth control, more

than 45 million women didn't get antenatal care or got poor care, and one million girls and women got HIV, while 25 million unsafe abortions were done. In countries such as Chile and the United Kingdom, teenage-responsive services were combined with adolescent-specific outreach and awareness-raising initiatives to combat adolescent pregnancy.

Narasimhan *et al*. (2017) reported that huge gaps existed in access to basic SRH services, therefore posing serious challenges to achieving universal health coverage by the year 2030. They emphasized that the gaps in access were increased by the lessening of resources towards international development, and highlighted the relevance and urgent need to strengthen linkages between HIV and Sexual and Reproductive Health and Rights programmes. Meanwhile, Warren *et al*. (2017) highlighted the importance of all girls and women to be able to access an integrated sexual and reproductive health and rights packages, which include HIV cate, prevention and treatment. They added that although the integrated approach had been promoted extensively, efforts had been insufficient and countries needed to prioritize strategies that enabled Universal Health Care, including sustainable ways to advance universal access to integrated sexual and reproductive health and HIV services.

In Ethiopia, Ayalew *et al*. (2019) stated that the freedom to make personal decisions about one's own sexuality and reproductive health should apply to all people, regardless of their age, gender, or any other attribute. More over half of those polled (53.4% of participants) expressed a favourable view of sexual and reproductive health and rights.

Cassidy et al. (2018), on the other hand, performed six focus groups with 56 undergraduate students aged 18 to 25 and seven key informant interviews with administrators and physicians. Knowledge, memory and decision-making processes; social factors; environmental context and resources; perceptions about the repercussions of the outcomes of the actions taken by the participants in the study; and positive emotions were identified as some of the barriers to sexual health service. Students' access to sexual health care was found to be influenced by their socioeconomic opportunity and motivation.

In Nepal Pandey *et al*.(2019) found that teenagers in Nepal suffer difficulties getting sexual and reproductive health treatments from adolescent-friendly health facilities. Using their data, the researchers concluded that the features of health care providers, institutional health care hurdles, a lack of privacy and confidentiality, lack of information about adolescent-friendly health services, as well as socio-cultural norms and attitudes toward teenagers' use of adolescent-friendly health services, all contributed to the low use of these services by adolescents.

According to Odo et al. (2018), teenagers in Enugu State, Nigeria, have access to physical but not financial access to sexual and reproductive health care. Adolescents may have difficulty accessing sexual and reproductive health care if there are no clinics specifically for them, according to reports. Access to sexual and reproductive health care was found to be strongly correlated with both one's level of education and one's household income. The vast majority of young people (86.7%) said they had access to

safe maternity services, and 67.5% said they had access to services for HIV/AIDS prevention and treatment. The vast majority stated that these programmes were easily available, but only a small percentage of teens could afford them financially. A closer look at the qualitative data revealed that there were no specific services for adolescents, only generic ones. Finally, the researchers found that having access to Sexual and Reproductive Health Services was strongly influenced by factors such as age, education, and wealth.

In addition, the Ghana AIDS Commission and its development partners raised public knowledge of sexually transmitted infection (STI) causes and prevention in Ghana (Oppong et al., 2013). The "Leadership for Change Initiative" at Abdou Moumouni University in Niamey used an innovative behaviour change methodology, according to Benevides et al. (2019), while the "Evidence-to-Action Project's" University "Leadership for Change Initiative" in Niger used Expand Net scale-up approaches to train 200 students as peer leaders and reach nearly (8,000) youths with Sexual and Reprod Health education.

The Kamuzu College of Nursing and the University of Illinois at Chicago have also teamed together on another HIV prevention and intervention initiative in Malawi's Ntcheu district, which involves the use of health workers from a district hospital and five of the university's rural health facilities. The University of Botswana and the University of South Africa are only two of the institutions with which Kamuzu College of Nursing

has formed collaborations through the Center of Excellence in Nursing, Midwifery, and Health Sciences Research (Mwape & Khaturia, 2000).

In Malawi as reported by Nash *et al*.(2019),Participants knew the health hazards and social unacceptability of early childbirth, although teen pregnancy was prevalent in the region. Additionally, the importance of female school completion and the common belief that motherhood was the end of a girl's education were acknowledged by respondents. There were reports of widespread and unprotected transactional intercourse that was linked to poverty. According to the report, initiation rites were common and encouraged girls to engage in sexual activity when they reached puberty. Adolescents were reportedly discouraged from using contraceptives and even condoms because of concerns about their inappropriateness. Adolescents also reported difficulties in getting their hands on condoms and other contraceptive methods. Many parents reported deferring discussions about sexual and reproductive health until after their child's sexual debut because they were worried about encouraging sexual behaviour. Mothers/female guardians were identified as the "gatekeepers" of sexual and reproductive health information and services. This desire to have role models or "outside experts" deliver sexual and reproductive health education and promote an alternative picture of adolescent parenting was expressed by both adolescents and mothers/guardians.

Munea *et al*.(2020) According to their research, none of the student-serving health facilities scored ≥ 75% on the three quality measurement components. Six out of eighteen (18) health care facilities (33.3 percent) had poor quality across all dimensions. They

added that the most compromised process component was the one that measured client-provider contact and privacy/confidentiality. However, a favourable outcome was observed for the input quality metric that examined the availability of trained healthcare professionals, medications, and supplies. As obstacles to providing effective services, the presence of community-based health insurance and an age-driven comprehensive youth-friendly service delivery model were noted. In contrast, Liddon et al. (2018) found that approximately 67% of women received information regarding condoms and birth control. The level of communication between Title X-funded clinics and private providers was greater than the disparities by mother's education, age, number of partners, race and ethnicity, and condom use.

In the study by Alomair *et al*. (2021),sexual and reproductive health was described as a multifaceted issue influenced by individual, familial, environmental, sociocultural, religious, and institutional variables. Unmarried status was also identified as a significant obstacle to getting sexual and reproductive information and services, with ignorance representing modesty and chastity. In addition, parental control was seen as a barrier to obtaining knowledge and gaining access to needed healthcare treatments. According to reports, schools contribute to a lack of understanding by having teachers remove sexual and reproductive health-related topics and avoid addressing related queries.

According to Ndayishimiye *et al*. (2020), There are three primary degrees of impact, which involve altering the Sexual and Reproductive Health experiences, decisions, and behaviours of young women. These were identified as interpersonal influences,

communal impacts, and macrosocial effects, according to the respondents. In the study, health care providers reported that adolescents had satisfactory access to Sexual and Reproductive Health Services, including accurate Sexual and Reproductive Health information, contraceptive methods, prevention and management of Sexually Transmitted Infections and HIV services, and counselling. However, it was claimed that access to certain services remained limited. Some items, such as female condoms, were less in demand and frequently expired before being supplied, according to research respondents. In addition, they discovered that 94.3 percent of health facilities supplied teenagers with information about accessible Sexual and Reproductive Health services, and that 51.6% of facilities claimed to offer low-cost treatments. Only 57.2% of respondents indicated that adolescents participated in the design of feedback mechanisms at their facility.

Challa *et al*. (2018) 25 health facilities were assessed to determine whether or not adolescent sexual and reproductive health services (ASRHS) were available, and the results revealed that 44% of the facilities surveyed did not provide ASRHS, and the ASRH services supplied varied substantially amongst facilities. Adolescents sexual and reproductive health services were used by a third of those polled. Fear of being seen in clinics (23.3 percent), a lack of money (18.3 percent), loss of privacy and secrecy (14.2 percent), and unpleasant health care personnel were among the factors identified by the researchers as obstacles to underutilization of services by adolescents. Mwandali et al. (2020) found that health care providers perceived three barriers to the provision of Adolescents Sexual and Reproductive Health (ASRH) services: integration of Sexual and Reproductive Health (ASRH) services, lack of training in relation to adolescents Sexual

and Reproductive Health (ASRH) services, and attitudes of health care providers toward young people, among other factors.

Lafort*et al.* (2017) revealed that 86.2 percent of women in Tete and 98.4 percent of women in Mombasa were using any modern contraception, while the percentage of women using non-barrier contraception (hormonal, IUD or sterilisation) ranged from 33.4% for Durban to 85.1 percent for Mysore. Emergency contraceptive use ranged from 2.4 percent in Mysore to 38.1 percent in Mombasa, while screening for cervical cancer ranged from 0.0 percent in Tete to 29.0 percent in Durban. Between 15% and 93% of women in Durban and Mysore had sought a termination of an undesired pregnancy at a health facility, respectively.

34.4% of women in Mombasa sought medical attention after being forced to have sex, whereas 51.9 percent of women in Mysore sought medical attention. Many of the differences across cities were judged to be statistically significant by the researchers. Ooms et al. (2020) showed that the overall availability of sexual and reproductive health commodities was low at less than 50% across all sectors, areas, and countries, with the highest mean availability finding in Kenyan public facilities at 46.6 percent relating to access to sexual and reproductive health services in Kenya, Tanzania, Uganda, and Zambia. The survey revealed that stock-outs were common, with the average number of stock-out days per month ranging from three in Kenya's privately owned and privately owned nonprofit sectors to twelve in Zambia's governmental sector. In the governmental

sectors of Kenya, Uganda, and Zambia, as well as the private not-for-profit sector in Zambia, all sexual and reproductive health items were offered free of charge to patients.

In the other categories, the number of sexual and reproductive health products that were out of reach for most people ranged from 2 to 9. Furthermore, the accessibility of Sexual and Reproductive Health commodities was low throughout the countries, with Kenya's and Zambia's public sectors having six commodities fulfilling the accessibility requirement, while the private sector of Uganda had only one. Ampt et al. (2020) observed that among Kenya's female sex workers (FSWs), unintended pregnancy and HIV infection rates were both high, but there were little health promotion activities to address FSWs' contraceptive requirements or other SRHR concerns. "WHISPER" mobile phone intervention was created and implemented using a participatory development strategy and behaviour change theory to address these high-priority concerns of female sex workers in Mombasa, Kenya.

The intervention framework specified six Sexual and Reproductive Health and rights Female sex workers saw these domains as extremely important. Social cognitive techniques for improving knowledge, outcome expectations, skills, and self-efficacy were well-received by workshop participants, according to their reactions to the intervention's content. Most participants claimed they would spread the word about the positive effects of the content. On-demand contraceptive information and motivational messages were part of a 12-month SMS (Short Message Sending) initiative that included stories of behaviour change among female sex workers and role models.

2.7.3 Promotion of Voluntary Medical Male Circumcision

According to Salud (2015) it was projected that 3.4 million new Voluntary Medical Male Circumcisions could stop the spread of HIV from 2015 to 2025. According to the author, communities that had successfully implemented Voluntary Medical Male Circumcision (VMMC) had lower rates of HIV infection. International guidelines now include the delivery of male circumcision as part of the usual practise, according to WHO (2017). To put it another way, this may be observed for example in the World Bank's Disease control priorities as a vital surgical procedure and in WHO's evidence-based interventions for adolescents in high HIV load areas (WHO, 2017). Complementing UNAIDS 2020's goal of 73 percent viral suppression with a 90 percent coverage rate of voluntary medical male circumcision among men aged 10–29 years, the Fast Track HIV prevention targets have been claimed to necessitate 90 percent coverage of medical male circumcision.

Atkins*et al*. (2020) indicated that the limited evidence on interventions that improved access and acceptability showed promising results, but that there were still gaps in the evidence because the interventions were not always defined and delivered the same way. This was partly because the context was not always clear and there wasn't enough information on how old the people were. More than twenty-three articles from 10 of the 14 priority countries studied by Carrasco and colleagues (2019) were included. Negative impressions of Voluntary Male Circumcision, fear of pain, and misunderstandings about its usefulness or necessity were the most common reasons mentioned for the lack of interest in Voluntary Male Circumcision. According to most countries, Voluntary

Medical Male Circumcision lowered health risks and improved personal hygiene, as well as increased sexual satisfaction for both men and their families.

Moreover according to Kennedy *et al*. (2020) who conducted research in Kenya, Malawi, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe; there was a strong impact of economic incentives on voluntary medical male circumcision uptake randomised controlled trials of food and/or transit vouchers on. As a result of conditional cash transfers, more men chose to have their male reproductive organs surgically removed. It was observed that 35.8% of men in Nyanza, Rwanda, had had Voluntary Medical Male Circumcision, which was higher than the national prevalence of 30% in 2014/2015. However, it was lower than the 92% in North Africa and the 62% in sub-Saharan Africa. A majority of participants were aged 23–27 years, and it was in this group where uptake was poor compared to other age-groups (Chiringa et *al*., 2011; Rupfutse *et al*., 2012; Morris *et al*., 2014).

Participation in Voluntary Medical Male Circumcision was highly correlated with socio-demographic factors. Religion was significantly related to low rates of Voluntary Medical Male Circumcision. This result was confirmed by research suggesting that religion was connected with adoption in Kenyan communities, particularly among the uncircumcised. Catholics were nearly 7.2 times more likely than Muslims to have low rates of Voluntary Medical Male Circumcision. This result is consistent with prior study indicating that religion and sociocultural attitudes were barriers to the adoption of Voluntary Medical

Male Circumcision in uncircumcised populations. However, schooling was reported to have a substantial effect on circumcision (Tapera et al., 2017; Plotkin et al., 2013).

Reportedly, voluntary medical male circumcision reduces the likelihood of female-to-male HIV transmission significantly (Gilbertson et al., 2019). Since 2007, Voluntary Medical Male Circumcision has been an integral part of the United States President's Emergency Plan for AIDS Relief (PEPFAR) strategy to combat the HIV epidemic in nations with high HIV prevalence and low circumcision rates. PEPFAR established aggressive annual circumcision targets and offered financing to implementation partners to deliver local Voluntary Medical Male Circumcision services in order to achieve the anticipated results. By 2017, 1,9 million males in Kenya have been circumcised, with 60 percent of circumcisions occurring in boys aged 10 to 14 years.

In spite of this, the data suggested that the quality of procedures in Voluntary Medical Male Circumcision initiatives in low-resource settings was substandard, and more crucially, that the pursuit of ambitious public health goals may undermine service delivery and protocol adherence. Thus, it was necessary to design new or alternative approaches to achieve a balance between the goals of boosting service adoption and conducting Voluntary Medical Male Circumcision responsibly (Gilbertson et al., 2019). Between 2011 and 2016, the incidence of HIV in Siaya County, Kenya decreased significantly due to the expanding use of antiretroviral medication and male circumcision for medical purposes. It was hypothesised that Voluntary Medical Male Circumcision, but not antiretroviral therapy, has a direct protective effect, possibly because antiretroviral therapy is typically administered to those with advanced HIV infection.

However, HIV incidence was reported to be still high and far from the elimination goal of one per 1000 people (Borgdorff *et al*., 2018).

2.7.4 Provision of antiretroviraldrugs

In 2012, the U.S. FDA approved the first HIV Pre-Exposure Prophylaxis (PrEP) drug, which is reported to be approximately 99 percent effective when taken as prescribed (Grov et al., 2021). Despite the fact that the primary aim of PrEP is to prevent HIV infection in the event of exposure, it has also been reported that the medicine has had a major impact on a variety of sexuality-related factors. PrEP is reported to strengthen sexual autonomy, boost sexual self-esteem, enhance sexual enjoyment, and lessen sexual anxiety in individuals who use it. For many, PrEP has also functioned as a gateway to enhance regular health and increase utilisation of sexual health care.

PrEP is not meant to minimise condomless anal intercourse or sexually transmitted infections, but rather to prevent HIV transmission, according to some contradictory research (Grov et al., 2021). In the United States, the American College Health Association (ACHA) underlined that the ongoing HIV epidemic was an important health priority that its members were required to embrace. The American College Health Association supported widespread access to HIV pre-exposure prophylaxis (PrEP) in college and university health services. By giving PrEP as a regular health care service, college health was uniquely positioned to have a substantial impact on the health of young adults in the U.S., they argued (ACHA, 2021).

In a study by Shrestha et al. (2018) evaluating PrEP delivery programmes at colleges and universities, PrEP acceptability ranged from 30.6% to 86.3%, with a mean of 56.2% across eight hypothetical PrEP programme scenarios. The PrEP programme scenario with the highest acceptability had the following levels of attributes: insurance coverage, daily dose, 95% efficacy, no side effects, treatment at an HIV clinic, and HIV testing required every six months. The cost of PrEP was the most relevant characteristic, followed by its efficacy and adverse effects; other characteristics were insignificant. Their findings indicated that PrEP is very acceptable in response to several PrEP programme situations with varying attribute profiles. Even with poor PrEP effectiveness, test-and-treat and PrEP were anticipated to be cost-effective HIV prevention strategies for men who engage in sexual activity with other men, according to the results of a study. Using a combination of these biological approaches, eradication of HIV is reportedly possible within the next two decades.

PrEP for HIV prevention should be evaluated for implementation among high-risk Chinese men who engage in sexual activity with other men (Li et al., 2018). According to Ajayi et al. (2018), Nigerian university students had low levels of awareness, knowledge, and usage of pre-exposure and post-exposure prophylaxis. Awareness of pre- and post-exposure prophylaxis was connected with recent HIV testing, awareness of a partner's HIV status, condom use, and the exchange of nude photographs. In addition, according to Kumar & Ratnaprabha (2019) in India, nursing students in central Karnataka had poor awareness of HIV and post-exposure prophylaxis.

SIDA (2010) disclosed that university HIV and AIDS programmes in Kenya were linked to a variety of organisations and entities for financial support, information sharing, and quality assurance. With MoPHS, NACC, and NASCOP, ties and alliances have been formedștiințiin Universities supplied monthly reports to the MoPHS including trends, types of diseases treated, number of patients, and HIV Counseling and Testing data. Reporting to these national authorities was required since it facilitated the procurement of antiretroviral medications and testing kits for HIV Counseling and Testing. Individual Universities had also forged unique alliances. Moi University, for example, had partnerships with AMPATH, ICL (I choose Life Africa), Walter Reed, ACCESS – Canada, the Red Cross, CIDM PEACE, and the Rotary club. Access –Kenya, APHIA II, KANCO, Association of African Universities, African Union/Agriculture Water Use Survey, UNESCO, CHE, and FKE were all affiliated with Baraton University. At Moi and Maseno Universities, as well as the University of Nairobi, it has been reported that antiretroviral medications are provided to infected individuals.

Nzioka *et al*. (2007) regarding the dispensing of antiretroviral medications, campus pharmacies were reportedly hampered in two ways. First, the dispensary employees lacked the necessary qualifications. In one of the colleges they visited, the officer in charge of the clinic was a certified nursing assistant. According to reports, this officer lacks the skills necessary to provide basic treatments for HIV-related disorders. Second, the dispensaries lacked the necessary materials and equipment to treat HIV-related infections. The continued existence of these restrictions was attributed by colleges to the Ministry of Education's low budget allocations. Nzioka et al. (2007) advised that such

organisations provide services such as mobile HIV Counseling and Testing and a clear referral system so that persons diagnosed with HIV might receive antiretroviral medications and counselling services in a more anonymous setting. In two of the three visited institutions, collaboration with non-governmental organisations and government health services was observed, although researchers reported that this link might be reinforced.

2.7.5 Provision of HIV Testing and Counseling services

According to Logie *et al*. (2017),student participant narratives revealed social-ecological barriers and facilitators to HIV testing. Mistreatment by healthcare providers, breaches of confidence, and HIV-related stigma were among the difficulties they encountered. Furthermore, healthcare providers' discrimination and judgment in HIV testing providing resulted in participants concealing their sexual orientation and/or gender identity as a result. According to Sileo *et al*. (2018), confidentiality concerns typically included clinic physical arrangements that divided HIV testing from other health services, as well as the fear that healthcare workers might disclose the client's status publicly. They also mentioned that they were worried that their classmates would find out they were getting tested at lesbian, gay, bisexual, and transgender-friendly clinics. HIV-related stigma also led to the anxiety of testing HIV-positive, which collided with the "gay sickness" stigma of HIV. HIV-positive participants also feared abuse from healthcare providers. A combination of individual, social, and structural variables were cited by participants as contributing to an increase in HIV testing uptake. According to their findings, there was a low prevalence of HIV testing among college-age men who engage in sexual activity with other men. There was a lot of trust between the men who had sex with men in

college and their partners, so they didn't get tested for HIV. They also had a smaller pool of sexual partners. It was discovered that 42.3% of them had never been tested for HIV (Marshall *et al*., 2020).

Meanwhile, He*et al*. (2019) conducted a study to discover additional HIV-effective test and intervention methods and to meet the first 90 of the 90–90–90 goal. Researchers in China aimed to create and test a novel HIV anonymous urine test vending machine at university campuses. 11 vending machines were installed in seven (7) trial colleges between June and December of 2016, mostly in the regions of Sichuan, Yunnan and Heilongjiang. 957 HIV urine collection kits were given out free and through vending machines; 378 (39.5 percent) urine samples were returned and 376 (99.5 percent) qualified for testing in professional laboratories. Using an ID code, participants were able to access confidential test results online. Only seven (1.86%) of the urine samples tested positive for the presence of bacteria. More than two-thirds of participants (255/376) checked for test results online, 72.2% of kits were purchased in dormitories and 27.8% in teaching buildings, and 88.9% were purchased between 21:00 and 24:00, providing direction for stakeholders on where to give HIV testing and at what time of the day.

In Ethiopia, biomedical strategies for Institutions of Higher Learning were organised at a National scale by National Alliance for State and Territorial AIDS Directors (NASTAD). Eight HIV testing campaigns allowed more than 8,000 students to be tested, and six institutions received HIV counseling/testing and one syndromic training (NASTAD, 2021). The University of Pretoria, according to (Grundling & Pillay, 2003), used a peer

education model in which trained student volunteers provided counselling. Through Memorandums of Understanding with the Universities of Botswana, Lesotho, Namibia, and Swaziland, the "Future Leaders @ Work" initiative was exported and implemented in the aforementioned Southern African Democratic Community countries. The South African Department of Health recognised this facility as an official site for HIV Counseling and Testing. A study by Asante (2013) found that more than half of the private university students in Accra, Ghana, had never been tested for HIV, despite the fact that nearly all of them were aware of where to get HIV counselling and testing.

In contrast, the intervention of Knowledge, Attitudes, and Practices investigations at the University of Zambia gave crucial insights into the levels of HIV stigma and the prevalence of Risky Sexual Behaviors. The university reacted with a programme focused on counselling and instruction that centred on student needs. They realised the significance of intricate connections, which made institutions both interesting and difficult, as well as vulnerable. In addition, they underlined that managing and supporting student life in the era of HIV necessitated that institutional managers actively interfere in what was once regarded as 'the private life of students' and have the ability to do so effectively (Mwapen & Kathuria, 2000). This was a cross-sectional study of 250 adolescents and young adults between the ages of 18 and 24 at the flagship and largest public university in Ghana. Copperbelt University in Zambia launched the 'In but Free' programme in response to the HIV Risky Sexual Behavior and HIV requirements of community jail inmates, some of whom were former students of the university. They utilised HIV Counseling and Testing as well as home-based care. The project revealed

the ability to reduce danger to inmates, their families, and themselves. In addition, it brought to life the fundamental notion that Institutions of Higher Education must be involved with the world in which they operate and sensitive to their communities in order to make significant contributions to real, current problems. It was reported to break the silence in a world where it was well-known that a variety of dangerous social and sexual activities contributed to the spread of HIV (Chiboola, 2001).

Meanwhile, Adam & Mutungi (2007) The subject of HIV testing remained highly contentious among Kenyan students, primarily due to social stigma. Also in Kenya, Jepkosgei (2013) discovered that despite a 99 percent knowledge rate among young people, this awareness has not converted into proactive behaviour change. The majority of sexually active respondents had neither undergone an HIV test nor knew the HIV status of their current partners. In the study conducted by Ochieng and Maiyo (2008) in Kenya, the colleges surveyed attempted to encourage HIV testing through an extensive educational effort. For those who volunteered to be tested, pre- and post-test counselling was consistently provided. The research demonstrated that students were encouraged to frequent counselling services. According to Nzioka *et al*. (2007), none of the colleges in their survey had permanent HIV testing and counselling services. However, efforts were made to develop mobile HIV counselling and testing stations at Migori and Highridge Teachers Training Colleges by forming partnerships with local clinics and non-governmental organisations. Shanzu Teachers Training College did not offer HIV Counseling and testing services on campus, but it directed learners to where they may obtain these services. In general, it was observed that trainees felt they should have

access to such services. When HIV Counseling and testing centres were offered at Highridge and Migori Teachers Training Colleges, it was stated that the demand was great and occasionally overwhelming.

In a study by Immonje (2016) evaluated the impact of HIV curriculum mainstreaming on the HIV risk perception and behaviour of Kenyan university students in the Great Lake Victoria Counties. During the students' orientation week, also known as Tamasha in Kiswahili or Cultural week, their institutions instructed students on how to get HIV Counseling and Testing and other health facilities. Moreover, according to SIDA (2010), HIV testing and counselling services were offered on-site at all universities included in their survey, excluding Moi University and University of Nairobi. However, the placement of these facilities was viewed as a barrier to access, and many of them were only open during business hours, making them inaccessible to students at all times. On the majority of campuses, the utilisation of these onsite HIV counselling and testing clinics was found to be poor. Due to the perceived lack of anonymity of on-campus HIV Counseling and Testing Centers, many students preferred to utilise those located off-campus. According to reports, Moi University offers counselling and testing for HIV at night, which is popular among students.

Cheruiyot *et al*. (2019) revealed that the utilisation of institutional HIV Counseling and Testing services among sampled university students was 45 percent in a population where 84.4 percent were aware that these services were available on their campuses. Additionally, more men than women were found to have utilised the services. The survey

revealed that participants utilised the services for a variety of purposes. Accessibility to the testing site, testing hours, the fear of being observed at the testing site, and the fear of the test results were also found as factors influencing service uptake. When questioned about the ideal attributes of an HIV Counseling and Testing centre on campus, students similarly cited these factors.

2.7.6 Provision of testing and treatment of Sexually Transmitted Infections

Habel *et al*. (2018) reported that 70.6% of colleges in their study had reported that they had a health centre of which 73.0% of these health centres offered Sexually Transmitted Infections diagnosis and treatment, express Sexually Transmitted Infections testing and self-collection. Human papillomavirus vaccination was also available at colleges that offered 4 year programmes and non-Minority Serving Institutions. Regarding Men who have Sex with Men-targeted services, 54.6% of clinics in institutions offered pharyngeal and 51.8% offered rectal Sexually Transmitted Infections testing.

In a different study by Martin-Smith *et al*. (2018), which was carried out among 1294 sexually active students with a mean age of 23.61 years, it was discovered that amongst the participants, knowledge of Sexually Transmitted Infections and testing was relatively high, and students held generally favourable attitudes about testing. Additionally, 52% reported ever having a Sexually Transmitted Infections test while 13% intended to have one in the next month. The researchers discovered that being female, older, a postgraduate, longer UK residence, Sexually Transmitted Infections knowledge, perceived susceptibility, subjective norms, attitudes and self-efficacy all positively predicted past Sexually Transmitted Infections testing behaviour. Furthermore, the study

discovered that perceived susceptibility to Sexually Transmitted Infections and social norms positively predicted intentions to have a Sexually Transmitted Infections test in the next month while perceived susceptibility also predicted past high-risk sexual behaviour. Moreover in a study by Denison *et al.* (2018) five drivers for Sexually Transmitted Infections testing were identified as crisis, partners, clinicians, routines, and previous knowledge. The final driver, previous knowledge, intersected with the previous four, particularly in relation to routines. Many participants acknowledged that the more they knew about Sexually Transmitted Infections the more likely they were to undertake routine tests. However, at the same time, many participants felt they did not have a good knowledge base and that their school-based sex education had been lacking. Alhassan *et al*. (2019) also conducted their study in one public university in the Greater Accra region.They determined factors associated with adolescents and young adult population's usage of mobile phones in the education and prevention of Sexually Transmitted Infections and found that male young adults and young adults who owned a smart phone were more likely to use mobile phones for education and prevention of Sexually Transmitted Infections.

According to Nzioki *et al*. (2007), all the colleges they looked at in Kenya had clinics where the students could get health care. They observed, however, that the dispensaries lacked essential drug supplies, equipment, and skilled personnel. According to them, this rendered them unable of successfully addressing college health issues, especially opportunistic infections. According to reports, the Shanzu Teachers Training College dispensary was in a particularly dismal state, lacking basic facilities and managed by

unqualified employees with no HIV training. According to reports, the surge in instances of Sexually Transmitted Diseases and HIV-related opportunistic infections has exceeded the capacity of institutional facilities, particularly at the Migori and Shanzu Teachers Training institutions. Researchers suspected that many students with Sexually Transmitted Diseases (STIs) or opportunistic infections avoided campus facilities out of fear of disclosure. In addition, the college dispensaries relied mostly on district and private hospitals in the vicinity of Teachers' Colleges for referrals.

2.7.7 Provision of Needle and Syringe Programmes

Adimora & Auerbach (2014) Explain that syringe exchange programmes are an intervention aimed at reducing the risk of disease transmission in the setting of ongoing drug use. Typically established by community-based organisations and advocates, these initiatives have showed efficacy in lowering HIV transmission, cost-effectiveness, and do not promote injection drug use (Hurley et al., 1997; National Institutes of Health, 1997; Lurie *et al*., 1998; Holtgrave & Pinkerton, 1997; Centers for Disease Control and Prevention, 2005). Platt *et al*. (2017) identified an additional 28 studies, 13 of which were from North America. Opioid Substitution Therapy was related with a 50% reduction in Hepatitis C Virus acquisition risk, constant across regions and with low heterogeneity, according to a meta-analysis of five studies from the United Kingdom, Europe, Australia, and China. The policy–legal reform in the United States that permits government funding of syringe exchange programmes and the guideline documents created by federal agencies for the use of such monies comprise a structural intervention that should have a considerable influence on the drug use–driven HIV and hepatitis epidemics in the United

States. This should reduce certain racial discrepancies in HIV infection rates (Adimora &Auerbach, 2010).

2.7.8 Provision of Opioid Substitution Therapy

Fernandes *et al*. (2017) In their investigation, thirteen systematic reviews and 133 relevant, unique papers published between 1989 and 2012 were included. Needle and Syringe Programmes were found to be efficient in reducing HIV transmission among People Who Inject Drugs, whereas the reduction of Hepatitis C Virus infection had mixed results. Full harm reduction interventions offered at the structural level and through multi component programmes, as well as a high level of coverage, were found to be more advantageous. Additionally, Platt *et al*. (2017) discovered that current use of Opioid Substitution Therapy lowered the probability of Hepatitis C Virus infection acquisition by fifty percent compared to no intervention. The intervention impact was found to be substantial, but the evidence was of poor quality because it was collected from observational studies with a high risk of bias (Van Den Berg *et al*., 2007; Crofts *et al*., 1997; Nolan *et al*., 2014; Thiede *et al*., 2000; Tsui *et al*., 2014). Despite the recent drop in the proportion of new HIV cases directly attributed to injection drug use, injection drug use remains a significant cause of HIV, particularly among sexual partners.

Simultaneously, the scale-up of Opioid Agonist Therapies (OAT), Syringe Services Programmes (SSPs), and antiretroviral therapy (ART) have remained low, contributing to an unstable HIV epidemic among persons who inject drugs (PWID). Despite the recent drop in the proportion of new HIV cases directly attributed to injection drug use, injection drug use remained a significant cause of HIV, particularly among sexual

partners. Simultaneously, scale-up of OAT, SSPs, and ART had remained modest, contributing to a dynamic HIV epidemic among injection drug users (PWID) (LaMonaca *et al*., 2019).

2.8 HIV prevention structural programme strategies

Structural interventions aim to address the root causes of HIV infection in people and populations. Social, economic, political, or environmental issues are examples of these underlying variables (Avert, 2021). Structural interventions include, but are not limited to, enhancing legislation, law enforcement, and programmes to reduce domestic violence. Specific examples of structural interventions include: boosting girls' access to education, employing cash transfers to empower women economically in order to keep them in school, removing third-party authorization requirements and other barriers to women and young people's access to HIV and sexual and reproductive health services; decriminalising same-sex relationships, cross-dressing, sex work, and drug possession and use for personal use, and scaling up community etiquette programmes (UNAIDS, 2016). HIV preventive structural interventions often include at least one of the following: policy or legal changes; environmental modifications; altering detrimental social norms; triggering social and political change; and empowerment of communities and groups (Auerbach, 2009; Vincent, 2009).

2.8.1 Strengthening institutional policies on HIV

Developing and implementing HIV-inclusive policies has been identified as a crucial intervention for regulating Risky Sexual Behavior in Institutions of Higher Education, as these policies serve as a signal for campus objectives (HRCF, 2019). These policies give

decision-makers, community members, and other significant stakeholders with a useful framework to better comprehend and ultimately support HIV interventions (HRCF, 2019).

According to Zheng et al. (2020), fourteen pieces of national policy and four pieces of Beijing's policy were analysed to determine the HIV policy's ability to reorganise implementation, which was determined to be performing at a moderate level. The percentage of Beijing students who have ever received HIV instruction in college reduced from 71.14 percent to 39.80 percent between 2006 and 2016, while the number of students with full understanding of HIV decreased from 50 percent to 40.42 percent. The results of the policy evaluation demonstrated that the State Council has played an active role in HIV prevention and control policy, including action plans, regulations, and notices, since 2001. According to He *et al*. (2013), it is noteworthy that the Ministry of Education created a strategy for implementation and collaborated closely with the Ministry of Health to issue a policy on HIV prevention and control in learning institutions.

In China, researchers discovered a drop in policy outputs between 2006 and 2016. Participating adolescent college students in a 2016 study had 0.34 times more odds of perceiving HIV health education at their colleges and 0.75 times greater odds of correctly answering all HIV-related questions than those in 2006. This was observed to correlate with a drop in the adoption of new policies beginning in 2006, showing a progressive deterioration of policy support (Huang *et al.*, 2007; Liu *et al*., 2007; Shi *et al*., Zhou *et al.*, 2006; Ma *et al.,* 2006; UNAIDS, 2012).

In 2005, HIV prevalence in Lesotho was 29 percent, and the National University of Lesotho was home to approximately 5000 full-time students. National University of Lesotho was establishing a policy that included a strategy plan outlining staff and student initiatives for policy formulation, capacity building, advocacy, information generation, dissemination, and storage, fundraising, networking, care and support, and community service (Ranneiling, 2005).

On September 6, 2000, the University of Cape Town Council in South Africa also approved an HIV policy. In 2003, a revised version was presented to Council (DoE et al., 2004). The HIV strategy of the Nelson Mandela Metropolitan University (previously the University of Port Elizabeth) was also praised. The policy was considered as socially responsible because it contained an informed definition of HIV, discussion of mechanisms of transmission, support for condom distribution, counselling at a campus clinic, and consideration of education and curricular revisions (Crewe, 2000).

The HIV policy at North-West University in South Africa was based on three principles: no discrimination towards persons living with HIV, who were to be treated the same as people with other serious illnesses, and a shared responsibility for infection prevention among students and faculty (Ennals & Rauan, 2002). The HIV policy of Rhodes University also addressed concerns of secrecy, testing, employment-related matters and education to prevent and end discrimination, universal precautions, prevention, treatment, staff and student interaction, and universal precautions (Michael & Fish, 2004).

According to Chetty (2003), the University of Witwatersrand exerted significant effort in formulating and implementing what was largely regarded (within South Africa) as an extremely thorough policy response to HIV regulation. In addition, as a big comprehensive research and teaching institution, the University was fortunate to have a number of outstanding academics who have made significant contributions to the creation of national HIV regulation policy on the health, legal, and social fronts (Chetty, 2003).

According to Chilisa and Bennell (2001), the University of Botswana was extremely committed to implementing its HIV Policy. The university identified a number of individuals in critical positions as "policy implementers," as well as all faculty and students, and envisioned an HIV-free generation by 2016. The strategy acknowledged the enormous impact of the disease ('one in three Batswana affected') through devoted and persistent leadership and management, while also emphasising the university's essential position in innovating responses to the pandemic (University of Botswana HIV and AIDS Policy, 2002). Kang'ethe and Mutopa (2017) drew the conclusion from their research on Southern African universities that little was being done from a policy standpoint to make the support structures at universities more responsive to People Living with HIV.

In Ethiopia, structural strategies for Institutions of Higher Learning were organised at a National scale by National Alliance for State and Territorial AIDS Directors (NASTAD). There were six universities that generated and adopted an HIV policy, five of which established HIV units and assigned permanent staff, five of which conducted HIV and

STI risk assessments, and five of which developed comprehensive HIV plans and allotted funds. By working with the Ministry of Public Health and the Ministry of Higher Education, Research, and Innovations, the Niger "Leadership for Change Initiative" of the "Evidence-to-Action Project" was able to influence national policy in that country.

SIDA (2010) conducted a number of case studies on the impact of and response to HIV at African universities and discovered that both the African Association of Universities (AAU) and the Association of Commonwealth Universities (ACOU) had boosted institutional assistance to member institutions for HIV-related activities. As a result of the SIDA (2010) baseline survey, which examined HIV-related activity at six East African universities, ACUs were established and HIV policies were published. However, according to Nzioka et al. (2007), only Highridge Teachers' Training College in Kenya has a policy on HIV in place of the three colleges they reviewed. It was discovered that the other universities were just following the education sector policy, which they had yet to personalise. The researchers did find, however, that all of the universities had plans in place to deal with the HIV danger. Furthermore, institutions had AIDS control units and coordinators who were responsible for planning and implementing projects and programmes in response to HIV.

Additionally, three of the four Kenyan universities evaluated by Immonje (2016) have well-established AIDS Control Units. Strategic plans for the next five to ten years were found to include HIV education as needed by the NACC Strategic Plan 2005/6-2009/10 and the AAU Toolkit 2004 at all four universities examined. Furthermore, all universities

demonstrated a clear academic interest in HIV curricula mainstreaming. He said that this also suggested a strong commitment to the research's financial viability, as all four participating universities had agreed that they would provide enough and long-term funding (Immonje, 2016).

Additionally, the Kenya HIV and AIDS Strategic Framework (KAFR) 2014/15-2018/19 placed "strengthening integration of health and community systems" as its fourth (4th) target. KARF's overall goal was to contribute to the achievement of vision 2030. Closely associated, the Kenya HIV and AIDS Research Agenda (KHARA 2014/15-2018/19 included reducing new infections expressed in the following words;

> Granulate the HIV epidemic to intensify HIV prevention efforts to priority geographies and populations…Granulate Kenya's HIV epidemic by county, age, population…adolescents, youth and key populations

In 1997, the Kenyan government created a comprehensive national strategy on HIV and AIDS, titled HIV/AIDS in Kenya (Sessional Paper No. 4 of 1997). (Republic of Kenya, 1997). This strategy envisioned the establishment of a National AIDS Control Council (NACC) to lead a multisectoral and collaborative effort to combat the spread of HIV in the country. In 1999, the government proclaimed HIV to be a national emergency and established the National AIDS Control Council to oversee the national response to the epidemic (Republic of Kenya, 1997). Since then, the NACC has established a National HIV and AIDS strategy plan for the period 2000-2005 that not only provides a solid policy and institutional framework, but also incorporates HIV into all major government activities in Kenya (NACC, 2000). In addition, the Kenyan government launched the implementation of the Big 4 Agenda between 2018 and 2022. The objective is to expand

the existing level of Universal Health Coverage (UHC) from 36% to 100% by 2022 through scaling up NHIF participation, increasing budgetary allocation to health, and adopting low-cost service delivery options. This agenda is consistent with the third Sustainable Development Goal; Good health and wellbeing for all at all ages (Mutinda, 2020).

2.8.2 Availability of structures to address gender inequalities

Ruiz-Perez*et al*. (2017)43 HIV preventive programmes aimed at socioeconomically disadvantaged ethnic minority women in Organisation for Economic Co-operation and Development (OECD) member states were examined and evaluated for their effectiveness. Researchers found that HIV prevention programmes aimed at low-income, ethnic minority women can be beneficial.

Additionally, Okarfor (2010) underscored the female vulnerability to HIV risk and recognized gender as an intervening variable in the association of the studied undergraduate students' HIV knowledge, risk perception and behaviour. In consideration of the gender aspect, University of Namibia had also introduced a compulsory course for first year students entitled 'contemporary social issues' which covered ethics, gender and HIV. Some departments also offered additional courses that covered HIV and AIDS-related issues (Otaala, 2000).

Odaga (2020) have conducted studies in this area. Researchers studied 101,504 students from 112 districts who were admitted to five public institutions between 2009 and 2017. In spite of a significant increase in the number of Ugandan women pursuing higher

education, the study concluded that gender inequalities still existed, and that the issues surrounding women's access to higher education had grown considerably more complex. To illustrate its complexity, only one of ten universities had half as many female students as males, and in eight of those universities, men had an 8:2 advantage over women. Uganda's higher education system is stereotypical, according to Ogada. It has reinforced images of women in one subject while simultaneously reinforcing stereotypes of males in another.

According to Koech (2021), In Kenya, gender equity and equality in education was a fundamental development concern and an objective in itself. Koech observed an increase in the number of men enrolling in ECDE certificate and diploma programmes in Kenya. The majority of men in Koech's study, however, were more interested in ECDE as a management position than as a childcare provider position. 513 trainees and nine principals of the nine training colleges in the two Keiyo North and South subcounties were targeted by Koech. Male youth educators in ECDE were found to be underrepresented because of social norms and biases, the low standing of the profession, and the poor compensation of the job.

2.8.3 Availability of structures addressingviolence and violations of human rights

Gender Based Violence impedes women’s engagement in HIV prevention, care, and treatment services. Several studies suggest that women who experience violence are less likely to link to HIV care (Hatcher *et al*., 2012; Mendoza *et al*., 2017; Watt *et al*., 2017; Maeri *et al*., 2016). Additionally researchers found that Gender Based Violence prevented women from initiating and adhering to antiretroviral drugs thereby making

them less likely to achieve viral suppression (Trimble *et al*., 2013; Espino *et al*., 2015; Machtinger*et al*., 2012). Assari *et al*. (2018) also reported that history of violence was associated with general anxiety,suicidality and depression. Schipani-McLaughlin*et al*. (2017) also added their contribution to this discussion. They reported that sexual violence among college women was a critical and complex issue on college campuses across the United States and that despite the federal and campus-wide requirements for which universities must comply, incidences of sexual violence at college campuses were vastly underreported to campus authorities or law enforcement.

Additionally, experiences of violence were found to be associated with reduced HIV testing among women (Leddy *et al*., 2019; Pearlman *et al*., 2005; Mohammed *et al*., 2017; Etudo *et al*., 2017; Nasrullah, *et al*., 2013; Loeliger *et al*., 2016). Fear of a violent reaction from one's partner in the event of a positive test result was reported to reduce rates of HIV testing (Naju, *et al*., 2012; Washio *et al*., 2017). Turan *et al*. (2011) also reported that anticipated stigma especially through physical violence from a partner upon testing positive for HIV was associated with refusing to test for HIV. The American College Health Association (ACHA) also recognizes relationship and sexualviolence as a grave public health issue affecting institutions of higher learning (Black *et al*. (2010).

Jouriles *et al*. (2018) carried out a meta-analysis which discovered that students who participated in a their programme, compared to those who did not, had better attitudes or beliefs about sexual violence and intervening to prevent it, and engaged in more programmes. Bonar *et al*. (2020) additionally focused on studies that had identified risk

factors for campus sexual violence. They found out that in terms of violence prevention in institutions studied, promising individual and relational level interventions existed, including active bystander, resistance, and gender transformative approaches.

Graham *et al*. (2017) In addition, a nationally representative survey of college and university websites (n = 995) was done to analyse the presence of publicly accessible online policies and definitions and to examine their correlations with school characteristics. A content analysis was conducted on a subsample (n = 100) of definitions of consent. The majority of schools' sexual assault policies and consent definitions were available online. Schools were more likely to have a policy or consent definition if they had more than 5,000 students, were public, or had more than 33 percent female enrolment. Detail and comprehensiveness differed among definitions. It was found that institutions of higher learning with a higher proportion of male students—particularly small, private schools—have an opportunity to improve access to sexual assault policies and definitions of consent.

Vanderwoerd *et al*. (2017) additionally, a research was conducted to determine the prevalence of sexual violence on independent Christian universities. Using a sample of part-time and full-time undergraduate students (N = 668) from eight private Christian colleges in Ontario, Canada, they discovered that 18 percent of women at religious colleges reported unwanted sexual contact within the past year, compared to self-reported rates on secular campuses ranging from 21,4 percent to 31,4 percent. An exploratory analysis of characteristics connected to victimisation revealed that religious universities may have created a'moral community' that reduced the probability of sexual assault.

Howard *et al*. (2019) also took the time to add to this debate. They reported thatwomen participants, below the age of 26, LGBTQ, or a race other than Caucasian were much more likely to report victimisation. In addition, participants who had been victimised were considerably more likely to score poorly on well-being scales than participants who had not been abused. Potter et al. (2020) also presented their findings from an ARC3 (Administrator-Researcher Campus Climate Collaborative) According to the Climate Survey, which was conducted at seven community colleges in a Northeastern state and found that sexual violence was more prevalent among students in the LGBT community than their heterosexual peers. A majority of non-heterosexual participants (63.6%) reported having been sexually assaulted while attending their community college, with more than a third (35.9%) reporting having been assaulted twice or more in the same timeframe. Students who identified as LGBTQ and said they had been sexually assaulted had significantly worse well-being scores and lower evaluations of the climate on campus.

Schipani-McLaughlin*et al*. (2017) In an effort to better understand the factors that influence reporting of sexual abuse to school authorities or law enforcement, a study was conducted at thirty (30) Georgia colleges and universities. University administrators who are in charge of enforcing campus sexual violence regulations provided the researchers with their data. Campus law enforcement regulations for responding to sexual assault on campus were viewed by administrators as facilitating the reporting of sexual assault among student victims (46.9 percent). Discussing sexual assault in orientations (53.1

percent) and coordinating crisis response on campus and in the community to provide assistance to victims were also listed in the facilitators' responsibilities (53.1 percent). More than just the formal campus sexual violence response and adjudication procedures were found to have a significant impact on the reporting of sexual violence on college and university campuses.

Mishra (2020), on the other hand, claimed that in Mizoram, a state in northeast India, despite several awareness-raising programmes and legislation, ladies in institutions were often turned into victims of bothersome behaviours by male stakeholders. A total of 727 students (496 from the arts and 231 from the sciences), 176 parents, and 131 teachers took part in the survey. In Mizoram, the majority of stakeholders agreed that teen fashion, a difficult home environment, test pressure, a peer group, the disabilities of females, drugs and alcohol, and technological gadgets were the root causes of violence against women.

Sadati *et al*. (2019) also took the time to add to this discourse. They reported that Ethiopia had high prevalence rates of sexual and gender-based violence in universities and rural agricultural colleges. They explored the idea of a participatory game design, in which the end-users (both male and female students) came up with the storylines for a serious game that addressed sexual and gender-based violence. They looked at the use of cellphilming (cell phone plus video) as a participatory visual method for engaging students from four agricultural colleges in developing the storylines for a serious digital game and based on fieldwork with approximately 100 students who produced 15

cellphilms. The project highlighted the ways that young people could be co-producers of knowledge about sexual and gender-based violence and simultaneously actors or agents in contributing to the development of a self-educating tool.In Kenya, in the study by Ochieng & Maiyo (2008) at colleges the researchers found out that 70% of students had constantly been reminded about their rights and encouraged to report cases of sexual harassment. They also reported that strong action was to be taken against staff and students found guilty of sexual harassment including rape, verbal abuse, grabbing and touching in an offensive manner.

2.8.4 Availability of structures addressing HIV related discrimination

Feinstein *et al*. (2020) reported that the field of HIV and Sexually Transmitted Infection prevention had been blamed for focusing primarily on men who have sex with men with limited attention paid to bisexual men although bisexual men were reported to also be at an increased risk for HIV and other Sexually Transmitted Infections. They added that bisexual men were less likely to utilize HIV and Sexually Transmitted Infection prevention services than men who had sex with men, yetstakeholders had developed very few interventions to address their unique needs (Feinstein *et al*., 2020).The researchers summarise the ways in which colleges and universities can improve HIV prevention, treatment, and care while bolstering the health of their students as follows: making inclusive sexual health education a top priority on campuses to address the inequality that LBGTQ students face; and partnering with and supporting student-led initiatives to promote HIV awareness and sexual health education, especially those led by LGBTQ and People Of Color (POC) student organisations.

In addition, the US National HIV and AIDS Strategy's guiding document for HIV prevention and care advocates for the development of PrEP services that target populations most afflicted by HIV in order to combat HIV-related discrimination. These include adolescents ages 13 to 24, homosexuals, bisexuals, and other MSM of all races and ethnicities, especially MSM of colour, transgender and non-binary individuals, and black transgender women Persons Who Inject Drugs (PWID) (Black *et al*., (2010).

2.9 Theoretical applications and models

2.9.1 UNAIDS (2010) HIV Combination Prevention Model

According to UNAIDS (2010), The method known as "combination prevention" has the greatest potential for resolving acknowledged deficiencies in HIV prevention programming and for achieving significant, sustained reductions in the prevalence of HIV in a variety of contexts. UNAIDS (2010) recognises the three complementary therapies as behavioural, biomedical, and structural. According to UNAIDS (2016), these programmes frequently employ intensive approaches comprising a combination of activities to address several goals, such as information, risk perception, norms, skills, and sexual behaviours. Figure 2.1 thus presents the UNAIDS (2010) Combination HIV Prevention Model.

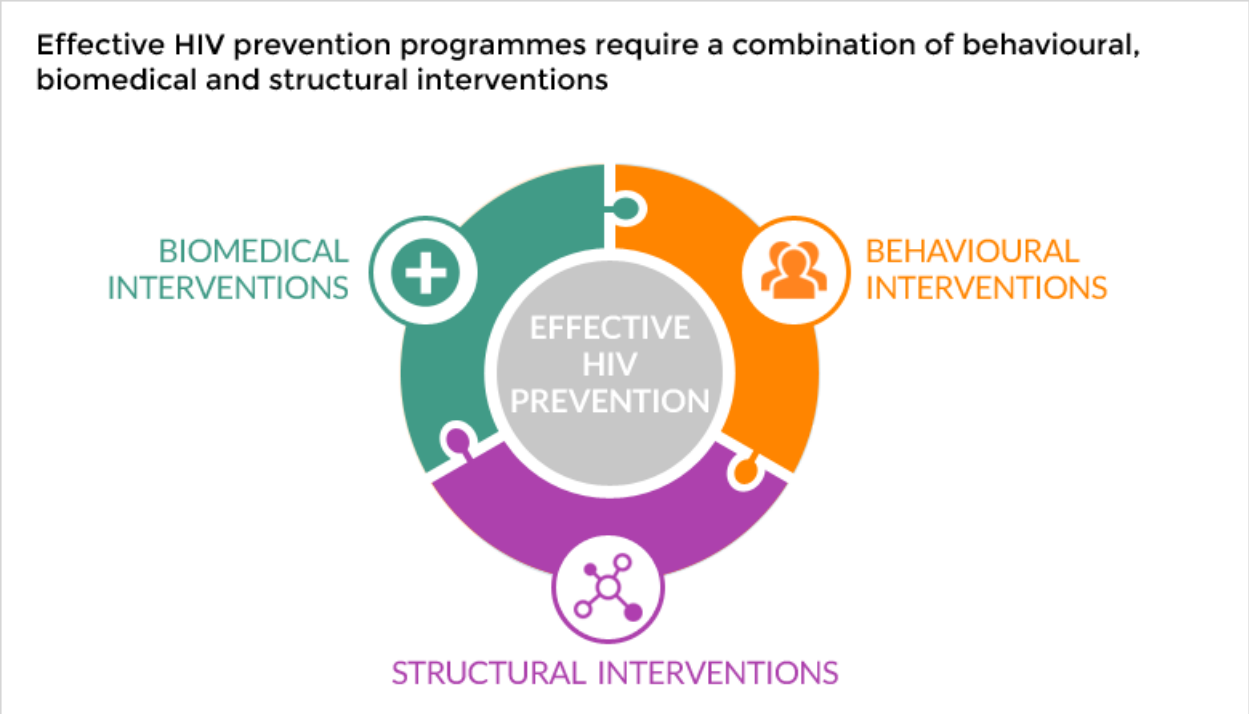

Figure 2.1 The UNAIDS (2010) Combination HIV Prevention Model

Source: UNAIDS, (2010)

2.9.2 HIV risk denialism theory

Denialism is the use of rhetorical strategies to create the illusion of argument or serious debate where none exists. The use of these fallacious arguments is common when a person's position is at odds with scientific consensus or overwhelming evidence that it is incorrect. Using emotionally appealing, but ultimately hollow and nonsensical arguments, they are able to divert attention away from serious dispute (Hoofnagle & Hoofnagle, 2007). As a result, HIV risk denialism refers to the use of rhetorical methods to provide the illusion of an argument or valid debate that there is minimal or low risk of obtaining HIV as a result of engaging in Risky Sexual Behaviour.This theory support these

studiesas majority of respondents was reported to be aware of the risks involved in engaging in HIV Risky Sexual Behaviour but still go ahead and practiced them.

2.9.3 Process Evaluation Theory

Process Evaluation Theory (PET) refers to the systematic collecting of information on a program's inputs, context, and other relevant qualities (CDC, 2008; Umunnakwe et al., 2017). In order to make sure that a programme has been implemented in the way it was intended during the design and planning stages, process assessment looks at its activities and operations (Rossi et al., 2004). This study has three out of four objectives on evaluation. For this study programme = strategies. The study sought to understand how the strategies were functioning and rate the performance of the strategies.

2.9.4 The HIV Risk taking Behaviour Scale (HRBS) Model

The HRBS consists of 10 items. A distinct HIV risk-taking behaviour is addressed by each of these items. Sexual and injecting behaviour are among the topics covered. Each act is graded out of a possible five on a 0-5 scale, with the higher the number, the greater the degree of recklessness. The totals are then used to calculate risky sexual behaviour, risky drug usage, and an HIV risk-taking behaviour score. Risk-taking behaviour is more likely to be indicated by higher scores on the entire test, which can be quantified from 0 to 55. The HRBS also analyses HIV risk-taking behaviours related to drug use and sexual activity, and takes into account both the individual's own risk of HIV and the risk posed to others. In order to test the efficacy of HIV prevention programmes, the HRBS was created. Such evaluations can benefit from employing the HRBS because it has been demonstrated to be accurate and dependable.

This model provided the study with a tested tool for measuring HIV risk taking behaviour. The tool was modified to include questions beyond those asked of injecting drug users or commercial sex workers. The scaling was also modified by the researcher in order to take into account the additional items included in the scale.HRBS delivers three scores: a total score indicating amount of HIV risk-taking behaviour; a Sub-total indicating degree of risk due to drug using habits; and a Sexual Behaviour Sub-total indicating level of risk related to unsafe sex. Every time a subject receives a high score, the danger of catching and spreading HIV increases.

2.9.5HIV risk behaviour from Immonje (2016)

The study also adapted the HIV risk behaviour developed by Immonje (2016) in her study 'Contribution of HIV curriculum mainstreaming to Kenyan University students' HIV risk perception and behaviour' where she used a ten (10) item scale for measuring and scoring HIV risk Behaviour among University students. These items were used in the current study, in conjunction with the HRBS model and other literature reviewed, to develop the dependent variable indicators for the current study and the HIV Risky Sexual Behaviour index. An 11th item; watching pornography, was added to modify Immonje's model thereby forming a new model for measuring HIV Risky Sexual Behaviour.

HIV RISK BEHAVIOUR (Immonje, 2016)

i. Non/incorrect condom use
ii. Multiple sex partners
iii. Ignorance of sex partner's HIV status

iv. Experimentation with anal sex, drugs & alcohol

v. Sharing of sharp objects (e.g. needles)

vi. Cross generational sex

vii. Transactional sex (for fees, marks, fish or other favours)

viii. Encounter withCommercial Sex Workers

ix. Early sex debut

x. VCT uptake to know one's own HIV status

The HIV Risk taking Behaviour Scale (HRBS) Model, HIV Risky Sexual Behaviour 10-point behaviours from Immonje (2016) and influence from reviewed literature subsequently influenced the formation of a HIV Risky Sexual Behavior index. It categorized HIV Risky Sexual Behavior into two (2) categories namely: 1: Low HIV Risky Sexual Behavior and 2: High HIV Risky Sexual Behavior.

2.10 Conceptual fframework

According to Oseno (2012), the independent variable, also referred to as the influencers is the variable that calls for manipulation in the study for a behavior or change to be triggered. In this study, the independent variables are the mitigation strategies that are used by Institutions of Higher Learning to mitigate Risky Sexual Behaviors. The dependent variable on the other hand is the character or attribute which is influenced by the independent variable (Oseno, 2012). For this study, this refers to the mitigation of HIV Risky Sexual Behavior.From the models and theory reviewed above, the researcher developed a hybrid conceptual model to guide the study. The likely linear relationship existing between the variables of the study is illustrated in Figure 2.2, and described in

the broad conceptual statements below. The study had an independent variable (efficacy of strategies used) which leads to a desired outcome in the dependent variable of (mitigation of HIV Risky Sexual Behaviour).

However, there were also intervening variables that could affect this linear relationship. Hence, National Reproductive Health Policy framework, Institutional HIV policy frameworks, Community participation in Reproductive Health continuum, Role of International Non Governmental Organisations, Non-Governmental Organisations, Community Based Organisations, County Governments and Socio-economic characteristics of students. However, this influence may be interfered with by the demographic characteristics of the respondents. Although mitigation strategies are supposed to affect the HIV Risky Sexual Behavior of the students; in reality their perception can also be affected by their behavior especially when stronger forces such as peer pressure, drug use, alcohol or poverty and deprivations distort the actions of the student, making them forget the right course, despite knowing the consequences of their actions. There is also a two-way relationship between the demographic and social characteristics of the students, meaning, each affects and is affected by the other. The mitigation strategies were assessed by whether or not they existed in the Institution of Higher learning, and the degree to which they subscribed to the indicators detailed in the HIV Risk taking Behaviour Scale (HRBS) Model and the Problem behavior Theory. The assessment was based on the extent of adherence to The UNAIDS (2010) combination HIV prevention model that proposes addressing HIV prevention through biomedical, behavioural and structural interventions.

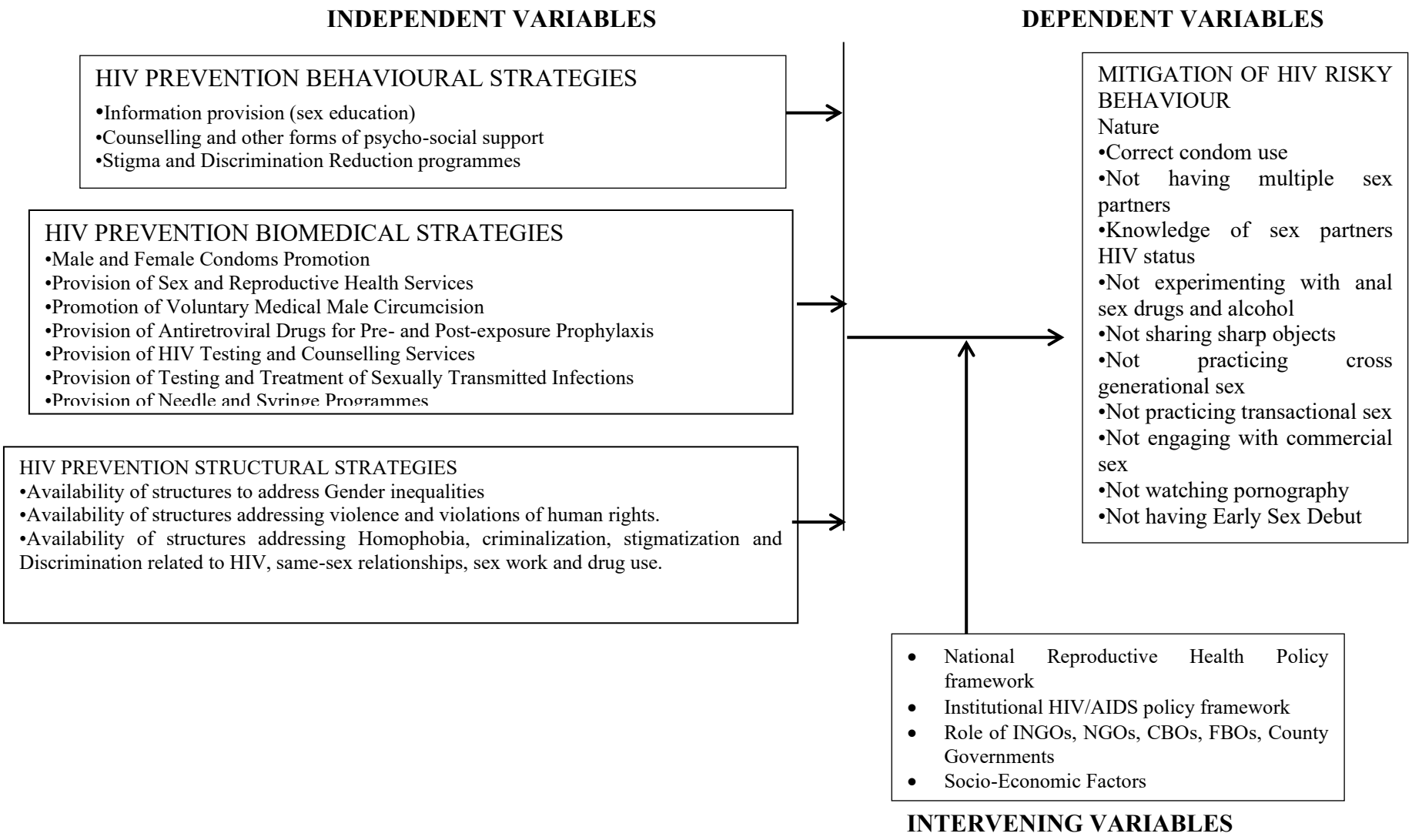

Figure 2.2 Conceptual Framework

Source: Researcher (2019)

2.11Summary

UNAIDS (2010), recommends "combination prevention" as the best prospect for addressing weaknesses that have been documented in programming for HIV prevention and in significant generation and sustained reductions in HIV incidence in diverse settings. The study employed HIV risk denialism, Process Evaluation Theory (PET) and the HRBS which consists of 10 items, each chosen to address a specific HIV risk-taking behaviour. The items cover both injecting and sexual behaviour. The study also adapted the HIV risk behaviour by Immonje (2016) where she used a ten (10)-item scale for measuring and scoring HIV risk Behaviour among university students. These items were used in in conjunction an 11th item; watching pornography, was added to modify Immonje's list of behaviour. The dependent variable for this study refers to the mitigation of HIV Risky Sexual Behavior. The study had an independent variable (efficacy of strategies used) which leads to a desired outcome in the dependent variable of (mitigation of HIV Risky Sexual Behaviour).

CHAPTER THREE

RESEARCH MATERIALS AND METHODS

3.1 Introduction

This chapter discusses the research design of the study. It describes the study site, target population, materials, and the methods that were used to get the sample for the study. It also outlines how both primary and secondary data were obtained, analyzed and presented. It further discusses; reliability, validity, assumptions, limitations; and ethical considerations that were employed while collecting data.

3.2 Research design

The study used the approach of mixed method research thereby incorporating both qualitative and quantitative research approaches. Creswell (2017) describes mixed methods research as a strategy to inquiry encompassing the collection of both quantitative and qualitative data, their integration, and the use of various designs that may incorporate philosophical assumptions and theoretical frameworks. The author goes on to explain that the fundamental premise of this type of research is that the combination of qualitative and quantitative methods provides a more comprehensive grasp of a study problem than either method alone.The mixed methods approach was found best as in this study there was a significant amount of information that was qualitative and there was also a significant amount of information that was quantitative.This study had four objectives. For each of the four objectives, the researcher sought to find the most suitable research design. The researcher realised that it was not possible to only use one research design to for all the four objectives. Vogt *et al*. (2012) report that it is good to combine research design when one wants to tell the full story in an area of inquiry. Therefore for objective

one, the researcher used the survey research design while for objectives two, three and four, the researcher usede the evaluation research designs.

According to Serem *et al*. (2013), Surveys are used to collect data on existing phenomena by asking people about their perceptions, attitudes, actions, and values. This architecture was chosen because it allowed for straightforward data collection, summarization, presentation, and interpretation. The design correctly helped to unearth information on the Nature and Extent of HIV Risky Sexual Behaviour among students in Institutions of Higher Learning in Western Kenya, the first objective. As this study collected data from selected students of Institutions of Higher Learning in Western Kenya in order to make inferences about the population of students of Institutions of Higher Learning in Western Kenya, cross-sectional survey design was further deemed fit to achieve study objective one.

Connelly (2016) elaborates that a cross-section study occurs at one point in time and that cross-sectional surveys are considered a snapshot that gives a picture of what the researcher wants to study. This given point in time for this study was the year 2020 and the entire picture for this particular objective is the nature and extent of HIV Risky Sexual Behaviour among students in Institutions of Higher Learning in Western Kenya. Spector (2019) also adds that cross-sectional surveys are flexible, can cover many different areas of human behaviour and populations and that it can be used with many populations. Connelly (2016) further adds that cross sectional survey is relatively quick to conduct when information is needed about what is happening currently. All the mentioned advantages mentioned were found to favour their use in addressing the study's first objective.

Furthermore, cross-sectional survey design was utilized as a fact finding operation. With appropriate interpretation, this design is typically employed to characterise occurrences. The first objective of this study was accomplished by appropriately highlighting the peculiarities of specific circumstances using this methodology. This is because the design attempts to answer who, what, when, where, and how much inquiries regarding a phenomenon. Consequently, this design indicates the frequency with which something occurs or is related with another variable (Walingo & Ngaira, 2008). The primary reason for adopting a cross-sectional survey approach in this study was to describe the current situation of HIV Risky Sexual Behavior in Higher Education Institutions. The design was also appropriate because it was used to collect attitudes and views in addition to data.

Furthermore, a majority of researchers having engaged in similar work preferred this research design including; Adams *et al*. (2017) , Adefuye *et al*. (2009), Chanakira *et al*. (2014) , Fagbamigbe *et al*.(2017), and Gray *et al*. (2019).A cross-sectional survey was therefore carried out among a representative sample of students at the seven Institutions of Higher Learning.For objectives two, three and four, evaluation research design was used. Evaluation research design is concerned with assessing the effects and impacts of social and development interventions in the real world and uses scientific methods to measure the implementation and outcomes of programmes (Punch, 2003). According to (Maxwell & Caldwell, 2008), outcome or impact evaluation is the aspect of evaluation that focuses on the effects that have been achieved by the intervention or its impacts. For this study it is the strategies and its impacts that were evaluated. The authors add that the

design aims at establishing causal effects and that is has a strong experimental tradition with a quantitative approach.

The design was thus seen most favourable to address the last three objectives since these three objectives intended to actually evaluate the HIV prevention strategies that were being employed by Institutions of Higher Learning in Western Kenya for their students. Table 3.1 summarises the research design for each study objective and the variables for measurement utilized.

Table 3.1: Summary of research designs as per the specificobjectives

Specific Objective	Measurable Variables (Indicators)	Research Design
i) Determine the nature and extent of risky sexual behavior among students in Institutions of Higher Learning in Western Kenya	• Non/incorrect condom use • Multiple sex partners • Ignorance of sex partner's HIV status • Experimentation with anal sex, drugs & alcohol • Sharing of sharp objects (e.g. needles) • Cross generational sex • Transactional sex (for fees, marks, fish or other favours) • Encounter with Commercial Sex Workers • Early sex debut • VCT uptake to know one's own HIV status <u>Level(extent) of Risk behaviour</u> • High (>5 indicators) • Low (< 3 indicators)	• Cross-Sectional Survey
ii) Evaluate the effectiveness of behavioural intervention strategies in the mitigation of HIV Risky	• Information provision (sex education) • Counselling and other forms of psycho-social support • Stigma and Discrimination	• Evaluation

Specific Objective	Measurable Variables (Indicators)	Research Design
Sexual Behavior among students in Institutions of Higher Learning in Western Kenya	Reduction programmes	
iii) Assess the effectiveness of biomedical intervention strategies towards the mitigation of HIV Risky Sexual Behavior among students in Institutions of Higher Learning in Western Kenya	• Male and Female Condoms Promotion • Provision of Sex And Reproductive Health Services • Promotion of Voluntary Medical Male Circumcision • Provision of Antiretroviral Drugs For Pre- and Post exposure Prophylaxis • Provision of HIV Testing And Counselling Services • Provision Of Testing and Treatment Of Sexually Transmitted Infections • Provision Of Needle and Syringe Programmes • Provision of Opioid Substitution	• Evaluation
iv)Evaluate the effectiveness of structural intervention strategies with relation to HIV Risky Sexual Behaviour among students in Institutions of Higher Learning in Western Kenya	• Availability of structures to address Gender inequalities • Availability of structures addressing Requirements of parental/carer consent • Availability of structures addressing violence and violations of human rights. • Availability of structures addressing Homophobia, criminalization, stigmatisation and Discrimination related to HIV, same-sex	• Evaluation

Source: Researcher (2020)

3.3 Study sites

The study sites were Institutions of Higher Learning in Western Kenya. For the purpose of this study, Western Kenya refers to the geographical Western region of Kenya therefore the area that is geographically located in the Western part of Kenya. This area was chosen as it has the highest number of Counties with the highest prevalence and incidence of HIV and AIDS in Kenya (Gok, 2018). These Counties with the highest prevalence and incidence of HIV located in Western Kenya are; Kisumu, Migori, Siaya, Kakamega, Homa Bay and Busia (GoK, 2020).

Based on the selection criteria and the distribution of the Institutions of Higher Learning, the study was conducted at; Great Lakes University of Kisumu, The Kisumu National Polytechnic, Alupe University College ,Rongo University, Tom Mboya University College, Lugari Diploma Teachers Training College and Kenya Medical and Training College in Bondo. Figure 3.1 presents the study map.

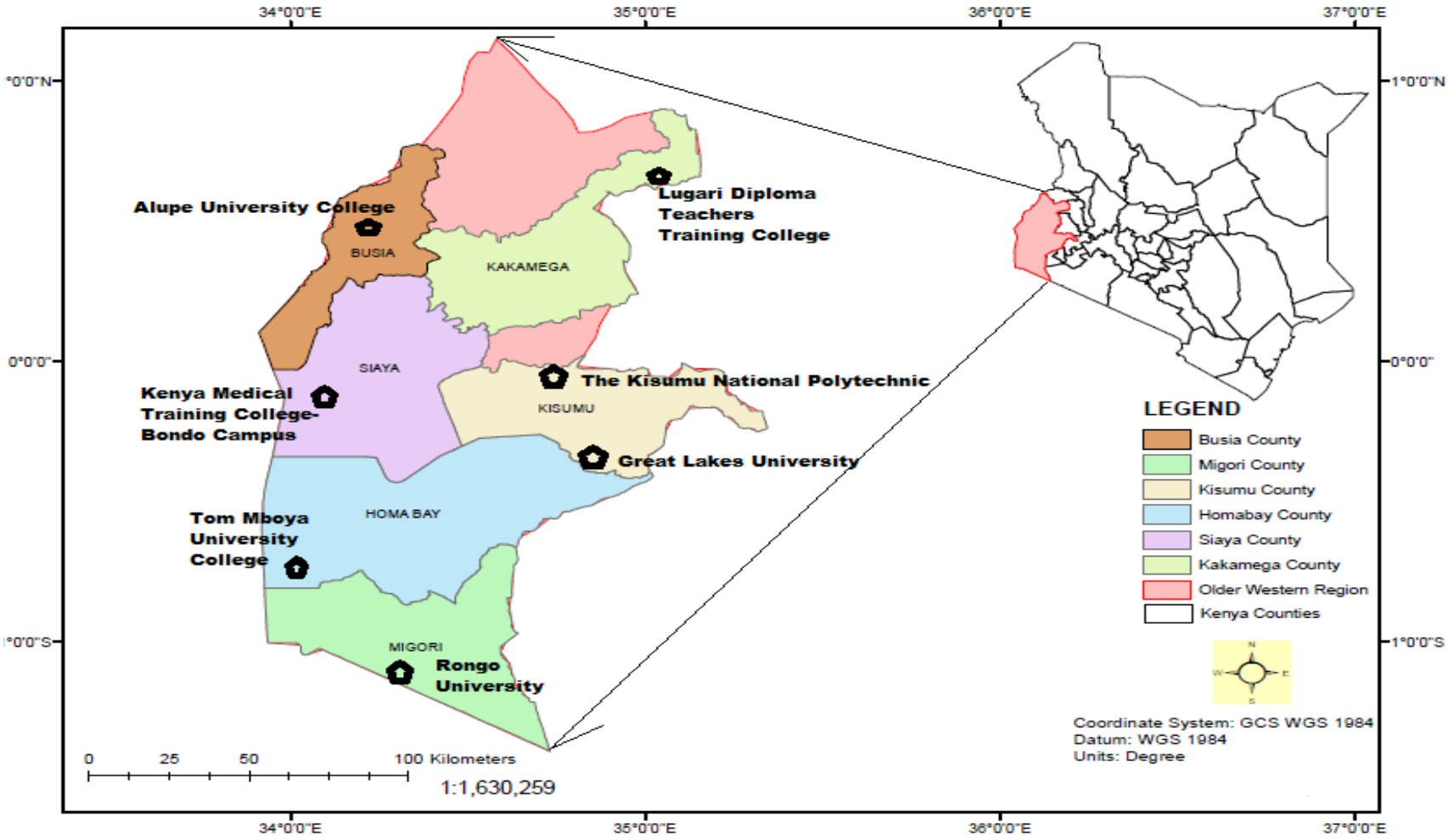

Figure 3.1: Map indicating the counties and Institutions of Higher Learning

Source: Researcher, (2020)

3.4 Study population

The study was carried out among students of Institutions of Higher Learning. There was a total population of 13,002 students which included a population of 1,000 students at Great Lakes University of Kisumu. Additionally there were 3318 students from The Kisumu National Polytechnic, 540 students at Alupe University College in Busia County, 6,345 students at Rongo University in Homabay County, 663 students at Tom Mboya University College, 400 students at Lugari Diploma Teacher Training College in Kakamega County and 736 students at Kenya Medical and Training College Bondo campus in Siaya County. Table 3.2 presents a breakdown of this information.

This study also interviewed Key Stakeholders in the HIV and AIDS and Sexual and Reproductive Health field including; Clinic officials at the institutions' health care clinics, Deans of students/students counselors and AIDS Control Unit heads. The study also comprised of officials of Faith Based Organizations; and officials of Non-Governmental Organizations/Community Based Organizations who run HIV, Sexual, and Reproductive Health programs for students in Universities and Colleges. Officials of County Governments who provided HIV and Sexual and Reproductive Health programmes for the study group were also part of the study population. Officials of hospitals and health centers that the study group visited for Sexual and Reproductive Healthcare purposes also formed part of the study.

The study also collected information from students in the Institutions of Higher Learning through Focus Group Discussions. The study interviewed 399 students in Institutions of Higher Learning through interviewer administered questionnaires. Through Key

Informant Interviews, the interviewer administered questionnaires to five Community Based Organization Non-Governmental Organization Officials; five county government officials; six officials in four university/college HIV Counseling and Testing Centers including one official at a Kenya Medical Research Institute (KEMRI) that had a Memorandum Of Understanding with one of the University Colleges which did not have its own HIV Counseling and Testing Center. Additionally there were six dean of students and one student counselor interviewed. Study participants generated quantitative information that fulfilled the general objective of the study. The Key Informants and the Focus Group Discussion participants provided more in-depth information to explain the observed trends in the survey.

3.5 Sampling strategy

3.5.1 Sampling strategy for students

After considering the research designs, the researcher then moved on to samping. Berndt (2020) emphasizes that knowledge of sampling methods is essential to design quality research. A sample is a collection of people, things, or items that are collected from a larger population for the purpose of determining the size of the population. To ensure that the findings from the study sample can be generalised to the population as a whole, this sample should be representative of the population (Invernizzi *et al*., 2020).

This research employed both probability and non-probability sampling techniques. Probability sample and non-probability sample are classifications for sampling procedures (Acharya *et al*., 2013.). Each member in the population has an equal chance of being picked for the study, according to the authors. Meanwhile, Invernizzi *et al*.

(2020) explain that non-probability samples are those in which the probability that a subject will be selected is unknown, resulting in a selection bias in the study. These samples include the most frequently used convenience/purposeful sampling, quota sampling, and snowball sampling.Purposive sampling was subsequently used to select the six Counties that formed part of the research. This purpose determining the choice of the Counties was that they were among those with the highest HIV prevalence rates in Western Kenya (NACSOP, 2020). In the purposive choice of these Counties, the researcher also considered to have a breadth in physical location regarding these Counties such that they would not all be concentrated in one are but would as much as possible spead out across the geographical Western Kenya region.

Secondly,the researcher was guided by the Kenya Universities and Colleges Central Placement Service (KUCCPS) clusters of Institutions of Higher Learning which are; Public Universities, Public University Constituent Colleges, Private Universities, Public Colleges, Private Colleges, National polytechnics and Teacher Trainer Colleges(kuccps.net, 2018).The researcher listed all Institutions of Higher Learning in Western Kenya under these seven clusters. Private Colleges were subsequently omitted as a cluster after discovering that they had relatively low student numbers in comparison to the institutions on the other clusters.

Within each of these KUCCPS clusters all Institutions falling within the six Counties were listed such that each County had all the six possible cluster institutions that existed in that County listed within it, that is all its Public Universities, Public University

Constituent Colleges, Private Universities, Public Colleges, National polytechnics and Teacher Trainer Colleges.

Thirdly, purposive sampling was used to select institutionsin each cluster. As there were seven clusters and six Counties, One County ended up with two clusters while the rest had one cluster each. The County with the two clusters was conveniently sampled as it had the highest number of clusters as compared to the rest of the Counties.Fourth, the total population of each institution was then determined which informed the total population of the study that stood at 13,002 students. According to Yamane (1967) this was deemed a small population. Yamane (1967)'s simplified formula for small population sample size calculation was adopted for the study. The formula states as follows:

$$n = \frac{N}{1 + N(e)^2} \qquad \text{……..}$$

Formula 3.1

Where:
n = the desired sample size
N= Population of students13, 002
e = Margin of error 5 %

$$n = \frac{3910}{1 + 3910(0.05)^2}$$

From the formula: n = 399 students

After the determination of the sample size, each institution was allocated athe number of students to be interviewed as per their numerical representation as demonstrated in table 3.2.

Table 3.2: Number of students per institution for the structured interviews

S/N	Name of Selected Institution	Number of Students Interviewed
1	Rongo University College	195
2	Kisumu National Polytechnic	102
3	Great Lakes University of Kisumu	31
4	Kenya Medical Training College (Bondo)	22
5	Tom Mboya University College	20
6	Alupe University College	17
7	Lugari Diploma Teacher Training College	12
	Total Interviewed Students	**399**

Source: Field Data, (2021)

Simple random sampling was then used to pick students within each institution as guided by students lists provided by Deans of students of the institutions. The population per institution was numbered off from 1 (one) up to the total number of students. Numbers 1 (one) up to the total student population per institution were put in a hat and the total sample per institution randomly picked from the hat according to their institutions such that the total population was selected according to table 3.2.The researcher collected information from the students through a telephone survey, also known as CATI or Computer-Assisted Telephonic Interview whichis a research method where the researcher surveys respondents over the telephone Anastas (1999).This method was used due to restrictions brought about by the Covid-19 pandemic. According to Ngwacho (2020) the pandemic disrupted learning for over 18 million learners and trainees in Kenya posing a

threat to the attainment of Sustainable Development Goal No.4 which is on access to quality, equitable and inclusive education and training, which are all provided by Institutions of Higher Learning.

3.5.2 Sample sizedetermination for Key Informants

Key Informants were purposively selected. The researcher selected officials from five (5) one Non-Governmental Organization; Six (6) County Government officials; Six (6) officials in Four (4) institutional HCTs including one official at the Kenya Medical Research Institute (KEMRI) in Busia that had an MOU with one of the University Colleges because it did not have its own HIV Counseling and Testing Centre. Additionally there were Six (6) Dean of students and one (1) student counselor selected.

3.5.3 Sample sizedetermination for Focus Group Discussions

Four (4)Focus Groups in four (4) institutions were purposively selected, These included; Rongo University College, Great Lakes University of Kisumu, Kenya Medical Training College in Bondo and Lugari Diploma Teacher Training College. Students leaders were selected into Focus Group Discussions through snow balling to enable the study to reach participants who are most open with sexual and reproductive health information. Eight (8) members per group per institution met in each Focus Group through the online meeting application, ZOOM.

Table 3.3: Sampling strategies

Study Population Unit	Sampling Method	Sample Size
Students	• Yamane's formula used to determine sample size of 399 students. Simple	• 399

	random sampling then used to sample students from each institution equitably based on the student numbers	
Student leaders FGDs	• Purposive	• 4 FGDs from 4 institutions
Key Informants • NGO officials	• Purposive	• 4
• County Government officials	• Purposive	• 6
• Officials in University/College HIV Counseling and Testing Center officials including one official at a Kenya Medical Research Institute (KEMRI) that had an Memorandum Of Understanding with one of the University Colleges which did not have its own HIV Counseling and Testing Center.	• Purposive	• 7
• Dean of students/ student counselor	• Purposive	• 7

Source: Researcher, (2020)

3.6 Data collection

Primary data was collected using 3 different instruments. These included an interviewer-administered semi-structured questionnaire for student respondents; a Key Informant Interview schedule and a Focus Group Discussion Questionnaire. Student leaders who were chosen to be the participants in the FGDs were found to be best suited as participants for this data collection method as they usually have a plent of information on their constituents and by virtue of the positions they hold are usually outspoken about student matters. Data was also collected through Secondary sources as explained in

section 3.5.5. Table 3.3 presents data collection instruments against their sampling approaches and sample size.

Table 3.4: Summary of datacollectiontools

Study Population unit	Sampling Method	Sample Size	Data Collection Tool	Appendix Number
Students	Simple random sampling	399	Interview administered semi-structured Questionnaire	i
Student Leaders FGDs	Purposive	4 FGDs	Focus Group Discussion Guide	ii
Key Informants • Deans of students/student counselors	Purposive	**7**	Key Informant Interview Guides	v
• Community Based/Non-Governmental officials	Purposive	5	Key Informant Interview Guides	vii
• County Government officials	Purposive	6	Key Informant Interview Guides	vii
• Officials in University/College HIV Counseling and Testing Centres	Purposive	**5**	Key Informant Interview Guides	vii

Source: Researcher (2020)

3.6.1 Primary data

3.6.1.1 Questionnaire for students

The interview administered semi-structured questionnaire (Appendix II) was developed by the researcher through an analysis of the study objectives and research questions to ensure that the questions adequately covered both the scope and depth of the study. The literature review of HIV and and Risky Sexual Behavior in Institutions of Higher

Learning and the pilot study results additionally informed the development of the questionnaire. The formation of the tool was mainly guided by 'Strategic Guidance for Evaluating HIV Prevention Programmes' by UNAIDS (2010) on the evaluation objectives and Immonje (2016)'s model used to describe HIV Risky Sexual Behaviour. The tool was then used to collect quantitative and qualitative data from students in Institutions of Higher Learning in Western Kenya. The questionnaire was administered telephonically to individual students by the researcher and two other trained research assistants. The information collected by the questionnaires included demographics, as well as information on HIV Risky Sexual Behavior. The first section of the questionnaire gathered participant's demographic data. The second section of the questionnaire gathered the nature and extent of risky sexual behavior. The third section of the questionnaire evaluated the effectiveness of the strategies used to mitigate students' HIV Risky Sexual Behavior.

3.6.1.2 Key Informant Interview guide

The Key Informant Interview guide (Appendix IV) was developed by the researcher through analyzing the aspects that needed in-depth professional understanding. This tool has open-ended questions and was administered to officials of organizations providing sexual and reproductive health care services to students within the study area. The tool was administered face to face while following the Government of Kenya and the World health Organization safety protocols on Covid-19 to individual Key Informants by the researcher and one other trained research assistant. The tool focused on gathering information on strengths, weaknesses, opportunities and threats for HIV Risky Sexual Behavior change and offered insights into improvement for HIV and Sexual and

Reproductive Health strategies. The Key Informant Interview guide also captured information on various factors affecting students' level of knowledge and behavior change. The guide collected information on best methodologies to reduce HIV sexual risk behavior among students in Institutions of Higher Learning in Western Kenya.

Key Informant Interviews were applied to collect qualitative data from the implementing agencies of Sexual and Reproductive Health programmes such as stories and themes about the four study objectives outlined. These approaches were used to collect information that could be triangulated with results from students.

3.6.1.3 Focus Group Discussion guide

The Focus Group Discussion guide (Appendix VII) was also developed by the researcher through analysing the aspects that needed in-depth understanding from the students' perspective which was not possible to achieve from the survey. This tool has open-ended questions and was administered to selected students who were vocal and open to discuss Sexual and Reproductive Health issues in order to obtain as much accurate information as possible. The tool was administered online through the Application ZOOM due to the closure of the institutions at the time by the Government of Kenya due to the Covid-19 pandemic. Four (4) Focus Group Discussions which purposively selected from 4 different Institutions of Higher Learning taking between 1-2 hours each and were conducted with 6-8 participants per group. The researcher worked together with one professional moderator per group who helped manage the Focus Group Discussion. The tool focused on gathering information on strengths, weaknesses, opportunities and threats for HIV Risky Sexual Behavior change and offered insights into improvement for HIV and Sexual

and Reproductive Health strategies. The Questionnaire also captured information on various factors affecting students' level of knowledge and behavior change. The guide collected information on best methodologies to reduce HIV sexual risk behavior among students in Institutions of Higher Learning in Western Kenya.Focused group discussions were applied to collect qualitative data from the implementing agencies of Sexual and Reproductive Health programmes such as stories and themes about the four study objectives outlined. These approaches were used to collect information that could be triangulated with results from students.

3.6.2 Secondary Data

The method involved the search for information in records, published books, Journals, maps, dissertations, newspapers as well as available government and University policy documents, curricula and annual reports from the Ministries of health and education.

3.7 Pre-test, validity and reliability of data instruments

The study ensured instruments validity and reliability as hereby discussed.

3.7.1 Pre-test and validity of instruments

A pre-test study is important in testing the validity of the instruments and clarity of language (Mugenda & Mugenda, 1999). The pre-test was performed on both the quantitative and qualitative data collection instruments to assure validity, reliability and sensitivity at MMUSTbecause it was not one of the selected institutions for study and shares similar characteristics to the seven Institutions of Higher Learning chosen for the study. The pilot revealed that the tool applied was valid and reliable and that there was normality and uniformity in data distribution. Cronbach's Alpha coefficient revealed 73%

/0.73 reliability. According to George & Mallery (2003), this is considered acceptable. The ideal internal consistency is considered acceptable and good if it is 0.7 and above. Table 3.4 presents George & Mallery (2003) rule of thumb that a Cronbach's alpha of below 0.7 is low and 0.70 and above is good and acceptable.

Necessary corrections were then made to improve the questionnaire from the state it had been in to a much better one. The information obtained from the questionnaire subsequently formed the basis for selection of respondents for the study.Validity refers to sampling adequacy and representativeness of the instruments. Training of the research team was done by the researcher on the overall purpose and procedures of the study, as well as on the study questionnaire, Key Informant Interview schedule and Focus Group Discussion questionnaire. In this study the need to ensure both external and social validity called for an evaluation research design to address the second, third and fourth objectives of the study on strategies and Risky Sexual Behaviour. More so, survey design was employed in the pre-test study and the first objective. The use of a mixed method approach in this study also provided an opportunity to triangulate and cross-check the results thus ensuring validity and credibility to the research process (Namenya, 2018).

According to Walingo & Ngaira (2008), Validity refers to the capacity of an instrument to measure what it is intended to measure. It evaluates whether the data collected in the study accurately represent the variables of the investigation. This is significant in research because findings obtained from such data are more precise, relevant, and significant. 39 students participated in a pilot research to determine the reliability of the

instruments (10 percent of the sample). The objective of the pilot study was to examine the clarity of the questionnaires, interview schedule, and Focus Group Discussion. Discarded were the objects that did not meet the expected data. It is crucial to conduct a pilot research to test the instruments' validity and the language's clarity (Mugenda & Mugenda, 1999).

The researcher used content validity to measure the degree to which data collected using a particular instrument represents. Statisticians were consulted to ensure content validity. Attempts were made to ensure validity of research results by taking into consideration and controlling extraneous variables affecting HIV Risk sexual behavior across the sampled students. The same variables were again considered when interpreting the results.

3.7.2 Reliability of instruments

Cronbach's alpha (α) is a measure of internal consistency, that is, how closely related a set of items are as a group in a dataset (Mugenda & Mugenda 1999; Babbie & Mouton, 2010). It is therefore not a statistical test – it is a coefficient of reliability (or consistency). It implies stability or dependability of an instrument or procedure in order to obtain information (Kasomo, 2006). It is commonly applied when you have multiple Likert questions in a study tool that form a scale and you wish to determine if the scale is reliable. The formula 3.2 is useful in computing reliability test in excel spreadsheet.

$$\alpha = \frac{k^2 \sigma_{ij}}{\sigma^2 x} \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad 3.2$$

Where α is Cronbach's alpha, k = number of items being tested, σ_{ij} = covariance between x_i and x_j, and σ_x= item variance and inter-item variances.

In this study, the reliability test was thoroughly carried out using statistical analysis in SPSS with selected key items per objective and/or key areas of the study (George and Mallery, 2003).Table 3.5 shows Cronbach's Alpha and the number of items tested per study category/objective. From the table all the items showed good internal consistency.

Table 3.5: Level of internal consistency based on Cronbach's alpha

Cronbach's alpha	**Internal consistency**
$\alpha \geq 0.9$	Excellent
$0.9>\alpha \geq 0.8$	Good
$0.8>\alpha \geq 0.7$	Acceptable
$0.7>\alpha \geq 0.6$	Questionable
$0.6>\alpha \geq 0.5$	Poor
$0.5>\alpha$	Unacceptable

Source: George and Mallery (2003)

Table 3.6: Reliability test (α) of items per study objective

Objective/study area	**Cronbach's Alpha (α)**	**Number of items / variables used**
i) Determine the Nature and Extent of HIV Risky Sexual Behavior in Institutions of Higher Learning in Western Kenya.	0.75	11
ii) Evaluate the effectiveness of behavioural intervention strategies in the mitigation of HIV Risky Sexual Behavior among students in Institutions of Higher Learning in HIV Western Kenya.	0.70	8
iii) Assess the effectiveness of biomedical intervention strategies towards the mitigation of	0.75	18

HIV Risky Sexual Behavior among students in Institutions of Higher Learning in Western Kenya.		
iv) Evaluate the effectiveness of structural intervention strategies with relation to HIV Risky Sexual Behaviour among students in Institutions of Higher Learning in Western Kenya.	0.88	17

Source: Researcher, (2020)

3.8 Data analysis and presentation

Data was handled, cleaned and analyzed as described below.

3.8.1 Data handling and cleaning

Qualitative data such as field Focus Group Discussion notes and transcripts were cleaned to yield precise information that could easily be used for analysis and report writing as per the study thematic areas. Each team led by the researcher went through three transcripts and compared them with the audio versions to check whether accuracy and consistency of data reported had been sustained. The quality of quantitative data was highly checked. To tighten the quality, the study quantitative data were collected from the field using a web based - online system Open Data Kit.The data was collected by the team of data collectors using their android smart phones. The team of data collectors included the researcher and two trained assistantswho were well trained by the Open Data Kit collect expert/administrator. An xlsform was developed by the expert with no room for sending incomplete form to the server by the research assistants. The researcher with consultation with the expert created an ONA server where data were being relied from the field after being collected.

The administrator of the online system www.ona.io.com invited the research team, trained and hosted the server for the results to be relied. Also, the GPS location of each filled questionnaire was shown, time and the data collector were indicated in the server thus, improving the quality of the data.

However, because the data were being collected virtually from students who were at home as directed by Government of Kenya due to COVID-19 pandemic guidelines, the Geo points collected reflected their usual residence that is home as opposed to the Institutions of Higher Learning. Upon completion of the data collection exercise, the researcher downloaded and exported the raw data to Statistical Package for Social Sciences (SPSS) version 23 ready for analysis.There was therefore improvement of the quality of the data and reduction of data content errors during data collection. Consequently, validity and reliability of the data were adhered to throughout the data collection exercise where the researcher and administrator of the Open Data Kit collect software monitored the system in the server to inform the research assistants about the progress of the exercise.

3.8.2 Quantitative dataanalysis

Quantitative data were analyzed using Statistical Package for Social Sciences (SPSS) 2.0 and excel spreadsheet. The quantitative data was organized, coded and edited by a process called data cleaning (Punch, 2003). The (SPSS) version 20.0 was used to analyze the data. Frequencies and descriptive statistics were applied to show level or status of the Nature and Extent of Risky Sexual Behavior among students in Institutions of Higher Learning in Western Kenya, Evaluate the effectiveness of behavioural intervention

strategies in the mitigation of HIV Risky Sexual Behavior among students in Institutions of Higher Learning in HIV Western Kenya;Assess the effectiveness of biomedical intervention strategies towards the mitigation of HIV Risky Sexual Behavior among students in Institutions of Higher Learning in Western Kenya and Evaluate the effectiveness of structural intervention strategies with relation to HIV Risky Sexual Behaviour among students in Institutions of Higher Learning in Western Kenya.Valid percentages, mean/averages, standard deviation and range were applied to measure the proportion of students with or showed significance in the study items as well their variability/dispersion.

In this study, inferential analyses were done with focus on bivariate analyses. Bivariate analysis was done to ascertain the association and level of significance between the waves of students i.e. 'low' and 'high' Risky Sexual Behaviors with; a) background information, and b) the effectiveness of the strategies used to mitigate students' HIV Risky Sexual Behavior. In using the equation 3.4 the chi-square test statistics was computed and compared with computed level of significance generated in SPSS.

$$\chi^2 = \sum \frac{(observed \times frequency - expected \times frequency)^2}{(expected \times frequency)}$$

$$X^2 = \sum_{i=1}^{n} \frac{(O_i - E_i)^2}{E_i}, \quad \text{.....3.4}$$

Where i:

X^2 = Pearson's Chi-square test statistic;

O_i = an observed frequency in the class;

E_i = an expected (theoretical) frequency; and

n = the number of class in the contingency table.

The p values were used to show the level of significance/differences between the waves. Null hypothesis was rejected if p-values were $p<0.1$ at 90 % confidence level; $p<0.05$ at 95 % confidence level; and $p<0.01$ at 99 % confidence level (meaning there was statistically significant evidence or difference between the low and high risky sexual behaviors among students in reference to background information, effectiveness to address risky sexual behaviors, challenges, strategies and ways of mitigating HIV Risky Sexual Behaviors among students in Institutions of Higher Learning.

3.8.3 Qualitative dataanalysis and interpretation

There were no statistical measurements for qualitative data, but each thematic area was analysed and triangulated with quantitative data to produce cohesive conclusions. After transcribing recorded sessions into Microsoft Word 2013 and rechecking the transcription, coding and harmonisation were performed on the transcripts. The primary ideas were subsequently summarised.

Additionally, a matrix comparing the contributions of each member to the primary topics was created. The key themes examined were the nature and extent of Risky Sexual Behavior, as well as the efficacy of the techniques adopted to mitigate Risky Sexual Behavior. The participants' contributions to each theme were then mutually assessed by merging their perspectives and establishing their general points of agreement as well as

their disagreements. All points of agreement and disagreement were identified and then analysed through a literature study in order to develop conclusions and make recommendations.

3.8.4 Data presentation

Quantitative data has been presented in the form of figures and tables. Tables with descriptive information contain the variables and variable options or choices, frequencies for each option or choice and the percentage of respondents who had endorsed each choice or option. Tables with Bivariate analysis demonstrate the variable and the conclusions reached in the comparison, outlining the specific p-value attained. Narratives have been used to further explain the tables. Qualitative data has been presented in prose format showing Key Informants' and Focus Group Discussion contribution to each theme and comparing different Key Informants and Focus Group Discussion contribution on the same theme. Detailed summaries showing contributions from each session by construct have been appended to this thesis in appendix VII.

3.9 Assumptions of the study

a) Respondents volunteered correct information without any fear of consequences;
b) Information gathered from the study is generalizable to other regions of similar contexts in Kenya and beyond.

3.10 Limitations of the study

Questionnaire respondents were accessed telephonically due to closure of Institutions of Higher Learning by the government of Kenya after the declaration of the Covid-19 pandemic in March 2020 leading to the physical closure of Institutions of Learning, the

researcher was unable to physically reach the student respondents as they were off campus. This led to a number of defaulters who could not be accessed due to poor cellular network for those in remote areas and other cellular challenges such as lack of a handset or lack of electricity to ensure the cellular phones where charged when the researcher made attempted to contact them. This means that such respondents were left out of the study. This limitation threatened reliability however, it was minimized through the sampling procedures. Sampling at institutions was systematically administered with the sampling interval being determined by dividing the average number of students in the institutions with the apportioned sample size.

Once more due to the closure of the Institutions of Higher Learning at the time of data collection, the researcher was unable to access the students physically for Focus Group Discussions. After consultation with her supervisors, she got approval from them to interview the students telephonically. Focus Group Discussions were held through the ZOOM application while key Informants were interviewed face to face while adhering to Covid-19 protocol.

The study area was also vast and spread out, it was challenging for the researcher to collect data by herself. To manage this limitation, the researcher employed the use of additional enumerators to help her collect data from the field. These enumerators were adequately trained beforehand.Furthermore, the research subject is in a sensitive area. During the administration of the questionnaire, in rare occasions the process triggered

psychological wounds that may have been buried by the respondents over time, causing them to be psychologically affected.

To manage this limitation, the researcher hired the assistance of a professional counselor on standby in case there would be need for more counseling services. Two respondents requested for and were given counseling services by the counselor.

3.11 Ethical considerations

The study was implemented in observation of the following ethical standards;

i. Research Authorization: Authorization was first received by the respondent from the Directorate of Post Graduate Studies of MMUST to allow the researcher to proceed to collect data from the field through an official letter as seen in appendix VIII.
ii. Ethical Approval: Ethical approval for the study was sought and issued by the Institutional Ethical Review Committee of MMUST which is licensed to review and award ethical clearance on studies touching on human subjects. The approval is attached in annex IX.
iii. National Research Clearance: Using the above 2 documents, the researcher applied for and obtained a research permit from the National Commission for Science, Technology and Innovations (NACOSTI) and a permit obtained as seen in appendix X.
iv. County Research Clearance: Using the NACOSTI permit, Permission to carry out research in the 6 Kenyan Counties was sought from the County Commissioners

and County Directors of Education of each of the Counties where research was conducted as seen in appendix XII.

v. During the study, the following ethical principles were also considered and observed;

Beneficence

This principle ensures that participants are free from harm physically, psychologically, economically and socially. Considering sensitivity of the topic in this study, it was anticipated that the process of interview may remind the respondents of painful moments of sexual abuse or coercion. This was minimized by: carefully phrasing questions in a sensitive and non-judgmental manner. Respondents were informed to withdraw when uncomfortable and the interviews were to be rescheduled if possible. However, this was not experienced during the study. In cases where the respondent could be distressed; the interview was to be stopped and postponed while basic counseling sessions were to be organized.

Respect for human dignity

In this study, participants decided voluntarily whether to participate in the study without risking any penalty. The respondents were provided with information on the purpose of the study, expected duration of participation and unforeseen risks; which helped the respondents to make informed consent before the start of the interview.

Justice

The right to fair treatment and the right to privacy are both based on this principle. The study made sure everyone was treated fairly by choosing participants without bias,

following the rules, giving the participants the researcher's contact information so they could ask questions at any time, and making sure everyone was treated with respect and courtesy at all times. The right to privacy was protected by making sure that the names of the people who filled out the questionnaire were not written on it. Instead, codes were used. This made sure that the informants stayed anonymous and that no link was made to them. Questionnaires that had been filled out were kept under lock and key, and only the main researcher had the key to get to the information.

Privacy

This was taken into account by holding the phone interviews in rooms that were confined and out of glance of the public. Confidentiality was kept by putting hard copies of information under lock and key, not sharing private information about respondents, and putting passwords on soft copies of documentation.

Self-determination

This was taken into account by only letting people who wanted to take part in the research do so. Respecting respondents' autonomy meant taking into account their differences in age, gender, race, religion, sexual orientation, language, disability, and socioeconomic status. Also, only professionals who had been trained were allowed to help collect data. The researcher and an additional qualified counselor were available to provide in-depth counseling to all respondents who requested for or were assessed to be in need of this service during the research. Research assistants were trained to identify such cases and the researcher/counselor were called in to attend to the respondents within 24 hours of the interview. Information privacy was observed throughout the study.

Consent to collect data was sought at all stages. Voluntary and written consent from participants was obtained without any implied or actual deprivation or penalty for refusal to participate; and with due respect for participants' well-being, privacy and dignity. Informed consent was designed to include information about the nature, extent and duration of the participation requested and disclosure of the risks and benefits of the participation in the research.

Participants were informed of their right to withdraw from evaluation and research at any time without penalty. Research findings are being reported accurately. Conflict of interest was not found among the research assistants. Information was collected for professional purposes only. Objectivity during data collection stage was adhered to, that is data was to be accurately and fully collected without bias or omissions. Data collection protocol was followed to ensure that data collection tools were applied correctly and efficiently.

In summary, this chapter has described the study sites which were the Institutions of Higher Learning in Western Kenya, and a brief description of the seven selected institutions for study namely; Great Lakes University of Kisumu, The Kisumu national Polytechnic, Rongo University,Alupe University College, Lugari Diploma Teachers Training College, Tom Mboya University College and Kenya Medical Training College in Bondo. The next chapter deals with results and discussions on data findings.

3.12 Summary

In this chapter the study population, research designs and sampling procedures were summarized through a series of tables All the research instruments for the study were

outlined and a summary of data collection tools tabulated.Validity and reliability of the pretest pilot study were described. Ethical considerations are also mentioned.

CHAPTER FOUR

THE NATURE AND EXTENT OF HIV RISKY SEXUAL BEHAVIOR

4.1 Introduction

This chapter reports study findings by presenting comprehensive analyses of the nature and extent of HIV Risky Sexual Behavior among students in Institutions of Higher Learning in Western Kenya. It first reports on the demographic characteristics of the respondents and subsequently discusses how they affect the dependent variable, which is mitigation of HIV Risky Sexual Behavior. This fourth chapter therefore addresses the first objective of the study that seeks to determine the nature and extent of HIV Risky Sexual Behavior among students.

4.2 Respondents demographic characteristics

The study first sought to establish the Institution of Higher Learning the respondent was affiliated to, then their age, followed by their gender, sexual orientation, and finally their marital status. Table 4.1 therefore breaks down the respondents' demographic characteristics.

Table 4.1: Respondents demographic characteristics

		Number (N=399)	**Percentage (%)**
Name of the institution	Rongo University	195	47.9
	Tom Mboya University College	21	5.3
	The Kisumu National Polytechnic	102	25.3
	Great Lakes University of Kisumu	35	8.8
	Lugari Diploma Teacher Training College	12	3.0
	Alupe University College	17	4.3
	Bondo Kenya Medical	22	5.5

	Training College		
Age	18 – 20	74	18.6
	21 – 24	325	81.4
	Median Age	22	
	Mean	21.97	
	Std. Deviation	1.55	
	Minimum	18	
	Maximum	24	
Gender	Male	202	50.6
	Female	197	49.4
Sexual orientation	Heterosexual	326	81.7
	Homosexual	45	11.3
	Bisexual	28	7.0
Are you married?	No	377	94.5
	Yes	22	5.5

Source: Field data, (2020)

4.2.1 Institutions of Higher Learning

Students from Rongo University constituted 195 (47.9%) of the respondents. Meanwhile, those from The Kisumu National Polytechnic comprised of one quarter of the total number of respondents 102 (25.3%). Those studying at Great Lakes University of Kisumu made up 35 (8.8%) of respondents while students at the Kenya Medical Training College, Bondo were 22 (5.5%) of the respondents. Students from Tom Mboya University College were represented by 21 (5.3%) of the respondents while there were 17 (4.3%) of Alupe University College respondents. Finally, there were 12 (3%) respondents from Lugari Diploma Teachers Training College. Table 4.1 breaks down the above information. The data analysis revealed a statistical significance of the demographic; Institutions of Higher Learning with p-value = 0.003 between the two categories of HIV Risky Sexual Behavior (High Risky Sexual Behavior and Low Risky Sexual Behavior). This implies that Institutions of Higher Learning are important in determining the mitigation of HIV Risky Sexual Behavior among students in Institutions of Higher

Learning in Western Kenya. Various Key Informants additionally shared informationabout their institutions that may help in interpreting the significance of these institutionsin determining HIV Risky Sexual Behavior in Western Kenya.The Dean of Students at Tom Mboya University College for example shared that their clinic is strategically located and that the nurse and lab team are available 24 hours a day to attend to the students thereby creating a highly reliable and accessible environment for provision of HIV and Sexual and Reproductive Health (SRH) services. The dean of students at Alupe University College on the other hand confessed that they have more weaknesses than strengths regarding provision of similar services, which may mean that students in the institution are disadvantaged in the acquisition of these services. The dean of students at Rongo University though stated that with the cooperation of the university clinician, they carry out continuous sensitization about HIV and SRH and guidance and counselling services to their students. These activities he retaliated are greatly supportedby various stakeholders including the university management.

At Kenya Medical Training College Bondo Campus there is no AIDS Control Unit(ACU) and no clinic within the campus for the students, neither is there a HIV Testing Centre. It is expected of these students to access health care services at the hospital to which their institution is attached, together with the rest of the public. This may mean that these students do not have the privacy they require to access these sensitive services, which may render some of them missing out on these services. Additionally they may have to compete for the same services with the rest of the public and thus may not be able to access what they need. A lack of an ACU on campus also means that at a structural level, the students have weak support from management regarding the provision of HIV

services, which is disadvantageous to their sexual health.Nevertheless, condoms are available for them at the entrances of their hostels, which may enhance uptake of condoms and thus help in the mitigation of HIV Risky Sexual Behaviour.

For Lugari Diploma Teacher Training College there is also no ACU, which again is structurally disadvantageous to the sexual health of the students as there is not accountable formal body within the institution that is in charge of student HIV matters. It is appreciated though that, a clinic is available within campus for students' general health problems but not for HIV testing. For HIV testing, the students have to go to the nearby Lumakhanda Hospital, as the service is unavailable on campus. This lack of an in-house HIV testing centre may prevent those who prefer to use facilities within the institution from acquiring them. Nevertheless, dispensers for condoms are located in toilets and entrances of the dormitories. At Kisumu National Polytechnic, there is an ACU which is in good condition. This positions the institution to mitigate students' HIV matters. Moreover, the university health clinic also has several rooms and is well ventilated thereby making it a comfortable environment and increasing the possibility to provide quality services. Their in-patient wards are still under construction and so only outpatient services are available. Condoms are distributed to the students directly on a one-to one basis, which may keep off shy students from accessing condoms and work against the mitigation of HIV Risky Sexual Behaviour.

At Great Lakes University of Kisumu, theACUis still is under construction. There is a university health clinic within the compound, which enables the students to access SRH services readily while condoms are provided through a dispenser at the clinic thereby encouraging their uptake. Provision of condoms through a dispenser is advantageous as it

encourages students to collect the condoms anonymously, which lead to the mitigation of HIV Risky Sexual Behaviour. There also exists a HIV Testing Centre within the clinic. For Rongo University, the HIV Testing Centre is well located in a private area of the institution and is in good condition. Condoms are provided through a dispenser at the clinic and in the hostels. At Alupe University College, there is no health clinic. Nevertheless, there exists a Memorandum of Understanding (MoU) with Kenya Medical Research Institute that offers health services including HIV testing to students off campus. There is also no ACU. At Tom Mboya University College, there is also no ACU, the clinic is located at the main campus, does not offer HIV testing but has condom dispensers. The findings in the current study are similar to those by Li *et al*. (2017) and Li *et al*. (2020) in China. The findings are also similar to those of Ajayi *et al*. (2019) and Alabi *et al.* (2020) in Nigeria, and Almrew *et al.* (2013) in Ethiopia. Additionally, Sagar *et al.* (2015) in the United Kingdom and Thongnopakun *et al.* (2019) in Thailand also found correlation a between the particular Institution of Higher Learning that a student attended and HIV Risky Sexual Behavior.

4.2.2 Age of respondents

Portrayed in table 4.2 is the distribution of respondents by their ages per Institution of Higher Learning.

Table 4.2: Age distribution of the respondents per Institution of Higher Learning

Age of the Respondents	**Name of The Institution of Higher Learning**						
	Rongo University	Tom Mboya University College	The Kisumu National Polytechnic	Great Lakes University of Kenya	Lugari Diploma TTC	Alupe University College	Bondo KMTC

18	1	0	1	1	0	1	0
19	9	1	5	4	0	0	0
20	14	6	17	7	1	6	0
21	31	4	32	9	0	5	2
22	49	8	23	7	2	3	0
23	41	2	10	2	1	1	2
24	48	0	14	5	8	1	18
TOTAL	195	21	102	35	12	17	22

Source: Field data, (2020)

Respondents were found to have a median age of 22 years with a range of 6 years; between (18 and 24) years old. The mean age was 21.97 years. Most respondents 325 (81.4%) were of ages (21-24) years old while the rest 74 (18.6%) were younger; between (18-20) years of age.The Standard Deviation was found to be 1.55. The data analysis found is a statistical significance with p-value = 0.070 among the two categories of HIV Risky Sexual Behavior (High Risky Sexual Behavior and Low Risky Sexual Behavior).This implies that age of students isan important determinant of the mitigation of HIV Risky Sexual Behavior among students in Institutions of Higher Learning in Western Kenya.There were 6 (1.5%) of 18 year old respondents, 19 (4.7%) of 19 year olds, 51 (12.7%) of 20 year olds, 81 (20.0%) of 21 year olds, 91 (22.8%) of 22 year olds, 58 (15.0%) of 23 year olds and 93 (23%) of 24 year olds. This study has established that the older the student is, the more likely they are to engage in HIV Risky Sexual Behaviour. This implies mitigation strategies should be enhanced for older students. That age is an important determinant of the mitigation of HIV Risky Sexual Behavior among students in Institutions of Higher Learning is confirmed by researchers such as Fetene& Mekonnen, (2018), Waktole(2019), Gonzálezet *al*. (2019), Andrew *et al*.(2019), Asiedu *et al*.(2012), Bankole *et al*. (2018), ;Benevides *et al*.(2019) and Denison *et al*. (2018).

4.2.3 Sex of respondents

Table 4.3 demonstrates the sex distribution of the respondents per Institution of Higher Learning.

Table 4.3: Sex distribution of the respondents per Institution of Higher Learning

		What is your Sex?	
		Male	**Female**
Name of the institution	Rongo University	100	95
	Tom Mboya University College	11	10
	The Kisumu National Polytechnic	52	50
	Great Lakes University of Kenya	15	20
	Lugari Diploma TTC	6	6
	Alupe University College	10	7
	BondoKMTC	12	10

Source: Field data, (2020)

Majority 202 (50.6%) of the respondents are male while 197 (49.4%) are female. Rongo University provided 100 (49.5%) of male respondents; while 11 (5.4%) of male respondents were obtained from Tom Mboya University College. Meanwhile, 51 (25.2%) of male respondents were acquired at The Kisumu National Polytechnic; while 15 (7.4%) of male respondents were searched out at Great Lakes University of Kenya. Additionally, 6 (2.9%) of male respondents were attained from Lugari Diploma Teachers Training

College; 10 (4.9%) of male respondents were gotten from Alupe University College and 12 (5.9%) of male respondents obtained from Bondo Kenya Medical Training College. For female students, Rongo University brought out 95 (48.2%) of female respondents while Tom Mboya University College generated 10 (5.0%) of female respondents. Slightly over one quarter 51 (25.8%) of female students were acquired from The Kisumu National Polytechnic while for Great Lakes University of Kisumu; 20 (10.1%) of female respondents took part in the study. Regarding respondents generated from Lugari Diploma Teachers Training College they were 6 (3.0%) of the female respondents. Meanwhile female respondents of Alupe University College were 7 (3.5%); and 10 (5.0%) from Bondo Kenya Medical Training College.

The study shows that there is a statistical significance with p-value = 0.075 among the two categories of HIV Risky Sexual Behavior (High Risky Sexual Behavior and Low Risky Sexual Behavior). This implies that sex of the studentisan important determinant ofthe mitigation of HIV Risky Sexual Behavior among students in Institutions. The current study finds that the males are more susceptible to HIV Risky Sexual Behaviour than the females meaning that mitigation strategies need to be intensified for male students. Other researchers who hold up this finding that male students are more susceptible to HIV Risky Sexual Behaviour than female students are Provenzano *et al.*(2018), Muche *et al.*(2017), Chanakira *et al*.(2014),Chanakira *et al*. (2015) Desale *et al*. (2016) Fagbamigbe &Idemudia (2017) Farahani *et al*. (2018) and Fetene *et al.* (2018).

4.2.4 Marital statuses of the respondents

With reference to their marital status, majority of the respondents 377 (94%), were not married while 22 (6%) were married. Figure 4.1 presents a breakdown of the marital statuses of the respondents.

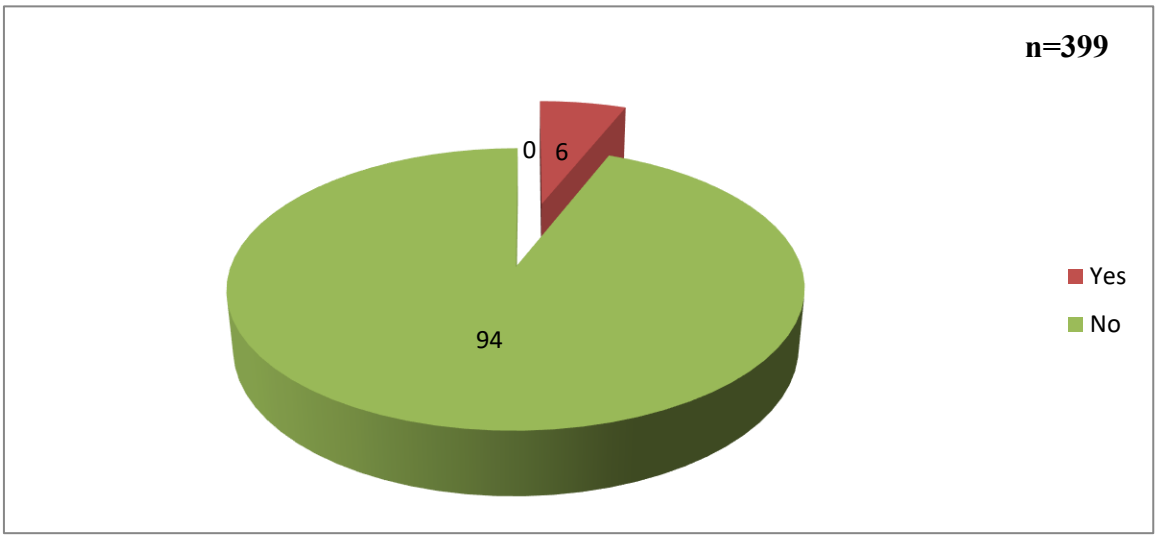

Figure 4.1: Marital statuses of respondents

Source: Field data, (2020)

Chi-square test performed revealed that in consideration of marital status of the respondents, there is no statistical significance between the two categories of HIV Risky Sexual Behavior (High Risky Sexual Behavior and Low Risky Sexual Behavior).Therefore, regarding students in Institutions of Higher Learning in Western Kenya, marital status has no influence on the mitigation of HIV Risky Sexual Behavior. Tlou (2019), Bärnighausen *et al*. (2007), González *et al*. (2019), Asiedu *et al*. (2012),

Campillo *et al*. (2018); and Dwyer-Lindgren *et al*. (2019) also found a lack of correlation between marital status and HIV Risky Sexual Behaviour substantiate this finding.

On the other hand, Randhawa & Alrowaili (2017) emphasized that the basic teachings about marriage and extra marital sex, that could help control HIV infection were almost the same in all major religions of the world. They added that individuals and communities who followed these instructions religiously benefited and those who did not practice the same had an increase in their chances of getting HIV. Marriage for those who are religious was thus viewed as a behavior of risk-reduction in sexual behavior hence leading to reduced HIV transmission.

4.2.5 Sexual orientation of respondents and HIV Risky Sexual Behavior

Table 4.4 presents the sexual orientation of the students.

Table 4.4: Sexual orientation of the respondents

Sexual orientation of the responder	**Rongo University**	**Tom Mboya University College**	**The Kisumu Polytechnic**	**Great Lakes University of Kisumu**	**Lugari Diploma TTC**	**Alupe University College**	**Bondo KMTC**	**TOTAL**
Heterosexual	154	11	93	35	12	16	10	331
Homosexual	2	10	2	0	0	1	12	45
Bisexual	21	0	7	0	0	0	0	28

Source: Field data, (2020)

Majority of students in the Institutions of Higher Learning are heterosexual. Of these, 154 (46%) are from Rongo University, 11 (3.3%) from Tom Mboya University College, 94

(92.1%) from The Kisumu National Polytechnic, 35 (10.7%) from Great Lakes University of Kisumu, 12 (3.6%) from Lugari Diploma Teacher Training College, 16 (4.9%) from Alupe University College and 10 (3.0%) from Bondo Kenya Medical Training College.Of the Rongo University respondents majority, 154 (78.9%) are heterosexual. Of the Tom Mboya University College respondents, 11 (52.3%) are heterosexual. Of The Kisumu National Polytechnic 94 (92.1%) are heterosexual. Of the Great Lakes University of Kisumu all 35 (100%) of the respondents are heterosexual. The case is similar for Lugari Diploma Teachers Training College where all 12 (100%) of the respondents are heterosexual. Of The Alupe University College respondents 16 (94.1 %) of the respondents are heterosexual. In all the Institutions of Higher Learning, majority of respondents are heterosexual except for Bondo Kenya Medical Training College where just less than half 10 (45.4 %) of the respondents are heterosexual. As majority of students are heterosexual, stakeholders need to put more emphasis towards strategies that target heterosexual students.

Regarding homosexuality, there are 45 (11.2%) of respondents who are homosexual. Of these, 20 (44.4%) are from Rongo University, 11 (22.2%) from Tom Mboya University College, 2 (4.4%) from The Kisumu National Polytechnic, none from Great Lakes University of Kisumu, none from Lugari Diploma Teacher Training College, 1 (2.2%) from Alupe University College and over one quarter, 12 (26.6%) from Kenya Medical Training College, Bondo. For Great Lakes University of Kisumu and Lugari Diploma Teacher Training College since they do not have homosexual respondents, strategies towards mitigation of HIV Risky specifically for homosexual students should be

intensified at Rongo University which has the highest concentration,Kenya Medical Training College, Bondo, Tom Mboya University College, The Kisumu National Polytechnic andAlupe University College, in that order.

Regarding bisexuality, there are 28 (7.0%) of respondents who are bisexual. Of these, 21 (5.2%) are from Rongo University, none from Tom Mboya University College, 7 (1.7%) from The Kisumu National Polytechnic, none from Great Lakes University of Kisumu, none from Lugari Diploma Teacher Training College, none from Alupe University College, and none from Bondo Kenya Medical Training College. Of the bisexual respondents, Rongo University has the majority, 20 (75%) while The Kisumu National Polytechnic has the rest 7 (25%). Strategies geared towards the mitigation of HIV Risky Sexual Behaviour targeting bisexual students should thus be concentrated at Rongo University and The Kisumu National Polytechnic with preference given to Rongo University.From the Chi-square test done, the study shows that there is a statistical significance with p-value = 0.075 between the two categories of HIV Risky Sexual Behavior (High Risky Sexual Behavior and Low Risky Sexual Behavior). This implies that sexual orientation of the student isan important determinant in the mitigationHIV Risky Sexual Behavior among students in Institutions.

At the Lugari Teachers Training College Focus Group Discussion, homosexuality and bisexuality were reported by a male participant to be existent but very low while at the Great Lakes University of Kisumu Focus Group Discussion, homosexuality and bisexuality are reported to be moderately occurring. During the Focus Group Discussion

with Rongo University, a female participant expressed that there are quite a number of lesbian students on campus due to the rise of '*men are trash*' syndrome taking shape on campus. According to Provenzano *et al.* (2018), one of the risks to have unprotected occasional sexual intercourse at Universities and Colleges was related to the homosexual or bisexual status. The researchers evaluated the knowledge and behavioral risks related to STIs among the students at the University of Palermo. Other researchers such as Cassidy *et al*.(2018), Cherie & Berhane (2012), Hargreaves (2007), Imaledo *et al*.(2012), Joda *et al*.(2013), Li *et al*. (2020), Yasmine *et al*.(2016), Yared*et al*.(2017) Yi *et al*. (2018) and Zhang *et al*.(2013)also found statistical significant correlation between sexual orientation and mitigation of HIV Risky Sexual Behavior among students. For example, Okonta *et al*. (2013) also discovered that bisexual or homosexual behavior had a significant association (0.7%, P<0.01) with HIV Risky Sexual Behaviour.

In summary, then study found Institutions of Higher Learning to be the most significant in the mitigation of HIV Risky Sexual Behaviour followed by age, then sexual orientation and sex. As mentioned earlier, the study found marital status not statistically significant in the mitigation of HIV Risky Sexual Behaviour among the students.

4.3 The nature and extent of HIV Risky Sexual Behavior among students

This section presents study findings on the first objective; the nature and extent of HIV Risky Sexual Behavior among students in Institutions of Higher Learning in Western Kenya as depicted in specific objective one. It discusses the manner in which and the extent to which HIV Risky Sexual Behavior is presented in Institutions of Higher Learning in Western Kenya. Focus Group Discussions, structured interviews with

students, and Key Informant Interviews showed HIV Risky Sexual Behavior in Institutions of Higher Learning in Western Kenya as presented in the sections below.

In describing HIV Risky Sexual Behaviour, a 10-point behaviour model from Immonje (2016) was adopted along with The HIV Risk taking Behaviour Scale (HRBS) described in section 2.6.4. The ten (10) behaviours by Immonje (2016) are; non/incorrect condom use, multiple sex partners and ignorance of sex partner's HIV status. They also include experimentation with anal sex, drugs and alcohol, sharing of sharp objects (for example needles),cross-generational sex and transactional sex (for fees, marks, fish or other favours). Finally they include encounter with commercial sex workers, Early Sex Debut and HIV testing uptake to know one's own HIV status. The researcher added watching of pornography Immonje's 10 points make the points 11. The 11th point was influenced by several studies, which pointed out its relevance in describing HIV Risky Sexual Behavior.

Many researchers have reported watching pornography as an influence of HIV Risky Sexual Behavior among students in Institutions of Higher Learning. These researchers include Farahani *et al*. (2018) who reported that ever-watched pornography is a predictor of having multiple sexual partners. Yunengsih & Setiawan (2021) found a significant relationship between HIV Risky Sexual Behavior in students and the age of the first-time exposure to pornography, pornographic materials accessed, and the reasons for watching pornography. Megersa & Teshome (2020) reported that students who did not watch pornographic movies had 99% lower odds of HIV Risky Sexual Behavior as compared to

their counterparts. Woldeamanne (2020) also echoed these findings by reporting that watching pornographic movies was statistically significantly associated with the higher risk of practicing HIV Risky Sexual Behavior. Adimas *et al*. (2021) and Efrati (2020) also echo similar findings.

Subsequently, regarding the assessment of HIV Risky Sexual Behaviour, the 11 points; the HIV Risk taking Behaviour Scale (HRBS) model and the Problem Behavior Theory influenced the formation of a HIV Risky Sexual Behaviour index that was then used to categorize to what extent the students had been involved in either LOW Risky Sexual Behaviour or HIGH Risky Sexual Behaviour. Table 4.5 therefore presents the HIV Risky Sexual Behavior index whose mean score result is 31.3% HIV Risky Sexual Behaviour. This means that there is a 31.3% average rate of involvement of students in Institutions of Higher Learning in HIV Risky Sexual Behaviour. This also indicates that from the various strategies that stakeholders have been applying to address HIV Risky Sexual Behaviour in this industry, they have been able to achieve the result of 31.3%. This score of 31.3% is consistent with the global new infections rate among young people aged (15-24) years according to (UNAIDS, 2020) which stands at 31% though slightly higher by 0.3%. In the current study, a consistency has therefore been found between the performance of strategies in mitigating HIV Risky Sexual Behaviour among students in Institutions of Higher Learning in Western Kenya and the global HIV incidence rate among youth. This implies that the result of mitigation efforts towards HIV Risky Sexual Behaviour at a global level among youth and at a local level among students of Institutions of Higher Learning in Western Kenya is relatively at par.

Table 4.5:HIV Risky Sexual Behavior index

HIV Risky Sexual Behaviors	**Number**	**Percent**
Non/incorrect condom use	181	56.7
Multiple sex partners	46	14.4
Ignorance of sex partner's HIV status	119	37.3
Experimentation with anal sex, drugs & alcohol	256	80.3
Sharing of sharp objects (e.g. needles)	45	11.3
Cross generational sex	109	34.2
Transactional sex (for fees, marks or other favours)	25	7.8
Encounter with Commercial Sex Workers	31	9.7
Early Sex Debut (before 18 years)	177	55.4
HIV Testing uptake to know one's own HIV status (never tested)	16	5.0
Watching Pornography	103	32.3
OVERRAL SCORE: HIV RISKY SEXUAL BEHAVIOR INDEX		
Mean	31.3%	
Standard Deviation (SD)	18.6	
Level of HIV Risky Sexual Behavior		
Low HIV Risky Sexual behaviors [n, %]	[130, 32.6%]	
High HIV Risky Sexual behaviors [n, %]	[269,	

67.4%]

Source: Field data, (2020)

The results of the index further show that 130 (32.6%) of the respondents in Institutions of Higher Learning in Western Kenya are involved in LOW HIV Risky Sexual Behaviors while 269 (67.4%) of the respondents in Institutions of Higher Learning in Western Kenya are involved in HIGH HIV Risky Sexual Behaviors as seen in table 4.5. These 32.6% who are involved in LOW HIV Risky Sexual Behaviours are a reflection of the impact of the mitigation strategies that have been successfully applied by various stakeholders in addressing HIV Risky Sexual behaviour while the 67.4% are an indication of the weaknesses and failures of stakeholders in the mitigation of the same. The results in the current study regarding students involved in LOW HIV Risky Sexual Behaviour are also relatively consistent with the global HIV incidence rate among youth at 31% (UNAIDS, 2020) and further relatively consistent with the finding from the index in the current study that 31.3% of students in Institutions of Higher Learning are involved in HIV Risky Behaviour. The finding of 67.4% for respondents involved in HIGH HIV Risky Sexual Behavior is extremely important to note as it is a reflection of the future HIV incidence rates that will occur among students in Institutions of Higher Learning if stakeholders continue applying their mitigation strategies as they are currently doing. The index additionally reveals the most risky behaviour that students in Institutions of Higher Learning are engaging in as; experimentation with anal sex, drugs and alcohol; and non/incorrect condom use.

4.3.1 Sexual engagement of respondents

Since this study's focus is on sexual behavior, it is important to begin by understanding to what extent the respondents had engaged in sex and hence the inclusion of this section. The study thus found out that out of the 399 students who participated in the study, 319 (80%) had prior sexual experience to the survey period.The results of this study demonstrate that 80% of students in Institutions of Higher Learning are therefore susceptible to HIV sexual risk as the disease is contacted mainly sexually.Figure 4.2 presents students who had already engaged in sex.

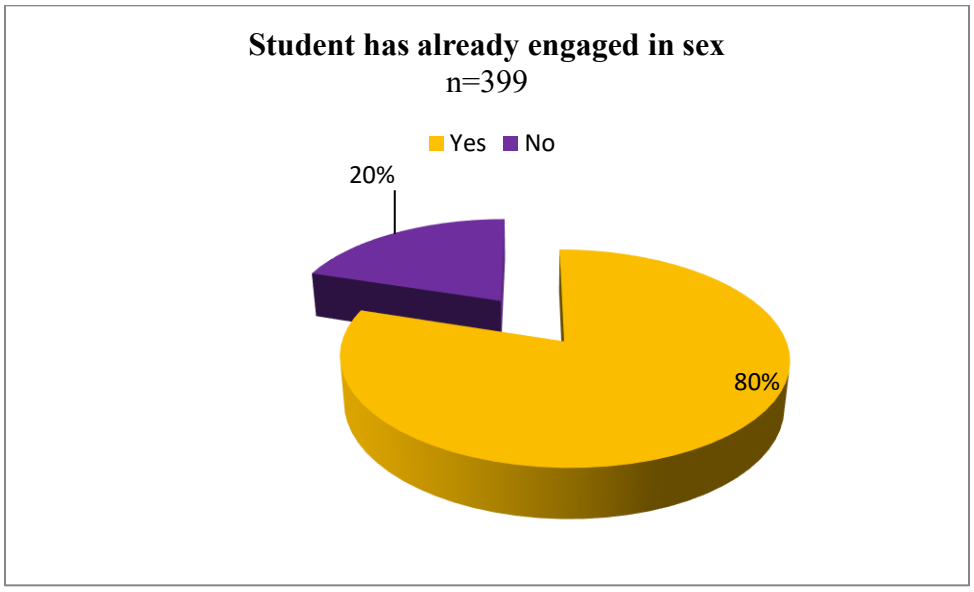

Figure 4.2: Students who had already engaged in sex
Source: Field data, (2020)

To substantiate this information, a male participant speaking in an FGD held at Rongo University, reported that it was very difficult for most of them to abstain from sex as according to them sex is a right and they as adults are entitled to these rights. He

suggested that there is a problem with their generation regarding abstaining from sex. This was further upheld in another FGD held at Lugari Diploma Teachers Training College where a female participant reported that students are unable to abstain from sex. Similar sentiments were echoed in another FGD held at Great Lakes University of Kisumu where a male participant reported that majority of students were unable to abstain from sex. Majority of key informants also admitted that majority of students were engaging in sexual intercourse. These included the deans of students of; Great Lakes University of Kisumu, the Kisumu National Polytechnic, Tom Mboya University College and Rongo University.

4.3.2 Non/incorrect condom use among respondents

Figure 4.3 presents the use of condoms among students in Institutions of Higher Learning in Western Kenya.

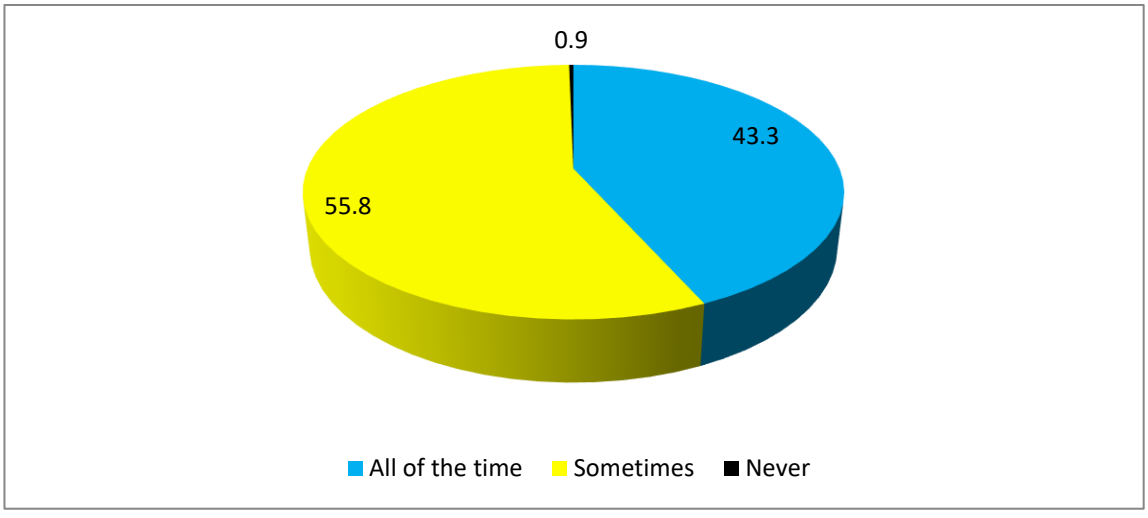

Figure 4.3: Condom use by respondents

Source: Field data, (2020)

When respondents were asked if they had ever had unprotected sex, a majority 226 (56.7%) answered in the affirmative, while 178 (43.3%) said that they had not. This result is an indication of the number of students who have ever had unprotected sex and since it is majority of students who have ever engaged in this practice, this is a cause for concern for all stakeholders. Stakeholders should hence put more effort in employing strategies towards the mitigation of non/incorrect condom use among these students. Nevertheless, this is an improvement when compared with results from a similar study by Immonje (2016) whereby a majority of 64% answered in the affirmative, while 36% said that they had not ever had unprotected sex.Immonje's study was on HIV and AIDS curriculum mainstreaming, HIV risk perception and HIV risk behaviour of university undergraduate students in the counties bordering Lake Victoria in Kenya.In the current study, there are 3(0.9%) students who have never used a condom at all while having sex. Despite these statistics being low, this is another cause for concern, that some students have never used a condom at all. Stakeholders should therefore revamp efforts to increase the uptake of condom use among those who havenever used condoms while having sex. Meanwhile, 138 (43.3%) of respondents, used a condom correctly and all of the time that they had sex. This finding is an indication of the success of condom use as a mitigationstrategy towards HIV Risky Sexual Behaviour. Thereby regarding condom use can be reported to be successful at 43%. Meanwhile a majority 178 (55.8%) only used a condom sometimes when they had sex. This finding is an indicator of those who are at risk of incorrect condom use. Thus, potentially 55.8% are at risk of contracting HIV due to non/incorrect condom use. Just like in the current study, Li *et al*. (2020) reported that the proportions of college/university students using condoms consistently during sexual intercourse with

partners were low and the predominant reason for not using condoms was not realizing the necessity of using condoms in sexual intercourse. Mokeira *et al.* (2018) in comparison found the prevalence of condom use among university students in the last intercourse to be just above fourty percent. Stakeholders threrefore urgently need to address the challenges of condom use among students. According to the HIV Risky Sexual Behavior index, non/incorrect condom use scores as the second most HIV Risky Sexual Behaviour.

Key Informants in this study also upheld that majority of students engaged in unprotected sex. These included the deans of students of Tom Mboya University College, The Kisumu National Polytechnic and Rongo University. These further includedthe deans of students of Bondo Kenya Medical Training College andGreat Lakes University of Kisumu. Also included were officials of Non-Governmental or Community Based Organizations which included; Compassion International Kenya in Busia, Ampath Plus Bondo-Siaya, Mbita Community Based Organization and Nyarani Community Based Organization. Officials of health care centers included were of Jaramogi Oginga Odinga Teaching and Referral Hospital, Homabay Hospital and Alupe Sub-County Hospital. Lastly institutional clinic officials included were of The Kisumu National Polytechnic, Rongo University and Tom Mboya University College. Additionally, a Migori County Government officialreported that;

> Students are aware of the risks of HIV and pregnancy but still go ahead and have sex without condoms. There is a negative attitude about using condoms as it is said that sex is "*not sweet*" with them. Peer pressure is blamed for this practice

From the FGD discussion, it appears that peer pressure is a major influence towards incorrect/non-condom use among the students and thus stakeholders need to be aware of the influence of peer pressure regarding HIV Risky Sexual Behavior and address this. Additionally, negative attitudes about condom use by students need to be addressed by stakeholders.

Similarly in a related study at Mbarara University of Science and Technology in Uganda Choudhry *et al*. (2014) found that half of the female students had engaged in non-condom use with multiple sexual partners. This was reported to have been influenced by peer pressure just as in the current study.Nevertheless, according to Goso *et al*. (2021), there were female students who held favorable attitudes towards condom use and conformed to condom-use.Memon *et al.* (2016) additionally presented that male students were more consistent in condom use compared to female students.In explanation, Shepherd *et al*. (2017) emphasized that social norms highly influenced intentional use of condoms by students.

In a related study by Mthembu *et al*. (2019), it was explained that the majority of students did not use condoms during their first sexual encounter because of a lack of preparedness.In the current study, by some institutions not using dispensers to provide condoms, by having insufficient supply of condoms and students not having sufficient knowledge on the proper use of condoms may be contributing to the lack of preparedness in condom use similar to whatMthembu *et al*. (2019) reported about.Similarly in Croatia,Simons *et al.* (2009) observed that the proportion of sexually active students was

not matched by an increase in condom use. The high level of incorrect condom useor using condoms only sometimes among students may be explained as risk denial regarding HIV. In a study by Li *et al*. (2020), the predominant reason for not worrying about being infected with diseases was that they did not realize the potential risk. In this study over one third, 148 (37.1%) of students did not feel at risk of contracting HIV while more than half 202 (50.6%), of students had never felt at risk of contracting HIV from their current partner. Risk denial refers to demonstrated disbelief that one can get infected by the HIV virus despite their Risky Sexual Behavior (UNAIDS, 2018).

In relation, in a study by Shiferaw *et al.* (2014), majority of students in Institutions of Higher Learning perceived themselves as having no chance of acquiring HIV infection. In Thailand, despite (94%) of students in Institutions of Higher Learning being moderately or highly at risk of HIV infection; still, (18%) did not consider themselves as being at risk or just perceived themselves as low risk, thereby tending to have unprotected sex Khawcharoenporn, *et al.* (2015).Moreover, in a study conducted by Farahani *et al.* (2018), more than half of respondents reported inconsistent condom use over the previous month. Despite this exposure to HIV and or Sexually Transmitted Infections risk, their respondents had a very low level of HIV and or Sexually Transmitted Infections risk perception. In the current study regarding engaging in unprotected sex for favours, 20% confessed that they engaged in the same, while majority (78%) reported that they did not. From this finding, not only were these students just engaging in unprotected sex, but these were willing to engage in unprotected sex to gain favours. This finding demonstrates the desperate extent that these students were willing

to go to by risking their health in order acquire favours. Stakeholders need to find strategies to cushion students socio-economically to contain the desperation that may lead students to engage in unprotected sex to gain favours.

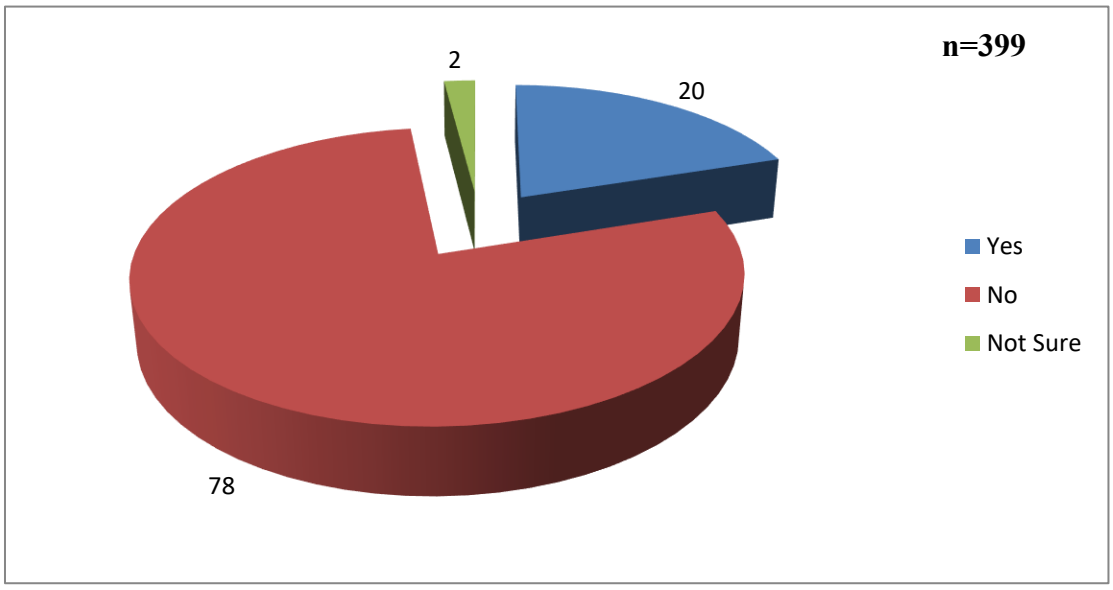

Figure 4.4: Respondents'unprotectedsex for favours

Source: Field data, (2020)

Almost a third (30%) of the respondents who were marriedconfessed to having had extra marital sex without a condom, again a rise in comparison to findings by Immonje (2016), while 63% claimed they had not. These unfaithful partners therefore presented a risk to their spouses in terms of exposing them to HIV infection. It is thus important for stakeholders to factor in specific strategies towards increasing condom use among married students. It should not be assumed that because they are married they do not need condoms.

4.3.3 Having multiplesex partners by respondents

Just above half of the total number of students were in a sexual relationship at the time of the study andstudents had an average of one sexual partner each. This is similar to findings by Immonje (2016) who discovered that majority (79.4%) did not have multiple sex partners within the same monthAmale participant from Rongo University reported that they learned by observing what their uncles, fathers and other relatives were doing and emphasized that their upbringing influenced them a lot. It is imperative therefore that the community is conscious about how they present their sexual behaviour to the youth. Stakeholders may need to relook at community awareness strategies by looping in community members to educate them on the impact of their sexual behaviour to the youth around them.

Despite what was revealed in the survey, a large number of Key Informants expressed that most students in Institutions of Higher Learning had multiple sexual partners. This included a student counselor and an official at the clinic of The Kisumu National Polytechnic. It also included the deans of students at Kenya Medical Training College Bondo; the dean of students and a clinic official at Rongo University; the dean of students at Alupe University College; a Kakamega County Government Official, and an official at the Health Department County Government of Busia. A Migori County Government official further mentioned that students in Institutions of Higher Learing engaged in group-sex.

Nevertheless, statistically based on data from respondents, this variable of multiple sexual partners scored LOW according to the HIV Risky Sexual Behavior index. This means that having multiple sexual partners lowly contributes to the occurrence of HIV

Risky Sexual Behavior among. In other words when considering where to concentrate regarding mitigation strategies, stakeholders in Western Kenya may prioritize other strategies before those that target students who have multiple sexual partners.In a study by Li *et al.* (2020), the proportion of male students who had intercourse over two times per month with male regular and casual partners formed the majority of respondents. This is twice as much sexual partners as compared to what was found in the current study. In an attempt at an explanation, Khawcharoenporn *et al*. (2015) reported that youth, even when aware of HIV risk, often did not consider this risk and instead of staying with steady partners continued to have multiple sexual partners.Table 4.6 demonstrates the number of sexual partners of students.

Table 4.6: Number of sexualpartnersrespondents have

	Sex differentials	**Mean**	**Median**	**Range**	**Std. Deviation**
Number of sexual partners have you had over the past 3 months	Male (177)	1.10	1	6	1.03
	Female (142)	0.72	1	3	0.60
	Total (n=319)	0.93	1	6	0.89

Source: Field data, (2020)

Having multiple sex partners may also be gauged by the duration students spend in relationships. Majority of respondents 190 (59.7%) had been in their sexual relationships for more than one year which is a long time while 56 (17.4%) of them had been in similar

relationships for 7-12 months. Just over one tenth 38 (11.9%) had been in their sexual relationship for 5-6 months, while 26 (8%) had been in a similar relationship for 3-4 months. Eight, 8 (2.5%) of the respondents had been in their sexual relationship for 1-2 months while 2 (0.5%) had been in a similar relationship for one month or less. On average, the students were in sexual relationships for a long time and were thus highly monogamous. Stakeholders therefore need to focus more on HIV prevention strategies that target couples. Additionally for students who spend a shorter time in sexual relationships, stakeholders still need to have mitigation initiatives towards HIV Risky Sexual Behaviour reduction for them. Figure 4.4 presents the students' duration in their current sexual relationship.

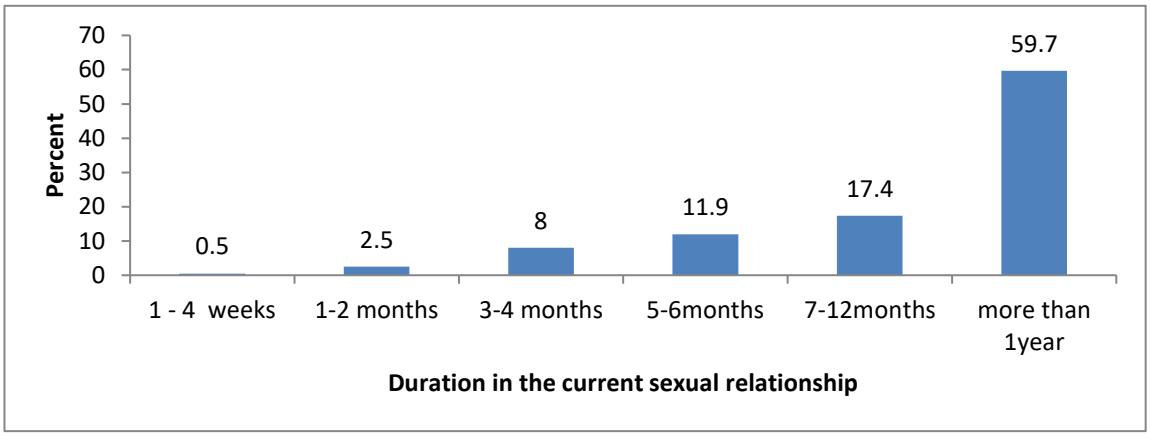

Figure 4.5: Duration respondents spend in sexual relationships

Source: Field data, (2020)

4.3.4 Respondentsignorance of their sex partner's HIV status

Just over one fifth 85 (21.3%), of students do not know if their partner has tested for HIV. This group is already disadvantaged regarding knowledge of their partners HIV status, as they do not know whether their partner has tested for HIV or not. Additionally, of the

respondents in this study, 70 (17.5%) have not discussed HIV results with their partners therefore denying their sexual partners knowledge of their HIV status.On the other hand, for those who have tested for HIV in this study, a majority 208 (70.2%) have been tested together with their partner which is a positive indicator in HIV risk reduction as both parties were targeted for HIV testing instead of just one and thus end up with knowledge of each partners status. Ignorance of sex partners HIV status scored HIGH according to the HIV Risky Sexual Behavior index. This means that not having knowledge of the HIV status of one's partner highly contributes to HIV Risky Sexual Behavior among students in Institutions of Higher Learning in Western Kenya.Stakeholders should thus continue to implement the interventions that lead to couples testing together

4.3.5Experimentation with anal sex, drugs and alcohol

Just more than a quarter 106 (26.6%), of students admitted to taking alcohol while majority 256 (64.2%), admitted to knowing at least one student who smoked marijuana. Alcohol and drug use consumption scored HIGH according to the HIV Risky Sexual Behavior index. This means that this variable highly contributes to the occurrence of HIV Risky Sexual Behavior among students. This is the most risky HIV sexual behaviour that students are engaged in according to the HIV Risky Sexual Behaviour index. Stakeholders should therefore enhance efforts to address experimentation with anal sex, drugs and alcohol among students. In the Focus Group Discussion held with Kenya Medical Training College in Bondo participants, a female participant reported that students frequented drinking joints in the nearby towns. In the Focus Group Discussion held with participants from Rongo University, a male participant reported that students frequently visited alcohol sale points around the university especially on weekends. The

participant reported that the presence of these joints encouraged the consumption of alcohol among the students. Another male participant reported that some students also bought alcohol to consume in their rooms.

Key Informants cited drug and alcohol use as being a factor promoting HIV Risky Sexual Behavior among the students. This included the heads of clinics at Rongo University, The Kisumu National Polytechnic; an official of Compassion International Kenya in Busia; officials of the County Governments of Kisumu and Busia; and deans of students of Bondo Kenya Medical Training College, Great Lakes University of Kisumu and Rongo University. In the current study, for those who had sexual experience, Rongo University has 58 (38.1%) of sexually active respondents who consume alcohol.Meanwhile, Tom Mboya University College has 13 (68.4%) of its sexually active respondents who consume alcohol, The Kisumu National Polytechnic has 21 (24.7%), Great Lakes University of Kisumu 4 (16%), Lugari Diploma Teacher Training College none, Alupe University College none and Bondo Kenya Medical Training College, 10 (52.6%) who consume alcohol. Most alcohol consumed by sexually active students is thus at Tom Mboya University College followed by Bondo Kenya Medical Training andthen Rongo University.In upholding the findings of the current study, Kilwein *et al.* (2018) reported that there was a significant interaction between risky sex and drinking and so did Ghandour *et al*.(2014), Jaffe *et al*.(2018), Kilwein *et al*.(2018) and Santangelo *et al*.(2018). Additionally,Ghandour *et al.*(2014) indicated that all substance use was associated with having one or multiple sexual partners.A study carried out in China among male participants pointed out that light alcohol consumption was positively

associated with contraceptive uses. Among female students,Wang *et al*.(2020) discovered that moderate alcohol consumption was positively associated with contraceptive uses.Table 4.8 presents alcohol consumption by those who had engaged in sex.

Table 4.7: Alcohol consumptionby those who had engaged in sex

Name of the institution	**Do you take alcohol?**		**Total**
	No	**Yes**	
Rongo University	94	58	152
Tom Mboya University College	6	13	19
The Kisumu National Polytechnic	64	21	85
Great Lakes University of Kenya	21	4	25
Lugari Diploma TTC	10	0	10
Alupe University College	9	0	9
BondoKMTC	9	10	19
TOTAL	213	106	319

Source: Field data, (2020)

Respondents also have specific places where they prefer to consume alcohol. The most preferred place to consume alcohol is at nightclubs. At Rongo University, drinking at a night club is preferred by 31 (53.4%) of alcohol consumers while at Tom Mboya UniversityCollege by 5 (38.4%). At The Kisumu National Polytechnic 9 (42.8%) of the alcohol consumers; at Great Lakes University of Kenya none while at Bondo Kenya

Medical Training College 1 (10%) of the alcohol consumers preferred to drink at nightclubs. Table 4.8 presents places where students prefer to consume alcohol.Stakeholders should also thus incorporate interventions targeting nightclubs.

Table 4.8: Places where respondents prefer to consume alcohol

	Alcohol consumption Points				**Total**
	Night Clubs	**Bars**	**Hostel/Home**	**Other (Specify)**	
Rongo University	31	12	12	3	58
Tom Mboya University College	5	4	4	0	13
The Kisumu National Polytechnic	9	1	8	3	21
Great Lakes University of Kenya	0	1	3	0	4
BondoKMTC	1	6	3	0	10

Source: Field data, (2020)

In this study, the frequency of alcohol consumption by students was also sought. For all the institutions, most of the students were found to consume alcohol rarely. Table 4.9 presents how often students consume alcohol.

Table 4.9: Rate of alcohol consumption

	Everyday	**3 or more days a week**	**1-2 days a week**	**Once every two weeks**	**Once a month**	**Rarely**
Rongo University	0	3	15	7	23	104
Tom Mboya University College	0	0	3	6	2	8
The Kisumu National Polytechnic	1	0	2	4	10	68
Great Lakes University of Kisumu	0	0	1	0	0	24
BondoKMTC	0	0	2	0	7	10

Source: Field data, (2020)

In this study, the consumption of marijuana was also sought, revealing that 122 (62.5%) of Rongo University students are aware of a student in their University or College who takes marijuana. At Tom Mboya University College it is 17 (80.9%) of its students whileat The Kisumu National Polytechnic it is 59 (57.8%) of its students. At Great Lakes University of Kisumu it is 18 (51.4%) of its students; at Lugari Diploma Teacher Training College it is six (50%) of its students; at Alupe University College it is four (23.5%) of its students, and at Bondo Kenya Medical Training College it is 17 (77.2%) of its students. Meanwhile according to the Rongo University clinic official there are no drug and alcohol services. Table 4.11 presents theconsumption of marijuana among the students. The consumption of marijuana is found to be high among students in Institutions of Higher Learning in Western Kenya.

Table 4.10: Consumption of marijuana

Institution under study	No	Yes	Do not know
Rongo University	27	122	3
Tom Mboya University College	2	17	0
The Kisumu National Polytechnic	25	59	1
Great Lakes University of Kisumu	3	18	4
Lugari Diploma TTC	1	6	3
Alupe University College	4	4	1

KMTC Bondo	1	17	1

Source: Field data, (2020)

The official from the County Government of Kakamega reported that the County has in place guidance and counseling services for students who engage in drugs and alcohol. On the other hand, an official of The Kisumu National Polytechnic reported that there were specific services for students who take alcohol and drugs such as drugs and substance abuse awareness for students. Experimentation with drugs and alcohol scored HIGH according to the HIV Risky Sexual Behavior index. This means taking drugs and alcohol highly contributes towards the occurrence of HIV Risky Sexual Behavior among students.

Hathaway et al. (2018) contributed to the research on the normalising of drug use among youth in Canada by analysing the narratives of university students about obtaining marijuana. They stated that the experiences and attitudes of the students revealed a comprehension of social practises and processes by which participants jointly promoted non-deviant conceptions of the act.

Hathaway (2015) stated that simple access was the norm for the majority of users, who avoided impersonal transactions with'street dealers' as a result, many of them purchased through acquaintances who were connected to a dealer, or pals who sold little quantities. According to Hathaway et al. (2018), the proposal by the Liberal administration of Prime Minister Justin Trudeau to legalise and regulate cannabis in Canada in the summer of 2018 aimed to reduce criminal participation. The authors underlined that limiting the

source of supply promoted a public health viewpoint that prioritised treatment, harm reduction, education, and preventative measures over prohibition, which minimised difficulties originating from the illegal status of the substance. In addition, the elimination of the shame associated with committing a crime was cited as an anticipated advantage, formalising social behaviours that separate drug consumers from drug sellers. A second key purpose of the Canadian government's plan to legalise and control the sale of marijuana was predicated on the idea that supply regulation would reduce juvenile access to the drug.

Meanwhile, Jensen & Roussell (2016) emphasised that decreases in illegal sources of supply purchased and shared by youth will surely be compensated by the diversion of lawfully produced narcotics to the black market for use by minors. Prioritizing the 'prevention' of substance use among young, whether under prohibition or enlightened regulation, they argued, was a dangerous trend that would prolong the legacy of ignoring the practice's cultural dissemination. It was reported that drug policies were impeded by their inability to adjust (Hathaway et al. 2016; Mostaghim & Hathaway 2013). Ending prohibition was viewed as a crucial first step necessitating additional research less concerned with rates of use and more concerned with the social activities of users that contributed to the normalisation of a particular substance. Cannabis use has undoubtedly become the "default option" among Canadian youth. Evidently, not everyone used marijuana or even tried it once, but the decision not to use needed greater effort as marijuana use has become the norm (Hathaway *et al*., 2016).

Alley *et al*. (2020) based on interviews with Canadian university students, they too contributed to the topic. They concluded that legalisation was unlikely to reduce high rates of usage or reverse observed normalisation tendencies. They assert that restrictions that excluded young people from legal safeguards would inevitably necessitate unregulated access, which was maintained through social networks of supply. In an effort to shed more light on how these networks functioned to maintain a mutual sense of normalcy and order, the researchers discovered that the presentation of normality as a collective achievement facilitated shared meanings that symbolic interactionists recognised as fundamental to the construction of reality, including the reality of marijuana use as an unremarkable or "normal" behaviour.

Findings by Yi *et al*. (2017) suggested that the incidence of illicit drug usage among university students differed by country in the ASEAN region. The researchers indicated that concerted social intervention programmes have to be developed to address related health and behavioural issues, such as illicit drug use and excessive alcohol consumption, with a focus on at-risk sections of the young population.

Accounting for state differences and temporal trends, RML was found to be associated with a drop in the prevalence of binge drinking among college students aged 21 and older and an increase in sedative abuse among minors. RML had not altered secular trends in the usage of other substances. In the context of related study demonstrating national increases in the prevalence of marijuana use among college students and relative increases following state RML, the researchers observed age-dependent declines in binge

drinking and increases in sedative usage. The findings supported a degree of specificity in RML-related changes in drug use trends and the significance of individual characteristics (Alley et al., 2020).

Wilkinson & Ivsins (2017) also identified three risk settings on university campuses, including the physical, social, and policy environments, in relation to the use and regulation of alcohol. Residence buildings and adjoining areas (physical risk environment) and the "party" culture of the university (social risk environment) were identified as the primary contributors to risk within their respective risk environments. In an effort to regulate risky alcohol consumption, university policies and practises (policy risk environment) has attempted to adjust these contexts. Current ways to regulate student alcohol consumption may not be optimal for preventing damages (e.g., health concerns, legal issues) to students, according to the findings (Wilkinson & Ivsins, 2017).

Study Mureithi et al. (2019) in Kenya used a sample of 351 female undergraduate students chosen from a target population of 40,647 female undergraduate students to carry out a similar study there. In addition, one (1) student counsellor from each of Nairobi County's universities took part in the research. The study found that awareness programmes had a statistically significant effect on substance usage. Students who participated in an awareness programme were more likely to quit using drugs, according to the study.

Al-Zboon & Al-Dababneh (2017) conducted another study to examine the perceptions of Jordanian special education student-teachers on substance misuse and the measures that

Jordanian universities are taking to counteract it. 202 pre-service special education teachers from three universities were randomly selected and subjected to open-ended interviews with a guide that provided some structure. Men's usage of cigarettes, water pipes, and synthetic marijuana ("joker"), as well as alcohol, was perceived by informants to be widespread among their fellow students. The most popular kind of smoking among women was water-pipe smoking, followed by tobacco.

Students reported that the university environment posed a danger for substance misuse, that substance abuse education at their university was insufficient, and that they desired more assistance to combat substance addiction. The importance of universities in substance addiction education and programmes to combat substance abuse was also recommended. Tobacco/hookah/alcohol use was strongly linked to participants' anger and aggression, depression and anxiety, as well as participants' positive attitude toward substances; low levels of religious belief; peers and family members' substance use; as well as parents' positive attitude toward substance use. Students who had an unfavourable view of their university were more likely to use any form of substance (except for prescribed medications). Smoking and hookah use, as well as alcohol consumption, were predicted with low self-esteem. Hard drug and prescription medication use was predicted by people's perceptions of easy access to illegal drugs. Finally, because of their good attitudes toward drugs, their peers were more likely to smoke cigarettes or use hookah Taremian *et al*. (2018).

4.3.6 Sharing of sharp objects

Figure 4.5 presents the sharing of sharp objects (for example needles) by students in Institutions of Higher Learning in Western Kenya.

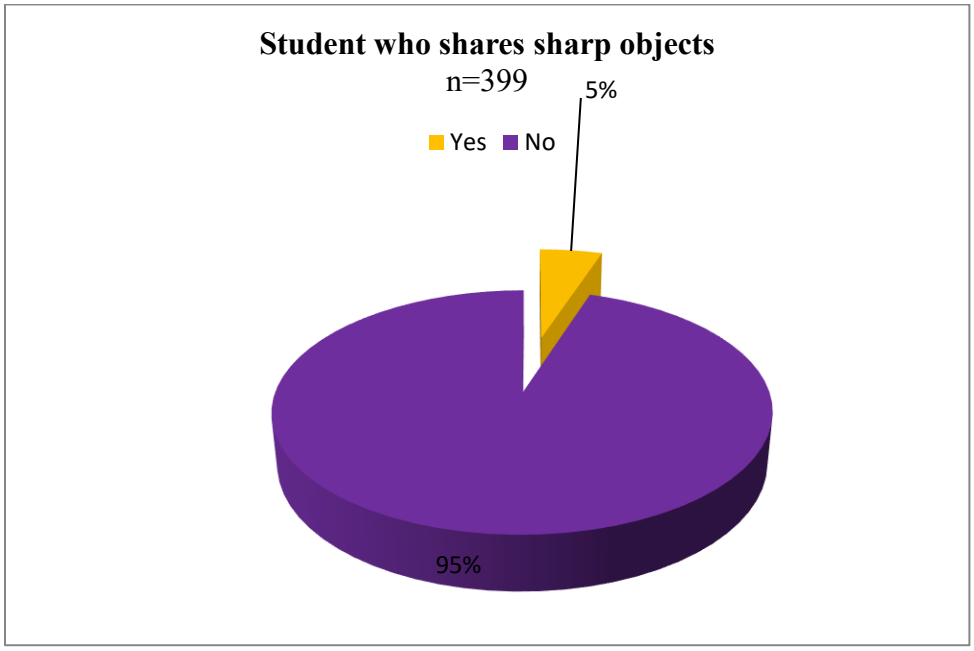

Figure 4.6: Students who share sharp objects

Source: Field data, (2020)

Out of the total number of students, 45 (11.3%) reported that they had used sharp objects or needles to inject themselves. Out of this number, 20 (5%) admitted to sharing sharp objects. Nevertheless there were no reported interventions found during the study specifically for those sharing sharp objects thereby presenting a high risk to 5% -11.3% of the respondents. In all Focus Group Discussions held students did point out that an attempt was made to inform them of the dangers of sharing sharp objects through the use of curricula but that no specific interventions for the same by stakeholders had been put in place. Sharing sharp objects scored HIGH according to the HIV Risky Sexual

Behavior index. This means sharing sharp objects highly contributes towards the occurrence of HIV Risky Sexual Behavior among students.

4.3.7Engagement of cross-generational sex

Table 4.11 presents cross-generational sex among students in Institutions of Higher Learning in Western Kenya.

Table 4.11: Cross-generational sex among respondents

Institution under study	**No**	**Yes**
Rongo University	104	48
Tom Mboya University College	11	8
The Kisumu National Polytechnic	53	32
Great Lakes University of Kisumu	19	6
Lugari Diploma TTC	7	3
Alupe University College	8	1
KMTC Bondo	8	11

Source: Field data, (2020)

In this study just over one third of respondents 109 (34.2%), admitted to having sex with partners outside their age bracket. This finding is consistent with the average HIGH Risky Sexual Behaviour score pointing at a possible relationship between the two. This variable, cross-generational sex scored HIGH according to the HIV Risky Sexual

Behavior index. This means that cross-generational sex is highly contributing towards the occurrence of HIV Risky Sexual Behavior among students. In this study, 48 (24.6%) of Rongo University respondents admitted to cross-generational sex while eight (38.0%) of Tom Mboya University College respondents admitted to the same. Just over one third 32 (31.3%) of The Kisumu National Polytechnic; 6 (18.7%) of Great Lakes University of Kisumu, 3(25%) of Lugari Diploma Teacher Training College,1(5.8%) of Alupe University College and 11 (50%) for Bondo Kenya Medical Training College admitted to cross-generational sex.

Female and male participants in all the four (4) Focus Group Discussions suggested that cross-generational sexual relationships were widespread and socially accepted among students in Institutions of Higher Learning in Western Kenya. Additionally, according to Zamudio-Haas *et al*.(2021) young people referred to a relatively well-off older sexual partner as a "*sponsor*." Dating '*sponsors*' was found to be influenced by several factors, but the desire to have money was cited as the most likely reason young people engaged in such relationships. Besides monetary gains, the participants in this study also mentioned desire to acquire expensive lifestyles, clothing and smart phones. Some female participants of the Focus Group Discussions mentioned inadequate economic support from their parents as a factor that pushed girls into looking for '*sponsors*' who chipped in to supplement their budgets. Female participants further observed that girls who dated *sponsors* were able to acquire expensive items, which their parents could afford.

An FGD held at Rongo University, a female participant reported that;

> Other than to access money and favors, cross-generational sex with students was a lot about social competition whereby the students used these relationships to access the trendiest items such as clothes, shoes, entertainment among others in order to stand out and enjoy campus life

This statement demonstrates the plastic life connected to cross-generational sex in these institutions, that students may not be seeking them for survival purposes but for a flashy lifestyle. These sentiments were supported by another female student from the same FGD and reported that;

> On Friday evenings after classes are done, girls are usually picked by older men in cars and dropped back on Saturday mornings

The statement brings about concern as to the measures that have been put in place by institutions to mitigate cross-generational sex. According to Zamudio-Haas *et al*.(2021),poverty proved to be the main driver of such cross-generational sex. Additional studies also confirm that students' insufficient sex education contributed to cross-generational sex among university female students (Kheswa &Mahlalela, 2014; Poscia *et al*., 2015). Glasscoe (2020) confirmed that cross-generational sex relationships were becoming a well-known phenomenon among students in Institutions of Higher Learning.

4.3.8 Transactional sex

Table 4.12 presents students engagement in transactional sex

Table 4.12: Engagement in transactional sex

Institution under study	No	Yes
Rongo University	133	19
Tom Mboya University College	16	3
The Kisumu National Polytechnic	78	7
Great Lakes University of Kisumu	23	2
Lugari Diploma Teachers Training College	10	0
Alupe University College	9	0
Kenya Medical Training College- Bondo	19	0

Source: Field data, (2020)

Transactional sexual relationships, characterized by exchange of sexual favors for monetary compensation or receipt of gifts, are a likely behavior among young people and older generations (Mumah, Kabiru, Izugbara & Mukiira, 2014; Robinson & Yeh, 2011; Tade & Adekoya, 2012).Transactional sex has been cited in considerable literature in terms of its critical role in HIV and Sexually Transmitted Infection transmission (Stoebenau *et al*., 2011).At Rongo University, 19 (12.5%) of its respondents admitted to engaging in transactional sex while 3 (15.7%) of Tom Mboya University College students admitted to the same. At The Kisumu National Polytechnic 7 (8.2%) of the

students admitted to transactional sex work.Additionally 2 (8%) of students at Great Lakes University of Kisumu admitted to engaging in transactional sex. Transactional sexscored HIGH according to the HIV Risky Sexual Behavior index. This means that this variable is highly contributing towards the occurrence of HIV Risky Sexual Behavior among students.In arelated study, Masvaruwe (2010) revealed how, young women and the men they dated used transactional sex relationships primarily to compete for social status in their peer groups as well as to fashion themselves as high-status, successful modern subjects.In Kenya, sexually active female students were reported to have engaged intentionally in transactional sex with their lecturers and would refuse to use condoms, which were nevertheless distributed freely within campus (Mwangi *et al*., 2014)thereby demonstrating the extreme extents to which these relationships had gotten.

In a similar study carried out among Nigerian students by Ajayi *et al*. (2019), correspondingly close to one-quarter of respondents had received money, gift or favors in exchange for sex. Several studies conducted in Kenya by Robinson & Yeh(2011), Stoebenau *et al*.(2017) and Mumah *et al*.(2014) suggested that young people could engage in sex to receive money, gifts or other favors. Peer pressure and higher social status achieved as a result of acquiring expensive things such as smart phones, clothing, jewellery and more; motivated young people to engage in transactional sex (Ajayi, *et al*., 2017; Tade & Adekoya, 2012). In a study by Ene*et al*. (2020), the prevalence of transactional sex was almost atone quarter of the respondents. This finding is consistent with results observed in a recent study carried out by Tade *et al*.(2012) in a Nigerian

University but slightly higher than prevalence observed in another recent study by Goso *et al*. (2020).

Ajayi & Somefu (2019) reported that the family system made transactional sex practice remain persistent in Institutions of Higher Learning. Ajayi & Okeke (2019) were also of the view that the traditional polygamous family system structure coupled with the high level of poverty promoted transactional sex. Similar studies have attributed the practice of transactional sex to women's poverty (Ajayi & Somefun, 2019; Gukurume, 2011; Okonkwo, 2018; Wamoyi, 2019). Therefore, to satisfy their material needs, young women from poor families were said to engage in transactional sex sometimes without condoms especially if the pay was high (Adefalu & Ayodele, 2019; Austrian, *et al*., 2019; Ajayi & Somefu, 2019).

4.3.9 Engagement incommercialsexby respondents

Table 4.14 presents students' engagement with commercial sex work.

Table 4.13: Engagement in commercialsex by respondents

Institution under study	No	Yes	Do not know
Rongo University	139	13	0
Tom Mboya University College	17	2	0
The Kisumu National Polytechnic	81	4	0
Great Lakes University	23	2	0

of Kisumu				
Lugari Teachers College	Diploma Training	10	0	0
Alupe College	University	8	1	0
Kenya Medical Training College- Bondo		16	2	1

Source: Field data, (2020)

In the currentstudy, an aspect of commercial sex work was sought. At Rongo University, 13 (8.5%) of its respondents admitted to having engaged with commercial sex work while 2 (10.5%) of Tom Mboya University College students admitted to the same. For The Kisumu National Polytechnic 4 (4.7%) of the students admitted to commercial sex work, 1 (5.5%) of Bondo Kenya Medical Training College while 2 (8%) of students at Great Lakes University of Kisumu admitted to the same. Engagement with commercial sex scored HIGH according to the HIV Risky Sexual Behavior index. This means that this variable is highly contributing towards the occurrence of HIV Risky Sexual Behavior among students. A different study conducted among formal and informal sex workers in Busia, Kenya, found that the rate of sex in exchange for money increased as the financial need increased (Robinson & Yeh, 2011). These results may be superimposed to students in Institutions of Higher Learning and be used to explain students involvement in sex work as influenced by the need for financial resources.

4.3.10 Early Sex Debut

Table 4.14 presents a breakdown of information on age at first sex / sexual debut of the respondents.

Table 4.14: Sexual debut of students

	Sex differentials	**Mean**	**Median**	**Range**	**Std. Deviation**
Age at first sex	Male (n=177)	17.79	18	18	2.58
	Female (n=142)	19.38	19	13	1.87
	Total (n=319)	18.40	19	25	2.78

Source: Field data, (2020)

Of the students who have engaged in sex, majority 201(63.0%) were engaging in sex at the time the study was being conducted. This is an indication of the high involvement of students in sex. Just less than one-half of the students 190 (47.6%) felt that the right time to start engaging in sexual intercourse was at college or university. Meanwhile, just below one-third 120 (30.1%) felt that the right time to start engaging in sexual intercourse was after marriage. Those who felt that it was right to begin engaging in sexual intercourse in High School were 30 (7.5%) while 2 (0.5%) felt that it was right to begin engaging in sexual intercourse from primary school. A majority of students believed that is was right to delay the onset of sex or their sexual debut, but did not put

this into practice and acted contrary to their beliefs. It is important to note that among what is described as a form of HIV Risky Sexual Behavior is Early Sexual Debut.

Early Sexual Debut is defined by researchers as; sexual debut that is before the age of 17 years according to Adams (2017).It is also defined as engagement in sex at 17 years and below according to Provenzano *et al*. (2018), engagement in sexual intercourse at the age of 18 years and below according to Khalajabadi *et al*. (2018), and engagement in sexual intercourse before the age of 18 years according to Alemu *et al*. (2020). There are many other authors such as Akintol *et al*.(2012), Alabi *et al*. (2020), Fagbamigbe & Idemudia(2017), Ghandour *et al*.(2014) Mekonnen *et al*. (2020) and Song *et al*.(2011) that also share their viewpoints, but they all suggest within what the aforementioned authors have presented. For purposes of this study, in consideration of consolidated information from several researchers, those students who had engaged in sexual intercourse before the age of 18 were considered to have had an Early Sexual Debut.

Alabi *et al.* (2020) emphasized that; Early Sexual Debut also had an influence on exposure to multiple sexual partners.In this study, a very low number of respondents 2 (0.6%) engaged in Early Sexual Debut of below 18 years. In this study, the mean age at first sexfor male respondents is 17.79, whicharestill below 18 years of age. For women, the mean age of sexual debut is 19.38, whicharelater than 18 years of age. For this study therefore, the male population is the one that could be reported to pose the HIV sexual risk in regards to Early Sexual Debut. Nevertheless, this variable scored LOW according to the HIV Risky Sexual Behavior index. This means that age of sexual debut lowly

contributes to HIV Risky Sexual Behavior among students in Institutions of Higher Learning in Western Kenya. What stakeholders can do is to continue efforts to ensure delayed sexual debut.

In a study conducted by Moreira *et al*. (2018), most University students had their first sexual intercourse before the age of 17.On the contrary, Li *et al*. (2015) found less than one fifth of female respondents having engaged in sex by the time they were in college. Guo *et al.* (2012) also found the mean age at sexual debut to be 22.8 years and similar to a study carried out in Ethiopia where Alemu *et al*. (2020)'s estimated pooled prevalence of Early Sexual Debut among students was less than one third of the respondents. According to Song *et al*. (2011), students who had initiated sexual activity early had high risks for negative health outcomes and hence for the current study it is important that stakeholders continue with interventions to delay sexual debut.

Nevertheless, Imaledo et al. (2012) contradict the results in the current studywhere age of sexual debut was lower at 17 years on average, and Doku (2012) who also found that the mean age for first sexual intercourse was even much lower at 14.8 years. According to Akintola *et al.* (2012), the university culture of sexual permissiveness and pressure from sexually experienced friends and male partners were the main factors that had influenced Early Sexual Debut. A significant proportion of women reported rape and financial gains as reasons for sexual debut in Kenya (Hafsa, 2012) where being female, watching pornography and having a boyfriend or girlfriend was found to be significantly associated with Early Sexual Debut. Early Sexual Debut was also found to be a risk factor in

contracting HIV among students in Institutions of Higher Learning by Blignaut *et al*. (2015).

Early Sexual Debut may also be influenced by the consumption of drugs and alcoholGhandour *et al.* (2014). Students who used alcohol and or drugs at sexual debut were twice as likely to have their first oral and vaginal sex with an unfamiliar partner or a stranger, which is one of the HIV risk behaviors (Akintola *et al.*, 2012). An unfamiliar partner means that the students may be more exposed to sexual risk. Figure 4.6presents the proportion of students who had their first sexual intercourse before attaining age 18 in Institutions of Higher learning in Western Kenya by their age and sex.

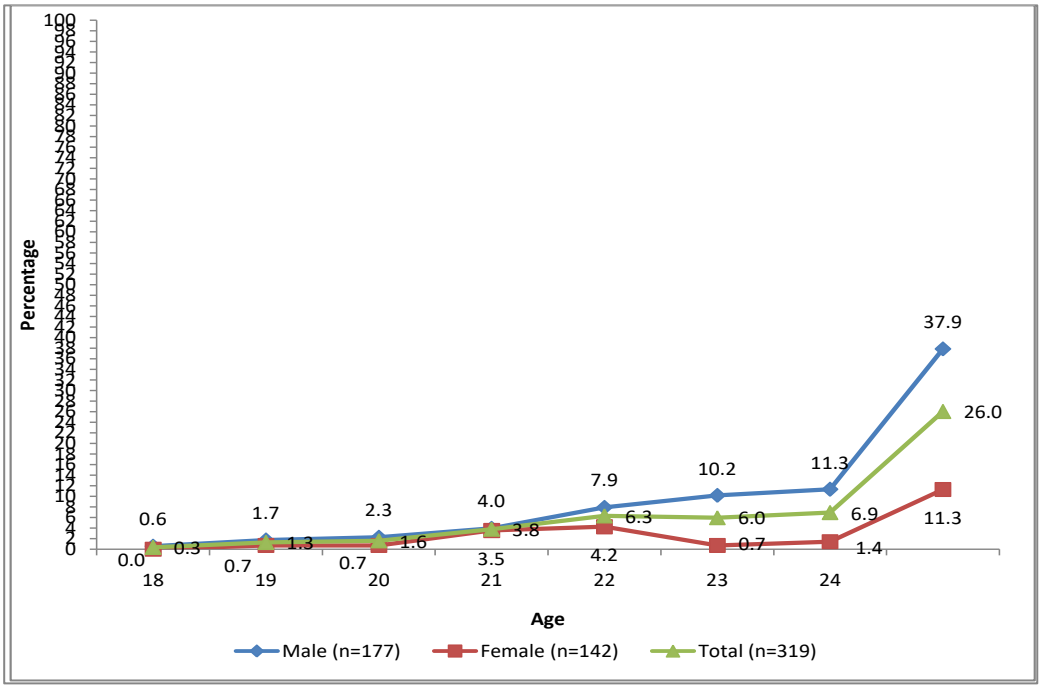

Figure 4.7: Respondents engaged in sexual debut before 18 years

Source: Field data, (2020)

4.3.11 Testing to know one's own HIV status

Figure 4.7 presents HIV testing by students in Institutions of Higher Learning in Western Kenya

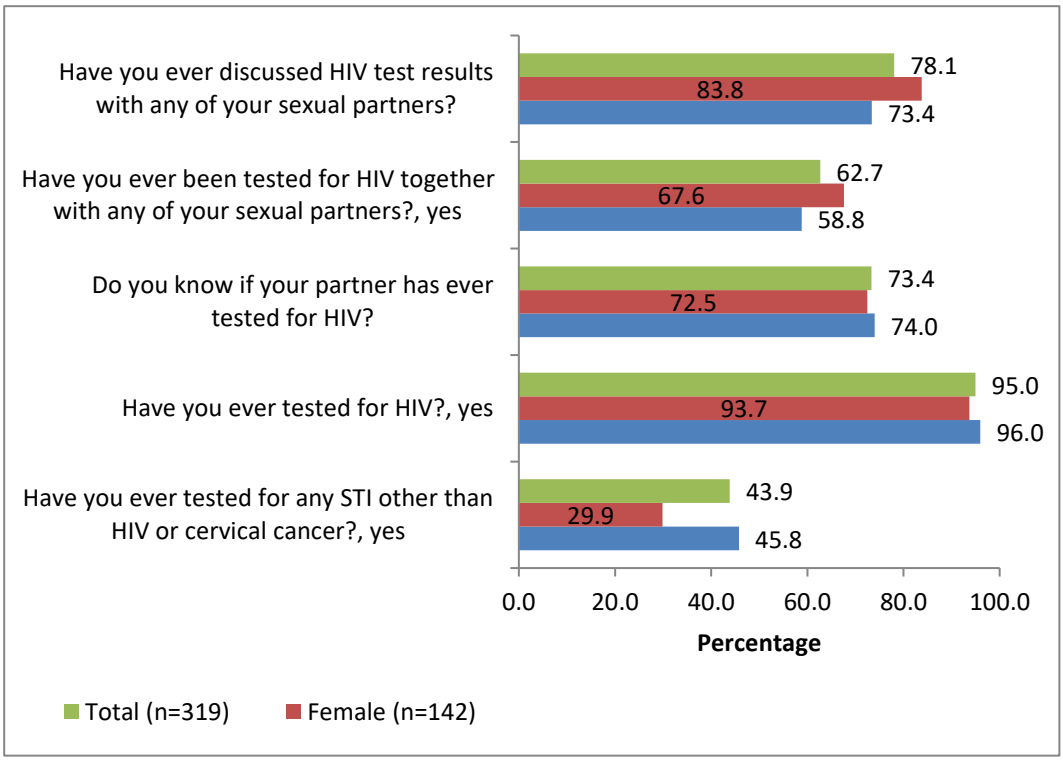

Figure 4.8: HIV testing by respondents

Source: Field data, (2020)

Knowing one's status is one of the measures used in the prevention against the spread of HIV as through knowledge of one's status, a person can take control to prevent the spread of the disease to others if tested positive and or maintain a negative HIV status if tested negative . Mbugua & Karonjo (2018) who affirmed that lack of testing posed high risk in the spread of HIV echo this thought.In the Focus Group Discussion held with Rongo University studentsaccording to a male participant, testing kits for HIV were reported to be sufficient and students were comfortable with the location of the testing center.

Nevertheless,according to a female participant familiarity with staff at the center discouraged students from being tested for HIV within the campus facility. According to a different female participant some of the staff were harsh when they saw students frequenting the clinic as they accused frequenters of engaging in HIV Risky Sexual Behavior. According to a male participant,someof the staff were also reported to be unfriendlythus discouraging the students from visiting the facility for Sexual and Reproductive Health Services.

In the Focus Group Discussion held with participants from Lugari Diploma Teachers Training College, a male respondent said that HIV testing was weak, as students had to go outside the college to the nearby Lumakhanda Hospital for testing. A female student confirmed that there was no facility within the institution providing HIV testing services.Among the respondents in the current study, 16 (4%) had never tested for HIV. Though this is a relatively low figure, it is important that stakeholders factor in this segment and purpose to reach out to them to ensure that all students have been tested for HIV. On the other hand, close to half 180 (45.1%) of students mentioned that knowing their status did not change their behavior suggesting that testing alone or knowing one's status may not significantly mitigate HIV Risky Sexual Behaviour. This is a significant percentage of students who seem not to be affected by knowledge of their status weather positive or negative.Nevertheless, this variable; HIV testing scored LOW according to the HIV Risky Sexual Behavior index. This means that HIV testing lowly contributes to HIV Risky Sexual Behavior among students in Institutions of Higher Learning in

Western Kenya. From Key Informants, regarding HIV testing, an official from the Health Department County Government of Busia reported that;

> Initially we had planned to be carrying out HIV testing services through outreaches to the universities and colleges but the experience was not good as only those who frequently tested themselves would come for testing but majority of students' shied away from the service and therefore the yield was so poor

As HIV outreach services were not as successful as had been expected, it is paramount for stakeholders to review alternative ways of increasing HIV testing among students. On the other hand, an official at the Kenya Medical Research Institute shared that they provided HIV Testing Services for Alupe University College students. Officials of the County Government of Homabay and Kakamega also confessed to providing HIV testing for students in Institutions of Higher Learning within their County. The Dean of Students of The Kisumu National Polytechnic reported that his office offered HIV testing for students in the institution. All the officials representing the health care centers outside the Institutions of Higher Learning reported that they provided HIV testing for the students. It may therefore be summarized that HIV testing facilities are numerous and accessible but psychosocial impediments to testing need to be addressed.

In related studies, Li *et al*. (2017, 2020) found that the rate of active HIV test was lowamong students and further reported that this was probably due to the ongoing impact of stigma and discrimination associated with HIV infection. On the contrary,just as was found in the current study, Mokgatle & Madiba (2017) foud that the uptake of HIV testing was high among the students, with almost three-quarters indicating that they had been tested in the past year. The official from Bondo Hospital also reported that they

partnered with many Non Governmental Organisations and Community Based Organisations in HIV testingof which some students in institutions of Higher Learning were beneficiaries. Nevertheless, the dean of students of Alupe University College complained that students were not willing to go for testing while The Kisumu National Polytechnic dean confessed that his office did not conduct HIV testing. Even for those who had gone for HIV testing, majority of students did not change their sexual behaviors even after knowing their HIV status. Figure 4.8 demonstrates this finding.

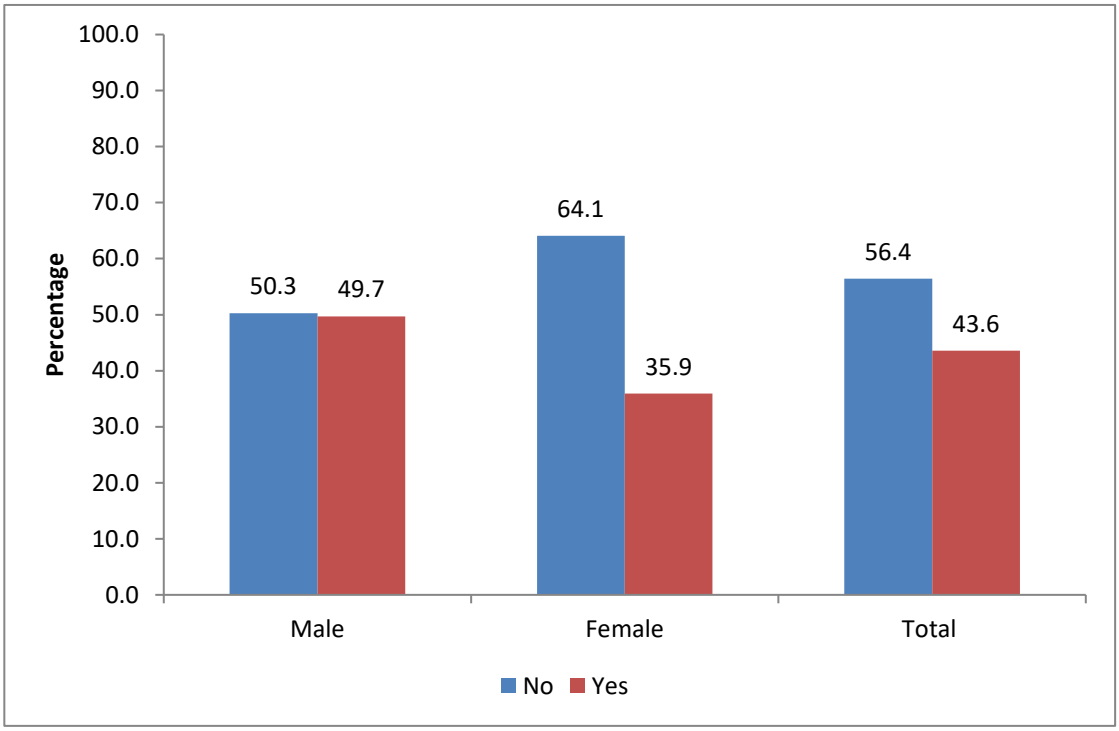

Figure 4.9: Respondents who changed their sexual behavior after HIV testing

Source: Field data, 2020

4.3.12 Watching pornography by respondents

Table 4.15 presents the respondents who engage in watching pornography while table 4.16 presents reasons for watching and not watching pornography by the respondents.

Table 4.15: Watching pornography by respondents

Institution under study	**No**	**Yes**
Rongo University	99	53
Tom Mboya University College	5	14
The Kisumu National Polytechnic	66	19
Great Lakes University of Kenya	22	3
Lugari Diploma Teachers Training College	9	1
Alupe University College	6	3
Kenya Medical Training College Bondo	9	10

Source: Field data, (2020)

Table 4.16: Reasons for watching pornographyby respondents

		Male [number, %]	**Female [number, %]**	**Total [n, %]**
Reason for watching pornography (n=103)	To learn sexual skill	18 (31.6)	11 (23.9)	29 (28.2)
	For entertainment	26 (45.6)	25 (54.3)	51 (49.5)
	Peer pressure	18 (31.6)	13 (28.3)	31 (30.1)
	Boredom Other/Specify	14 (24.6) 6 (10.5)	16 (34.8) 1 (2.2)	30 (29.1) 7 (6.8)

Reasons for NOT watching pornography (n=204)	Religious reasons	22 (18.3)	18 (18.8)	40 (18.5)
	Upbringing	28 (23.3)	27 (28.1)	55 (25.5)
	Lack of interest	82 (68.3)	57 (59.4)	139 (64.4)
	Other/Specify	6 (5.0)	3 (3.1)	9 (4.2)

Source: Field data, (2020)

In this study, slightly over one quarter 103 (25.8%) of respondents admitted to having watched pornography.The reasons given for doing watching pornography are lack of discipline, lack of maturity and inability to avoid the urge. Other reasons given are addiction, curiosity, personal interest and pleasure. Stakeholders should thus put emphasis on initiatives that promote virtues among students such as discipline and maturity in order to help students whoare struggling with watching pornography. This variable scored HIGH according to the HIV Risky Sexual Behavior index. This means that watching pornography is highly contributing to HIV Risky Sexual Behavior among students in Institutions of Higher Learning in Western Kenya.Many researchers have reported watching pornography as an influence of HIV Risky Sexual Behavior even among students in Institutions of Higher Learning. These researchers include Farahani *et al*. (2018) who reported that ever-watched pornography was a significant predictor of having multiple sexual partners.Yunengsih & Setiawan (2021) found a significant relationship between HIV Risky Sexual Behavior in students and the age of the first-time exposure to pornography, pornographic materials accessed, and the reasons for watching pornography. Megersa & Teshome (2020) reported that students who did not watch porn movies had 99% lower odds of HIV Risky Sexual Behavior as compared to their counterparts.

Woldeamanne (2020) also echoed these findings in his work by reporting that watching pornographic movies was statistically significantly associated with the higher risk of practicing HIV Risky Sexual Behavior. Adimas *et al*. (2021) also echo similar findings and Efrati (2020).Table 4.26 therefore presents reasons for watching and not watching pornography amongst students in Institutions of Higher Learning in Western Kenya. At Rongo University, 53 (34%) of its respondents admitted to having watched pornography while 14 (73.6%) of Tom Mboya University College students admitted to the same. At Lugari Diploma Teacher Training College 1 (10%) and at Alupe University College 3 (50%) admitted to watching pornography. The official at Kenya Medical Research Institute, which serves Alupe University College, commented that due to free internet at the University College many students have resorted to pornographic sexual behaviours done in the night evidenced by pieces of condoms around the University College environs. The dean of students at The Kisumu National Polytechnic reported that the institution had managed to filter pornographic sites by 50%.

4.4 Summary

There is highly likely to be a spike in incidence of HIV among students in Institutions of Higher Learning if the challenges identified in behavioural strategies are not addressed by stakeholders in good time. Kenya is likely to regress to 2015 statistics whenmajority (60%) of HIVcases was of young people. The gains that have already been made may thus be lost if stakeholders do not respond adequately.

CHAPTER FIVE

HIV PREVENTION BEHAVIORAL STRATEGIES

5.1 Introduction

This chapter presents the findings on the evaluation of the effectiveness of behavioral strategies employed to mitigate students' HIV Risky Sexual Behaviors in Institutions of Higher Learning, therefore addressing study objective two. UK Consortium on AIDS and Interventions Development (2013) gives examples of behavioral interventions as; provision of information;counselling and other forms of psychosocialsupport; stigma, and discrimination reduction programmes. Data from student questionnaires, Focus Group Discussions and Key Informant Interviews are presented in charts, graphs, tables and descriptive narratives.

5.2 Overall effectiveness of behavioral strategies

Table 5.1presents a summary of behavioural mitigation strategies that were found to have been appliedin Institutions of Higher Learning in Western Kenyatowards HIV Risky Sexual Behaviors amongstudents.

Table 5.1: Behavioural sstrategies used to mmitigate HIV Risky Sexual Behavior

Ways through which behavioural intervention strategies have had an impact on students' sexual and reproductive choices/decisions	**Low sexual risky behaviors (n=130)**	**High sexual risky behaviors (n=269)**	**X2**	**P-value**
Information Provision	81.3	18.7	7.375	0.007***
Counselling and other forms of psycho-social support	56.1	43.9	3.069	0.080*

**p>0.1 **p>0.05 ***p> 0.01 statistically significant between strategies and level of HIV Risky Sexual Behavior*

Source: Field data, 2020

The p values were used to show the level of significance/differences between the waves. Null hypothesis was rejected if p-values were $p<0.1$ at 90 % confidence level; $p<0.05$ at 95% confidence level; and $p<0.01$ at 99 % confidence level. This means that there was statistically significant evidence or difference between the low and high Risky Sexual Behaviors among students in reference to behavioural interventions in mitigating HIV Risky Sexual Behaviors among students in Institutions of Higher Learning in Western Kenya.

Therefore regarding information provision the study shows that there is a statistical significance with p-value = 0.007 between the two categories of HIV Risky Sexual Behavior (High Risky Sexual Behavior and Low Risky Sexual Behavior). This implies that information provision has been successful in helping mitigate HIV Risky Sexual Behaviouramong students. Moreoveras shown in the Chi-square test in table 5.1, when it comes tocounselling and psycho-social support, the study shows that there is a statistical significance with p-value = 0.080 among the two categories of HIV Risky Sexual Behavior (High Risky Sexual Behavior and Low Risky Sexual Behavior).This implies that counselling and psychosocial support has been successful in mitigating HIV Risky Sexual Behaviour. The most successful behavioural intervention has thus been found to be information provision followed by counselling and psychosocial support. This means that institutions and other stakeholders should continue to put focus on HIV information provision as they strengthen counselling and psychosocial support efforts.

Key Informants such as the dean of students of The Kisumu National Polytechnic also reported that they successfully held health talks on HIV for students. The official of

Homabay County also reported that they were successful in regular training of students of Institutions of Higher Learning as they received sufficient support from the County government for these initiatives. Furthermore, the official from Compassion International, a Non-Governmental Organisation in Busia shared that they were successful in the distribution of pamphlets on awareness and knowledge to students and that these had successful implications towards Risky Sexual Behaviour. They also added that they successfully reached out to students during sporting activities and as there was a large audience during such functions, their interventions had significant impact.The Lugari Diploma Teachers Training College nurse also shared that her strengths were that she was well trained and had long-term experience when it came to HIV guidance and counseling services of students. The nurse at Rongo University additionally shared that there was an established university health committee which dealt with HIV matters and that there was an existing HIV course offered in the first year of students' study, additionally she added that they made use of use of peer education during cultural day. The County Government of Kisumu also conducted regular training of their health workers and enhanced existing and upcoming health facilities that students in Institutions of Higher Learning could access for use. On the other hand, the Lugari Teachers Training College dean also stressed the need to improve on guidance and counselling at their institution.From the survey, stigma and discrimination reduction programmes are reported as not being provided to the students.

5.3 Information provision on HIV

Information provided to students on HIV by Institutions of Higher Learning in Western Kenya is broken down in Table 5.2.

Table 5.2: Level of students' information on HIV

Level of information that students have on HIV	Male [number, %]	Female [number, %]	Total [n, %]
Low information	6 (3.0)	5 (2.5)	11 (2.8)
Moderate information	72 (35.6)	91 (46.2)	163 (40.9)
High level of information	124 (61.4)	101 (51.3)	225 (56.4)

Source: Field data, 2020

The current study found that majority of students, 225 (56.4%) had high-level information on HIV. The majority of men 124 (61.4%) had high-level information of HIV and similarly, the majority of women 101 (51.3%) also had high-level information of HIV. Nevertheless, the men were found to have more high level HIV information than women did. It is paramount therefore that stakeholders get to understand the reason for the discrepancy between high-level knowledge in men verses women. Additionally, researchers need to enhance their interventions to ensure female students' high level knowledge increases to similar levels as the males.

Apart from those who had high level of information, there were those who had moderate information on HIV. In this study, these were 163 (40.9%) and were therefore less than half of the respondents. Less than half of the females 91 (46.2%) had moderate

information on HIV. For males, slightly over one third 72 (35.6%) had moderate information on HIV. More females were found to have moderate information on HIV as compared to males. Stakeholders should make an effort to ensure that those who have moderate level knowledge move to the point where they have high-level knowledge.The findings from the respondents are corroborated by information from Rongo University, Great Lakes University of Kisumu and Bondo Kenya Medical Training College Focus Group Discussion participants, who reported that HIV is taught to them as part of their curriculum. Bondo Kenya Medical Training College and Great Lakes University of Kisumu Focus Groups who had a high number of students studying health-related courses attributed their high-level knowledge on HIV to the programmes most of them were studying which are health-based programmes.

Some Key Informants also shared how they provide HIV information to the students. The heads of clinics at Rongo University, The Kisumu National Polytechnic and Tom Mboya University College reported that they hold HIV talks during 1st years' orientation events. At Lugari Diploma Teachers Training College, the head of clinic reported of inviting guest speakers from the nearby Lumakhanda hospital to talk to the students on HIV yearly. An official from Compassion International Kenya in Busia, which is a Community Based Organization in that County, and an official of *Medecins Sans Frontieres*, which is a Non-Governmental Organisation in Migori County, informed that they do hold workshops and seminars to educate students in Institutions of Higher Learning on HIV. An official from the Migori County Ministry of Health accounted that they do hold awareness creation workshops and seminars for students in Institutions of

Higher Learning through a programme called "*DREAMS*" which specifically targets female students.

An official from the County government of Kisumu further reported that they hold HIV seminars for students while an official from The Kakamega County testified that they hold HIV in-service training for student teachers.Moreover, an official of Homabay Hospital mentioned that they train peer educators for Institutions of Higher Learning; while an official of Bondo Hospital mentioned that they hold HIV awareness programmes for students. The deans of students of Rongo University, The Kisumu National Polytechnic, Alupe University College and Tom Mboya University College all informed that they hold HIV talks for their students. Despite this high provision of information from an array of stakeholders, the survey still revealed that a few of the men 6 (3%) and a few of the females 5(2.5%) had low knowledge about HIV though there is not a significant difference between males and females who have low HIV knowledge. There is need for stakeholders to attempt to understand why a few students still have low knowledge on HIV and put interventions in place to ensure that these students are identified, reached out to and that their level of HIV knowledge appropriately and adequately enhanced.

Norman & Carr (2003) say that HIV knowledge is significantly related to concern for personal risk. In agreement, Andrew *et al*. (2018) also realized that information about a disease might be an initial step towards behavioral risk change. Chaves *et al*. (2014), Bigala *et al*. (2014), James *et al*. (2018), Dilorio *et al*. (2000), Pharr *et al*. (2017) and Li

et al. (2020) also support this notion. Nevertheless, and on the contraryOnah *et al*.(2004) and Omoyeni *et al*.(2014) reported that high knowledge of HIV had no correlation with subsequent sexual behavior among their respondents.

As some researchers do emphasize, HIV knowledge is indeed important in addressing HIV Risky Sexual Behavior. Nevertheless, other researchers also stress that it is not optimum to inform about HIV independently without the inclusion of Sexual and Reproductive Health information if positive results are to be achieved in the fight against HIV (Gonzales & Kadengye, 2019; WHO *et al*., 2009; Spaulding *et al*., 2009; Kennedy & Spaulding, 2010). These researchers emphasize that examining HIV issues on their own without the consideration of Sexual and Reproductive Health is inefficient towards the fight against HIV. It is therefore paramount that when HIV information is being given to students, Sexual and Reproductive Health information is shared simultaneously as well to optimize overall on the gains of addressing Risky Sexual Behavior. For this reason, this study sought to find out to what extent respondents had information on Sexual and Reproductive Health. Good Sexual and Reproductive Health is referred to as a state of complete physical, mental and social well-being in all matters relating to the reproductive system (Hoffman *et al*., 2017).Table 5.3 therefore presents Sexual and Reproductive Health levels of information among Students of Institutions of Higher Learning in Western Kenya.

Table 5.3: Level of Information on Sexual and Reproductive Healthamong respondents

Level of Information about Sexual and Reproductive Health	Male [number, %]	Female [number, %]	Total [n, %]
Low knowledge	16 (7.9)	15 (7.6)	31 (7.8)
Moderate knowledge	111 (55.0)	114 (57.9)	225 (56.4)
High level of knowledge	75 (37.1)	68 (34.5)	143 (35.8)

Source: Field data, 2020

The study found that just over one-third 143 (35.8%) of respondents have a high level of Sexual and Reproductive Health (SRH) knowledge. Close to forty percent of men 75 (37.1%) have high level of Sexual and Reproductive Health knowledge while over one third of women 68 (34.5%) have a high level of Sexual and Reproductive Health knowledge. Those who have moderate knowledge are the majority 225 (56.4%). A majority of females 114 (57.9%) have moderate knowledge as well as a majority of males 111 (55%). A low number of students 31 (7.8%) have low level of Sexual and Reproductive Health knowledge. Of the males, 16 (7.9 %) havelow-level knowledge while of the females 15 (7.6%) havelow-level knowledge on Sexual and Reproductive Health. There is urgent need for stakeholders to put in interventions that will increase the provision of high level SRH knowledge to all students.

In the Focus Group Discussions held with Bondo Medical Training College and Great Lakes University of Kisumu, some participants shared that students learning in health-related institutions havehigh-level knowledge on Sexual and Reproductive Health issues.This is especially so when it comes to treatment of Sexually Transmitted Infections

and feel that this makes them engage in HIV Risky Sexual Behavior at a higher rate than those who are not studying in health courses-inclined institutions. Looking at related studies, in a study carried out by Yared *et al.* (2017), despite awareness of Sexually Transmitted Infections, over twenty percent of the respondents had contracted a Sexually Transmitted Infection, gotten pregnant and had unsafe abortions in the past one year. Additionally, Kim *et al.* (2018) stated that reproductive health behavior was significantly influenced by sexual knowledge while Li *et al*. (2017) noted that both males and females with higher Sexual and Reproductive Health knowledge were less likely to report having experience of their partner's pregnancy or abortion. Nevertheless, Duby *et al*. (2020) noted with concern that young people were more worried about getting pregnant than contracting HIV.

This current study reveals that students in Institutions of Higher Learning in Western Kenya who have high level information on HIV are 225 (56.4%) while students in Institutions of Higher Learning in Western Kenya who have high level information on Sexual and Reproductive Health are 143 (35.8%). There is thus more focus on providing students with HIV knowledge at the expense of providing them with Sexual and Reproductive Health knowledge which is counter-productive in the fight against HIV. Stakeholders should seek to bring a balance between the two by optimizing both. Table 5.4 summarizes the knowledge on the extent to which Risky Sexual Behavior results in contracting HIV among students in Institutions of Higher Learning in Western Kenya.

Table 5.4: Extentof knowledge that Risky Sexual Behavior results in contracting HIV

Knowledge on the extent to which Risky Sexual Behavior results in contracting HIV	**Male [number, %]**	**Female [number, %]**	**Total [n, %]**
None	0 (0)	2 (1.0)	2 (0.5)
Small	11 (5.4)	10 (5.1)	21 (5.3)
Moderate	43 (21.3)	33 (16.8)	76 (19.0)
High	148 (73.3)	152 (77.2)	300 (75.2)

Source: Field data, 2020

This study also sought to find out the extent to which students have information that Risky Sexual Behavior results in contracting HIV. Subsequently, the study found that the majority 300 (75.2%) of respondents have a high level of knowledge on the extent to which Risky Sexual behavior results in contracting HIV. A majority of women 152 (77.2%) have high level knowledge on the extent to which Risky Sexual Behavior results in contracting HIV. A majority of men 148 (73.3%) also have high level knowledge on the extent to which Risky Sexual Behavior results in contracting HIV. This is positive information in that students are highly aware of the relationship between Risky Sexual Behaviour and contracting HIV. Stakeholders to optimize this knowledge so that all students have high-level knowledge at the highest levels should enhance intervention efforts. Additionally a few respondents 76 (19%) have moderate knowledge on the extent to which students know that Risky Sexual Behavior results in contracting HIV. A few men 43 (21.3%) have moderate knowledge on the extent to which students know that

Risky Sexual Behavior results in contracting HIV while a few females 33 (16.8%) also have moderate knowledge on the extent to which students know that Risky Sexual Behavior results in contracting HIV. Stakeholders to ensure that students who have moderate SRH knowledge achieve high SRH knowledge should enhance intervention efforts.

Those who have low knowledge on extent that Risky Sexual Behavior results in contracting HIV are few 21 (5.3%). For the men 10 (5.1%) have low knowledge on extent that Risky Sexual Behavior results in contracting HIV and for the females 11 (5.4%) have low knowledge on extent that Risky Sexual Behavior results in contracting HIV. Once more, stakeholders to ensure that students who have low SRH knowledge achieve high SRH knowledge should enhance intervention efforts. There are also 2 (0.5%) who have no knowledge at all on the extent that Risky Sexual Behavior results in contracting HIV and these are both female. It is unfortunate that there are students who have no knowledge at all on the extent that Risky Sexual Behavior results in contracting HIV and that they were both female. Female-targeting interventions to provide information on SRH to those who have no information should be prioritized urgently.

Researchers have also emphasized the importance to prioritizing first year students when it comes to imparting information on HIV and Sexual and Reproductive Health. First year programmes are particularly helpful in targeting Early Sexual Debut as a Risky Sexual Behaviour. This study hence looked at the specific information that was given to first year students and found out that the majority of respondents 161 (52.8%) received

knowledge on abstinence from sex. For the males 91(56.5%) of them received this knowledge while for the females, 70 (48.6%) received this knowledge. As much as these efforts are recognized, there is need for stakeholders to ensure that 100% of first year students access HIV interventions when they join campus.

Regarding the exact knowledge that these first years received at the interventions, majority, 208 (68.2%) received knowledge on the use of condoms. For the males 126 (78.3%) received this knowledge while for the females 82 (56.9%) received this knowledge. It is noted that provision of knowledge on the use of condoms is biased towards men yet ensuring that females are as highly targeted is vital. Stakeholders should thus enhance efforts that ensure that females are prioritized when it comes to the provision of knowledge on the use of condoms. Those who gained knowledge on how to delay sexual debut are 90 (29.5%). For the males 50 (31.1%) received this knowledge while for the females 40 (27.8%) received this knowledge.Those who learned about the management of HIV are 229 (75.1%). Of the males, 116 (72%) received this knowledge while of the females 113 (78.5%) received this knowledge. Those who learned about prevention of HIV are 275 (90.2%). Of the males, 113 (78.5%) received this knowledge while of the females 132 (91.7%) received this knowledge. Those who learned about the treatment of HIV are 183 (60%). Of the males 95 (59.0%) received this knowledge while of the females 88 (61.1%) received this knowledge. Those who learned about the use of contraception are 129 (42.3%). Of the males 69 (42.9%) received this knowledge while of the females 60 (41.7%) received this knowledge. Those who gained other knowledge other than those mentioned above are 11 (3.6%). Of the males 5 (3.1%) received this

knowledge while of the females 6 (4.2%) received this knowledge. These other knowledge are; general information on Reproductive Health care and self-hygiene, HIV modesof transmission, reproductive health hygiene, Sexually Transmitted Infections, their management and preventions, guidance and counselling, peer influence on HIV Risky Sexual Behavior, and cancer. Generally, the rate at which students learned the above knowledge is low and should be enhanced for both men and women.

Among the Key Informants who had programmes geared towards first year students only, The Dean of Students' of Alupe University College reported that;

> We have a mentorship programme that puts emphasis on prevention efforts targeted at the incoming first years that are not yet sexually active

This programme is likely to go a long way in delaying sexual debut and thus contributing positively in mitigating HIV Risky Sexual Behaviour. In an FGD held with the participants from Alupe University College, a male participant reported that;

> For first year students, there are talks given by the Ministry of Health particularly to create awareness on HIV and AIDS but the facilitators usually do not call a spade a spade. They should hit the nail on the head. They should be bold. They should also conduct the activity every semester instead of once off. It is sad that no NGOs or CBOs are involved in providing such activities

From the above statement, students are seen to be desperate for boldness in the delivery of HIV information. Additionally, they desire for the information to be shared more frequently than is being done. The study also looked at where information was provided from. Table 5.5 presents sources of HIV and Sexual and Reproductive Health information.

Table 5.5: Sources of HIV and Sexual Reproductive Health information

Sources of HIV and Sexual Reproductive Health Information	**Male (n=120) %**	**Female (107) %**	**Total [(n=227), %]**
Peer educator	34.2	38.3	82 (36.1)
Friend/Classmate	16.7	13.1	34 (15.0)
Regular/periodic small group meeting (BCCG)	10.0	16.8	30 (13.2)
Curriculum/Lecturer in class	52.5	47.7	116 (51.1)
Health worker in the University or College	10.8	13.1	27 (11.9)
Counselor in the University/College	20.8	24.3	51 (22.5)
Health Worker in a center outside the University or college	22.5	16.8	45 (19.8)
Faith Based Organization	10.8	14.0	28 (12.3)
Non-Governmental or Community Based Organization	30.8	16.8	58 (25.6)
Family member	11.7	10.3	25 (11.0)
Other please specify	8.3	3.7	14 (6.2)

Source: Field Data, 2020

Majority of students 116 (51.1%) received knowledge from the curriculum in class such that majority of males 61 (52.5%) and majority of females 55 (47.5%) received knowledge from their curriculum. Care and attention should thus be given in the development and review of such curricula, as they are the most common source of HIV

information for students. Additionally students received knowledge from Non-Governmental Organizations or Community Based Organizations around the community. These were 102 (25.6%) respondents. Some sourced their HIV and Sexual and Reproductive Health information from peer educators. These are 144 (36.1%). Knowledge from the student counselor within the Institution of Higher Learning reached 90 (22.5%) of the students. This was followed by knowledge from health workers outside the university or college from whom 79 (19.8%) of students gained their knowledge. Meanwhile 60 (15%) of students got their knowledge from friends or classmates; 53 (13.2%) from regular or periodic Small Group meetings on campus; 49 (12.3%) from Faith Based Organizations, 47 (11.9%) from the health worker in the University; 44 (11.0%) received knowledge from a family member while 25 (6.2%) received knowledge from other Sources. These Other sources included first years orientation including parties, internet including social media, trainings, debate platforms, social workers and counselors and school newspapers and pamphlets. Stakeholders need to look at all the sources of information that students have on HIV and enhance the ones students find most popular then improve upon their delivery of the same.Figure 5.1 presents specific information that students learned regarding HIV, Sexual, and Reproductive Health from initiatives at University or College.

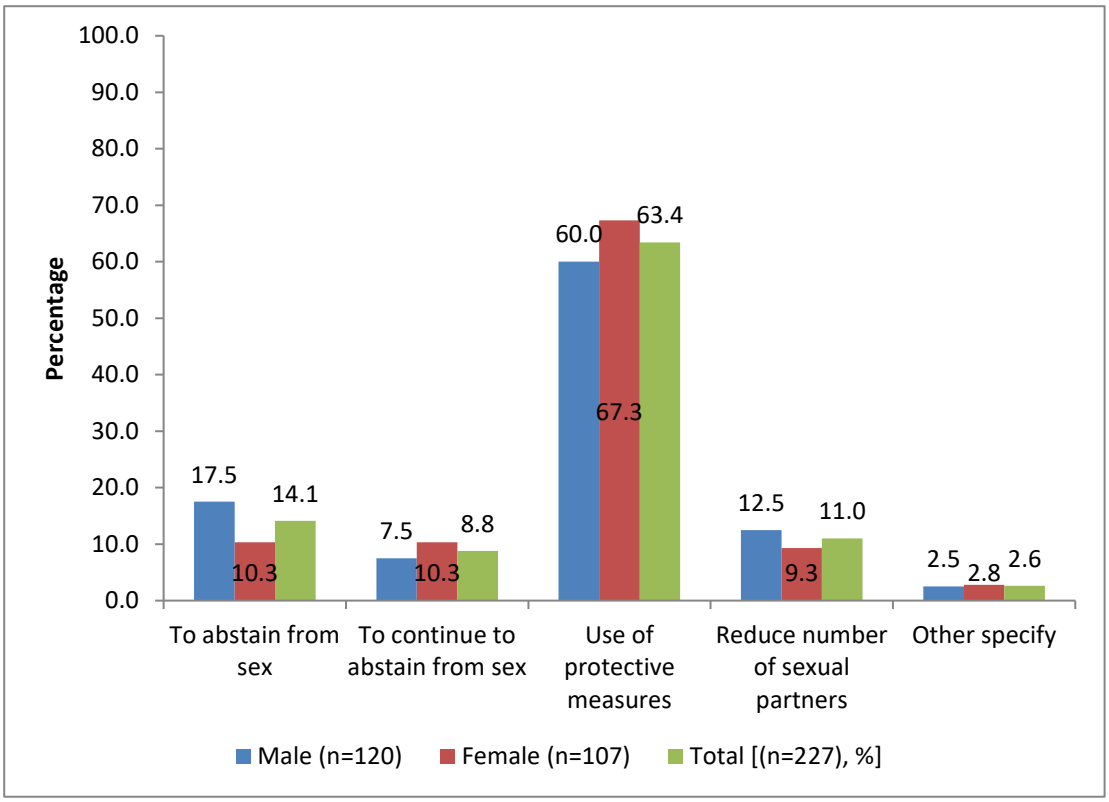

Figure 5.1: Knowledge from HIV and SRHtraining beyond firstyear of study

Source: Field Data, (2020)

Those who learned how to now abstain from sex constituted 45 (14.1%) of the respondents of whom were 35 (17.5%) of males and 20 (10.3%) of females. For those who learned how to continue to abstain from sex, these constituted 28 (8.8%) of the respondents. Of these, there were 20 (10.3%) of the females while there were 15(7.5%) of the males. Nevertheless, what students learned most was to use protective measures to reduce Risky Sexual Behavior. The majority belonged to this category 252 (63.4%) of whom there were 132 (67.3%) of the females and 121 (60.0%) of the males. Those who learned to reduce the number of sexual partners were 44 (11.0%) of whom there were 25 (12.5%) of the males and 18 (9.3%) of the females. Students also learned other behaviour

risk reduction including; being faithful to one partner, the knowledge that HIV is manageable, Knowledge on female condoms and encouragement to get HIV tested for HIV. Other than protective measures, stakeholders thus need to enhance other measures that they use to provide information to students beyond first year.Table 5.6 presents methods used to provide HIV and Sexual and Reproductive Health information to students.

Table 5.6: Methods used to provide HIV and SRH information to respondents

Education Methods used	**Male (n=202)**	**Female (n=197)**	**Total (n=399)**
Traditional media platforms (Newspapers/radio/TV)	33.2	34.0	33.6
Social media platforms (Facebook, Whatsapp, Instragram etc)	71.3	73.6	72.4
Art and entertainment (Plays,drama, dance theatre etc)	25.7	17.8	21.8
Institutional/Non institutional (lectures/ motivational talks/seminars/workshops)	63.4	59.4	61.4
Peer to peer education	39.6	50.8	45.1
Other specify	7.9	4.6	6.3

Source: Field data, 2020

Stakeholders used an array of methods to provideHIV, Sexual, and Reproductive Health information to students. The one most cited by students as being used by stakeholders were social media platforms such as Facebook, Whatsapp and Instagram at 289 (72.4%). Stakeholders should thus study more on how to use social media to best relay HIV

information to students and apply the same. This was followed by Institutional/Non-Institutional lectures, motivational talks, seminars and workshops. These contributions were cited by 245 (61.4%) of the students. Peer to peer education was cited by 180 (45.1%) of the respondents. Traditional media platforms such as newspapers, radio and Television were also cited by 134 (33.6%) of respondents, art and entertainment such as drama by 87 (21.8%) of respondents and finally others which included banners, church retreats, classmates and friends, elders, Google search, guidance and counseling, journals and books, notice board, parents and, student's clubs. These were cited by 25 (6.3%) of the respondents. The dean of students of Rongo University College reported to using the University Facebook page, Instagram and Whatsapp to disseminate HIV and and Sexual and Reproductive Health information to students while an official of Medicines Sans Frontieres in Homabay talked of how they used Religious Education movies and music for the same purpose. For Tom Mboya University College, the Dean of Students reported that the policy to allow the use of modern methods was not yet approved but was waiting council approval for it to be functional. Table 5.7 presents methods students felt were best to relay HIV and Sexual and Reproductive Health information.

Table 5.7: Methods respondentsfelt were best to provide HIV and SRH information

Methods Information transmission	**Male (n=202)**	**Female (n=197)**	**Total (n=399)**
Traditional media platforms (Newspapers/radio/TV)	11.9	8.6	10.25
Social media platforms (Facebook, Whatsapp, Instragram)	47	41.6	44.3

Art and entertainment (Plays, drama, dance theatre)	15.3	11.2	13.25
Institutional/Non institutional (lectures/ motivational talks/seminars/workshops)	34.2	36	35.1
Peer to peer education	34.2	40.6	37.4
Other specify	3.5	1.5	2.5

Source: Field data, 2020

Students also shared that they preferred an array of methods for providing HIV and Sexual and Reproductive Health information to them. The one most cited by students were social media platforms such as Facebook, Whatsapp and Instagram by 177 (44.3%) of respondents. This was followed by Peer to peer education by 149 (37.4%); Institutional/Non-Institutional lectures, motivational talks, seminars and workshops at 140 (35.1%), Art and Entertainment such as drama by 53(13.25%), Traditional media platforms such as Newspapers, Television and Radio at 41 (10.25%) and others by 10 (2.5%). Others included; guidance and counseling from a professional, online search engines such as Google, notice boards, parents and safe spaces for open dialogue.

An official of Nyarami VCT Migori County reported to using peer educators as mobilizers whom they used to carry out daylong events and youth day clinics for students. A Compassion International Kenya in Busia County official said that they had created a Facebook page that posted on matters concerning reproductive health and HIV matters where students could raise and add comments. They had also created Whatsapp groups where students could get knowledge and help.Figure 5.2 presents a breakdown of

Factors believed to have contributed towards effective communication of HIV and Sexual and Reproductive Health by students.

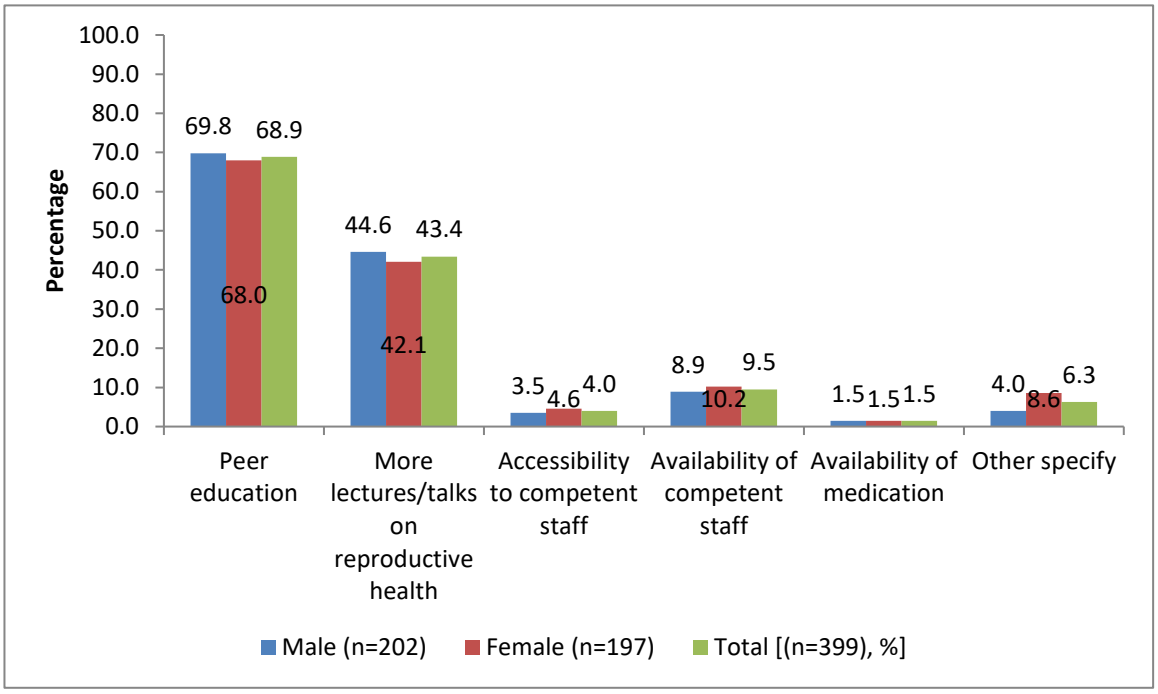

Figure 5.2: Factors contributing towards effective communication of HIV and SRH

Source: Field Data, (2020)

There are factors that students believed contributed towards the effective communication of HIV and Sexual and Reproductive Health knowledge. Of these, peer education was rated highest among the students, of which 275 (68.9%) of students supported; 234 (68.0%) of the females and 141 (69.8%) of the males. This was closely followed by Talks on Reproductive Health where the learning institutions organized presenters to talk to the students on HIV and Sexual and Reproductive Health Knowledge. Availability of competent staff in relation to HIV and Sexual and Reproductive Health was cited by 38 (9.5%) of the students, 20 (10.2%) of the females and 17(8.9%) of the males. Accessibility of competent staff in relation to HIV and Sexual and Reproductive Health

was further cited by 16 (4.0%) of the respondents, 18 (4.6%) who were female and 14 (3.5%) who were male. Availability of medication was cited by 6 (1.5%) of the respondents as a factor that contributed towards the effective communication of HIV and Sexual and Reproductive Health knowledge while other factors mentioned included; through billboards; campaigns; social media; Guiding and counseling; Radio and journals; and Internet platforms especially for the shy students. These others were 25 (6.3%) of the population of whom 34 (8.6%) were female and 16 (4.0%) male. Table 5.8 presents students' access to behavior change communication in Institutions of Higher Learning in Western Kenya.

Table 5.8: Respondents' access to Behavior Change Information

Access to behavior change communication	**Rongo University**	**Tom Mboya University College**	**Kisumu Polytechnic**	**Great Lakes University of Kenya**	**Lugari Diploma TTC**	**Alupe University College**	**Bondo KMTC**
Nil	54	15	23	62	0	0	0
Low	66	3	18	19	1	4	1
Moderate	45	7	23	3	4	5	5
High	41	3	3	5	4	4	9

Source: Field data, (2020)

The extent to which respondents had access to Behavior Change Communication was assessed. This study has shown that, just less than half 196 (49.1%), had moderate access

to Behavior Change Communication while close to one-third 116 (29.1%), had high access to Behavior Change Communication. Meanwhile, slightly less than one fifth 74 (18.5%) had low access while 13 (3.3%) had no access at all to Behavior Change Communication.Ngigi & Busolo (2018) refer to Behavior Change Communication (BCC) as an interactive process of any intervention with individuals, groups or communities to develop communication strategies to promote positive behaviors, which are appropriate to their settings. For this study, this appropriate behavior would refer to behavior that would reduce HIV Risky Sexual Behavior such as proper and consistent use of condoms, maintaining one faithful partner, abstaining from sexual intercourse among others. Communication would therefore need to be appropriately done in order to elicit the accurate change in behavior from non-desirable, to desirable.

In the meantime, specifically the extent to which respondents had access to information on how to prevent unplanned pregnancies was assessed subsequently. It was detected that just less than half 194 (48.4%), had moderate access to information on how to prevent unplanned pregnancies while 152 (38.1%) had high access to information on how to prevent unplanned pregnancies. Meanwhile, 44 (11%) had low access to information on how to prevent unplanned pregnancies while 10 (2.5%) had no access at all to information on how to prevent unplanned pregnancies. Table 5.9 presents the extent to which students lacked information on planning for pregnancies.

Table 5.9: Access to information on Planning for Pregnancies

Access to information on unplanned pregnancies	**Rongo University**	**Tom Mboya University College**	**Kisumu Polytechnic**	**Great Lakes University of Kenya**	**Lugari Diploma TTC**	**Alupe University College**	**Bondo KMTC**
Nil	2	5	3	3	0	6	0
Low	16	0	8	3	8	24	0
Moderate	50	52	43	63	42	35	50
High	32	43	47	31	50	35	50

Source: Field data, (2020)

The extent to which respondents had acquired information on how to prevent Sexually Transmitted Infections was also revealed, and it was uncovered that 177 (44.4%) had acquired moderate information on how to prevent Sexually Transmitted Infections while 152 (38.1%) had acquired a high level of information how to prevent Sexually Transmitted Infections. Meanwhile, 56 (14%) had acquired a low level of information on how to prevent Sexually Transmitted Infections while 9 (2.3%) had acquired no information at all on how to prevent Sexually Transmitted Infections. Table 5.10 presents students access to information on Sexually Transmitted Infections.

Table 5.10: Access to information on Sexually Transmitted Infections

Access to information on STIs?	**Rongo University**	**Tom Mboya University College**	**Kisumu Polytechnic**	**Great Lakes University of Kenya**	**Lugari Diploma TTC**	**Alupe University College**	**Bondo KMTC**
Nil	9	1	2	1	0	0	0
Low	63	0	21	5	0	3	1
Moderate	48	7	25	15	7	5	3
High	42	5	27	9	5	4	10

Source: Field data, (2020)

Additional studies also confirmed that students' insufficient sex education contributed to cross-generational sex among university female students (Kheswa &Mahlalela 2014; Poscia *et al*., 2015). The Dean of Students of Kenya Medical Training College Bondo reported that his office was involved in conducting health talks and seminars on HIV; he also added that they made use of technology for example internet and social media. The official at Jaramogi Oginga Odinga Teaching and Referreral hospital also reported that they used Ministry of health websites, use of media to teach Reproductive Health and health matters; and planned sessions orientation when first years students were reporting. The official from Menya Medical Research Institute in Busia shared that in his opinion sex education should be a major subject in the institution and that they provided educative communication materials to support the youth. The Dean of Students of Tom

Mboya University College shared that they held health talk during orientation. Meanwhile The Dean of Students of Lugari Diploma Teachers Training College shared that they posted messages educating on HIV on the notice board while an official of Rongo University reported that they had a facebook student page and Whatsapp peer educators' walls, which they used to disseminate HIV information. Additionally, an official from The Kisumu National Polytechnic commented that Peer Counselors and departmental class representatives held talks with the students at their departments and at orientation for 1st year students on sexual behavior, grooming and others. He added that materials for educational actions were also provided and that wifi was available for students to search for HIV information online. The Rongo University Clinic official reported that they held sensitization sessions on HIV prevention during orientation particularly Abstinence. The official of Rongo University also reported that they also made use of social media through their health representative to share information.

5.4 Counselling and other forms of psycho-social support

Figure 5.3 presents HIV Counseling of Students in Institutions of Higher Learning in Western Kenya.

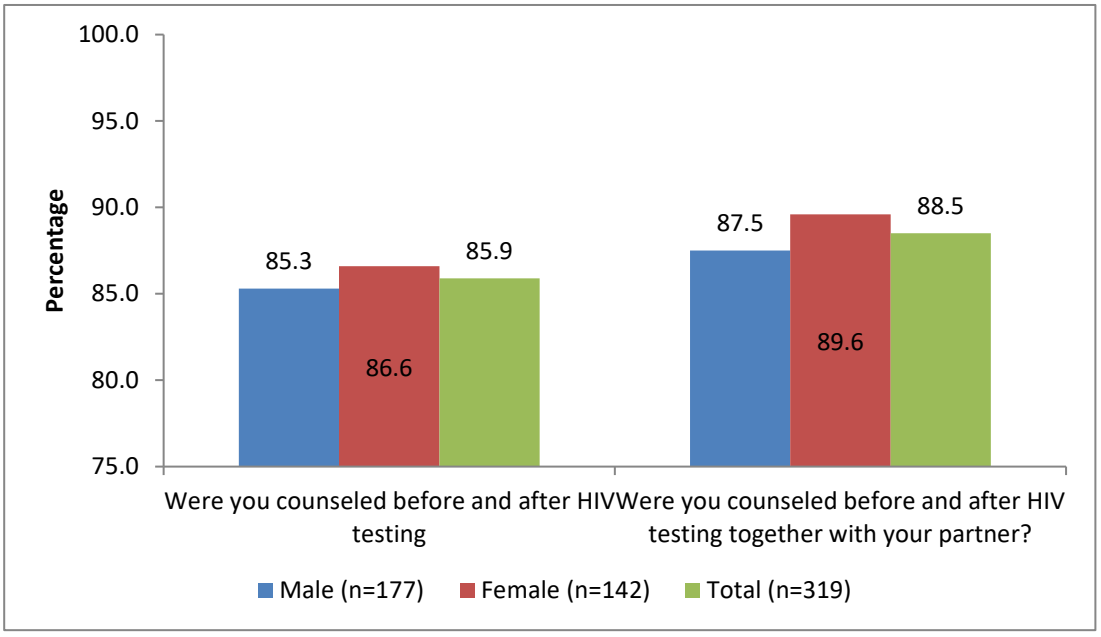

Figure 5.3: HIV counselling of respondents

Source: Field data, (2020)

Out of the 319 students who had engaged in sexual intercourse, there were 177 male students of whom 150 (85.3%) had been counselled after going for a HIV test. Out of the 142 female respondents, 123 (86.9%) had been counselled when they went for HIV tests as an individual. In total, 274 (85.9%) of those who had engaged in sex and went for a HIV test received counselling. There was therefore need for all stakeholders involved in HIV testing to ensure that they all provided HIV counselling to 100% of those students who sought the services. Additionally those who had been counselled together with their partners were 87.5% of men, 89.6% of females and a total of 88.5% of the respondents.

The Dean of Students of Lugari Teachers Training College confirmed that they had a Guidance and Counselling Department in place that provided HIV counseling to the students.

Additional information was sourced from Key Informants. The official from County Government of Migori reported that they did offer counselling and pychosocial support to students in Institutions of Higher Learning but not within the institutions themselves due to stigma. The official of Ampath PLUS Siaya shared that they did offer counseling and psychosocial support to some to students. The official at Bondo Hospital confessed that they provide psychosocial support by monitoring any students, just like any other patient who may have been diagnosed with HIV. The official from Compassion International Kenya a Non-Governmental Organisation in Busia County reported that they had a programme for HIV infected students on how to live positively. Kenya Medical Research Institute also had a Memorandum of Undertanding with Alupe University College to provide services to Alupe University College students. Their official reported that they offered counseling services for students before and after HIV testing.Other than Counselling, psychosocial support was assessed. According to WHO (2009) types of psychosocial support include provision of mental health support for the students, support groups, peer support, collaboration and referrals to various stakeholders, and primary health care services including the distribution of HAART.

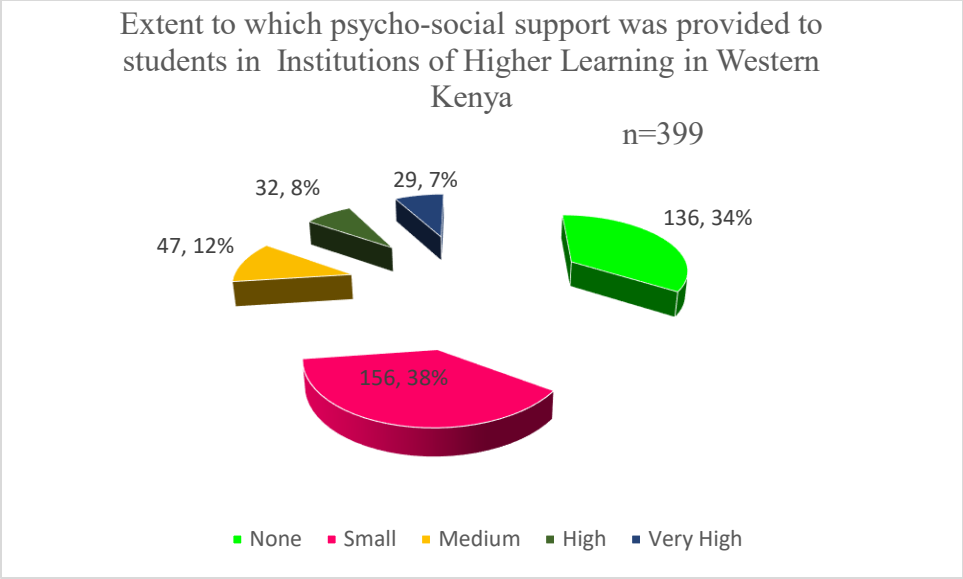

Figure 5.4: Extent to which psycho-social support services were provided to respondents

Source: Field data, (2020)

In the survey, 136 (34%) of students reported that there was no psychosocial support provided to them as students of Institutions of Higher Learning, 156 (38%) reported that services were provided to a small extent, 47 (12%) to a medium extent, 32 (8%) to a high extent and 29 (7%) to a very high extent. The extent to which stakeholders were providing psycho-social support services to students in Institutions of Higher Learning in Western Kenya were therefore found wanting.

The officials who reported that they did not provide psychosocial support to the students regarding HIV included those of; The Kisumu National Polytechnic, Rongo University, Tom Mboya University College, Alupe University College, Great Lakes University of Kisumu and Tom Mboya University College. This demonstrates that most Institutions of Higher Learning were not providing psychosocial support services to students infected or

affected by HIV other than HIV counselling. The organizations other than those earlier mentioned in this section that admitted to providing psychosocial support to students in Institutions of Higher Learning included the dean of Students of Kenya Medical Training College Bondo, The County Government of Kakamega, Homabay Hospital, Jaramogi Oginga Odinga Teaching and Referral Hospital, Alupe Sub-County Hospital, Ampath PLUS Bondo County; County Government of Busia, Nyarami VCT in Migori, *Medicines Sans Frontieres*in Homabay, County Government of Homabay, County Government of Kisumu and County Government of Busia. The dean of students of Kenya Medical Trainng College in Bondo shared that they had psychosocial support groups in the institution. The official at Ampath PLUS Bondo Siaya County also shared that they held psychosocial support groups for HIV positive students. Jaramogi Oginga Odinga Teaching also provided Team Building and Referral Hospital as a form of psychosocial support for students who also complained of a lack of follow-up on the students after counseling had been provided the counseling sessions were usually provided during orientation and there was usually no follow-up after. The official also added that there was a deficiency when it came to policy in providing behavioral interventions.

The official at Kenya Medical Research Institute emphasized guidance and counseling services within Alupe University College were lacking. The Dean of students at Alupe University College though declared that they had a mentorship programme, which served to provide psychosocial support to students infected and affected by HIV. Meanwhile the Alupe University College Dean also shared that they provided guidance and counseling programmes and invited guest speakers from the hospitals to talk to the students.

5.5 Stigma and discriminationreductionprogrammes

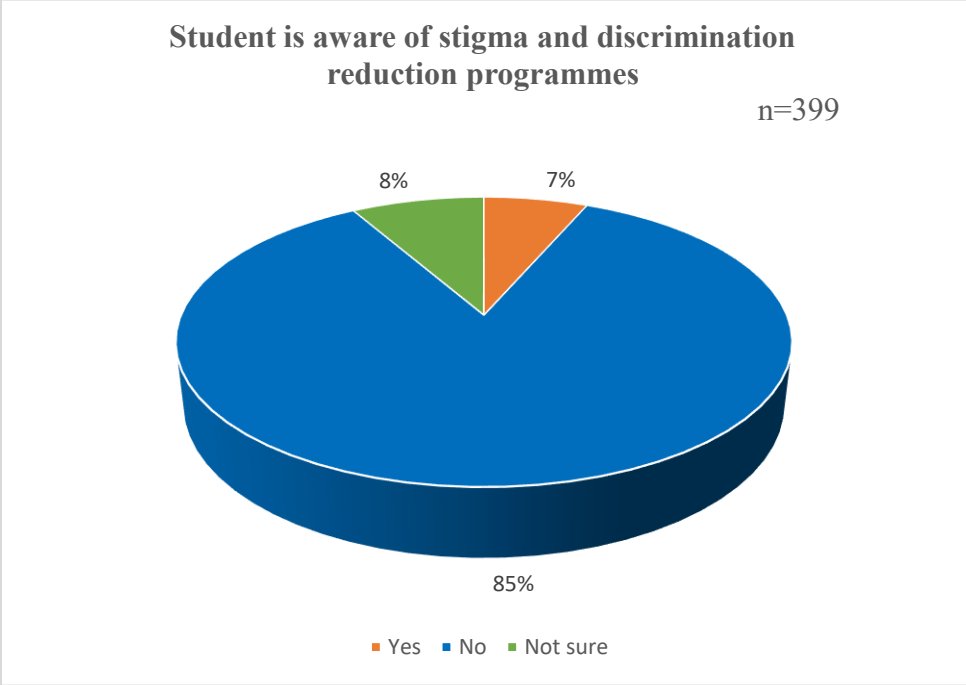

Figure 5.5: Respondents awareness of stigma and discriminationreduction

Source: Field data, (2020)

In the survey, 339 (85%) of students reported that there were not aware of any stigma and discrimination programmes available to them as students of Institutions of Higher Learning, while 28 (7%) were aware. Meanwhile 32 (8%) were not sure of the availability of these programmes. The official from Medicines Sans Frontiers Migori County commented that they have a policy on supervision to remove discrimination and reduce stigma through which they train staff against stigma and discrimination. Grossman & Stangl (2013), report that there is mounting evidence that HIV-related stigma and discrimination are barriers to HIV testing, tosero-status disclosure, to retention in care and uptake of and adherence to antiretroviral therapy (ART). They emphasize that stigma

associated with HIV continues to hamper prevention and treatment efforts. Stigma and discrimination reduction strategies therefore contribute immensely in addressing HIV prevention among students in Institutions of Higher Learning in Western Kenya.

5.6 Challenges in implementing behavioral strategies of HIV prevention

Table 5.11 presents the challenges faced in communicating about Risky Sexual Behavior among students in institutions of higher learning in Western Kenya.

Table 5.11: Challenges faced in communication about HIV Risky Sexual Behaviour

(n=399)

Communication Challenges faced	Nil	Low	Moderate	High
Extent to which respondents had access to behavior change communication	3.3	18.5	49.1	29.1
Extent to which respondents had access to information on how to prevent unplanned pregnancies	2.5	11	48.4	38.1
Extent to which respondents had access to information on STIs	2.5	14	44.4	39.1

Source: Field data, 2020

The Dean of Students of Lugari Diploma Teachers Training College complained that there was need to improve on the provision of guidance and counseling which was a challenge in the institution. Additionally, an official from Bondo Hospital, Siaya County expressed that one of the challenges they experienced with implementing the behavioural Strategies in Institutions of Higher Learning was insufficient finances. This notion was agreed upon by officials from the County Governments of Kakamega, Kisumu and

Homabay and the official from the Jaramogi Oginga Odinga Teaching and Referral Hospital in Kisumu.

The Dean of students of Bondo Kenya Medical Training College complained of a lack of sufficient staff that could implement the behavioural strategies such as providing counseling and psychosocial support, and implementing stigma and discrimination reduction programmes. For counseling particularly, The Kisumu Polytechnic students' counselor complained of a lack of involvement of all student sexual partners when it came to counseling .The official of County Government of Busia also mentioned that there was lack of clarity in policy on the provision of behavioural interventions in Institutions of Higher Learning as a challenge.

Meanwhile, lack of modern ways of providing sexual education was mentioned as a challenge by the dean of students Tom Mboya University. The Dean of students at Kenya Medical Training College in Bondo complained of lack of enough staff to train students, irregular meetings and seminars when it came to implementation of interventions, lack of sufficient time dedicated to these interventions and uncooperative students. The official from Compassion International in Busia also shared that one of the challenges they were facing was that some students assumed that they already had knowledge of what they are being educate on which served as a psychological hindrance in information provision. Meanwhile, the nurse at Lugari Diploma Teachers Training College expressed the difficulty she experienced as dealing with students who were mostly married adults in the institution. The official from Jaramogi Oginga Odinga Teaching and Referral Hospital in

Kisumu further expressed a lack of follow-up guidance and counseling sessions and cases of cases of students after they interacted with them during orientation events in their first year and further complained of low budget allocation and lack of enough funds.

The Rongo University clinic head additionally confessed that there was a lack of capacity regarding guidance and counseling in the clinic and that more money should be added in the budget to enhance provision of behavioural interventions. None of the institutions confessed to provision of stigma and discrimination reduction services, which poses a major challenge.The official of the County Government of Kisumu also shared frustration about inadequate finances, lack of policy implementation in the provision of behavioural interventions and a lack of cooperation between the Ministry of Health and students in Institutions of Higher Learning. Additionally the Dean of Alupe University College reported that;

> Other than organizing talks for the students there is nothing else we can do, since this is a free society students are free to stay where they want and with whosoever they wish to

Stakeholders also need to go through the process of debriefing to encourage them towards mitigation efforts. Table 5.12 presents challenges faced in communicating about Risky Sexual Behaviour in Institutions of Higher Learning in Western Kenya, which is part of a summary of what has been discussed in this section.

Table 5.12: Challenges faced in communicating about Risky Sexual Behaviour

Communication Challenges faced on Risky Sexual Behavior			**(n=399)**	
	Nil%	Low%	Moderate%	High%
Extent to which respondents had acquired Behavior Change Communication at University/College	3.3	18.5	49.1	29.1
Extent to which respondents had acquired information on how to prevent unplanned pregnancies at University/College	2.5	11	48.4	38.1
Extent to which respondents had acquired to information on how to prevent Sexually Transmitted Infections at University/College	2.5	14	44.4	39.1
Extent to which respondents had received information on the relationship between the consumption of psychotropic drugs and Risky Sexual Behavior at the University/College	2.3	12.8	37.8	47.1
Extent to which respondents had received information on the value of the use of Pre-exposure prophylaxis in the reduction of HIV exposure at the University/College	12.3	30.1	31.3	26.3
Extent to which respondents had received information on the value of the use of Post-exposure prophylaxis in the reduction of HIV exposure at the	12.8	29.3	32.1	25.8

University/College				
Extent to which respondents had knowledge on the proper use of condoms from your University/College	5.8	9	22.8	62.4
Extent to which respondents had adequate knowledge on the hazards of abortions	6	11.8	42.1	40.1

Source: Field data, (2020)

5.7 Summary

Information provision has been found to be the most successful behavioural intervention followed by counseling and psychosocial support. Stigma and discrimination reduction programmes were on the other found to be extremely scanty.

CHAPTER SIX

HIV PREVENTION BIOMEDICAL INTERVENTION STRATEGIES IN INSTITUTIONS OF HIGHER LEARNING IN WESTERN KENYA

6.1 Introduction

This chapter presents the findings on the evaluation of the effectiveness of biomedical Strategies employed to mitigate students' HIV Risky Sexual Behaviors in Institutions of Higher Learning, therefore addressing study objective three. In this chapter, the effectiveness of these strategies in reducing HIV Risky Sexual Behavior is evaluated. Data from student questionnaires, Focus Group Discussions and Key Informant Interviews is presented in charts, graphs, tables and descriptive narratives.

6.2 Overall effectiveness of biomedical strategies

Table 6.1 presents biomedical strategies used to Mitigate HIV Risky Sexual Behaviors and students' level of HIV Risky Sexual Behaviors in Institutions of Higher Learning in Western Kenya.

Table 6.1: Biomedical strategies used to mitigate HIV Risky Sexual Behavior

Biomedical interventions Impact on students' sexual and reproductive choices/decisions	**Low sexual risky behaviors (n=130)**	**High sexual risky behaviors (n=269)**	**X2**	**P-value**
Promotion of sex and reproductive	53.4	46.6	16.870	0.000***

health services				
Male and Female Condoms promotion	57.0	43.0	9.943	0.002***
Provision and testing of STIs	61.9	38.1	6.986	0.008***
Provision of ARVs	60.5	39.5	18.048	0.000***
Accessibilityof ARVs for the students				
Health care service providers away from the institution	78.3	21.7	4.969	0.026**
NGOs/CBOs around the institution	22.2	77.8	8.959	0.003***

**p>0.1 **p>0.05 ***p> 0.01 statistically significant between strategies and level of HIV Risky Sexual Behavior*

Source: Field data, (2020)

The p values were used to show the level of significance/differences between the waves. Null hypothesis was rejected if p-values were $p<0.1$ at 90 % confidence level; $p<0.05$ at 95 % confidence level; and $p<0.01$ at 99 % confidence level (meaning there was statistically significant evidence or difference between the low and high Risky Sexual Behaviors among students in reference to background information, and the study objectives.Furthermore, following the Chi-square test In table 6.6, regarding Promotion of sex and reproductive health services the study shows that there is a statistical significance with p-value = 0.000 at among the two categories of HIV Risky Sexual Behavior (High Risky Sexual Behavior and Low Risky Sexual Behavior).

This implies that this mitigation strategy applied is successful in mitigating HIV Risky Sexual Behaviour. In addition, following the Chi-square test In table 6.6, regarding male and females condoms promotion the study shows that there is a statistical significance with p-value = 0.002 among the two categories of HIV Risky Sexual Behavior (High Risky Sexual Behavior and Low Risky Sexual Behavior). This implies that the mitigation strategy applied is successful in mitigating HIV Risky Sexual Behaviour. Moreover, following the Chi-square test In table 6.6, regarding Provision and testing of Sexually Transmitted Infections the study shows that there is a statistical significance with p-value = 0.008 among the two categories of HIV Risky Sexual Behavior (High Risky Sexual Behavior and Low Risky Sexual Behavior). This implies that the mitigation strategy applied is successful in mitigating HIV Risky Sexual Behaviour. Moreover, following the Chi-square test in table 6.6, regarding provision of ARVs the study shows that there is a statistical significance with p-value = 0.000 between the two categories of HIV Risky Sexual Behavior (High Risky Sexual Behavior and Low Risky Sexual Behavior). This implies that this mitigation strategy is successful in helping students in mitigating HIV Risky Sexual Behaviour. In this regard, the strategies employed were successful in linking the students to ARVs at a p-value = 0.026 level with Health care service providers away from the institution at a p-value = 0.003 with NGOs/CBOs around the institution.

The most successful biomedical interventions were found to be the provision of ARVs along with promotion of sex and reproductive health services and provision of HIV counseling and testing services. These were followed by the promotion of male and female condoms and finally the provision and testing of Sexually Transmitted Infections.

The other biomedical interventions such as promotion of Voluntary Medical male Circumcision, provision of needle and syringe programmes and provision of opioid substitution therapy were found to be lacking.

6.3 Male and female condoms promotion

Majority 272 (68.2%) of students in Institution of Higher Learning shared that promotion of male and female condoms were effective while 74 (18.5%) shared that they were somehow effective. A few 53 (13.3%) shared that the male and female condoms promotion was not effective.As much as majority of respondent opinion was that the promotion of male and female condoms was effective, there was still an over 30% gap in achieving maximum condoms promotion effectiveness, which stakeholders need to look into.

In a study carried out by Mbelle *et al*. (2018) done in South Africa, Students exhibited favourable sentiments concerning the use of condoms. The majority of respondents responded that they felt comfortable taking a pack of condoms posted in public locations of campus. However, the issue was on female students who lacked the confidence to take or accept condoms displayed on campus. In addition, the Department of Health's unbranded 'Choice' condoms were odourless and easily accessible. While students accepted the 'Choice' condoms, many preferred and favoured the flavoured brand-name condoms. They stated that if the Department of Health had wished to increase the use of condoms among young people, supplied condoms would have had to compete with branded condom ranges, which appeared more appealing and offered more options than the generic 'Choice' condoms. The lack of condoms for minority groups such as Lesbian,

Gay, Bisexual, Transgender, and Intersexual (LGBTI) students was also noted as a problem. The majority of Lesbian, Gay, Bisexual, Transgender, and Intersexual (LGBTI) students reported feeling excluded from Higher Education and Training HIV and AIDS (HEAIDS) campaigns due to the limited availability of protection techniques such as dental dams and lubricants. Concerning the distribution of condoms, they argued that government programmes had neglected critical communities.

The Key Informants who admitted to having programmes that provided male and female condoms specifically targeting first year students included deans of students of; Tom Mboya University College, Rongo University, Great Lakes University of Kisumu, Alupe University College, Lugari Diploma Teacher Training College; The County Government of Kakamega; Homabay Hospital, Bondo Hospital-Siaya, *Medicines Sans Frontieres* in Migori, Mbita Community Based Organisation, and Compassion International Kenya in Busia County. A Key Informant from Ampath PLUS-Siaya County reported that:

> We have *Freshers* comprehensive health talk where HIV is the main topic. We teach students how to use condoms and how to access condoms

Stakeholders can be seen to be putting effort towards creating awareness on the use of condoms and these efforts should further enhanced. Some Key Informants admitted that they did not have programmes specifically targeting first year students at all. At Ampath PLUS Siaya there was a complaint of condoms usually stocking out. In studies conducted by other researchers, Higher Education and Training HIV Programme(2010) in South Africa reported that HIV prevalence increased with age. According to Blignaut *et al.*

(2010), these figures highlighted the importance of specifically targeting first-year students to help ensure that they did not become infected with HIV.The onset of tertiary education is reported to be an especially vulnerable stage for young peopleby (Selikow *et al*., 2009; Mutinta, 2012; Blignaut *et al*., 2015) who confirmed the immense pressure on the students to engage in HIV Risky Sexual Behaviors at this time. Blignaut *et al*. (2015) added that to compound the issue many students come from schools where they had not received adequate and accurate information about HIV.A Key Informant from the Tom Mboya University College clinic reported thata high population of students does not use condoms therefore they are at risk of getting HIV. In the Focus Group Discussions held with students from Rongo University, a female participant reported that condoms were distributed in hostels on campus but were only spotted once or twice per semester, which was insufficient. Once they were placed in the morning, by evening they were finished. The students were nevertheless happy with the type of condoms they were given.In the Focus Group Discussion held with participants from Lugari Diploma Teachers Training College, a male participant expressed that there were free condoms available on campus within the hostels and they were happy with the service through he expressed that he felt that the availability of condoms increased immorality. Meanwhile in the Focus Group Discussion held with students from Kenya Medical Training College in Bondo and the one held with participants from Great Lakes University of Kisumu, condoms were reported to be available on campus and that they were sufficient in supply. Furthermore, a participant from Great Lakes University of Kisumu expressed that he liked the provided condoms at his College.

The dean of students of Lugari Diploma Teachers Training College reported that there was provision of condoms in strategic places within the campus while the official at Alupe hospital confessed that they had condoms provision for the students along with health talks. At the Kisumu National Polytechnic and official reported that there is a health director whose committee is given condoms for distribution to the students. He also added that they also put condoms in the washrooms for students.

6.4 Provision of Sex and Reproductive Health Services

The provision of Sex and Reproductive Health services in Institutions of Higher Learning was also considered. Majority 275 (67%) of the respondents admitted that sex and reproductive Health Services were provided to them while a low number 56 (14%) shared that these services were not provided for them. Another 67 (17%) was uncertain about these provisions. Figure 6.1 demonstrates the extent to which students in Institutions of Higher Learning accessed Sexual and Productive health Services.

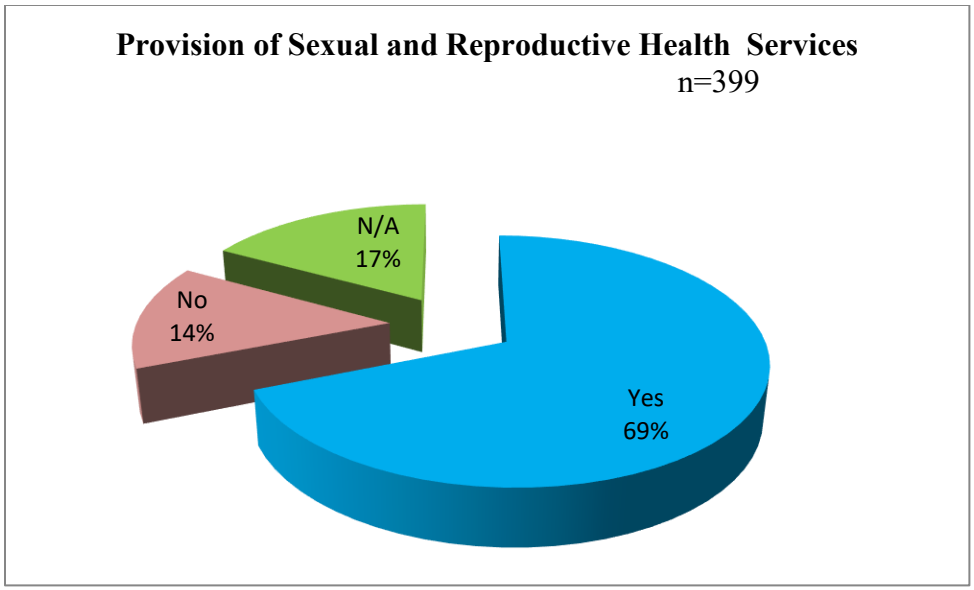

Figure 6.1: Extent of respondentsaccess toSRH Services
Source: Field data, (2020)

Table 6.1 demonstrates motivation for students when accessing Sexual and Reproductive Health and HIV health care centers within or outside the College or University.

Table 6.2: Motivation for respondents in accessing SRH and HIV health care centers

	Male (n=202)	Female (n=197)	Total (n=399)
Students' motivation			
Time spent to be served	6.9	4.6	23 (5.8)
Access to medication	45.0	50.3	190 (47.6)
Competency of staff	5.4	8.6	28 (7.0)
Professionalism of staff	28.2	21.3	99 (24.8)
Other please specify	14.4	15.2	59 (14.8)

Source: Field data, 2020

It was discovered that time spent to be served affected 23 (5.8%) of the respondents of whom 14 (6.9%) were male while 8 (4.6%) were female. Access to medication affected 190 (47.6%) of the respondents of whom 99 (50.3%) were female while 91 (45.0%) were male. Competency of staff affected 28 (7.0%) of the respondents of whom 11(5.4%) were male while 17 (8.6%) were female. Professionalism of staff affected 99 (24.8%) of the respondents of whom 42 (21.3%) were female while 57 (28.2%) were male. There were other factors that motivated students when making a decision to access Sexual and Reproductive Health and HIV health care centers within or outside the College or University and these affected 59 (14.8%) of the respondents of whom 30 (15.2%) were female while 29 (14.4%) were male. These included; Privacy, confidentiality, anonymous location, to know HIV and health status, get more information on Sexual and Reproductive Health /HIV.

The majority 243 (60.9%) of students reported that there were dedicated spaces for students where they could access HIV and Sexual and Reproductive Health provisions. Just over one fifth, 90 (22.6%) reported that there were no dedicated spaces while 66 (16.6%) did not know whether these spaces existed or not.The majority 118 (59.9%) of female students reported that there were dedicated spaces for students where they could access HIV and Sexual and Reproductive Health Knowledge. Over one fifth 93 (23.4%) reported that there were no dedicated spaces while 67 (16.8%) did not know whether these spaces existed or not. The majority 125 (61.9%) of male students reported that there were dedicated spaces for students where they could access HIV and Sexual and Reproductive Health Knowledge.

One fifth 87 (21.8%)reported that there were no dedicated spaces while 65 (16.3%) did not know whether these spaces existed or not.From the Key Informants the following officials of organizations admitted to having set aside dedicated spaces where students of Institutions of Higher Learning could have access to Sexual and Reproductive Health information; Compassion International Kenya in Busia County, Tom Mboya University College at their clinic, County Government of Kisumu, County Government of Homabay, County Government of Migori-in nearby health facilities, Bondo Kenya Medical Training College, The Kisumu National Polytechnic, Lugari Diploma Teacher Training College, Alupe University College-at Kenya Medical Training Institute, Great Lakes University of Kisumu and AMPATH PLUS Bondo-Siaya County.

For those officials who reported that these dedicated spaced did not exist, they were; Homabay Hospital, Rongo University, Jaramogi Oginga Odinga Teaching and Referral Hospital Kisumu County, Alupe Hospital Busia, AMPATH PLUS, Bondo Siaya, County Government of Busia, Mbita Community Based Organization Homabay,Medicines Sans Frontiers Migori.Government of Kisumu official also said that they offered Sexually Transmitted Infections and Family Planning programmes to the students. The official from Medicines Sans Frontiers Non-Governmental Organisation in Migori reported that they offered safe abortion, contraceptives, and menstrual hygiene programmes.On the other hand, A Key Informant from Bondo Hospital mentioned that they provided the *Linda Mama* programme for pregnant students and he reported that:

> *Linda Mama* provides a package of Basic Health Services accessed on the basis of need and not ability to pay. It ensures that pregnant women and infants have access to quality and affordable health services

A health official gave a dissimilar report from Alupe Sub-County Hospital who reported that they had no Sexual and Reproductive Health programmes for the students. Officials of Jaramogi Oginga Odinga Teaching and Referral and Homabay Hospitals reported to also offer the "*Linda Mama*" programme, and the "*Afya Halisi*", programme that provides Ante Natal Care and Outreach programmes to students of Institutions of Higher Learning.

The County Government of Kakamega official reported that all mothers, students of Institutions of Higher Learning included could access Maternal Child Health care, Prevention of Mother to Child Transmission and Ante Natal Care. The County Deans of students also reported as follows; Tom Mboya University College said that they offered family planning and guidance and counselling; while Rongo University said they provided Reproductive Health Care in partnership with Marie Stopes and the Rongo Referral Hospital.According to the male respondents, 17 (8.3%) had gotten their partners pregnant while for the female respondents, 16 (8%) had ever been pregnant. For female students, 5 (2.3%) had experiences a miscarriage/abortion while studying at the University/College.

There are female respondents who had ever been pregnant at University/College. These were 32 (16%) of the female respondents. Half, 16 (50%) were from Rongo University;

1(3.1%) from Tom Boya University College, 5 (15.6%) from The Kisumu National Polytechnic, 1(3.1%) from Great Lakes University of Kisumu, 3 (9.3%) from Lugari Diploma Teacher Training College, none from Alupe University College and 6 (18.7%) from Bondo Kenya Medical Training College. Table 6.3 displays pregnancies among respondents while figure 6.2 presents miscarriages and or abortions among respondents.

Table 6.3: Pregnancies among respondents

	Female students: Have you ever been pregnant?							**Total**
	Rongo University	**Tom Mboya University College**	**The Kisumu National Polytechnic**	**Great Lakes University of Kenya**	**Lugari Diploma TTC**	**Alupe University College**	**Bondo KMTC**	
No	77	9	46	19	3	7	4	165
Yes	16	1	5	1	3	0	6	32
Total	**93**	**10**	**51**	**20**	**6**	**7**	**10**	**197**

Source: Field data, (2020)

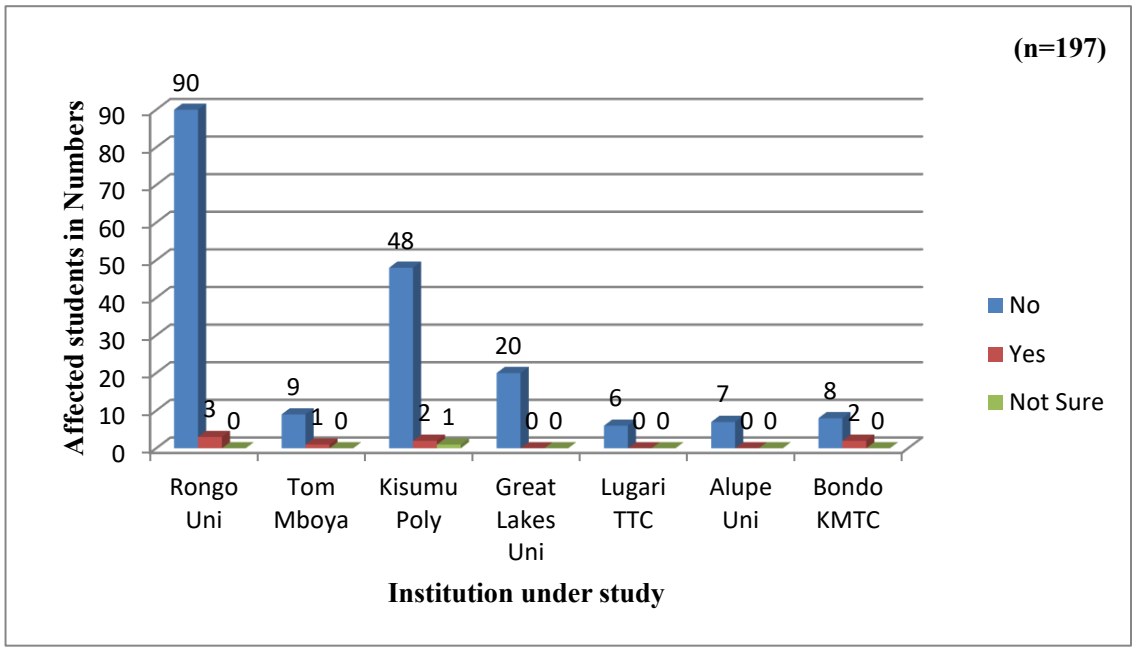

Figure 6.2: Miscarriages/Abortions among respondents

Source: Field data, (2020)

A female participant in the Rongo University Focus Group Discussion reported that Emergency Contraception was readily available at a cost to them in the chemists around campus but were not provided within campus. Nevertheless, contraceptive pills were available on campus at the clinic. In the Lugari Teachers Training College Focus Group Discussion, a female participant expressed that no contraceptives were available on campus. She expressed that availability of contraceptives would encourage promiscuity. Contraception use is one of the HIV risk-reduction measures considering that complications after unsafe abortions were responsible for causing 13% of maternal deaths in Kenya (Nduvi, 2015).

In a similar study carried out by Kara *et al.* (2019),there was relatively low utilization of contraception among female students in Institutions of Higher Learning in Dodoma, Tanzania, despite majority of the participants having knowledge of contraception. This seems to be a trend around Sub-Saharan Africa seeing, that a similar study carried out in Namibia by Mutsindikwa *et al.* (2019) also showed poor practices towards contraception from majority of the student population. It is therefore an issue of concern that in this study, the use of non-condom contraception was low among the respondents with majority 195 (61.2%) not ever having used any modern contraceptive method. To make the situation direr, over one third of respondents 99 (31.1%) had not discussed contraception methods with any of their sexual partners. For those who used contraception, condoms were the most preferred with 285 (89.3%) of users followed by the Emergency Contraception with 173 (54.3%) of users.

Oral pills were used by 102 (32%)and *depo provera/*injection by 81 (25.3%). Implants were used by 55 (17.3%) while the Intra Uterine Device was used by 26 (8%) of respondents. That the Emergency Contraception as opposed to longer term methods being more popular is a cause for concern as researchers point out the risks of using the Emergency contraception more than once or twice yearly. It also presents a negative picture on preparedness for sexual encounters by the students. Considering the high numbers of sexually active respondents, the uptake of contraception should be much higher. Regarding Key Informants on provision of contraception; The Dean of students at Bondo Kenya Medical Training College mentioned that his office provided condom distribution and family planning programs for both men and women. Figure 6.3 presents

contraception provision among sexual active students in Institutions of Higher Learning in Western Kenya.

An official from the Jaramogi Oginga Odinga Teaching and Referral hospital expressed that they provided Ante Natal Care for pregnant mothers, which could also be accessed by the students around the hospital.They also held community outreach programs for the students of sexual and reproductive health. They additionally ran the Linda mama and Afya Halisi programmes through which students also benefitted. Meanwhile the Tom Mboya University College Dean of students confessed that they provided Family planning services distributed condoms. An official of The Kisumu National Polytechnic confessed that they provided Sexually Transmitted Infections programmes, birth Control, cervical cancer screening and that free WIFI is available to ease access to Sexual and Reproductive Health information. At Rongo University, the clinic head shared that Sexual and Reproductive Health outreaches were done within the institution by the organisation Marie-Stopes (AMUA).

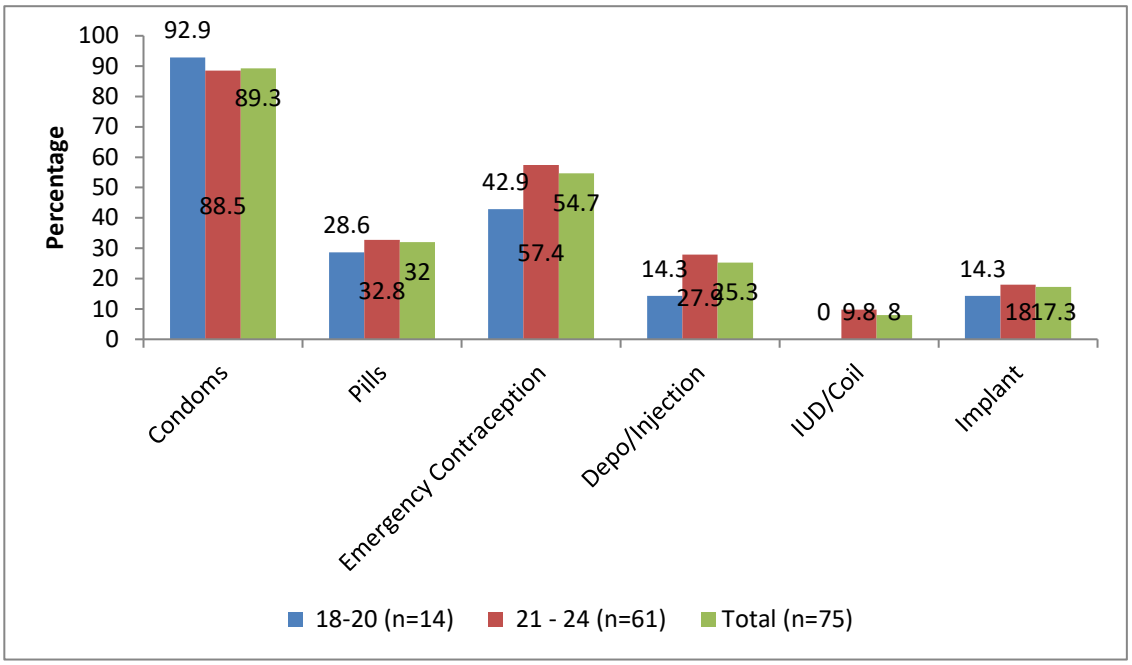

Figure 6.3: Contraceptive provisions among sexual active respondents

Source: Field data, (2020)

6.5 Promotion of Voluntary Medical Male Circumcision

Unfortunately, according to the survey, Focus Group Discussions and Key Informants, none of the institutions or organizations that took part in the research promoted Voluntary Medical Male Circumcision. This study poses a challenge to stakeholders to commit to strategies that will promote Voluntary Medical Male Circumcision among students in Institutions of Higher Learning in Western Kenya. This is particularly for pure scientists who are trained to provide majority of biomedical HIV prevention strategies.

6.6 Provision of Antiretroviral Drugs

A majority, 195 (96.5%) of males and 190 (96.4%) of females had knowledge of Antiretroviral Drugs were while 3 (2.5%) of females and an equal percentage of males did not have knowledge about Antiretroviral Drugs were. Similarly 2 (1.0%) of males

and a similar percentage of females did not know what Antiretroviral Drugs were.Figure 6.4presents the knowledge of Antiretroviral Drugs among students and provision of Antiretroviral Drugs by Institutions of Higher Learning.

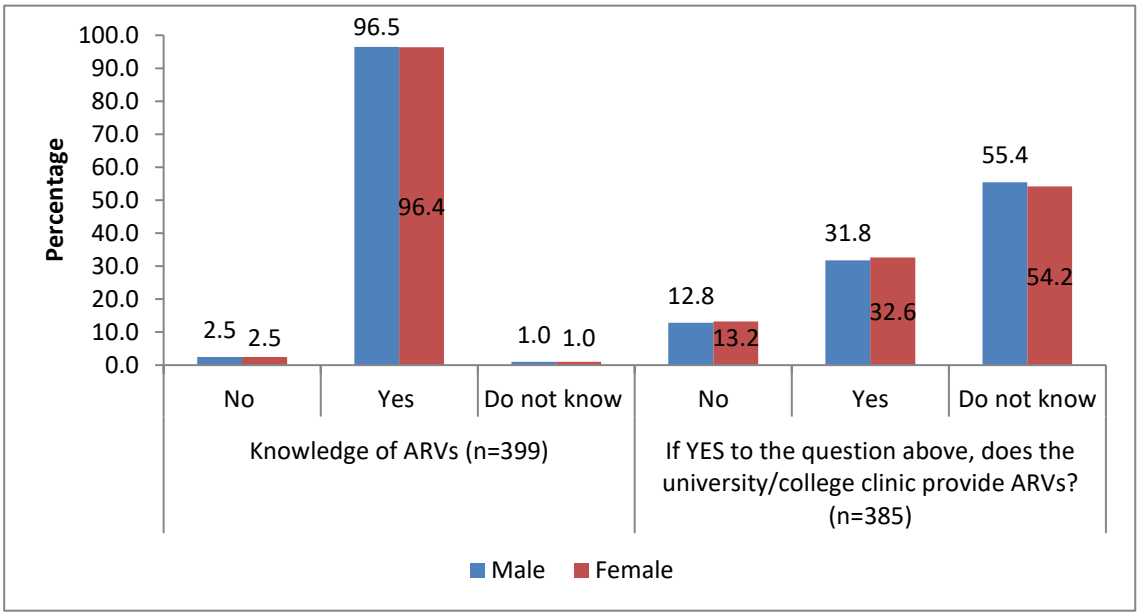

Figure 6.4: Sources of Antiretroviral Drugs

Source: Field Data, (2020)

Just over one quarter 26 (12.8%) of males and 26 (13.2%) of females reported that their Institutions of Higher Learning did not provide Antiretroviral Drugs; 64 (31.8%) of males and 64 (32.6%) of females reported that their Institutions did provide Antiretroviral Drugs. Meanwhile 112 (55.4%) of males and 107 (54.2%) of females did not know whether their institutions provided these Antiretroviral Drugs or not. Majority of students 270 (67.6%) reported Health Care providers around their Institutions as being sources of Antiretroviral Drugs. Over one third 143 (35.9%) mentioned their University or College clinic as a source of Antiretroviral Drugs. A fifth 83 (20.9%) mentioned health Care

providers outside their Institutions of Higher Learning. A few 9 (2.3%) cited Non-Governmental Organizations and or Community Based Organizations while much fewer 3(0.8%) cited Faith Based Organizations.

Table 6.4: Sources of Antiretroviral Drugs

Access to Antiretroviral Drugs	**Male (n=202)**	**Female (n=197)**	**Total (n=399)**
University/College Clinic	32.2	39.6	35.9
Health care service providers around the institution	72.3	62.9	67.6
Health care service providers away from the institution	17.3	24.4	20.9
NGOs/CBOs around the institution	2.0	2.5	2.3
FBOs around the institution	1.5	0.0	0.8

Source: Field Data, 2020

Furthermore the extent to which respondents had received information on the value of the use of PReP towards the reduction of HIV exposure was noted. Pre-exposure prophylaxis (or PrEP) is a way for people who do not have HIV but are at a very high risk of getting HIV to prevent HIV infection by taking a pill every day (Stutts *et al*., 2020). Of all the respondents, 49 (12.3%) of the respondents had not received information on the value of the use of PReP in the reduction of HIV exposure, while one-third 120 (30.1%), and had received a low level of information. Just over one third 125 (31.3%) had received a moderate level of information while just over one quarter 105 (26.3%) received a high level of information from their University or College.

Table 6.5: Information on the use of PReP

Level on use of PReP	**Rongo University**	**TM Univ. College**	**Kisumu Poly**	**GL UK**	**Lugari TTC**	**Alupe**	**KMTC Bondo**
Nil	11	10	21	1	2	2	0
Low	27	62	40	9	2	4	1
Moderate	36	3	21	10	7	7	9
High	26	3	21	15	1	4	12

Source: Field Data, (2020)

Additionally, the extent to which respondents had received information on the value of the use of PEP was noted. Post-exposure prophylaxis (or PEP), is a short course of HIV medicines taken very soon after a possible exposure to HIV to prevent the virus from taking hold in one's body while (Liu *et al.*, 2014). Access to information on the value of PEP towards reduction of HIV exposure was realized to be high in a quarter 103 (25.8%) of the respondents, low in about one third 117 (29.3%) of respondents, moderate in just over one third 128 (32.1%) of respondents and nil in 23 (5.8%) of respondents.

6.7 Provision of HIV testing and counselling services

Just more than a tenth 45 (11.3%), of the students had not received counseling when they went for a HIV test yet professional HIV counseling greatly helps in the reduction of HIV risk and transmission as emphasized by Noll *et al*. (2020). In Focus Group Discussion

held with Bondo Kenya Medical Training College students, counseling services were reported to be wanting on campus.

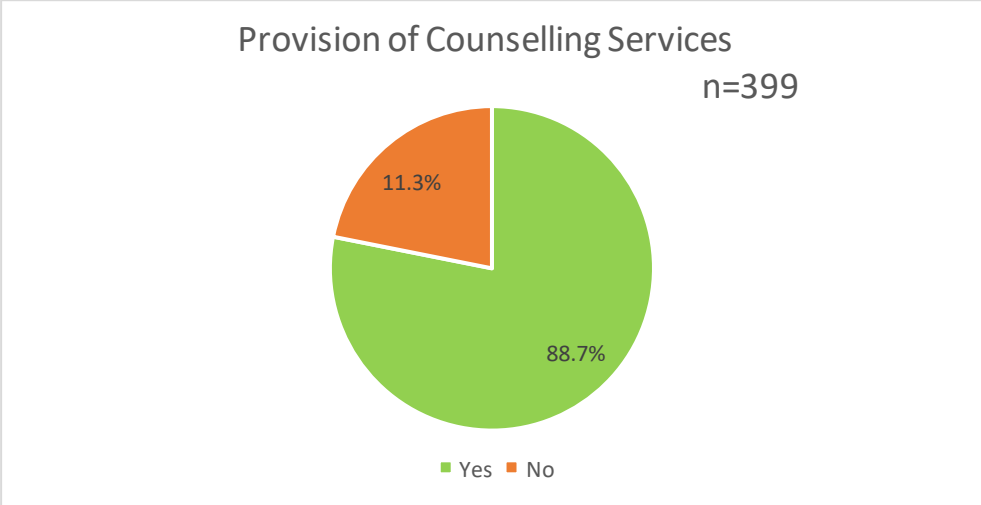

Figure 6.5: Provision of counselling services

Source: Field data, (2020)

Knowing one's status is one of the measures used in the prevention against the spread of HIV as through knowledge of one's status, a person can take control to prevent the spread of the disease to others if tested positive and or maintain a negative HIV status if tested negative . Mbugua & Karonjo (2018) who affirmed that lack of testing posed high risk in the spread of HIV echoed this thought. In the Focus Group Discussion held with

At Rongo University students reported that testing kits for HIV were sufficient and that students were comfortable with the location of the testing center according to a male participant. Nevertheless, familiarity with staff at the centre-discouraged students from being tested for HIV within the campus facility according to a female participant. Some of the staff was harsh when they saw students frequenting the clinic as they accused

frequenters of engaging in HIV Risky Sexual Behavior according to a female participant. Some of the staff were also unfriendly thus discouraging the students from visiting the facility for Sexual and Reproductive Health Services according to a male participant.

In the Focus Group Discussion held with participants from Lugari Diploma Teacher Training College, a male respondent said that HIV testing was weak as students had to go outside the College to a nearby Hospital for testing. A female student added that there was no facility within the institution providing HIV testing services. Among the respondents in this study, 16 (4%) had never tested for HIV. Close to half 180 (45.1%) of students mentioned that knowing their status did not change their behavior suggesting that testing alone or knowing one's status did not significantly reduce HIV risk. This is a significant percentage of students who seem not to be affected by knowledge of their status weather positive or negative. Regarding HIV testing, a Key Informant from the Health Department County Government of Busia reported that:

> Initially we had planned to be carrying out HIV testing services as outreaches to the Universities and Colleges but the experience was not good. Only those who frequently test themselves come for testing but majority of students shy away from the service and therefore the yield was so poor

It is therefore vital that relationships among stakeholders are strengthened for the benefit of students. An official at the Kenya Medical Research Institute shared that they provided HIV Testing Services for Alupe University College students. Officials of the County Government of Homabay and Kakamega also confessed to providing HIV testing for students in Institutions of Higher Learning within their County. The dean of Students of The Kisumu National Polytechnic reported that his office offered HIV testing for

students. All the officials representing the Health Care centers outside the Institutions of Higher Learning reported that they provided HIV testing for the students. Li *et al*. (2017, 2020) found that the rate of active HIV test was low, probably due to the ongoing impact of stigma and discrimination associated with HIV infection. On the contrary just as was found in this study, according to Mokgatle & Madiba (2017) the uptake of HIV testing was high among the students, with almost three-quarters indicating that they had been tested in the past year.

6.8 Provision oftesting and treatmentof Sexually Transmitted Infections

An official from The County Government of Migori shared that they conducted Sexually Transmitted Infections screening of which students in Institutions of Higher Learning were beneficiaries. The Bondo Hospital Siaya official also shared that they held Sexually Transmitted Infections prevention awareness. Meanwhile the official from Compassion international Kenya Busia reported that they held trainings on STIs and how these affected the education and health of the students. The official from the County Government of Kisumu also shared that they held Sexually Transmitted Infections programmes for students in Institutions of Higher Learning. The official from Migori County said that they offered Family Planning programmes and Sexually Transmitted Infections screenings and treatment.

6.9 Provision of Needle and Syringe Programmes

Unfortunately, none of the institutions or organizations that took part in the research provided Needle and Syringe Programmes. This study poses a challenge to stakeholders

to commit to strategies that will provide Needle and Syringe Programmes for students in Institutions of Higher Learning in Western Kenya.

6.10 Provision of Opioid Substitution Therapy

Unfortunately, none of the institutions or organizations that took part in the research provided Opioid Substitution Therapy. This study poses a challenge to stakeholders to commit to strategies that will provide Opioid Substitution Therapy for students in Institutions of Higher Learning in Western Kenya.

6.11 Summary

Promotion of sex and reproductive health services and provision of ARVs were found to be the most effective followed by promotion of male and female condoms and provision and provision and testing of STIs and then followed by provision and testing of Sexually Transmitted Infections. Provision of needle and syringe programmes and opioid substitution therapy were found to be extremely scanty in Institutions of Higher Learning in Western Kenya.

CHAPTER SEVEN

HIV PREVENTION STRUCTURAL INTERVENTION STRATEGIES IN INSTITUTIONS OF HIGHER LEARNING IN WESTERN KENYA

7.1 Introduction

This chapter presents the findings on the evaluation of the effectiveness of structural strategies that are employed to mitigate students' HIV Risky Sexual Behaviors in Institutions of Higher Learning in Western Kenya, therefore addressing study objective four, which is the last objective of the study. Structural interventions seek to address underlying factors that make individuals or groups vulnerable to HIV infection. These underlying factors could be social, economic, political or environmental (Avert, 2021). Data from student questionnaires, Focus Group Discussions and Key Informant Interviews is presented in charts, graphs, tables and descriptive narratives.

7.2 Availability of structures to address gender inequalities

Key Informants shared information regarding interventions by their institutions on structures to address gender inequalities among students in Institutions of Higher Learning in Western Kenya. The official from Ampath PLUS Siaya shared that their organisation offers Sexual and Gender Based Violence screening for these students. Other than that there are no other reports of structures to address gender inequalities in Institutions of Higher Learning. The survey did not reveal much regarding structures to address gender inequalities among students in Institutions of Higher Learning. It is clear that this is one of the largest loopholes in mitigating HIV Risky Sexual Behaviour among these students and therefore vital that stakeholders invest in the provision of structures to

address gender inequalities among the same students.Ghanotakis*et al*. (2012) in a related study points to a growing body of evidence suggesting that gender inequality affects the ability of women and girls to protect themselves from HIV, prevent unintended pregnancies and access and continue to use HIV prevention, care and treatment services. It is therefore important that if students are to be protected from HIV, if pregnancies are to be prevented, if female students are to access and continue to use HIV prevention, care and treatment services, structures must be put in place to ensure gender equality among them. Stakeholders must therefore commit to filling this huge intervention gap.

7.3 Availability of structures addressing violence and violations of human rights

From the survey, a few respondents 19 (6.0%) reported that they had engaged in physical violence while on campus. Engagement in physical violence was minimal with Rongo University having 11(7.2%) of its population having engaged in physical violence, Tom Mboya University College 1(5.2%), 5 (5.8%) for The Kisumu National Polytechnic, and 2(10.5%) for Bondo Kenya Medical Training College. It can be seen that Institutions of Higher Learning are thus successful in controlling the occurrence of physical violence in campuses as its occurrence is low. Table 7.1 presents students' engagement in physical violence. Gomez Camargo *et al*(2014) in a related study alluded that a history of physical violence was related to involvement in HIV Risky Sexual Behavior. This therefore alludes that the containment of physical violence within Institutions of Higher Learning may have assisted in the mitigation of HIV Risky Sexual Behavior in the current study.

Table 7.1:Respondents' Engagement in Physical Violence

Institution under study	No	Yes
Rongo University	141	11
Tom Mboya University College	18	1
The Kisumu National Polytechnic	80	5
Great Lakes University of Kenya	25	0
Lugari Diploma TTC	10	0
Alupe University College	9	0
KMTC Bondo	17	2

Source: Field data, (2020)

On the other hand as violence occurs in many forms, there are respondents who have experienced Sexual and Gender Based Violence (SGBV) in one way or another. Over one third, 55 (36.1%) of respondents of Rongo University have had sexual intercourse where somebody is physically forcing them, hurting them, or threatening them. This is a high occurrence of rape among respondents of Rongo University denoting the urgent need for stakeholders to step in and mitigate the occurrence of rape in this institution. Meanwhile, for Tom Mboya University College it is 4 (19%)who have had sexual intercourse where somebody is physically forcing them, hurting them, or threatening them. For The National Kisumu Polytechnic it is 25 (24.5%), for Great Lakes University of Kisumu

they are 4 (11.42%), for Lugari Diploma Teacher Training College 4 (33.3%), Alupe University College 7 (63.6%), while for Bondo Kenya Medical Training College none were reported to have been raped. Occurrences of rape are particularly high for Alupe University College where majority of students have experienced rape. In this regard, stakeholders also need to focus on Lugari Diploma Teacher Training College and The National Kisumu Polytechnic. The occurrences of rape need to be urgently looked into by stakeholders. Systems need to be put in place by stakeholders to protect potential rape victims. Institutions also need to be well lit in the night and security patrolled day and night. The prescence of CCTV cameras may also help to discourage the occurrences of rape. Figure 7.1therefore presents occurrences of rape among students.

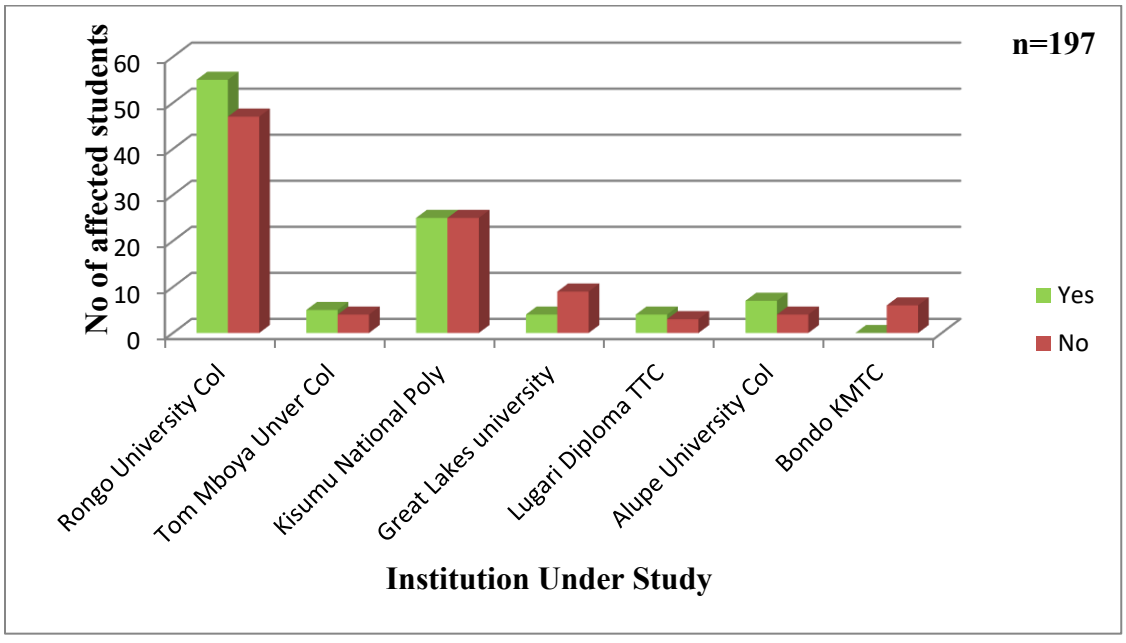

Figure 7.1: Occurrences of rape among respondents

Source: Field data, (2020)

Meanwhile, for 38 (19.3%) of respondents someone had made attempts to stroke, fondle or kiss them. This is sexual harassment. Stakeholders need to ensure that institutions have working sexual harassment policies in place in each institution and they must be active in ensuring that these policies are used as an instrument to protect students from sexual harassment. Over one third, 39 (20 %) of respondents of Rongo University have experienced sexual harassment. For Tom Mboya University College it is 4 (19 %), for The National Kisumu Polytechnic it is 29 (28.4%), for Great Lakes University of Kisumu they are 17 (48.5%), for Lugari Diploma Teacher Training College 5 (41.6%) and 6 (35.2%) for Bondo Kenya Medical Training College.

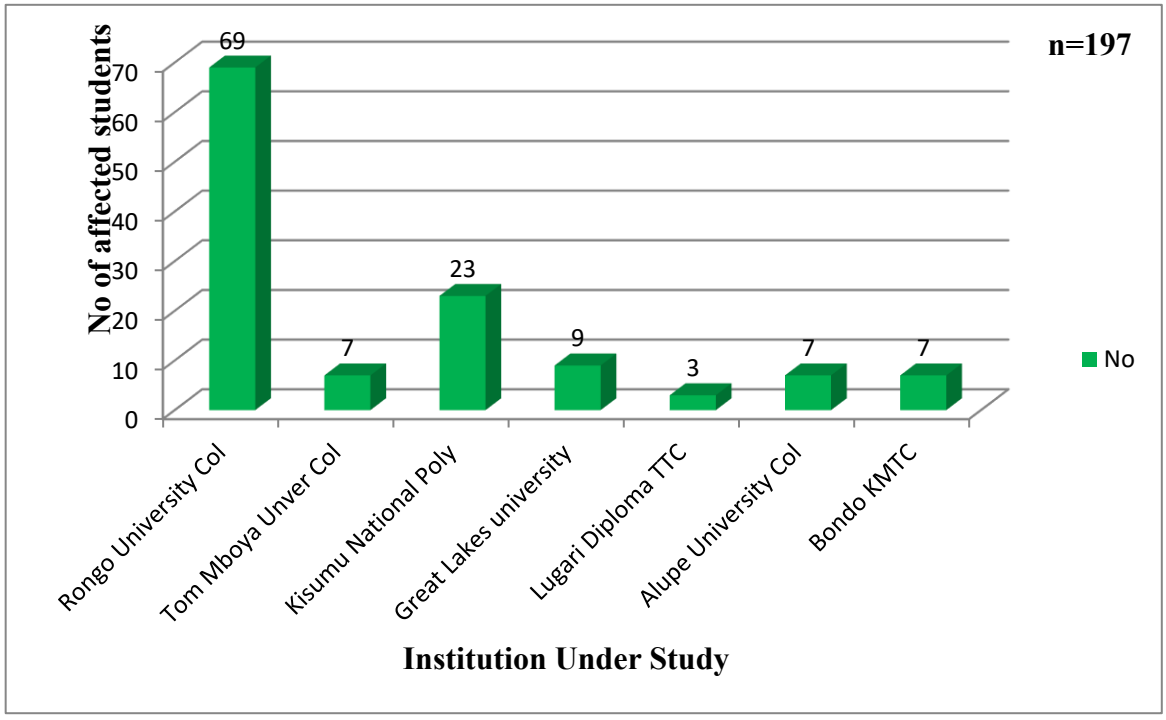

Figure 7.2: Sexual harassmentof respondents

Source: Field data, (2020)

The occurrence of sexual harassment is high and therefore stakeholders need to inverst better in efforts to mitigate its occurrence. Figure 7.2 presents occurrences of sexual harassment among students.

On another note, some students have been treated badly for refusing to have sex hence faced retaliation. This includes students who have refused to give in to sex for marks. Stakeholders need to empower students to speak up when experiencing such retaliation and put mechanisms in place to punish the perpetrators.Over one third, 48 (24.6 %) of respondents of Rongo University had experienced sexual retaliation. For Tom Mboya University College it was 3 (14.2 %), for The National Kisumu Polytechnic it was 25 (24.5 %), for Great Lakes University of Kisumu they are 7 (20 %), for Lugari Diploma Teacher Training College 7 (58.3%) and 10 (58.8%) for Bondo Kenya Medical Training College and 2 (16.6%) at Alupe Diploma Teacher Training College were reported to have been affected in this regard. Figure 7.4 presents occurrences of sexual retaliation among student.Close to a third of all the respondents 109 (27.3%) did not know where to report in the event they were victims of Sexual and Gender Based Violence thus exacerbating the occurrence as perpetrators may know that victims are unaware of where to report and victims may be discouraged to report as they are ignorant of where to do so.

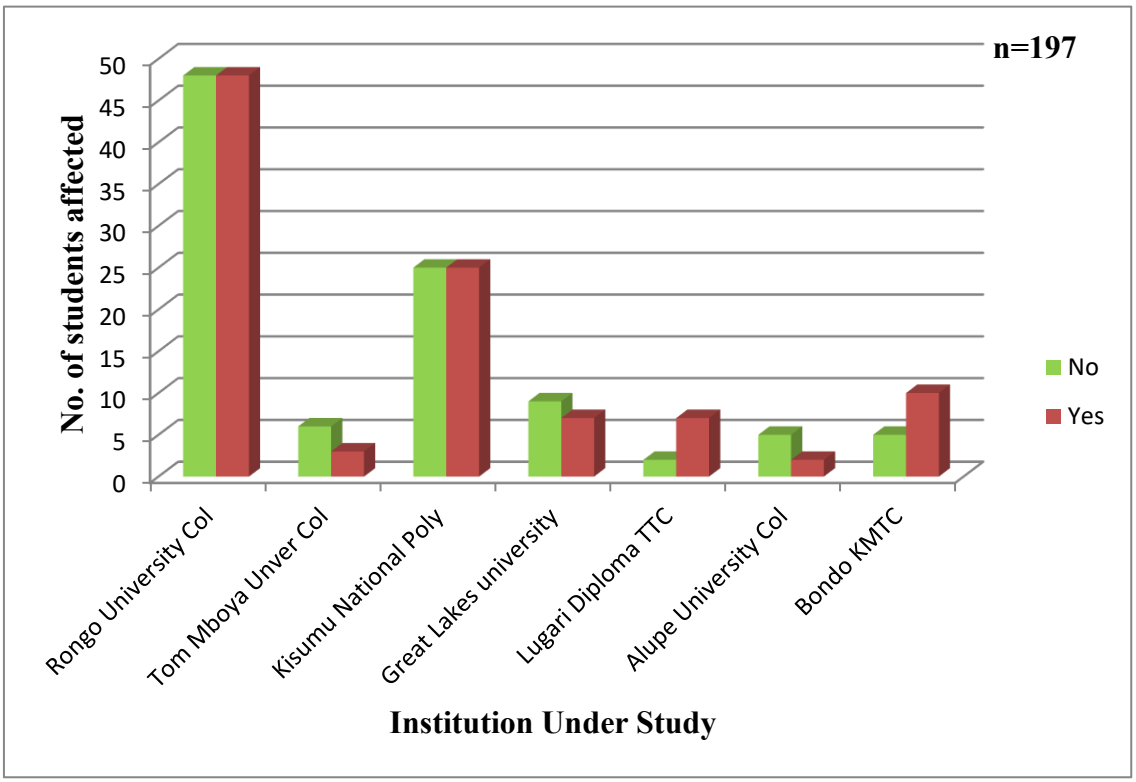

Figure 7.3: Sexual retaliationof respondents

Source: Field data, (2020)

7.4 Availability of structures addressing homophobia

From the survey, on the availability of structures to address homophobia, there were no affirmative reports found. Nevertheless, the dean of Students of Lugari Diploma Teachers Training College commented that they have rules and regulations within their HIV policy to regulate HIV- related discrimination. Meanwhile the official of Ministry of Health of Migori County complained of challenges of frequent change of policies, infrequent meetings due to cost implications, overriding activities whereby sometimes there are so many activities to be implemented at the same time, unpredictable calendars of Institutions of Higher Learning caused by strikes and a lack of focus on drugs and

alcoholinitiatives. The official at Bondo Hospital on the hand reported of success in mitigation efforts through good support provided by both County and National governments. The official also praised policies and guidelines by the Ministry of Healththat he said are effective and also applauded the regular campaigns within Siaya County both physical and through local TV and radio stations.The County Government of Kakamega official reported that they have an Ante Natal Care policy through which the expectant mothers are given care and attention to safeguard newborn babies. They also reported that they have a Maternal and Child Health policy where both mother and child are given antiretroviral care and health support from which students benefit.Meanwhile the Nyarami VCT official reported that they have a policy on supervision to addressHIV discrimination but also faced challenges such as low funds from donors; lack of physical infrastructure; inconsistence in activities targeting university students; andpolicy documents on guidance being few or not clear. The official from Homabay County also reported of there being numerous health facilities in all sub-counties, which increases access to SRH, care for students. Meanwhile the official from Jaramogi Oginga Odinga Teaching and Referral hospital commented that they have HIV prevention policies and HIV and Sexually Transmitted Infections control policiesand alsoused youthful providers to provide services to students.All the mentioned policies, programmes and facilities work together to improve students access to SRH care which in turn contributes to reduction of HIV Risky Sexual Behaviour.

The dean of students of Tom MboyaUniversity College also shared that the institution's HIV policy has been drafted and is awaiting council approval. He confessed that there are few trainings that the organization gives on mitigation of HIV RiskySexual Behaviour at

the same time adding that poor internet connection also aggravates this challange. He expressed that most activities are not moving because of policies that have not yet been approved and approved policies that are not appropriately implemented and that there was no budget allocated for the management of the HIV programme.The dean of students at Lugari Diploma Teachers Training College added that there is a challenge of insufficient staff training and additionally thelong process it has taken for the HIV policy to be approved. Rongo University is reported to have a HIV policy which is new but is to be reviewed every 5years while for The Kisumu National Polytechnic the HIVpolicy which existsis to be reviewed every 3 years and is reported to have conformed to NACC regulations in Maisha I and II.It is also vital that stakeholders provide structures that ensure that students feel safe when accessing HIV and Sexual and Reproductive Health services.Table 7.2therefore presents points students felt they got adequate anonymity about discussing HIV.

Table 7.2: Points respondents get anonymity discussing HIV

Point of adequate anonymity	**Male (n=202)**	**Female (n=197)**	**Total (n=399)**
University/College clinic	18.3	14.7	16.5
A VCT within the university but away from the clinic	13.9	14.2	14.0
Aids Control Unit (ACU) at the University/College	1.0	2.0	1.5
VCT outside the University/College	31.2	34.0	32.6

Hospitals/health care centers around the University/College	22.8	26.4	24.6
FBO/Church/Mosquearound the University/College	2.0	5.1	3.5
NGO/CBO around the University/College	8.4	1.5	5.0
Other Specify	2.5	2.0	2.3

Source: Field Data, 2020

Almost one third 130 (32.6%) of students felt that they got most anonymity about discussing HIV and Sexual and Reproductive Health issues at HIV Counselling and Testing Centres that are outside the university or college. Regarding where students got anonymous services, hospitals/health care centers were preferred by 98 (24.6%) of the students; 66 (16.5%) cited clinics in their universities or colleges. Majority 56 (14%) cited HIV Counselling and Testing Centres within the university but away from the clinic. Meanwhile, 20 (5%) cited Non Governmental Organizations/Community Based Organizations around the University/College 14 (3.5%)Faith Based Organizations; 9 (2.3%) cited family, safe student/open spaces, friends, seminars and workshops/clubs; 6(1.5%) the Aids Control Unit as places where students got anonymous services.Figure 7.4 gives a summary of the role of Management and the extent to which students felt they responded to mitigating HIV Risky Sexual Behavior among students in Institutions of Higher Learning in Western Kenya.

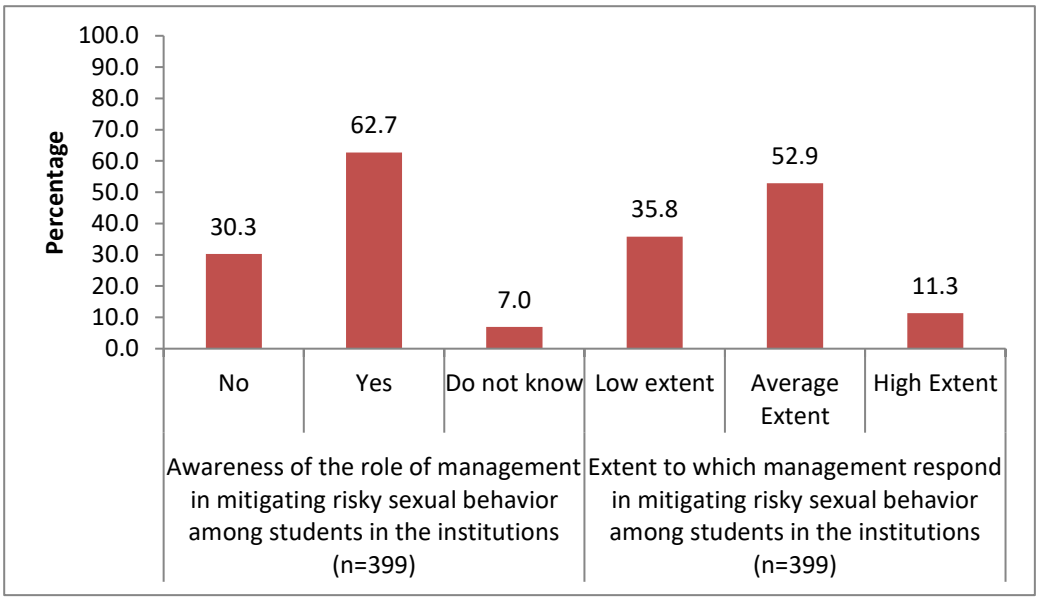

Figure 7.4: Role of management in response to mitigating Risky Sexual Behavior

Source: Field Data, (2020)

A majority 250 (62.7%) of respondents were aware of the role that management of Institutions of Higher Learning played in the mitigation of HIV Risky Sexual Behavior among students in Institutions of Higher Learning. One-third 121 (30.3%) of respondents were not aware of the role of management while 28 (7%) did not know about the role of management in mitigating Risky Sexual Behavior.According to the respondents, the extent to which management responded in mitigating HIV Risky Sexual Behavior among students was 211 (52.9%) to a moderate extent, 143 (35.8%) to a low extent and 45 (11.3%) to a high extent.

It was also observed that the extent to which respondents had knowledge on the relationship between the consumption of psychotropic drugs and HIV Risky Sexual Behavior was high among 188 (47.1%) of the respondents, moderate among 151 (37.8%)

of the respondents, low among 51 (12.8%) of the respondents while9 (2.3%) of respondents had no idea about the relationshipon the relationship between the consumption of psychotropic drugs and HIV Risky Sexual Behavior.

Table 7.3: Absence of a dress code effect on sexual behavior

Level of Dress code effect	Rongo Univ.	Tom Mboya Univ. College	The Kisumu Nat. Poly	Great Lakes Univ. of Kisumu	Lugari Diploma TTC	Alupe University College	KMTC Bondo Campus
Nil	27	14	25	36	33	12	5
Low	28	14	18	23	8	18	27
Moderate	30	52	16	23	50	47	45
High	15	19	42	29	8	24	23

Source: Field Data, (2020)

Table 7.4: Presence of a dress code affect on sexual behavior

Presence of dress code on sexual behavior	Rongo Univ.	Tom Mboya Univ. College	The Kisumu Nat. Poly	Great Lakes Univ. of Kisumu	Lugari Diploma TTC	Alupe Univ. College	KMTC Bondo Campus
Nil	27	14	26	20	25	12	9

Low	28	14	22	37	25	18	32
Moderate	31	57	25	26	25	47	50
High	13	14	28	17	25	24	9

Source: Field Data, (2020)

Challenges that existed from regulations targeting Risky Sexual behavior were also looked into. The extent to which the absence of a dress code affected the sexual behavior of respondents was discovered to be high among 95 (23.8%) of respondents, moderate among 116 (29.1%) of the respondents, low among 93 (23.3%) of respondents and nil among 95 (23.8%) of respondents. Meanwhile, the extent to which the presence of a dress code affected their sexual behavior was found to be high among 71 (17.8%) of respondents, moderate among 128 (32.1%) of respondents, low among 105 (26.3%) of the respondents and low among 95 (23.8%) of the respondents.

Students furthermore suggested recommendations as revealed in table 7.5

Table 7.5: Respondents' suggested ways of mitigating Risky Sexual Behavior

Mitigating Risky Sexual Behavior mechanism	N=399	
	Number	Percentage %
Increasing funds	51	12.8
Creation of social media groups/platforms	97	24.3
Invite speakers	106	26.6
Public awareness	241	60.4
Employ experienced/courageous personnel	83	20.8
Distribute merchandise	63	15.8

Introduce active clubs/programmes	69	17.3
Use peer educators	174	43.6
Offer ARVs	47	11.8
Improve confidentiality in facilities	88	22.1
Increase time	46	11.5
Improve programmes	83	20.8
Create awareness on existing programs	89	22.3
Strengthen curriculum	88	22.1
Discontinue peer educators	9	2.3
Introduce abortion care in the university/college	22	5.5
Other/Specify_____	110	27.6

Source: Field Data, (2020)

There were various recommendations that the students made on how they felt that Risky Sexual Behavior could be mitigated in Institutions of Higher Learning in Western Kenya.A few 51 (12.8%) proposed looking for ways to increase funds to students to prevent them from engaging in Risky Sexual Behavior; 97(24.3%) proposed creation of social media groups or platforms; 106 (26.6%) proposed inviting speakers to the institutions to educate the students on Risky Sexual Behavior; a majority 241 (60.4%) of the students suggested that the institutions should create public awareness on Risky Sexual Behavior; those who suggested that the institutions employ experienced and courageous personnel were 83 (20.8%); those who suggested the stakeholders should distribute merchandise such as T-shirts were63 (15.8%); those who suggested that

stakeholders introduce active clubs or programs were 69 (17.3%); those who suggested the use of peer educators were 174 (43.6%); those who suggested that the institutions should offer Antiretroviral drugs were47 (11.8%); those who suggested that institutions to improve confidentiality in facilities 88 (22.1%); respondents who suggested that more time be increased towardsprovision of programmes were 46(11.5%); those who suggested the programmes currently provided be improved were83 (20.8%); those who suggested that awareness should be created on existing programmes were 89 (22.3%) ; those who suggested that strengthening of the curriculum should be done were 88 (22.1%) ; those who suggested that peer educators should be discontinued were 9 (2.3%); those who suggested that abortion care should be introduced in the University or College were 23 (5.5%).

7.5 Summary

A majority (62.7%) of respondents were aware of the role that management of institutions of higher learning played in the mitigation of risky sexual behavior among students in institutions of higher learning. One third (30.3%) of respondents were not aware of the role of management while 7% did not know about the role of management in managing risky sexual behavior.According to the respondents, the extent to which management responded in mitigating risky sexual behavior among students was 52.9% to an average extent, 35.8% to a low extent and 11.3% to a high extent. Figure 6.1 gives a summary of the role of management and the extent to which students felt they responded to mitigating risky sexual behavior among students in Institutions of Higher Learning in Western Kenya.

CHAPTER EIGHT

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

8.1 Introduction

This study sought to evaluatethe strategies used in the mitigation of HIVRisky Sexual Behavior among students of Institutions of Higher Learning in Western Kenya.Specifically, it first determined the nature and extent of HIV Risky Sexual Behavior.The study thenevaluated the effectiveness of behavioural, biomedical and structural intervention strategies.The researcher interviewed students and key stakeholders and conducted Focus Group Discussions with students to derive the results that have been discussed.

8.2 The nature and extent of HIV Risky Sexual Behavior

The results show that slightly over a third 130 (32.6%) of the respondents in Institutions of Higher Learning in Western Kenya are involved in LOW HIV Risky Sexual Behaviors while 269 (67.4%) of the respondents in Institutions of Higher Learning in Western Kenya are involved in HIGH HIV Risky Sexual Behaviors. There is therefore urgent need for stakeholders to improve on the mitigation efforts currently offered and provide the missingones to prevent HIV incidence rising to 67.4% in these institutions.

Regarding demographic characteristics, the study shows that there is a highly statistically significant difference with p-value = 0.003 betweenthe institution the student studies at and HIV Risky Sexual Behavior. The study also found p-value = 0.027 betweencounties

the student studies atand HIV Risky Sexual Behavior and;p-value = 0.07 betweenage of the studentand HIV Risky Sexual Behavior. Additionally, the study foundp-value = 0.075 betweensex of the respondent andp-value = 0.075 betweensexual orientation of the student,and HIV Risky Sexual Behavior. This means that these demographic factors are significant in determining HIV Risky Sexual Behaviour among students and stakeholders should consider them when implementing mitigation strategies.

For analysis, the studydeveloped a HIV Risky Sexual Behavior index scoredetailed in section 2.6.5 and shown in table 4.5. The index categorized HIV Risky Sexual Behavior into two (2) categories namely: 1: Low HIV Risky Sexual Behavior and 2: High HIV Risky Sexual Behavior.The study found the mean rate of involvement in HIV Risky Sexual Behaviour to be 31.3%.According to the index, alcohol and drug consumption, transactional sex, commercial sex work, watching pornography and cross-generational sex all scored HIGH. These behaviour are the ones that the students are highly involved in.

The study also found out that of the 399 students who participated in the study, 319 (80%) had prior sexual experience to the survey period. A majority of students were thus sexually active. Only less than half 138 (43.3%) of respondents, used a condom all of the time that they had sex, while a majority 178 (56.4%) only used a condom sometimes or used a condom incorrectly. A majority (56.7%) of students are therefore exposed to contracting HIV inconsistent and improper condom use. Additionally, just above half of the total number of students were in a sexual relationship at the time the study was taking place. The study also found students to have an average of one sexual partner each and

therefore students are largely monogamous.Of those who have tested for HIV in this study, a majority 208 (70.2%) have been tested together with their partner which is a positive indicator in HIV risk reduction as both parties were targeted for HIV testing instead of just one.

Just more than a quarter 106 (26.6%), of students admitted to taking alcohol while majority 256 (64.2%), admitted to knowing at least one student who took marijuana. The consumption of drugs is thus high. Specifically, the extent to which the presence of an alcohol service point on campus affects students' access to alcohol is viewed as high by majority 275(68.9%). In this study, Tom Mboya University College has the most sexually active students who consume alcohol at 68.4% followed by Bondo Kenya Medical Training College at 52.6%, and Rongo University at 38.1%. Great Lakes University of Kisumu has the least 4 (16%). Lugari Diploma Teacher Training College and Alupe University College have no sexually active students who consume alcohol. Most alcohol consumed by sexually active students is atnightclubs. Of all the institutions, students at Rongo University prefer drinking at a nightclubthe most 31 (53.4%). Regarding the consumption of marijuana, Tom Mboya University College has the highest number of students who consume marijuana (80.9%) and Alupe University College the least 4 (23.5%).

Out of the total number of students, 45 (11.3%) reported that they had used sharp objects or needles to inject themselves. Out of this number, 20 (5%) admitted to sharing these sharp objects.Nevertheless, there were no reported interventions found during the study

specifically for those sharing sharp objects.On the other hand, for this study, the male population is the one that was found to pose the HIV sexual risk in regards to Early Sexual Debut. Nevertheless, the variable is found to lowly contribute to HIV Risky Sexual Behavior among students in Institutions of Higher Learning in Western Kenya as it did not occur at a high rate particularly among the female respondents.

8.3 HIV preventionbehaviouralinterventionstrategies

This study reveals that students in Institutions of Higher Learning in Western Kenya havehigh-level information on HIV.There are 225 (56.4%) of students who have high level HIV knowledge. On the contrary, those who havehigh-level information on Sexual and Reproductive Health are 143 (35.8%). Stakeholders are found to be thus putting more focus on providing students with HIV knowledge and not putting as much effort on provision of Sexual and Reproductive Health knowledge, which is counter-productive in the fight against HIV.

Majority of the students 116 (51.1%) received most of their HIV and Sexual and Reproductive Health information from the curriculum and or lecturer. What students, learned most from stakeholders was to use protective measures to reduce Risky Sexual Behavior by 252 (63.4%). Stakeholders used an array of methods to provide HIV, Sexual, and Reproductive Health information to students. The one most cited by students is social media platforms such as Facebook, Whatsapp and Instagram at 289 (72.4%). Students also shared that they preferred an array of methods for receiving HIV and Sexual and Reproductive Health information. The one most cited by students also were

social media platforms such as Facebook, Whatsapp and Instagram by 177 (44.3%) of respondents.

Regarding HIV counselling, 274 (85.9%) of those who have engaged in sex and went for a HIV test havereceived counseling. Those who have been counselled together with their partners are the majority353 (88.5%) of the respondents. Furthermore, the extent to which stakeholders were providing psychosocial support services to students in is found wanting. More effort needs to be invested by stakeholders to better the strategy. Most institutions are failing to fill this HIV-prevention gap.

The extent to which stakeholders are providing stigma and discrimination reduction programmes to students in Institutions of Higher Learning in Western Kenya isalso found wantingas only the official from Nyarami VCT Migori County commented that they have a policy on supervision to remove discrimination and policy on stigmareduction. An official from Bondo Hospital, Siaya County expressed that one of the challenges they experience with implementing the behavioural strategies in Institutions of Higher Learning is insufficient finances. This notion was agreed upon by officials from the County Governments of Kakamega, Kisumu and Homabay and the official from the Jaramogi Oginga Odinga Teaching and Referral Hospital in Kisumu.

8.4 HIV prevention biomedical intervention strategies

A few 53 (13.3%) of respondents shared that male and female condoms promotion was not effective. Furthermore, Majority 275 (67%) of the respondents admitted that Sex and Reproductive Health Services are provided to them. In as much as the use of

contraception is fundamental in the prevention of unwanted pregnancies and Sexually Transmitted Infections, in this study, 16 (8%) of female students had been pregnant in College or University.Meanwhile 6 (2.3%) admitted to having had a miscarriage or abortion while in college or university and likewise 17 (8.3%) of male students admitted to having got their partners pregnant in college or university indicating non-use or improper use of contraceptives.

Furthermore, just more than a tenth 45 (11.3%), of the students had not received counseling when they went for a HIV test yet professional HIV counseling greatly helps in the reduction of HIV risk and transmission as emphasized by Noll *et al*. (2020). Unfortunately, none of the institutions or organizations that took part in the research provideNeedle and Syringe Programmes. Also unfortunately, none of the institutions or organizations that took part in the research provide Opioid Substitution Therapy. An official from the County Government of Migori shared that they conducted Sexually Transmitted Infections screening of which students in Institutions of Higher Learning were beneficiaries. The Bondo Hospital Siaya official also shared that they held Sexually Transmitted Infections prevention awareness. Meanwhile the official from Compassion international Kenya Busia reported that they held trainings on Sexually Transmitted Infections.

8.5 HIV preventionstructuralinterventionstrategies

The survey did not reveal much regarding structures to address gender inequalities among students in Institutions of Higher Learning. It is therefore vital that stakeholders invest in the provision of structures to address gender inequalities among students in Institutions of Higher Learning.As the occurrence of physical violence is low, it isappreciated that

Institutions of Higher Learning are successful in controlling the occurrence of physical violence in campuses. Stakeholders need to continue and further enhance these efforts in controlling violence.In the current study there are respondents who had experienced Sexual and Gender Based Violence (SGBV) in one way or another. For 38 (19.3%), someone had made attempts to stroke, fondle or kiss them while for 30 (15.3%), they had been treated badly for refusing to have sex hence faced retaliation. Close to a third of all the respondents 109 (27.3%) did not know where to report in the event they were victims of Sexual and Gender Based Violence. The cases of rape, sexual harassment and sexual retaliation particularly affecting female students in Institutions of Higher Learning in Western Kenya must be urgently addressed.The survey did not reveal much regarding structures to address violation of human rights among students in Institutions of Higher Learning. It is vital that stakeholders invest in the provision of structures to address violence and violation of human rights in Institutions of Higher Learning.

The survey did not reveal much regarding structures to address homophobia and HIV-related discrimination among students in Institutions of Higher Learning. It is vital that stakeholders invest in the provision of structures to address homophobia and HIV-related discrimination in Institutions of Higher Learning.A majority 250 (62.7%) of respondents were aware of the role that management of Institutions of Higher Learning played in the mitigation of HIV Risky Sexual Behavior among students in Institutions of Higher Learning. One-third 121 (30.3%) of respondents were not aware of the role of management while 28 (7%) did not know about the role of management in mitigating Risky Sexual Behavior. It is vital that all Students in Institutions of Higher Learning in

Western Kenya are informed on the role of management when it comes to the mitigation of HIV Risky Sexual Behaviour.

From Key Informants, the official from Ampath PLUS Siaya shared that their organization offers Sexual and Gender Based Violence screening for students in Institutions of Higher Learning. Other than that there were no other reports of structures to address gender inequalities in Institutions of Higher Learning. The survey also did not reveal structures to address gender inequalities among students in Institutions of Higher Learning. There is urgent need to set up structures that gender inequalities among students in Institutions of Higher Learning in Western Kenya.The Dean of Students of Lugari Diploma Teachers Training College commented that they had rules and regulations within their HIV policy to regulate HIV-related discrimination.

Almost one third 130 (32.6%) of students felt that they got most anonymity about discussing HIV and Sexual and Reproductive Health issues at HIV Counselling and Testing Centres outside the University or College. Hospitals/Health Care Centers were cited by 98 (24.6%) of the students; 66 (16.5%) cited clinics in their universities or colleges. Majority 56 (14%) cited HIV Counselling and Testing Centres within the university but away from the clinic. A few 20 (5%) cited Non Governmental Organizations/Community Based Organizations around the University/College, 14 (3.5%)Faith Based Organizations; 9 (2.3%) cited Family, Safe student/open spaces, friends, seminars and workshops/clubs; 6(1.5%) Aids Control Unit. Students preferred to look for HIV and Sexual and Reproductive Health services away from campuses and this

needed to be addressed such that students would eventually find campus to be a safe space.

8.6 Conclusions

i. There is bound to be a spike in incidence of HIV among students in Institutions of Higher Learning if the loopholes identified in strategy provision are not addressed by stakeholders in good time. The Country is likely to regress to 2015statistics when majority 60% of cases were of young people. The gains that have already been made will have thus been lost taking us seven (7) years back.

ii. Regarding the HIV Behavioural intervention strategies theseinterventions are found to be successful in helping students to mitigateHIV Risky Sexual behaviour in Institutions of Higher Learning in Western Kenya. The most successful has been found to be information provision followed by counseling and psycho-social support. Stigma and discrimination reduction programmes were on the other found to be extremely scanty.

iii. Regarding the HIV Biomedical intervention strategiespromotion of sex and reproductive health servicesand provision of ARVs are the most effective followed by promotion of male and female condoms and then followed byprovision and testing of Sexually Transmitted Infections.Provision of needle and syringe programmes and opioid substitution therapy are found to be extremely scanty in Institutions of Higher Learning in Western Kenya.

iv. There is an extremely serious challenge in the provision of structural HIV interventions. These include availability of structures to address gender

inequalities among students,availability of structures addressing violence and violation of human rights among students and availability of structures addressing homophobia and HIV-related discrimination among students.

8.7 Recommendations

i. Based on the first study objective, stakeholders implementing strategies shouldmove with haste to address HIV Risky Sexual Behaviour identified. There is bound to be a spike in incidence of HIV among students if the loopholes identified are not addressed in good time. Western Kenya have to particularly regard institutions, counties, age, sex and sexual orientation of the students into interventions planning as these variables have been found to be significant on HIV Risky Sexual Behaviour in Institutions of Higher Learning in Western Kenya.

Strategies need to be cognizant of the higher population of male students and enhance interventions targeting them. Additionally the particular female students who may not be aware of the link between HIV Risky Sexual Behaviour and HIV need to have specific attention given to them regarding interventions. Due to the relatively high number of homosexual representation at Kenya Medical Training College - Bondo; and bisexual representation at Rongo University, heightened strategies targeting these key populations in these institutions need to be enforced.

Additionally, interventions need to continue to focus on ensuring that students in Institutions of Higher Learning in Western Kenya maintain monogamy in sexual relationships as they are doing. It is also vital that stakeholders ensure the control of

alcohol service points around Institutions of Higher Learning in Western Kenya. These service points should not be too accessible and available to the students.Stakeholders are further encouraged to continue toprovide and further enhance interventions that encourage students in Institutions of Higher Learning in Western Kenya to test for HIV together with their partners.

As the rate of marijuana consumption has been found to be particularly high, stakeholders need to put more effort on interventions that will successfully address the consumption of marijuana by reducing it.The high rate of alcohol consumption by students at Rongo University also needs to be addressed by stakeholders. Most alcohol consumed by sexually active students is at Tom Mboya University College while none is consumed at Lugari Diploma Teachers Training College. Stakeholders are therefore encouraged to borrow the strategies applied at Lugari Diploma Teachers Training College to be applied at Tom Mboya University College and other institutions facing a similar predicament.

As night clubs are the most popular places where students in Institutions of Higher Learning consumed alcohol, it is important for stakeholders to emphasize on strategies addressing the consumption of alcohol particularly targeting the night clubs that students frequent.There is also urgent need to come up with interventions that cater to students who share sharp objects in all Institutions of Higher Learning in Western Kenya.The interventions that have been employed to delay sexual debut among students in Institutions of Higher Learning in Western Kenya should continue to be applied and stakeholders should work with those engaged in interventions at Secondary School level to further strengthen these interventions.Stakeholders should further put emphasis on

strategies that increase the consistent uses of both male and female condoms among students in Institutions of Higher Learning in Western Kenya. Furthermore, the training on how to use condoms correctly should be emphasized and regularly carried out. Stakeholders should furthermore continue putting emphasis on strategies that help students stay in long-term sexual relationships and to stay faithful to one sexual partner.

Stakeholders should also put emphasis on strategies that encourage students in Institutions of Higher Learning in Western Kenya to test together with those they are in a sexual relationship with and implement strategies that create an enabling environment for students to be open with their sexual partners about their HIV status. There is also an urgent need for stakeholders to come up with better or improved strategies to address cross-generational sex, commercial sex,and transactional sex among students at Institutions of Higher Learning in Western Kenya. The strategies that are already being applied need to be revamped.As there are limited reported strategies that had been put in place to address the watching of pornography among the students, it is vital that stakeholders prioritize strategies specific to this act.

It is paramount that stakeholders also increase their efforts in providing Sexual and Reproductive Health knowledge to students as they also ensure that an increased number of them have access to high knowledge on both HIV and Sexual and Reproductive Health. Stakeholders are also encouraged to therefore continue offering students information on the link between HIV Risky Sexual Behaviour and HIV and at the same time enhance their efforts in order to optimize them.

There is need for Institutions of Higher Learning to review curricula accordingly to increase students' level of HIV and Sexual and Reproductive Health information to an optimum level. Furthermore, stakeholders need to focus on social media platforms and see how best they can be used to communicate HIV and Sexual and Reproductive Health information.

ii. Regarding study objective two, stakeholders are found to be putting more focus on providing students with HIV knowledge at the expense of providing them with Sexual and Reproductive Health knowledge as well which is counter-productive in the fight against HIV. It is important that all (100%) of the students have high-level knowledge on HIV. Therefore, it is important for the Institutions of Higher Learning in Western Kenya to improve upon their provision of HIV information to both female and male students to a point at which all students and of both genders is highly informed on HIV.

There is need for all stakeholders involved in HIV testing to ensure that they all provide HIV counseling to 100% of those students who sought the services.More effort needs to be invested by stakeholders to better interventions in providing stigma and discrimination reduction programmes to students in Institutions of Higher Learning in Western Kenya.There isfurther need for all stakeholders involved in HIV testing to ensure that they all provide HIV counseling to 100% of those students who seek the services.Additionally more effort needs to be invested by stakeholders inproviding psychosocial support services,Stigma and Discrimination Reduction Programmes to students.Since only less than half of the

respondents, used a condom correctly and all of the time that they had sex there is need to enhance interventions that frequently train students in Institutions of Higher Learning on correct condom use. Additionally, since a majority of respondents only used a condom sometimes when they had sex there was also need to enhance efforts on interventions to increase the uptake of contraception and PReP. The recommendation is further emphasised by the finding that almost a third of married respondents confessed to having had extra marital sex without a condom.

iii. Regarding study objective three, as much as Majority 275 (67%) of the respondents admitted that sex and reproductive Health Services are provided to them, this provision is not sufficient and has to be increased.Stakeholders need to create a safer environment within Institutions of Higher Learning for students to access ARVs as opposed to feeling they have to access them off-campus.Opportunities for HIV counselling interventions also need to be increased. This study poses a challenge to stakeholders to commit to strategies that will provide Needle and Syringe Programmes, Opioid Substitution Therapy and Voluntary Medical Male Circumcision among students in Institutions of Higher Learning in Western Kenya.

iv. Regarding study objective four, stakeholders need to urgently focus on and implement structures to address violation of human rights among students and structures to address homophobia and HIV-related discrimination among students. It is vital that stakeholders invest in the provision of structures to address gender inequalities among students in Institutions of Higher Learning. It is appreciated

that Institutions of Higher Learning are successful in controlling the occurrence of physical violence in campuses as its occurrence is low. Stakeholders need to continue and further enhance these efforts in controlling violence. The cases of rape, sexual harassment and sexual retaliation particularly affecting female students in Institutions of Higher Learning in Western Kenya must be urgently addressed.

8.8 Areas of further research

From the study findings its worth recommending the following further studies:

i. The challenges in the provision of structures to address gender inequalities, stigma and discrimination reduction, homophobia, violation of human rights and HIV-related discrimination need to be explored.

ii. As one fifth of respondents reported engaging in unprotected sex for favours meaning that they risked contacting HIV for favours, it was important for stakeholders to explore these favours and investigate how students may be empowered to access these needs/wants without having to enagage in unprotected sex for favours.

iii. As findings from the survey revealed that majority of students were found to be testing for HIV together with their sexual partners, it is vital to ascertain the factors promoting this behaviour in Institutions of Higher Learning as helps in reducing HIV infections. Stakeholders can subsequently get involved in the promotion of these factors.

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APPENDICES

APPENDIX I: INFORMED CONSENT/LETTER OF INTRODUCTION TO STUDENTS

Introduction

Dear respondent,

My name is Patricia Kariaga, a postgraduate student in the department of Disaster Management and Sustainable Development at Masinde Muliro University of Science and Technology (MMUST). I am doing research on the topic ***"Efficacy of Strategies used to mitigate HIV Risky Sexual Behavior among students of Institutions of Higher Learning in Western Kenya.".*** This questionnaire therefore aims to collect information that will be used for the purposes of developing and improving upon strategies to improve the mitigation of HIV Sexually Risky Behavior among students in Institutions of Higher Learning Western Kenya. The information shall be used for academic research purposes only and utmost confidentiality shall be accorded to the personal information that will be obtained through the study.

Your co-operation in this study is highly appreciated because you have been identified as one of the key stakeholders among students in institutions of Higher Learning in Western Kenya. In case you feel you need counseling during or after the research, the researcher who is a professional social worker and whose contacts are below will be available to offer you the services free. She may also refer you to another professional counselor if you are comfortable with this.

Thank you for your precious time.

Patricia Kariaga

Mobile number/ Whatsapp: +254719654340 **E-mail address**: pkariaga@gmail.com

APPENDIX II:INTERVIEW GUIDE FOR STUDENTS

Instructions

- Please complete the following questions. Unless directed otherwise, please circle the number corresponding to your response.
- If you do not prefer to answer a question, you are free to check the box indicating that this is your preference.

SECTION 1: DEMOGRAPHIC CHARACTERISTICS

S/N	QUESTION	RESPONSE OPTIONS	CODE
1.	What is your date of birth?	State exact date	
2.	What is your gender?	Male…….. Female……..	1 2
3.	What is the name of the institution where you are studying?	State exact name	
4.	What is your sexual orientation?	Heterosexual Homosexual Bisexual Intersex Other/specify_____	1 2 3 4 5
5.	Are you married?	Yes No	1 2

SECTION 2: Questions to answer **objective 1**: To determine the nature and extent of HIV Risky Sexual Behavior among students in institutions of higher learning in Western Kenya

S/N	QUESTION	RESPONSE	CODE
6.	In your opinion, when is the right time to start having sex?	Primary School High School College/University After College/University After Marriage Do not know Prefer not to answer	1 2 3 4 5 6 7
7.	Have you ever had sex?	Yes……. No……	1 2

		Prefer not to answer…..	3
8.	Are you currently engaged in a sexual relationship?	Yes…….	1
		No……	2
		Don't know…..	3
9.	How long have you been in your current sexual relationship?	Indicate the period	
		1 – 4 weeks	1
		1-2 months	2
		3-4 months	3
		5-6months	4
		7-12months	5
		more than 1year	6
10.	How many sexual partners have you had over the past 3 months?	1	1
		2-3	2
		4-5	3
		6-7	4
		8 and above	5
		None	6
11.	Have you ever used a condom during a sexual encounter?	YES	1
		NO	2
		Do not know	3
		Prefer not to answer	4
12.	If YES to the above question, how often do you use condoms during sexual encounters?	All of the time……	1
		Sometimes…….	2
		Never……..	3
13	If YES to the question 10, how do you always use condoms correctly during sexual encounters?	All of the time……	1
		Sometimes…….	2
		Never……..	3
14.	Have you ever tested for HIV?	YES	1
		NO	2
		Do not know	3
		Prefer not to answer	4
15.	Do you know if your partner has ever tested for HIV?	YES	1
		NO	2
		Do not know	3
		Prefer not to answer	4
16.	Have you ever been tested for HIV together with any of your sexual partners?	YES	1
		NO	2
		Do not know	3
		Prefer not to answer	4
17.	Have you ever discussed HIV test results with any of your sexual partners?	YES	1
		NO	2
		Do not know	3
		Prefer not to answer	4
18.	After knowing your status, did you change your sexual	YES	1
		NO	2

	behavior?	Do not know Prefer not to answer	3 4
19.	If YES to the question above, in what way did you change your behavior after knowing your status?	Increased engagement in risky behavior Reduced engagement in risky behavior	1 2
22.	Have you ever felt vulnerable to HIV?	YES NO Do not know Prefer not to answer	1 2 3 4
23.	If YES to the question above, why? (Circle all appropriate)	Because I engage in risky sexual behavior Because my partner engages in risky sexual behavior Because I consume alcohol and /or drugs Because I am fearful that I may be raped/sodomised/defiled Because I am gay/bi-sexual Because of lack of resources Because of my gender/sex Other/Specify_____ Do not know Prefer not to answer	1 2 3 4 5 6 7 8 9 10

S/N	QUESTION	RESPONSE	CODE
24.	What do you think your chances of getting HIV from sexual encounters are?	None Small Moderate High Prefer not to answer	1 2 3 4 5
25.	Do you take alcohol?	YES NO Do not know Prefer not to answer	1 2 3 4
26.	If YES to the question above which is your favorite point of alcohol consumption?	Night Clubs Bars Traditional Brew clubs Hostel/Home Other (Specify)_____	1 2 3 4 5
27.	How often do you go to the joint above?	Everyday 3 or more days a week 1-2 days a week	1 2 3

		Once every two weeks Once a month Rarely Never	4 5 6 7
28.	Are you aware of any student in your university/college who takes marijuana or any other drugs?	YES NO Do not know Prefer not to answer	1 2 3 4
29.	Of your 5 closest friends/classmates; how many are involved in sexually risky behavior?	1 2 3 4 All Do not know	1 2 3 4 5 6
30.	Have you ever engaged in sex for favors?	YES NO Do not know Prefer not to answer	1 2 3 4
31.	Have you been engaged in physical violence over the past 3 months either` as the victim or the perpetrator	YES NO Do not know Prefer not to answer	1 2 3 4
32.	Have you ever had sex with a stranger?	YES NO Do not know Prefer not to answer	1 2 3 4
33.	If the answer to the question above is YES, how often have you had sex with strangers over the past 3 months?	Never Once 2-3 times 4-5 times 6 times or more Prefer not to answer	1 2 3 4 5 6
34.	Do you watch pornography?	YES NO Do not know Prefer not to answer	1 2 3 4
35.	If the answer is YES to question 42 above, why do watch pornography? (Circle all applicable)	To learn sexual skill For entertainment Peer pressure Boredom Other/Specify_____	1 2 3 4 5
36.	If the answer is NO to question 42 above, why do not watch pornography?	Religious reasons Upbringing Lack of interest Do not know Prefer not to answer	1 2 3 4 5

37.	Have you ever had anal sex?	YES NO Do not know Prefer not to answer	1 2 3 4
38.	Do you share any sharp objects such as razor blades, needles etc?	YES NO Do not know Prefer not to answer	1 2 3 4
39.	Do you have sex with people who are at least 18 years older than you?	YES NO Do not know Prefer not to answer	1 2 3 4
40.	Do you engage in sex for monetary compensation or receipt of gifts	YES NO Do not know Prefer not to answer	1 2 3 4
41.	Have you ever sold or bought sex?	YES NO Do not know Prefer not to answer	1 2 3 4

42.

S/N	QUESTION	NIL	LOW	MODERATE	HIGH	Prefer not to answer
a)	To what extent has the consumption of alcohol and psychotropic drugs contributed to students' engagement in risky sexual behavior?					
b)	To what extent does the presence of an alcohol service point on campus affect students' easy access to alcohol?					
c)	To what extent does the presence of an alcohol					

	service point on campus affect your engagement in risky sexual behavior?					
d)	To what extent do you have adequate access to counseling services within the university/college?					
e)	To what extent has the availability of contraceptives and condoms affected your sexual behavior?					

SECTION 3: Questions on **objective 2**: To evaluate the effectiveness of the behavioural strategies used to mitigate students' Risky Sexual Behavior in institutions of higher learning in Western Kenya

To answer the question below, please tick your answer in the appropriate box

43.

S/N	QUESTION	NIL	LOW	MODERATE	HIGH	Prefer not to answer
a)	To what extent do you have access to behavior change communication?					
b)	To what extent do you have access to information on unplanned pregnancies?					
c)	To what extent do you have access to information on					

	STIs?					
d)	To what extent do you have knowledge on consumption of psychotropic drugs?					
e)	To what extent do you have access to PReP?					
f)	To what extent do you have access to PeP?					
g)	To what extent do you have knowledge on use of condoms from your university/college?					
h)	To what extent do you have adequate knowledge on the hazards of abortions?					

S/N	QUESTION	RESPONSE	CODE
44.	How much do you know about HIV and AIDS?	Low knowledge Moderate knowledge High level of knowledge	1 2 3
45.	How much do you know about reproductive health?	Low knowledge Moderate knowledge High level of knowledge	1 2 3
46.	In your opinion, to what extent does risky sexual behavior result in contracting HIV?	None Small Moderate High Prefer not to answer	1 2 3 4 5
47.	In your first year of study, were there specific HIV and AIDS	YES NO Do not know	1 2 3

	and or Sexual and Reproductive Health (SRH) interventions geared towards first year students only?	Prefer not to answer	4
48.	If YES to the question above, what specific knowledge did you receive?	Abstinence from sex Use of condoms Delay of sexual debut Management of HIV Prevention of HIV Treatment of HIV Use of contraception Other/Specify	1 2 3 4 5 6 7 8
49.	Beyond your first year of study have you received any information/training on Sexual and Reproductive Health/ HIV and AIDS?	YES NO Do not know Prefer not to answer	1 2 3 4
50.	If YES to the question above, through which means did you receive this knowledge? (Circle all appropriate)	Peer educator Friend/Classmate Regular/periodic small group meeting (BCCG) Curriculum/Lecturer in class Health worker in the University or College Counsellor in the University/College Health Worker in a centre outside the University or college Faith Based Organisation NGO/CBO within the community Family member Other please specify_____	1 2 3 4 5 6 7 8 9 10 11
51.	What was the most significant thing you learned from the initiative above?	To abstain from sex To continue to abstain from sex Use of protective measures Reduce number of sexual partners Other please specify_____	1 2 3 4 5

52.	Which factors do you believe will help in contributing to effective communication of sexual health information to you?	Peer education More lectures/talks on reproductive health Accessibility to competent staff Availability of competent staff Availability of medication Other please specify_____	1 2 3 4 5 6
53.	What methods have been used to relay HIV and Sexual and Reproductive Health information to you?	Traditional media platforms (Newspapers/radio/TV) Social media platforms (Facebook, Whatsapp, Instragram etc) Art and entertainment (Plays,drama, dance theatre etc) Institutional/Non institutional (lectures/ motivational talks/seminars/workshops) Peer to peer education Other please specify_____	1 2 3 4 5 6
54.	Whichmethods do you feel are best to relay HIV and Sexual and Reproductive Health information to you?	Traditional media platforms (Newspapers/radio/TV) Social media platforms (Facebook, Whatsapp, Instragram etc) Art and entertainment (Plays,drama, dance theatre etc) Institutional/Non institutional (lectures/ motivational talks/seminars/workshops) Peer to peer education Other please specify_____	1 2 3 4 5 6
55.	Do you have dedicated spaces where you can access information about Sexual and Reproductive Health topics at your University/College?	YES NO Do not know Prefer not to answer	1 2 3 4

56.	Have you ever used PReP?	YES NO Do not know Prefer not to answer	1 2 3 4
57.	Have you ever used PeP?	YES NO	1 2

		Do not know Prefer not to answer	3 4
58.	Are you aware of HIV counseling programmes in your institution?	YES NO Do not know Prefer not to answer	1 2 3 4
59.	Are you aware of HIV psychosocial support programmes in your institution?	YES NO Do not know Prefer not to answer	1 2 3 4
60.	What are the challenges you find with accessing Sexual and Reproductive Health and HIV health care centers within your college/university and those outside serving students of your college/university? (Circle all appropriate)	Time spent to be served Access to medication Competency of staff Professionalism of staff Other please specify_____	1 2 3 4 5 6

SECTION 3: Questions on **objective 3**: To evaluate the effectiveness of the biomedical strategies used to mitigate students' Risky Sexual Behavior in institutions of higher learning in Western Kenya

61.	Do you know what ARVs are?	YES NO Do not know Prefer not to answer	1 2 3 4
62.	If YES to the question above, does the university/college clinic provide ARVs?	YES NO Do not know Prefer not to answer	1 2 3 4
63.	From which sources can students in your university /college get ARVs if they want them?	University/College Clinic Health care service providers around the institution Health care service providers away from the institution NGOs/CBOs around the institution FBOs around the institution	1 2 3 4 5

		Other/Specify_____	6
64.	To what extent are male and female condoms promoted to students by your institution?		
65.	Please indicate all the ways through which university/college HIV events have had on your sexual and reproductive choices		YES NO
		Decided to continue abstaining from sex	1 2
		Decided to start abstaining	1 2
		Encouraged faithfulness to one partner	1 2
		Started to be faithful to one partner	1 2
		Reduced the number of sexual partners	1 2
		Started using condoms consistently and correctly	1 2
		Had an HIV test	1 2
		No change in behavior	1 2
		Other/Specify_____	1 2
		Do not know of these events	1
		Do not attend these events	1
66.	Have you ever tested for any STI other than HIV or cervical cancer?	YES	1
		NO	2
		Do not know	3
		Prefer not to answer	4
67.	Have you ever used any modern contraceptive method?	YES	1
		NO	2
		Do not know	3
		Prefer not to answer	4
68.	If YES to the question above, which method or combination of methods have you ever used? For each method listed, indicate 1 for 'yes' ever used the method and 2 for 'no', not using the method.	**Circle all appropriate**	YES NO
		Condoms	**1 2**
		Pills	**1 2**
		Emergency Contraception	**1 2**
		Depo/Injection	**1 2**
		IUD/Coil	**1 2**
		Implant	**1 2**
		Other (Specify)_____	**1 2**
69.	How many times have you used the emergency contraception over the last 1 year	Once	1
		Twice	2
		Thrice	3
		Four times or more	4
		Never	5
		Prefer not to answer	6
70.	**For male students:**have	YES	1

	you gotten any of your sexual partners pregnant? **For female students:** Have you ever been pregnant?	NO Do not know Prefer not to answer YES NO Do not know Prefer not to answer	2 3 4 1 2 3 4
71.	**For female students**, have you ever had a miscarriage/abortion while studying at your University/College?	YES NO Do not know Prefer not to answer	1 2 3 4
72.	If you answered YES to the question above, what kind of care did you receive from your University/College (Circle all appropriate)	Referral to the nearest hospital/health centre Medication Counselling HIV testing Other/Specify_____ Do not know Prefer not to answer	1 2 3 4 5 6 7
73.	If you answered YES to question 22, from which other organization/s did you receive care?	Hospital/Healthcare centre NGO/CBO Faith Based Organisation Private Organisation	1 2 3 4

SECTION 4: Questions on **objective 4**: To evaluate the effectiveness of structural strategies used to mitigate students' Risky Sexual Behavior in institutions of higher learning in Western Kenya

74.

S/N	QUESTION	NIL	LOW	MODERATE	HIGH	Prefer not to answer
a)	To what extent does the absence of a dress code affect your sexual behavior?					
b)	To what extent does the presence of a dress					

	code affect your sexual behavior?					
c)	To what extent does the absence of a campus curfew limitation in hostels affect your sexual conduct?					
d)	To what extent does the presence of a campus curfew limitation in hostels affect your sexual conduct?					

e) Do co-gender hostels encourage risky sexual behavior? YES 1
Circle the answer NO 2

f) If you answered YES to the question above, HOW do co-gender hostels encourage risky sexual behavior (Circle all appropriate)
Encourage co-habitation 1
Ease access to members of the opposite sex 2
Other/Specify_____ 3

g) Have you been a victim of Sexual and Gender Based Violence (SGBV) while at your university/college
YES 1
NO 2

h) If YES to the question above, did you report the incident to your learning institution
YES 1
NO 2
Do not know 3
Prefer not to answer 4

i) Are you aware where to report in the event that you are a victim of SGBV?

YES 1
NO 2
Do not know 3
Prefer not to answer 4

j) Did you receive counseling when provided with HIV services (testing, PeP,PReP)
YES 1
NO 2
Do not know 3
Prefer not to answer 4

75.	In your opinion, what may be improved upon to mitigate risky sexual behavior among students in your university/College?	Increasing funds	1
		Creation of social media groups/platforms	2
		Invite speakers	3
		Public awareness	4
		Employ experienced/courageous personnel	5
		Distribute merchandise	6
		Introduce active clubs/programs	7
		Use peer educators	8
		Offer ARVs	9
		Improve confidentiality in facilities	10
		Increase time 2	11
		Improve programs	12
		Create awareness on existing programs	13
		Strengthen curriculum	14
		Discontinue peer educators	15
		Introduce abortion care in the university/college	16
		Other/Specify_____	17

76. Are you aware of the role of management in mitigating risky sexual behavior among students in your institution?

YES	1
NO	2
Do not know	3
Prefer not to answer	4

77. To what extent does management respond in mitigatingrisky sexual behavior among students in your institution?

Low extent	1
Average Extent	2
High Extent	3

78.	At which point to you feel you get adequate anonymity on discussing HIV	University/College clinic	1
		A VCT within the university but away from the clinic	2
		Aids Control Unit (ACU) at the University/College	3
		VCT outside the University/College	4
		Hospitals/health care centres around the University/College	5
		FBO/Church/Mosque around the University/College	6
		NGO/CBO around the University/College	7 8
		Other/Specify_____	
79.	What are the challenges you find with accessing Sexual and Reproductive Health and HIV health care centers within your college/university and those outside serving students of your college/university? (Circle all appropriate)	Time spent to be served	1
		Access to medication	2
		Competency of staff	3
		Professionalism of staff	4
		Other please specify_____	5 6
80.	What do you believe encourages you to visit Sexual and Reproductive Health and HIV health care	Time spent to be served	1
		Access to medication	2
		Competency of staff	3
		Professionalism of staff	4 5

	centers?	Other please specify_____	6

Questions/Comments:_____
_____
_____
_____

This concludes the survey. Thank you for your participation.

APPENDIX III:LETTER OF INTRODUCTION TO KEY INFORMANTS

Introduction

Dear respondent,

My name is Patricia Kariaga, a postgraduate student in the department of Disaster Management and Sustainable Development at Masinde Muliro University of Science and Technology (MMUST). I am doing research on the topic ***"Efficacy of Strategies used to mitigate HIV Risky Sexual Behavior among students of Institutions of Higher Learning in Western Kenya.".*** This questionnaire therefore aims to collect information that will be used for the purposes of developing and improving upon strategies to improve the mitigation of HIV Sexually Risky Behavior among students in Institutions of Higher Learning Western Kenya. The information shall be used for academic research purposes only and utmost confidentiality shall be accorded to the personal information that will be obtained through the study.

Your co-operation in this study is highly appreciated because you have been identified as one of the key stakeholders among students in institutions of Higher Learning in Western Kenya. In case you feel you need counseling during or after the research, the researcher who is a professional social worker and whose contacts are below will be available to offer you the services free. She may also refer you to another professional counselor if you are comfortable with this.

Thank you for your precious time.

Patricia Kariaga

Mobile number/ Whatsapp: +254719654340 **E-mail address**: pkariaga@gmail.com

APPENDIX IV:IN DEPTH INTERVIEW GUIDE FOR KEY INFORMANTS

(University /County Government /NGO/CBO/FBO officials)
SOCIODEMOGRAPHIC AND ECONOMIC CHARACTERISTICS

Sex: ( ) Male ( ) Female

Age: _____

Religion: _____

Marital status: _____

Occupation:_____

Duration of time working within the organisation: _____

Name of Organization/Institution:_____

QUESTIONS:

1. In what ways and to what extent do students in Institutions of Higher Learning present HIV Risky Sexual Behaviour?_____
   _____
   _
2. What are the HIV behavioural prevention interventions that your organization/unit offers to these students ?_____
   _____
3. What are the HIV biomedical prevention interventions that your organization/unit offers to these students?_____
   _____
4. What are the HIV structural prevention interventions that your organization/unit offers to these students?
   _____
   _____

Questions/Comments:_____
_____
_____
_____
This concludes the interview. Thank you for your participation.

APPENDIX VI:LETTER OF INTRODUCTION TO FOCUS GROUP DISCUSSION RESPONDENTS

Introduction

Dear respondent,

My name is Patricia Kariaga, a postgraduate student in the department of Disaster Management and Sustainable Development at Masinde Muliro University of Science and Technology (MMUST). I am doing research on the topic ***"Efficacy of Strategies used to mitigate HIV Risky Sexual Behavior among students of Institutions of Higher Learning in Western Kenya.".*** This questionnaire therefore aims to collect information that will be used for the purposes of developing and improving upon strategies to improve the mitigation of HIV Sexually Risky Behavior among students in Institutions of Higher Learning Western Kenya. The information shall be used for academic research purposes only and utmost confidentiality shall be accorded to the personal information that will be obtained through the study.

Your co-operation in this study is highly appreciated because you have been identified as one of the key stakeholders among students in institutions of Higher Learning in Western Kenya. In case you feel you need counseling during or after the research, the researcher who is a professional social worker and whose contacts are below will be available to offer you the services free. She may also refer you to another professional counselor if you are comfortable with this.

Thank you for your precious time.

Patricia Kariaga

Mobile number/ Whatsapp: +254719654340 **E-mail address**: pkariaga@gmail.com

APPENDIX VII:FOCUS GROUP DISCUSSION GUIDE

a) How would you say Risky Sexual Behavior is presented by students at your university/college? The researcher explains the key terms and themes and guides a discussion on the topic. A moderator assists in guiding the discussion.

b) What are the HIV behavioural intervention strategies that are being used to manage risky sexual behavior at your university/college? The researcher explains the key terms and themes and guides a discussion on the topic. A moderator assists in guiding the discussion.

c) What are the HIV biomedical intervention strategies that are being used to manage risky sexual behavior at your university/college? The researcher explains the key terms and themes and guides a discussion on the topic. A moderator assists in guiding the discussion.

d) What are the HIV structural intervention strategies that are being used to manage risky sexual behavior at your university/college? The researcher explains the key terms and themes and guides a discussion on the topic. A moderator assists in guiding the discussion.

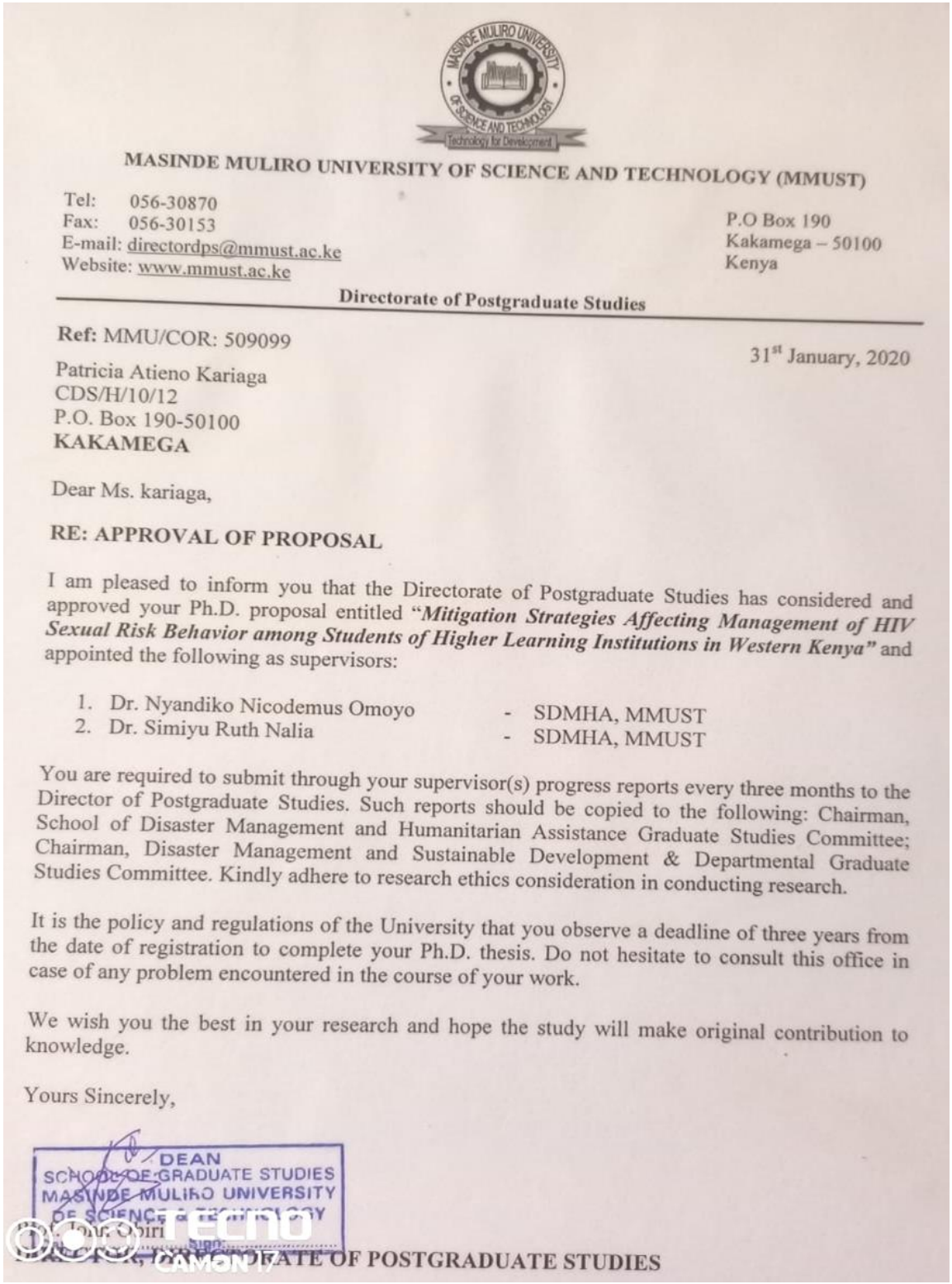
WRAP UP

We have come to the end of our discussions. Is there anything else you would like to tell me?

Do you have any questions?

Thank you very much for taking the time to participate in these discussions today.

APPENDIX IIX: DIRECTORATE OF POST GRDUATE STUDIES PROPOSAL APPROVAL LETTER



MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

Tel: 056-30870
Fax: 056-30153
E-mail: directordps@mmust.ac.ke
Website: www.mmust.ac.ke

P.O Box 190
Kakamega – 50100
Kenya

Directorate of Postgraduate Studies

Ref: MMU/COR: 509099

31st January, 2020

Patricia Atieno Kariaga
CDS/H/10/12
P.O. Box 190-50100
KAKAMEGA

Dear Ms. kariaga,

RE: APPROVAL OF PROPOSAL

I am pleased to inform you that the Directorate of Postgraduate Studies has considered and approved your Ph.D. proposal entitled "***Mitigation Strategies Affecting Management of HIV Sexual Risk Behavior among Students of Higher Learning Institutions in Western Kenya***" and appointed the following as supervisors:

1. Dr. Nyandiko Nicodemus Omoyo - SDMHA, MMUST
2. Dr. Simiyu Ruth Nalia - SDMHA, MMUST

You are required to submit through your supervisor(s) progress reports every three months to the Director of Postgraduate Studies. Such reports should be copied to the following: Chairman, School of Disaster Management and Humanitarian Assistance Graduate Studies Committee; Chairman, Disaster Management and Sustainable Development & Departmental Graduate Studies Committee. Kindly adhere to research ethics consideration in conducting research.

It is the policy and regulations of the University that you observe a deadline of three years from the date of registration to complete your Ph.D. thesis. Do not hesitate to consult this office in case of any problem encountered in the course of your work.

We wish you the best in your research and hope the study will make original contribution to knowledge.

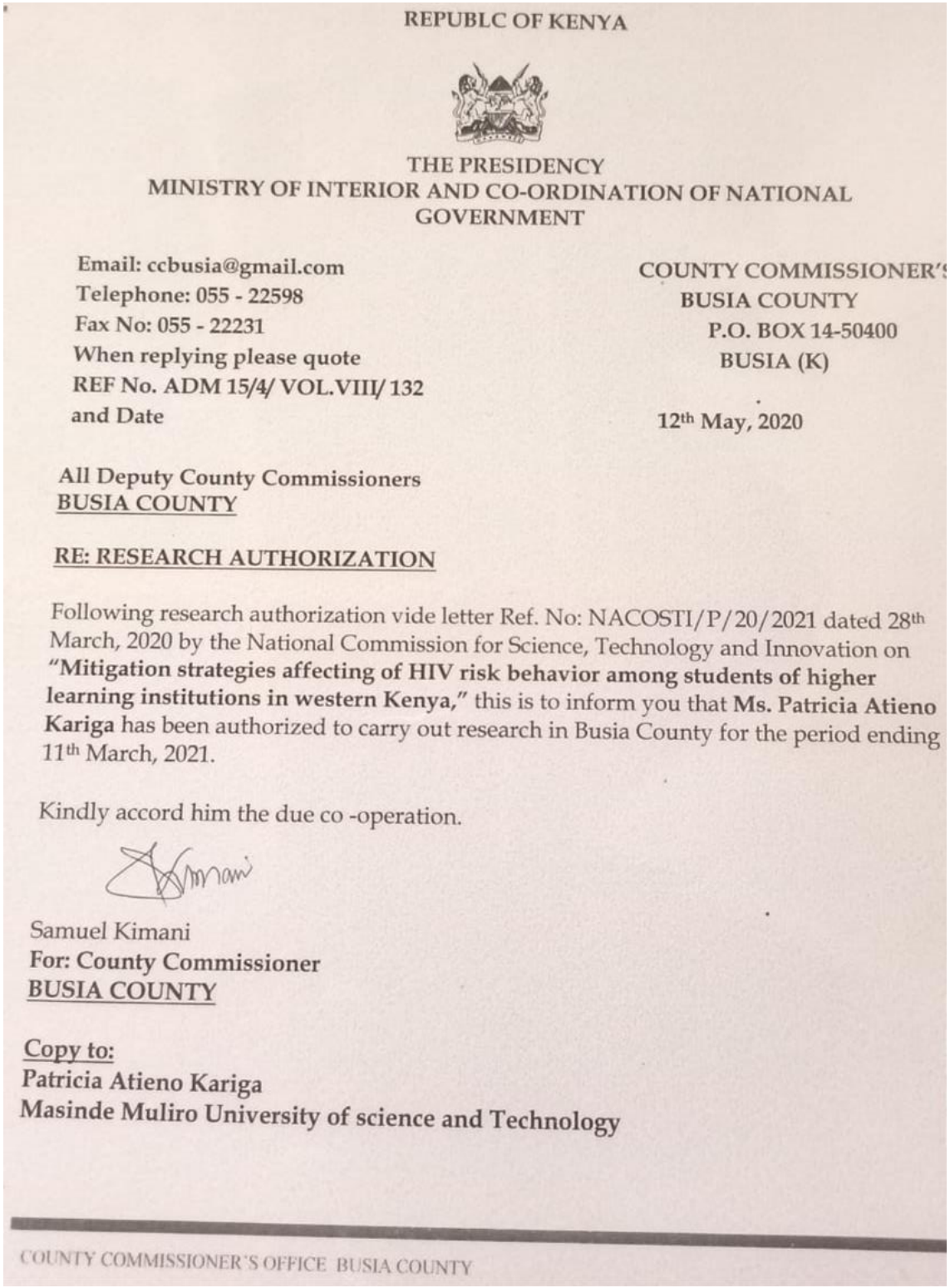
Yours Sincerely,

DEAN
SCHOOL OF GRADUATE STUDIES
MASINDE MULIRO UNIVERSITY
OF SCIENCE & TECHNOLOGY

Prof. Obiri

DIRECTOR, DIRECTORATE OF POSTGRADUATE STUDIES

APPENDIX IX: BUSIA COUNTY COMMISSIONERS OFFICE RESEARCH AUTHORIZATION LETTER



REPUBLC OF KENYA

THE PRESIDENCY
MINISTRY OF INTERIOR AND CO-ORDINATION OF NATIONAL GOVERNMENT

Email: ccbusia@gmail.com
Telephone: 055 - 22598
Fax No: 055 - 22231
When replying please quote
REF No. ADM 15/4/ VOL.VIII/ 132
and Date

COUNTY COMMISSIONER'S
BUSIA COUNTY
P.O. BOX 14-50400
BUSIA (K)

12th May, 2020

All Deputy County Commissioners
BUSIA COUNTY

RE: RESEARCH AUTHORIZATION

Following research authorization vide letter Ref. No: NACOSTI/P/20/2021 dated 28th March, 2020 by the National Commission for Science, Technology and Innovation on **"Mitigation strategies affecting of HIV risk behavior among students of higher learning institutions in western Kenya,"** this is to inform you that **Ms. Patricia Atieno Kariga** has been authorized to carry out research in Busia County for the period ending 11th March, 2021.

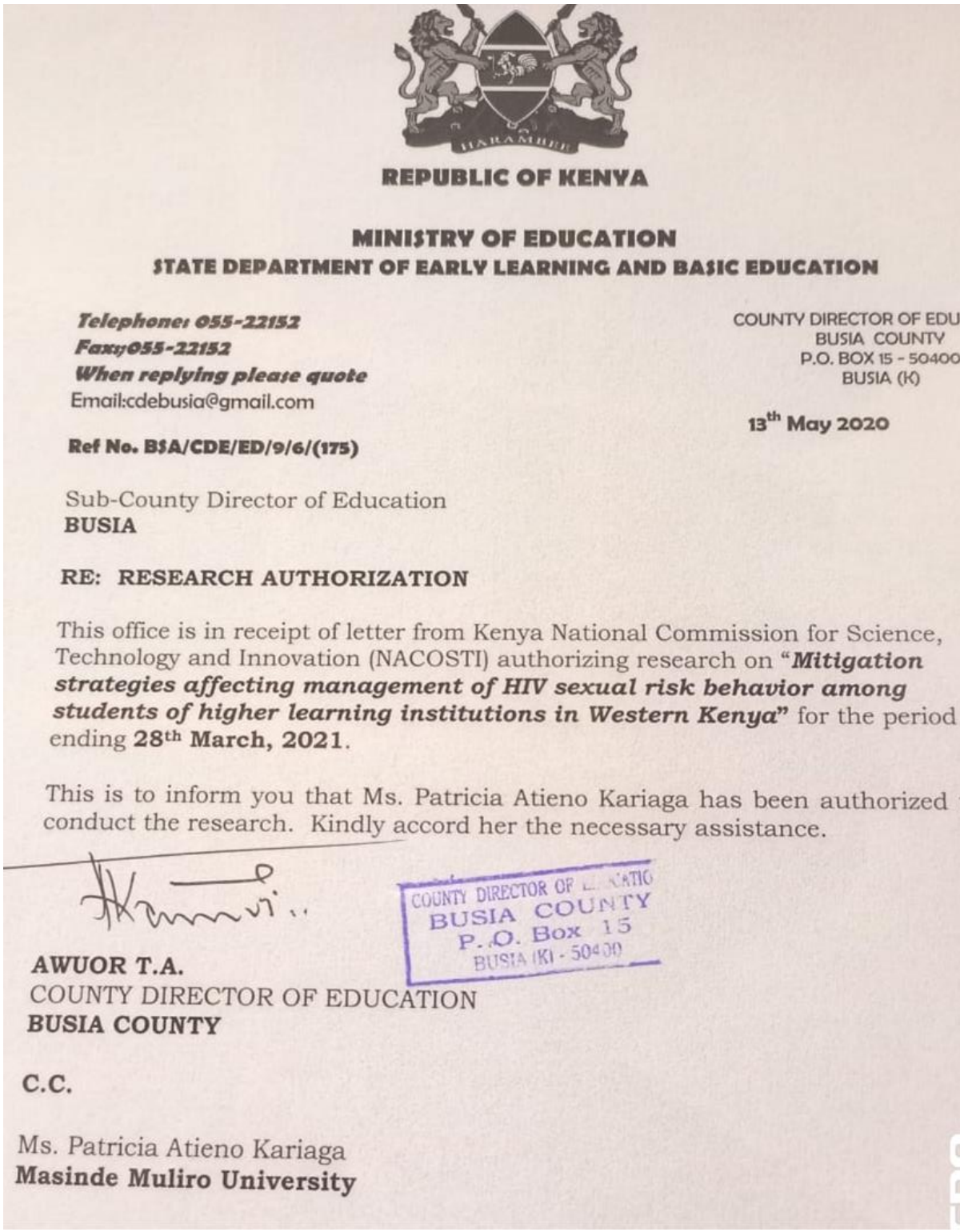
Kindly accord him the due co -operation.

Samuel Kimani
For: County Commissioner
BUSIA COUNTY

Copy to:
Patricia Atieno Kariga
Masinde Muliro University of science and Technology

COUNTY COMMISSIONER'S OFFICE BUSIA COUNTY

APPENDIX X: BUSIA COUNTY-MINISTRY OF EDUCATION RESEARCH AUTHORIZATION LETTER



REPUBLIC OF KENYA

MINISTRY OF EDUCATION
STATE DEPARTMENT OF EARLY LEARNING AND BASIC EDUCATION

Telephone: 055-22152
Fax:055-22152
When replying please quote
Email:cdebusia@gmail.com

COUNTY DIRECTOR OF EDU
BUSIA COUNTY
P.O. BOX 15 - 50400
BUSIA (K)

13th May 2020

Ref No. BSA/CDE/ED/9/6/(175)

Sub-County Director of Education
BUSIA

RE: RESEARCH AUTHORIZATION

This office is in receipt of letter from Kenya National Commission for Science, Technology and Innovation (NACOSTI) authorizing research on "***Mitigation strategies affecting management of HIV sexual risk behavior among students of higher learning institutions in Western Kenya***" for the period ending **28th March, 2021**.

This is to inform you that Ms. Patricia Atieno Kariaga has been authorized conduct the research. Kindly accord her the necessary assistance.

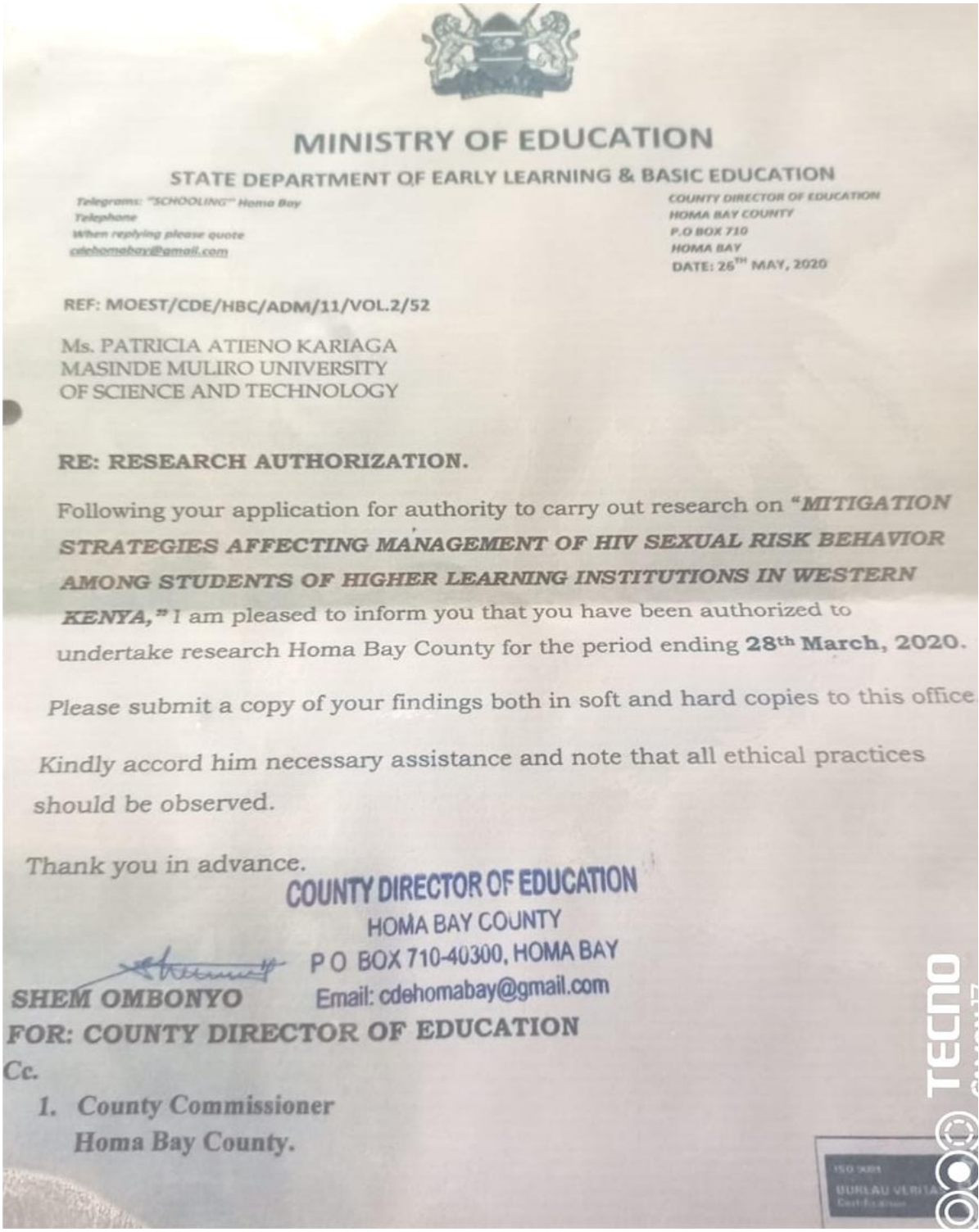
COUNTY DIRECTOR OF EDUCATIO
BUSIA COUNTY
P.O. Box 15
BUSIA (K) - 50400

AWUOR T.A.
COUNTY DIRECTOR OF EDUCATION
BUSIA COUNTY

C.C.

Ms. Patricia Atieno Kariaga
Masinde Muliro University

APPENDIX XI: HOMA BAY COUNTY-MINISTRY OF EDUCATION RESEARCH AUTHORIZATION LETTER



MINISTRY OF EDUCATION

STATE DEPARTMENT OF EARLY LEARNING & BASIC EDUCATION

Telegrams: "SCHOOLING" Homa Bay
Telephone
When replying please quote
cdehomabay@gmail.com

COUNTY DIRECTOR OF EDUCATION
HOMA BAY COUNTY
P.O BOX 710
HOMA BAY
DATE: 26TH MAY, 2020

REF: MOEST/CDE/HBC/ADM/11/VOL.2/52

Ms. PATRICIA ATIENO KARIAGA
MASINDE MULIRO UNIVERSITY
OF SCIENCE AND TECHNOLOGY

RE: RESEARCH AUTHORIZATION.

Following your application for authority to carry out research on ***"MITIGATION STRATEGIES AFFECTING MANAGEMENT OF HIV SEXUAL RISK BEHAVIOR AMONG STUDENTS OF HIGHER LEARNING INSTITUTIONS IN WESTERN KENYA,"*** I am pleased to inform you that you have been authorized to undertake research Homa Bay County for the period ending **28th March, 2020.**

Please submit a copy of your findings both in soft and hard copies to this office.

Kindly accord him necessary assistance and note that all ethical practices should be observed.

Thank you in advance.

COUNTY DIRECTOR OF EDUCATION
HOMA BAY COUNTY
P O BOX 710-40300, HOMA BAY
Email: cdehomabay@gmail.com

SHEM OMBONYO
FOR: COUNTY DIRECTOR OF EDUCATION

Cc.
1. County Commissioner
   Homa Bay County.

APPENDIX XII: KISUMU COUNTY-MINISTRY OF EDUCATION RESEARCH AUTHORIZATION LETTER

REPUBLIC OF KENYA

MINISTRY OF EDUCATION
State Department of Early Learning & Basic Education

Telegrams:"schooling",Kisumu
Telephone: Kisumu 057 - 2024599
Email: countyeducation.kisumu@gmail.com

When replying please quote

COUNTY DIRECTOR OF EDUCATION
KISUMU COUNTY
PROVINCIAL HEADQUARTERS NYANZA
3RD FLOOR
P.O. BOX 575 – 40100
KISUMU

REF: CDE/KSM/GA/3/24/ (109)

05th May, 2020

TO WHOM IT MAY CONCERN

RE: RESEARCH AUTHORIZATION
Ms. Patricia Atieno Kariaga – NACOSTI/P/20/4513

The above named is from Masinde Muliro University of Science and Technology.

This is to certify that she has been granted authority to carry out research on ***"Mitigation Strategies affecting management of HIV Sexual Risk Behavior among students of Higher Learning Institutions in Western Kenya"*** for the period ending **28th March, 2021.**

Any assistance accorded to her to accomplish the assignment will be highly appreciated.

ORINA NYANKIRA
For: COUNTY DIRECTOR OF EDUCATION
KISUMU COUNTY

APPENDIX XIII: KISUMU COUNTY-MINISTRY OF INTERIOR AND COORDINATION AUTHORIZATION LETTER

OFFICE OF THE PRESIDENT
MINISTRY OF INTERIOR AND COORDINATION OF NATIONAL GOVERNMENT

Telephone: Kisumu 2022219/Fax: 2022219
Email: ckisumucounty@gmail.com

COUNTY COMMISSIONER
KISUMU COUNTY
P.O. BOX 1912-40100
KISUMU

CC/KC/RES/1/3/VOL.IV(7)

4th May, 2020

All Deputy County Commissioners
KISUMU

RESEARCH AUTHORITY
MS PATRICIA ATIENO KARIAGA

Reference is made to a NACOSTI letter 743960 dated 28th March, 2020. The above named student of Masinde Muliro University of Science and Technology has been authorized to carry out a research on ***Mitigation strategies affecting management of HIV sexual Risk Behaviour among students of higher learning Institutions in Western Kenya"*** The research ends on 28th March, 2021.

Kindly accord her any assistance that she may need.

S. W. WAWERU
COUNTY COMMISSIONER
KISUMU COUNTY

Copy to:

Ms Patricia Atieno Kariaga
Masinde Muliro University of Science and Technology

APPENDIX XIV: KAKAMEGA COUNTY-MINISTRY OF INTERIOR AND COORDINATION AUTHORIZATION LETTER

REPUBLIC OF KENYA

THE PRESIDENCY

MINISTRY OF INTERIOR & CO-ORDINATION OF NATIONAL GOVERNMENT

COUNTY COMMISSIONER
KAKAMEGA COUNTY
P O BOX 43-50100
KAKAMEGA.

Office Mobile No: 0707 085260
Email-cckakamega12@yahoo.com

When replying please quote

Ref No: ED/12/1/VOL.V/78

Date: 21/04/2020

MS. PATRICIA ATIENO KARIAGA
MASINDE MULIRO UNIVERSITY
SCIENCE AND TECHNOLOGY
P O BOX 190-50100
KAKAMEGA

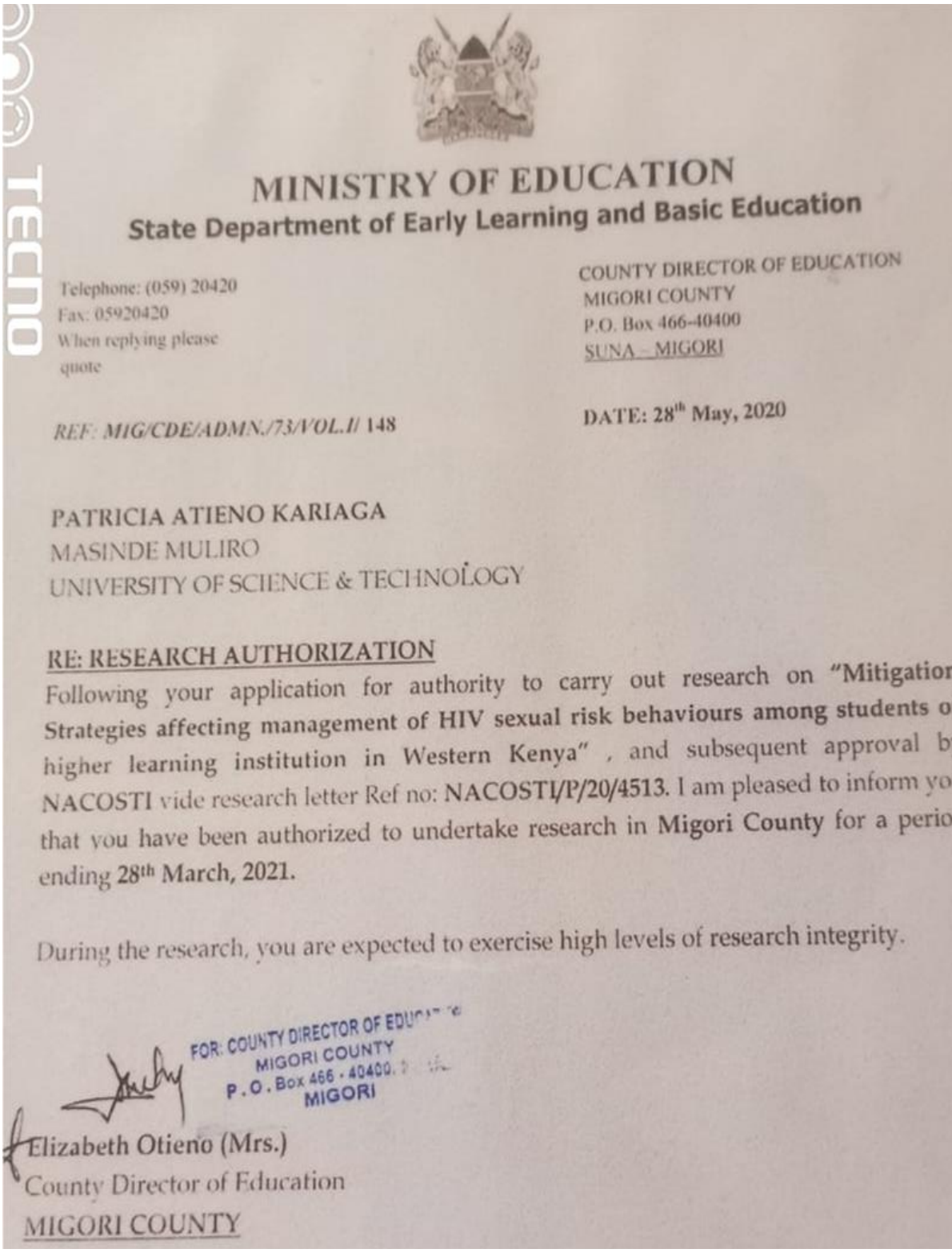
RE: RESEARCH AUTHORIZATION

Following your authorization vide letter Ref: NACOSTI/P/20/4513 dated 28th March, 2020 by NACOSTI to undertake research on "***Mitigation Strategies Affecting Management of HIV SEXUAL RISK BEHAVIOUR AMONG STUDENTS OF HIGHER LEARNING INSTITUTIONS IN WESTERN KENYA.***" I am pleased to inform you that you have been authorized to carry out the research on the same.

COUNTY COMMISSIONER
KAKAMEGA COUNTY

V. CHERONO
FOR: COUNTY COMMISSIONER
KAKAMEGA COUNTY

APPENDIX XV: MIGORI COUNTY-MINISTRY OF EDUCATION RESEARCH AUTHORIZATION LETTER



MINISTRY OF EDUCATION
State Department of Early Learning and Basic Education

Telephone: (059) 20420
Fax: 05920420
When replying please quote

COUNTY DIRECTOR OF EDUCATION
MIGORI COUNTY
P.O. Box 466-40400
SUNA – MIGORI

REF: MIG/CDE/ADMN./73/VOL.I/ 148

DATE: 28th May, 2020

PATRICIA ATIENO KARIAGA
MASINDE MULIRO
UNIVERSITY OF SCIENCE & TECHNOLOGY

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "Mitigation Strategies affecting management of HIV sexual risk behaviours among students o higher learning institution in Western Kenya" , and subsequent approval b NACOSTI vide research letter Ref no: NACOSTI/P/20/4513. I am pleased to inform yo that you have been authorized to undertake research in Migori County for a perio ending 28th March, 2021.

During the research, you are expected to exercise high levels of research integrity.

FOR: COUNTY DIRECTOR OF EDUC...
MIGORI COUNTY
P.O. Box 466 - 40400
MIGORI

Elizabeth Otieno (Mrs.)
County Director of Education
MIGORI COUNTY

APPENDIX XVI: MIGORI COUNTY-MINISTRY OF INTERIOR AND COORDINATION AUTHORIZATION LETTER

THE PRESIDENCY

MINISTRY OF INTERIOR AND COORDINATION OF NATIONAL GOVERNMENT

Telephone: (059) 20511
FAX (059)20361
Email:
countycommissionermigori@yahoo.com

When replying please quote

OFFICE OF THE COUNTY COMMISSIONER
MIGORI COUNTY
P.O. BOX 2 - 40400
SUNA- MIGORI.

Ref. No: CC/ED.12/19 VOL.III/108

Date: 28th May, 2020

TO WHOM IT MAY CONCERN

RE: RESEARCH AUTHORIZATION

Patricia Atieno Kariaga **NACOSTI/P/20/4513** of Masinde Muliro University of Science and Technology, has been authorized to carry out research on ***"Mitigation strategies affecting management of HIV sexual risk behavior among students of higher learning institutions in Migori County"*** *for* the period ending **28th March, 2021.**

Accord her the necessary assistance.

MUNA KENNEDY LEDAMA
FOR: COUNTY COMMISSIONER
MIGORI COUNTY

CC
The County Director of Education
Migori County

The County Director of Health Services
Migori County

APPENDIX XVII: SIAYA COUNTY-MINISTRY OF INTERIOR AND COORDINATION AUTHORIZATION LETTER

REPUBLIC OF KENYA

THE PRESIDENCY

MINISTRY OF INTERIOR & CO-ORDINATION OF NATIONAL GOVERNMENT

COUNTY COMMISSIONER
SIAYA COUNTY
P O Box 83-40600
SIAYA

E-Mail cc.siaya@yahoo.com
When replying please quote

CC/SC/A.31 VOL.III/84

7th May, 2020

All Deputy County Commissioners,
SIAYA COUNTY.

RE: RESEARCH AUTHORIZATION – PATRICIA ATIENO KARIAGA

The person referred to above from Masinde Muliro University of Science & Technology, Kakamega has been authorized by the Director-General/CEO, National Commission for Science, Technology and Innovation vide letter Ref. No. NACOSTI /P/20/4513 dated 28th March, 2020 to carry out research on *"MITIGATION STRATEGIES AFFECTING MANAGEMENT OF HIV SEXUAL RISK BEHAVIOR AMONG STUDENTS OF HIGHER LEARNING INSTITUTIONS IN WESTERN KENYA"* for the period ending 8th March, 2020.

The purpose of this letter, therefore, is to ask that you accord her the necessary support as she carries out research in your Sub County.

W. G. WACHIRA,
For: COUNTY COMMISSIONER,
SIAYA COUNTY.

Copy to: Patricia Atieno Kariaga,
Masinde Muliro University of
Science & Technology,
P.O. Box 190 – 50100,
KAKAMEGA.

County Director of Education,
SIAYA COUNTY.

APPENDIX XIIX: RONGO UNIVERSITY AUTHORIZATION LETTER

RONGO UNIVERSITY

OFFICE OF THE DEPUTY VICE – CHANCELLOR
(ACADEMIC AND STUDENT AFFAIRS)

Tel: 028 00 36 56
Fax: 020 802 92 08
Cell: 0770308255
Web: www.rongoversity.ac.ke

P.O. Box 103- 40404
RONGO,
KENYA
Email: dvc-academic@rongoversity.ac.ke

REF: RU/DVCASA/C/30/073/VOL. II/101 DATE: 1ST SEPTEMBER 2020

Patricia Atieno Kariaga,
P. O. Box 190-50100,
KAKAMEGA,
Kenya.
Tel. (+254) 719654340.

Dear Ms Kariaga,

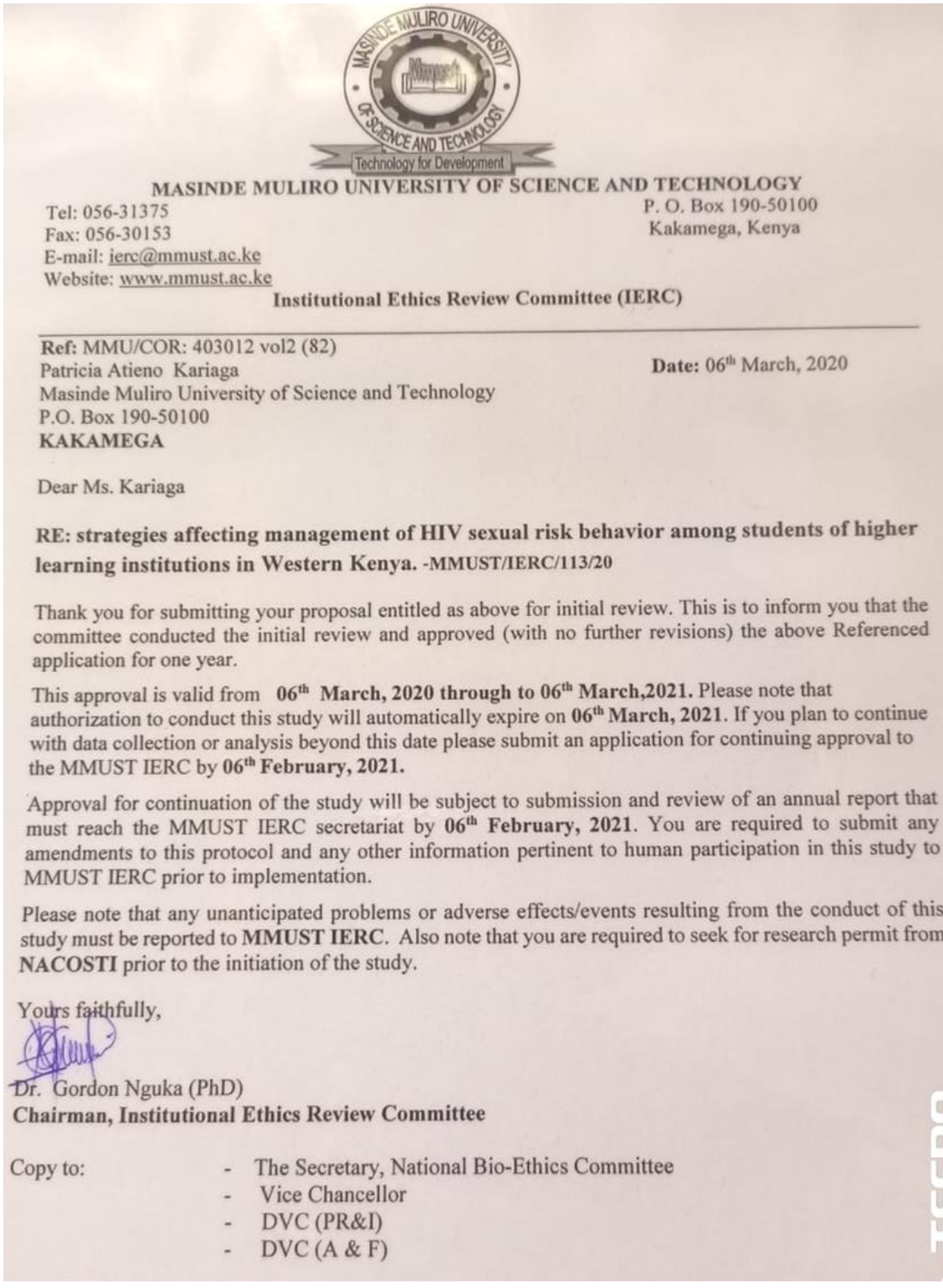
RE: PERMISSION TO CONDUCT RESEARCH

This is the response to your letter of 29/09/2020 to the Vice – Chancellor of Rongo University in which you requested for permission to carry out some research, with our Dean of Students and Officer in Charge of the health services as respondents. Permission is herein granted, on condition that you shall adhere to ethical guidelines in your study and subsequent reporting.

Prof. Augustino Onkware
Deputy Vice-Chancellor (Academic and Student Affairs)

CC. Vice – chancellor
Deputy Vice – Chancellor, AFP
Dean of Students
Officer in Charge, University Health Services
Chief Security Officer

APPENDIX XIX: MMUST INSTITUTIONAL ETHICS REVIEW COMMITTEE (IERC) AUTHORIZATION LETTER



MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY

Tel: 056-31375
Fax: 056-30153
E-mail: ierc@mmust.ac.ke
Website: www.mmust.ac.ke

P. O. Box 190-50100
Kakamega, Kenya

Institutional Ethics Review Committee (IERC)

Ref: MMU/COR: 403012 vol2 (82)

Date: 06th March, 2020

Patricia Atieno Kariaga
Masinde Muliro University of Science and Technology
P.O. Box 190-50100
KAKAMEGA

Dear Ms. Kariaga

RE: strategies affecting management of HIV sexual risk behavior among students of higher learning institutions in Western Kenya. -MMUST/IERC/113/20

Thank you for submitting your proposal entitled as above for initial review. This is to inform you that the committee conducted the initial review and approved (with no further revisions) the above Referenced application for one year.

This approval is valid from **06th March, 2020 through to 06th March,2021.** Please note that authorization to conduct this study will automatically expire on **06th March, 2021**. If you plan to continue with data collection or analysis beyond this date please submit an application for continuing approval to the MMUST IERC by **06th February, 2021.**

Approval for continuation of the study will be subject to submission and review of an annual report that must reach the MMUST IERC secretariat by **06th February, 2021**. You are required to submit any amendments to this protocol and any other information pertinent to human participation in this study to MMUST IERC prior to implementation.

Please note that any unanticipated problems or adverse effects/events resulting from the conduct of this study must be reported to **MMUST IERC**. Also note that you are required to seek for research permit from **NACOSTI** prior to the initiation of the study.

Yours faithfully,

Dr. Gordon Nguka (PhD)
Chairman, Institutional Ethics Review Committee

Copy to:
- The Secretary, National Bio-Ethics Committee
- Vice Chancellor
- DVC (PR&I)
- DVC (A & F)

APPENDIX XX: NATIONAL COMMISION FOR SCIENCE, TECHNOLOGY AND INNOVATION RESEARCH PERMIT

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 743960

Date of Issue: 28/March/2020

RESEARCH LICENSE



This is to Certify that Ms.. Patricia Atieno Kariaga of Masinde Muliro University of Science and Technology, has been licensed to conduct research in Busia, Homabay, Kakamega, Kisumu, Migori, Siaya on the topic: MITIGATION STRATEGIES AFFECTING MANAGEMENT OF HIV SEXUAL RISK BEHAVIOR AMONG STUDENTS OF HIGHER LEARNING INSTITUTIONS IN WESTERN KENYA for the period ending : 28/March/2021.

License No: **NACOSTI/P/20/4513**

743960

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.