



COLLEGE OF MEDICINE

**Exploring HIV and STI prevalence, sexual practices and
drug use among self-identified women who have sex with
women in Blantyre, Malawi**

By

Winnie Agnes Botha

(BA Communications and Cultural Studies)

A Dissertation Submitted in Partial Fulfilment of the Requirements of the

Master of Science in Global Health Implementation Degree

October 2020

CERTIFICATE OF APPROVAL

The Dissertation of Winnie Agnes Botha is approved by the Thesis Examination
Committee

(Chairman, Post Graduate Committee)

Dr Vincent Jumbe (Supervisor)

(External Examiner)

(Internal Examiner)

Dr Eric Umar
(Head of Department)

DECLARATION

I, Winnie Agnes Botha, hereby declare that this dissertation is my original work and has not been presented for any other awards at the University of Malawi or any other university.

Name of Candidate : Winnie Agnes Botha

Signature : 

Date : 2nd December 2019

ACKNOWLEDGEMENTS

I would like to thank Dr Vincent Jumbe my supervisor and the Centre for the Development of People (CEDEP) for helping me access the study population. I am also very grateful to the Health Systems and Policy Department under the School of Public Health as well as my colleagues on the MSc-GHI program for their support.

ABSTRACT

Introduction: Women who have sex with women (WSW) are mostly not included in Human Immunodeficiency Virus (HIV) and Sexually Transmitted Infections (STI) prevention interventions since female-female sex is presumed to be low risk. However, studies from other countries have reported significant STI burden in WSW. No study has been done in Malawi.

Objectives: To explore HIV, STI prevalence, drug use and risky sexual behaviours amongst WSW in Blantyre, Malawi.

Methods: This was a cross-sectional study using quantitative method. Snowball sampling technique was used to recruit study participants. Participants were recruited through the Center for the Development of People (CEDEP), a Non-Governmental Organization working with sexual minorities in Malawi. 42 WSW aged 18-49 were recruited. A structured questionnaire was administered which focused on (a) demographic characteristics, (b) exploring self-reported HIV and STI prevalence and (c) drug usage and WSW sexual practices.

Results: 42 participants were recruited with a median age of 23 years (range 18-33). Self-reported HIV prevalence was 2% (1/42). Prevalence for *Candida albicans* infection was 29% (12/42) and genital warts 7% (3/42). One participant (2%) self-reported having syphilis in the past one year and had no history of sexual contact with men. Sexual practices in the past one year were also assessed. All study participants (100%) reported to have engaged in fingering and clitoris to clitoris sexual contact; (59%) had multiple female sex partners and (26%) were involved in female-male sex. (36%) reported using unsterilized sex toys and (28.5%) were involved in oral sex. Drug use in the past one year was also assessed. No participants reported injected drug use. However non-injectable drugs like Marijuana (50%), Cuba (7.14%) and Cocaine (12%) were reported.

Conclusions: This was the first robust study on WSW in Malawi. It has demonstrated a low prevalence of self-reported HIV infection in WSW. However, STIs reported suggest that WSW are vulnerable to blood borne infections (syphilis). Episodes of warts and syphilis in a woman who had no history of sex with men suggest that female-female sex can transmit STIs.

TABLE OF CONTENTS

CERTIFICATE OF APPROVAL	i
DECLARATION	ii
ACKNOWLEDGEMENTS.....	iii
ABSTRACT	iv
LIST OF TABLES	viii
LIST OF FIGURES	ix
LIST OF ABBREVIATIONS AND ACRONYMS	x
CHAPTER ONE: INTRODUCTION AND BACKGROUND.....	1
1.1 Introduction	1
1.2 Operating Definitions	1
1.3 Background	2
1.4 Problem Statement.....	3
1.5 Literature Review	3
1.5 Justification for MSEF in this Study	11
1.5 Justification of the Study	12
1.6 Objectives.....	12
1.6.1 Broad objective.....	12
1.6.2 Specific Objectives.....	12
CHAPTER TWO: METHODS.....	13
2.1 Type of Research Study	13
2.2 Study Place.....	13
2.3 Study Population	14
2.4 Study Period	14
2.5 Sample Size and Sampling Technique	14
2.6 Eligibility Criteria for Study Participants	16
2.7 Data Collection.....	16
2.8 Data Management and Analysis.....	17
2.9 Study Limitations	17
2.10 Ethical Considerations	18
CHAPTER THREE: RESULTS	19
3.1 Study Participants.....	19
3.2 Risky Sexual Activities.....	19

3.3 HIV, STI Prevalence and Knowledge	22
3.4 Sexual Behaviors and HIV/STI Acquisition	25
CHAPTER FOUR: DISCUSSION	28
4.1 Introduction	28
CHAPTER 5: CONCLUSION AND RECOMMENDATIONS	33
5.1 Conclusion	33
5.2 Recommendations	34
REFERENCE	36
APPENDICES	41
Appendix A: Participant’s Consent Form	41
Appendix B: Questionnaire	44
Appendix C: Research Approval Letters.....	54
Appendix D: Certificate of Approval.....	56
Appendix E: Manuscript	57

LIST OF TABLES

Table 1: Study Period.....	14
Table 2: Participants Demographic Characteristics (n=42).....	19
Table 3: Condom Usage (n=11).....	20
Table 4: Sexual practices WSW-BT	20
Table 5: Trauma/Cuts Experience amongst WSW by Sexual Acts (n=12)	21
Table 6: Alcohol Use	21
Table 7: Drug Use	22
Table 8: WSW Knowledge on Risky Act	25
Table 9: Female- Female Sex and HIV	25
Table 10: Participants Involved in Fingering Developed Warts (n=42)	26
Table 11: Participants Involved in Fingering and Developed Candida (n=42)	26
Table 12: Used Toys and Developed Candida (n=15)	26
Table 13: Involved in Penis-Vagina Sex Developed Candida (n=11)	27

LIST OF FIGURES

Figure 1: A Modified Social Ecological Framework for HIV risk in WSW	11
Figure 2: Map of Blantyre City.....	13
Figure 3: Trauma/Cuts experience among WSW in BT	21
Figure 4: HTC Visits WSW BT Figure 5: HIV Prevalence WSW BT	22
Figure 6: Partner HIV Status Knowledge.....	23
Figure 7: STI Prevalence	24
Figure 8: Self-reported STIs episodes in WSW in BT (n=16)	24
Figure 9: WSW Same STIs with Female Partner (n=42).....	24

LIST OF ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
CEDEP	Centre for the Development of People
COMREC	College of Medicine Research Ethics Committee
HIV	Human Immunodeficiency Virus
LGBTI	Lesbian, Gay, Bisexual, Transgender, Intersex
MSEF	Modified Social Ecological Framework
MSM	Men who have sex with men
SEM	Social Ecological Model
STI	Sexually Transmitted Infections
WSW	Women who have sex with women

CHAPTER ONE: INTRODUCTION AND BACKGROUND

1.1 Introduction

This study was undertaken to establish prevalence of HIV, STIs, drug use and sexual practices among women self-reporting having sex with other women in the past year from the time of data collection. The conclusion that WSW in Malawi are not at risk of HIV and STI acquisition, as evidenced by their exclusion from policies and programming on HIV and STIs, lack scientific backing [1]. However, epidemiological studies conducted elsewhere show that WSW can transmit STIs through female-female sex [2]. The Centers for Disease Control and Prevention (CDC) confirmed and reported a case of female-female sexual transmission in 2014 [3]. Risks for HIV transmission by female-to-female sexual contact include unprotected exposure to vaginal or other body fluids and to blood from menstruation, exposure to blood from trauma during rough sex, injection and drug use, heterosexual sex, tattooing, piercing and use of shared sex toys between the partner [4, 5]. To date, there is no study conducted in Malawi to provide HIV and STI epidemiological data on which to base HIV prevention programming in WSW. It is envisaged that this study will cover that gap.

1.2 Operating Definitions

Sexual identity: Sexual identity refers to what human beings think of one self in terms of whom they are sexually and romantically attracted to [6]. One can be attracted to people of the same gender or other of different gender identity. Again, human beings can grow to be different from the gender assigned to them at birth [6]. Since gender identity and roles associated with being male or female are socially prescribed, people whose gender and sexual identity is different from what society expects, face challenges

like discrimination and are called immoral [7]. In trying to fit in society, these sexual minorities face a number of health challenges.

Sexual orientation: A human being's emotional and sexual attraction, intimate and sexual relations with individuals of a different, the same, or both sexes [8]. These intimate and sexual attractions can include members of one's own sex (gay men or lesbians), attraction to members of the opposite sex (heterosexuals) and romantic attraction to members of both sexes (bisexuals) [8].

Gender Diversity: Refers to the extent to which a person's gender identity, role, or expression differs from the cultural norms prescribed for people of a particular sex [6]. This term is becoming more popular as a way to describe people without reference to a particular cultural norm, in a manner that is more affirming and potentially less stigmatizing than gender nonconformity [6].

Women who have sex with Women (WSW): These are females who engage in sexual activities with other females and these may include lesbian (women who are sexually attracted to fellow women only), heterosexual (women who are attracted to men only, but may be involved in female sex due to circumstances) and bisexual women (women who are sexually attracted to fellow women and men) and transgender men (females transitioning to the male gender) [9]. WSW is a preferred term as it focuses on studying factors which may put one at risk of acquiring or transmitting HIV and STIs and not labels of sexual identity, which are controversial and disputable [10].

1.3 Background

Globally, female-to-female sexual contact is assumed to comprise low-risk behaviour for contracting STIs including HIV [11]. This assumption has contributed to the exclusion of WSW from the overall HIV/STI prevention discourse. Again, as their sexual

health concerns are commonly dismissed, many WSW believe they are at low risk of acquiring STIs and HIV. Contrary to this perception, research suggests that WSWs engage in high-risk sexual behaviour with both male and female partners [12]. This study therefore explores HIV and STI prevalence and risky sexual behaviours amongst WSW in Blantyre, Malawi.

1.4 Problem Statement

Although there's epidemiological evidence elsewhere that WSW are at risk of HIV and STI acquisition, in Malawi there's no local data on the prevalence of HIV and STI and related risk factors amongst WSW. This lack of epidemiological data may lead the population to be excluded from focused HIV interventions [5]. This lack of local data merited the need to conduct this study.

1.5 Literature Review

1.4.1 HIV and STI in WSW Globally

This section looks at scientific evidence available globally on the burden of STI and HIV and other risky behaviours that put WSW at risk of acquiring HIV and STI through female-female sex. Data on WSW, although scarce, were largely searched through PubMed, HINARI, Google Scholar, Medical and other health journals.

Scarcity of data on the burden of HIV and STI amongst WSW, to some extent, indicates that little attention has been paid to this population. A systematic review of sexual health and risk behaviors on WSW living in low-and Middle-Income countries reported HIV prevalence among WSW ranging from 0% in East Asia and Pacific, 0%-2.9% in Latin America and the Caribbean to 7.7%-9.6% in Sub-Saharan Africa. Other regions did not

report HIV prevalence in this population [12]. Overall, WSW reported risky sexual behaviors, including sex with men, men who have sex with men (MSM), and HIV-infected partners; transactional sex; and substance abuse [12]. The reviewers noted that WSW are at risk for contracting HIV and STIs and that data to address WSW sexual health needs remain limited [12].

HIV risk in WSWs could be underreported hence conclusions that the risk among this population is insignificant [13], with women bearing the highest burden of HIV, both at country and global level, the possibility of HIV transmission through sexual contact should not be dismissed [14]. Globally, in 2016 there were an estimated 17.8 million women living with HIV (15 and older), constituting 52 per cent of all adults living with HIV and young women and adolescent girls aged 15-24 are particularly affected [15]. In sub-Saharan Africa, women comprised 56 per cent of new infections among adults (15 and older); and the proportion was higher among young women aged 15-24, who made up 67 per cent of new infections among young people [15]. The Centers for Disease Control and Prevention (CDC) confirmed and reported the first case of HIV female-female sexual transmission in 2014 [3]. Risks for HIV transmission by female-to-female sexual contact include unprotected exposure to vaginal or other body fluids and to blood from menstruation, exposure to blood from trauma during rough sex, injection and drug use, heterosexual sex, tattooing, piercing and use of shared sex toys between the partner [4, 5].

Research on HIV and AIDS pandemic prevention has given much evidence which focuses on HIV and STI transmission through anal and vaginal intercourse [16]. A few studies have addressed transmission between women and even a fewer studies have

examined female-to-female risk of Sexually Transmitted Infections [17, 18]. Although some early studies produced no evidence of STIs through female-female sex, current reports highlight that several STIs are transmissible through same-sex female contact, including herpes, trichomoniasis, human papillomavirus and HIV and that women who report sexual relations only with other women do become infected with STIs [9].

An American based study found out that frequency of female–female sexual exposure was independently associated with increased odds of STIs when female–male sexual behaviour was controlled for, which the researchers argue that it represents the first estimation of magnitude of risk due specifically to sexual behaviour between women [19,13].In addition to this, a study conducted in the United Kingdom showed a diagnosis of trichomoniasis, genital herpes, and genital warts among women who had no history of sex with men implying that sexual transmission of STIs between women engaging in same sex sexual relationships is possible [11].

Another study in the United States of America found that a 20-year-old African-American woman, with no obvious HIV risk factors, was diagnosed with HIV, and the infecting strain closely matched that of the strain infecting her openly bisexual female partner [20]. It has been highlighted that the route of transmission was probably use of sex toys, used vigorously enough to cause exchange of blood-tinged body fluids [20].The researchers highlight that thorough risk review revealed lesbian intercourse as her only risk factor for HIV infection as she had no history of substance abuse, including use of injection drugs, had no tattoos or body piercing, had never engaged in heterosexual intercourse. And above all, the researcher highlights that the woman had never received blood products and as a student in junior college with no known exposure to body fluids,

she had engaged in lesbian sex for 2 years, during which time she had had a single partner [20].

A community-based, cross-sectional survey conducted in Kenya among 280 WSWs who were at least 18 years old, had at least one male sexual partner in the past three years, showed that a significant proportion of participants reported that they had been infected with at least one STI in the past three years (33.9%) and of the women who reported having been tested for HIV, 9.4% (7.5% of the total sample) received a positive test result [21]. The study found out that WSWs in Kenya are at risk of negative sexual and reproductive health outcomes, including HIV and STIs which indicates a need to incorporate WSW health concerns within national health policy programming [21].

1.4.2 HIV and STI Risk amongst WSW in Malawi

This section tried to look at the available epidemiological data on WSW in Malawi. There was no scientific published data available on the study population. However, some literature on WSW structural challenges was found. Thus, epidemiological and social studies on other key populations and sexual minorities, like lesbians and MSM were available to build an argument for this study.

In Malawi HIV, just like globally, disproportionately affects women. The country's Ministry of Health in 2015-2016, found HIV prevalence among adult women (aged 15-64) to be 12.8%, compared with 8.2% among adult men. This disparity is especially prominent among 25- to 29-year-olds, as HIV prevalence is three times higher among women than men in this age group (14.1% vs. 4.8%) [22].

The sexual practices that Malawian WSW engage in have not been thoroughly assessed despite research evidence showing that HIV prevalence and incidence is higher among the general population of Malawian women [22]. Lack of data in relation to the HIV situation of WSW shows how these sexual minorities are left out in different health issues including strategies on HIV. Malawian researchers note that the Malawi HIV Prevention Strategy (MHPS) only provides data for MSM and MSM female partners' prevalence but does not provide data for WSW and trans-men [1]. This challenge of data scarcity on WSW in Malawi, researchers argue, is due to the belief that there are not any public health problems faced by WSW [1].

Bandawe and Mambulasa noted that WSW are not specifically recognised in any of Malawi Government policies. Again, the levels of HIV risks in this population have never been measured. It is also argued that there are clear inconsistencies between the laws and policies of the Malawi Government as the Penal Code criminalises same sex relations driving sexual minorities, especially those engaging in same sex, underground and making them more vulnerable to HIV infection and other STIs [1]. The country's National HIV and AIDS Policy acknowledges that the country has a population of persons who engage in same sex and the document highlights the need of according these key populations with quality health care as they are the most vulnerable [23]. Further to this, although the Malawi government through the Ministry of Health undertakes to provide adequate health care to its people to ensure that HIV and STI prevention, treatment, care and support can be accessed by all without discrimination, including people engaging in same sex sexual relations, the fact that same-sex relations are illegal in Malawi is used as a justification for not providing the services to them [1, 23].

WSW is a diverse group with variations in sexual identity, sexual behaviours, sexual practices, and risk behaviours and are at risk of acquiring STIs from current and prior partners, both male and female [13]. The population should not be presumed to be at low or no risk for STIs based on sexual orientation, and reporting of same-sex behaviour by women should not deter providers from considering and performing screening for STIs including HIV [24]. Effective delivery of sexual health services to WSW requires a comprehensive and open discussion of sexual and behavioural risks beyond sexual identity [18].

1.4.3 Conceptual Framework

This study was guided by modified social ecological framework (MSEF). The framework modifies the traditional social ecological model (SEM) [25] by tailoring the levels of risk to HIV-relevant domains [26]. The MSEF is a flexible model for guiding epidemiologic studies among key populations at risk for HIV in diverse socio-cultural contexts. The framework argues that successful HIV prevention strategies for key populations require effective integration of evidence-based biomedical, behavioral, and structural interventions. It also highlights that the focus of epidemiologic studies has traditionally been on describing individual-level risk factors, but the future necessitates comprehensive epidemiologic data characterizing multiple levels of HIV risk [27].

1.4.3.1 Layers of Risk in the Modified Social Ecological Framework

The MSEF is composed of five layers of risk for HIV infection: individual, network, community, policy, and stage of the HIV epidemic [27] recognizing that social and structural factors contribute in the HIV acquisition or transmission especially among hidden populations such as WSW, MSM, prisoners and female Sex Workers (FSW).

Individual: The MSEF looks at a person's vulnerability to disease and infection as influenced by both biological and behavioural factors [27]. These risks should be measured when there is biological or public health plausibility of being actual risk factors, ideally secondary to a rigorous systematic review with meta-analysis [26]. It is at an individual level where a person goes through fantasies and willingness to explore and engage in sexual activities which may pose as a risk to HIV and other STIs [12]. In WSWs individual risk factors include, lack of knowledge on how to practice safe female-female sex, needle sharing, unprotected vaginal sex with male partners. These risks present the highest probability of exposure to HIV and STIs.

Social and sexual networks: This level looks at a human being as comprised of interpersonal relationships including family, friends, neighbours and others that directly influence health and health behaviours in a number of ways [27]. Through these networks the webs of human relationships including dyadic, familial, social, sexual, drug-using and sexual exchange are formed [27].

In line with this level, health experts note that HIV risks and other health outcomes are associated with social influence, social engagement, disease prevalence, access to information, intimate contact and social networks [25]. Sexual networks for key populations mostly are a group of people who have a higher probability of exposure to infectious disease from each other mediated through sexual exposure, shared use of injection, and/or non-injection drug paraphernalia, or increased physical contact [27]. Risks at this level, for WSWs, include biological risks i.e. HIV infection rates and behavioural risks i.e. sexual contact, factors that potentiate HIV transmission among individual members of a network [26]. Apart from the social network associated risks,

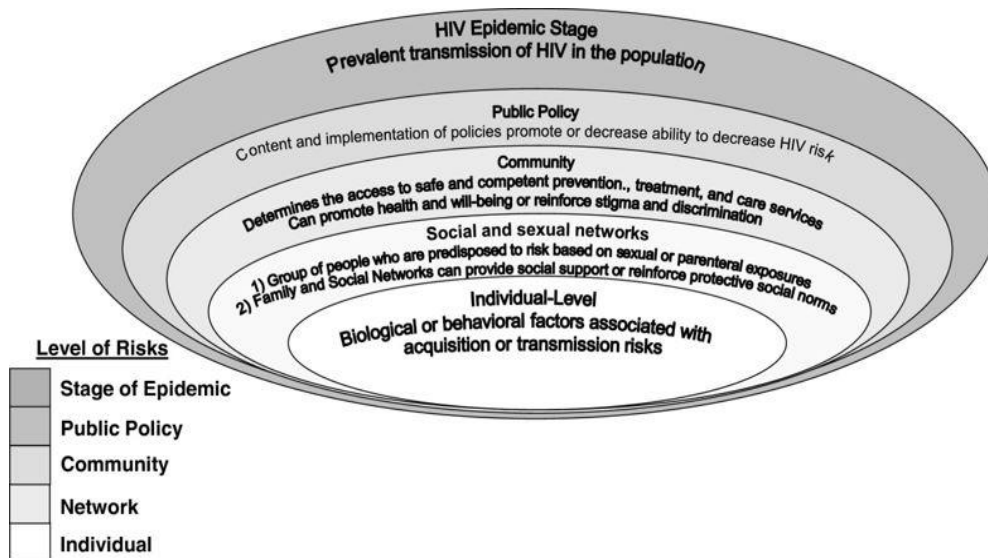
this level looks at family and social networks as providers of social support and reinforces social norms and behaviour that serve as protective factors and reduce HIV transmission risks. However social networks provide both positive and bad influence [27].

Community: The MSEF puts community at level three with the argument that community environments can either promote health and well-being or be a source of stigma [27]. This level highlights that interpretation of community norms may increase or mitigate the risk level for HIV infection within the community. Stigma and discrimination against WSWs populations often manifests at the level of the community in limiting the provision and/or uptake of HIV prevention, treatment, and care services [27].

Laws and policies: Country laws and policies are also featured in the MSEF on the basis that they provide the general framework for shaping the risk of marginalized populations as well as the general population [27]. Legal and policy environments play a critical role in hindering or supporting HIV prevention programs among key populations [28]. In countries, like Malawi, laws criminalize homosexuality, sex work and substance use, based on morals, cultural relativism, and political will rather than the results of public health science [28]. The MSEF looks at laws and policy as contributing factors to high HIV incidence and prevalence in populations at risk [28].

Stage of the epidemic: The framework puts stage of the epidemic as the final stage, which overlaps all the four highlighted levels. MSEF argues that the stage of the epidemic at social and sexual network level, community level, and country level will determine the risk of disease acquisition for the individual [27].

The model agrees with scientists that no behaviour, policy or law, community determinant, network attribute, or individual characteristic can create infectious disease, rather these can only create conditions which either increase or decrease the probability of acquisition or onward transmission of an already prevalent disease therefore the stage at which the epidemic is at all the four levels, determines the level of risk [1, 27, 28].



Source: Baral et al. (2013)

Figure 1: A Modified Social Ecological Framework for HIV risk in WSW

1.5 Justification for MSEF in this Study

The choice for the framework was made after assessing the modifications the researchers have done to the old model and the new modification fits well with this study [25, 27]. Again, MSEF is used to explain the complex associations between social, individual practices, the physical environment and health by contextualizing factors that they may put a human being at risk of contracting HIV.

This study, therefore, used the MSEF since the framework focuses on multi-level risk factors of HIV among sexual minorities. The framework is based on the premise that among sexual minorities, individual-level risk factors are driven or mediated by higher order social and structural levels of risk which are out of the control of any individual person [29].

1.5 Justification of the Study

There is insufficient evidence and data on the prevalence of HIV and STI and predisposing risk factors among WSW in Malawi [1]. This study provides evidence to inform evidence-based interventions for HIV prevention in this population. The study will also potentially bridge the knowledge gap in WSWs HIV sexual risks in Malawi and propose how the risks can be mitigated.

1.6 Objectives

1.6.1 Broad objective

- To explore HIV and STI prevalence, drug use and risky sexual practices amongst WSW in Blantyre, Malawi.

1.6.2 Specific Objectives

- Determine HIV and STI prevalence among WSW
- Explore sexual practices and knowledge on HIV and STI among WSW
- Explore risky sexual behaviours amongst WSW

2.3 Study Population

The study recruited 42 self-identified WSW only who reported to have engaged in same sexual activities for the past one year. WSW in the age of 18-49, residing in Blantyre urban were recruited. Due to ethical considerations, only those in the legal adult age of 18-49 were sampled.

2.4 Study Period

The study was conducted between February to November 2019. The table below details study activities during this period:

Table 1: Study Period

ACTIVITY	A U G 18	F E B 19	M A R 19	A P R 19	M A Y 19	J U N 19	J U L 19	AU G 20 19	S E P 19	O C T 19	N O V 19
Study proposal development											
Submission to COMREC											
Proposal at COMREC											
Data collection											
Dissertation writing											
Results dissemination											

2.5 Sample Size and Sampling Technique

Sexual minorities are a hidden population and to recruit participants the study used snowball sampling technique using through the Center for the Development of People-CEDEP, a national Non-Governmental Organization working with sexual minorities. Forty-two (42) females self- reporting engaging in sexual activities with another woman in the reproductive age category of 18-49 were recruited.

The sample size was calculated using the Cochrans' formula [31] and assumptions detailed below:

$$n = \frac{Z^2 p(1-p)}{d^2}$$

Where; n=the desired sample where eligible population > 10 000; z=standard normal deviation (1.96) corresponding to 95% confidence limit; D=degree of precision usually set at 0.05. P= prevalence/proportion. The prevalence used to calculate sample size in this study has been taken from a study conducted in South Africa, which showed HIV prevalence of 9% among WSWs.

$$\text{Thus, } n = \frac{1.96^2 \times 0.09(1 - 0.09)}{0.05^2} = 126$$

The sample size estimate is further adjusted to consider a finite population of those involved in female-female sex as follows:

$$n(f) = \frac{n}{1 + (n-1)/N}$$

Where; n (f)=desired sample from a finite population < 10 000; n=desired sample size for population > 10 000 and N=estimate of the population size -60. Thus, our computed new sample size is:

$$\frac{126}{1 + (126-1)/60} = 42$$

Total Sample size is 42

2.6 Eligibility Criteria for Study Participants

2.6.1 Inclusion Criteria

- Born a woman (women self-identifying as trans-men, Lesbians, Bisexual).
- Self-reporting having sex with another/other women in the past one year
- Residing in Blantyre for the past one year
- In the age of 18-49

2.6.2 Exclusion Criteria

- Born male
- Never engaged in sex with a another woman in the past one year
- Below the age of 18 and above 49

2.7 Data Collection

A structured questionnaire, which was translated from English to Chichewa, was administered to explore HIV and STI prevalence and risk factors among WSW. The questionnaire had three components: (a) questions on demographic characteristics of participants, (b) questions to measure self-reported HIV and STI prevalence and (c) measures of predicted multi-level sexual risk factors.

The demographic information collected concentrated on: residence, sexual orientation, age, occupation and marital status. Study participants also self-reported if ever or in the past year they have tested for HIV and STIs. They as well self-reported their HIV status and if ever or in the past one year they have had STIs.

The last part was measuring the study's hypothesised sexual risks among WSW where information like; sexual practices, number of sex partners (both male and female), sexual

risks (i.e. condom use with male partners), access to health care, human rights violations, stigma and discrimination and mental health, was collected.

The questionnaire was translated into Chichewa and pre-tested before data collection. Interviews were all face-to-face and informed consent was sought before the start of interview. All the interviews were conducted in spaces where the study participants felt free and safe.

2.8 Data Management and Analysis

Data was entered in a Microsoft Access database. Two independent people entered the data. Both data sets were merged for cleaning. The questionnaires were stored in a lockable filing cabinet.

In this study, factors hypothesized to be sexual risks amongst WSW are independent variables while HIV status is the outcome/dependent variable. Data was exported to STATA (STATA Corp 2005) for analysis and in results presentation, descriptive analysis was conducted. Again SPSS analysis was used in generating the confidence intervals that was presented in tables.

2.9 Study Limitations

Just like any cross-sectional study conducted at a single site, associations should not be interpreted as causal and data are not generalizable. However, this study's results provide a useful pointer for Malawi when it comes to developing HIV prevention strategies for this population. Again, this study dealt with socially stigmatized topics, such as HIV sero-status and sexual behaviours. While every step to ensure confidentiality and create

a safe space for the participants was observed, it is possible that some participants were still holding back the truth during the interviews. This may lead to twisted data towards favourable answers (i.e. an over reporting of condom use and under reporting of number of sexual partners). Researchers refer to this limitation as “social desirability bias,” which is faced by all researchers seeking to examine sensitive topics including HIV[26].

2.10 Ethical Considerations

Informed consent was sought from the participants before administering the questionnaire. Since this is a vulnerable population who can be at risk for taking part in the study, the informed consent was done verbally. However, there was a written consent that was read out and given to participants to read and no signing of documents was done at any point. In addition, since WSWs are a hidden population, and their sexual practices are criminalized, participants’ privacy was observed by conducting the interviews in private and safe places. All data collected through both questionnaires and recorders had no names. To observe confidentiality, codes or numbers were assigned to each questionnaire. Apart from reimbursing transport costs, there were no additional incentives paid out for participating in the study and ethical approval from the College of Medicine Research Ethics Committee-COMREC was sort for the study to be conducted.

CHAPTER THREE: RESULTS

3.1 Study Participants

There were forty-two (42) participants in total aged 18-33 years with a median age of 23. On sexual orientation, 32 participants self-identified as lesbians while 10 self-identified as bisexual. On gender identification, 26 gave a self-identification of female and 16 said their gender was trans-man. There were more participants who grew up in urban areas however only two participants talked of living outside the country at least once (**Table 2**).

Table 2: Participants Demographic Characteristics (n=42)

Characteristic		
Age range (Years)	18-33	
Marital status	Married	3 (7%)
	Single	39 (93%)
Educational level	Primary	6 (14%)
	Secondary	24 (57%)
	Post-secondary	12 (28.5%)
Employment status	Employed	37 (88%)
	Non-Employed	5 (11%)
Place of growth	Urban	38 (90%)
	Rural	4 (9.5%)
Considered gender	Female	26 (61%)
	Trans-man	16(38%)
Sexual orientation	Lesbian	32 (76%)
	Bisexual	10(24%)

3.2 Risky Sexual Activities

The reported median age of female-female sexual debut was 15 (8-30). 25 (59%) of participants reported to have had more than one female sexual partner and had engaged

in sexual activities with them in the last 12 months. The median number of female sexual partners was at 4.5 per person (1-11) in the past 12 months. However, the number of sexual partners one had in the past 12 months had no significant association with any demographic characteristic. 11 (26%) of participants reported to have male partners with the median number 1.5 (1-2) in the past 12 months. When asked “How often do you use a condom with male partners?” participants either remembered or lost count (**Table 3**).

Table 3: Condom Usage (n=11)

	Frequency=n	Frequency= %
Condom used not regularly	5	45
Never used	1	2
Condom Used all the time	5	45

When asked the type of sexual practices they engage in, a number of risky sexual behaviours were mentioned, i.e. having sexual contact during menses (17%), exchanging sex toys without sterilizing them (36%) as shown in Table 4 below.

Table 4: Sexual practices WSW-BT

Sexual practice	Frequency =n	Frequency =%
Clit to clit (vagina to vagina, scissoring)	42	100
Oral Sex	12	28.57
Sex toys (plastic penis, vibrator)	15	35.71
Fingering	42	100

When asked “Do you experience trauma/cuts when engaging in sex or any other sexual activities with your female sex partners?” 28.5% of the respondents reported to have experienced trauma and cuts. See **Figure 3 and Table 5**.

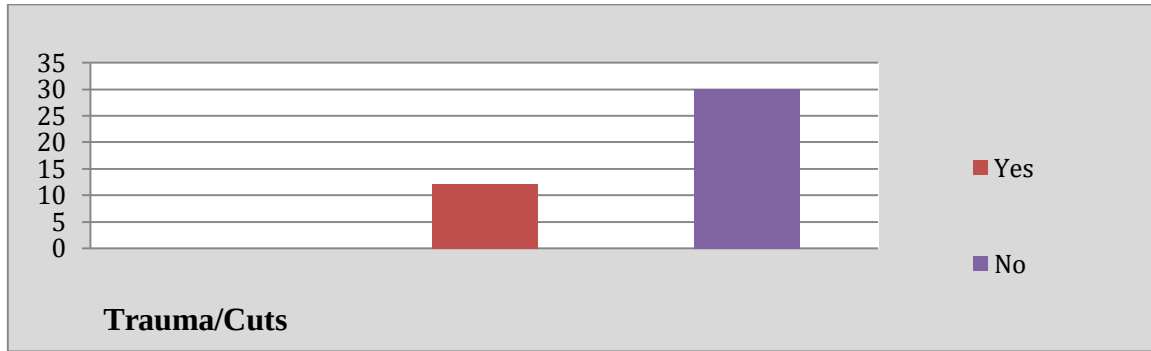


Figure 3: Trauma/Cuts experience amongst WSW in BT

Table 5: Trauma/Cuts Experience amongst WSW by Sexual Acts (n=12)

Sexual act	Frequency =n	Frequency =%
Clit to clit (vagina to vagina, scissoring)	0	0
Oral sex	0	0
Sex toys (plastic penis, vibrator)	0	0
Fingering	12	28.5

3.2.1 Other Risky Behaviours

Since drug and alcohol abuse can also be associated with HIV acquisition, the study asked the participants if they take alcohol (Beer, Spirits and Ciders) and drugs both injectable and non-injectable. The majority of the participants (71.4 %) reported to have been involved in excessive beer drinking with more than 15 bottles of beer (Chill, Castel, Carlsberg green and Special Brew). No participants reported injected drug use; however non-injectable drugs like Marijuana (50%), Cuba (7.14%) and Cocaine (12%) were reported as indicated in **Table 6 and 7**.

Table 6: Alcohol Use

	Frequency =n	Frequency =%
Beer	30(more than 15 bottles per sitting)	71.43
Cider	6(9bottles per sitting)	14.29
Spirits	2(more than 8 shots per sitting)	4.76
NA	4(0-1 bottle or shot)	9.58

Table 7: Drug Use

	Frequency =n	Frequency =%
Marijuana	21	50
Cuba Drug	3	7.14
Cocaine	5	11.9
NA	20	47.61

3.3 HIV, STI Prevalence and Knowledge

3.3.1 HIV Prevalence

To measure HIV prevalence, (self-reported), participants were asked, “When did you go for an HIV test?” “What is your HIV status?” Using World Health Organization-WHO-recommendations on HIV Testing and Counselling-HTC, respondents who reported to have never gone for HTC over 12 months ago and those who had never been tested were categorized together as never tested. 33 (79%) of the participants reported to have never gone for HTC in the past 12 months (**Figure 4**). Additionally, 76% reported to be HIV negative, 21% reported not to know their HIV status while an HIV Prevalence of 2% was recorded (**Figure 5**).

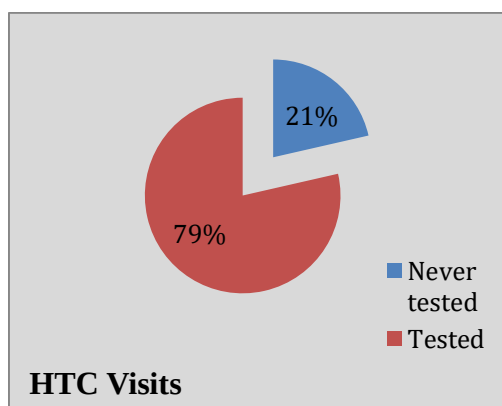


Figure 4: HTC Visits WSW BT

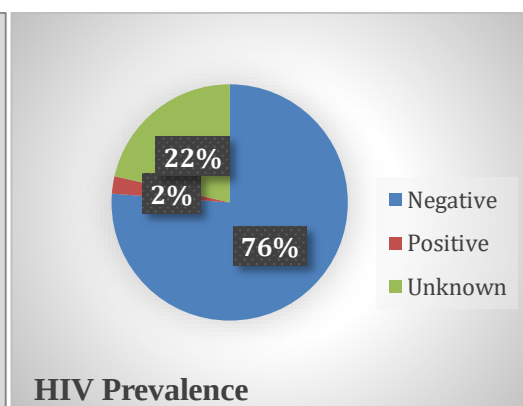


Figure 5: HIV Prevalence WSW BT

The study also asked the participants if they know their female partners' HIV status especially those that they are getting intimate with. Although the rest reported to either know or not know their partner's status, 9.5% of the respondents did not remember (unknown) the status of their sexual partners (**Figure 6**).

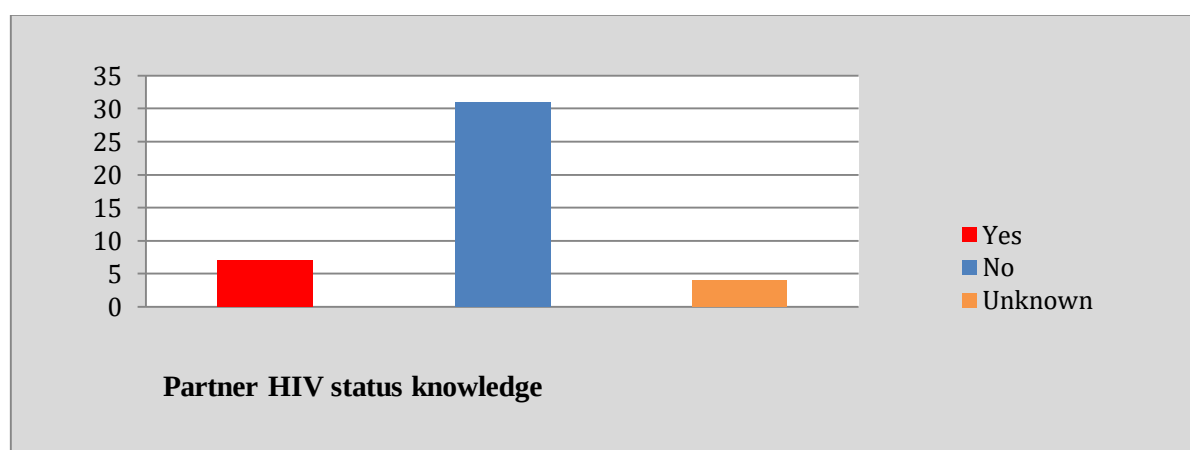


Figure 6: Partner HIV Status Knowledge

3.3.2 STI Prevalence

The study gives a general estimation of STI prevalence, **Figure 7**. The respondents were asked if they had STIs in the last 12 months and to name them. Candida, syphilis and warts were reported with candida being the most reported (29%), as demonstrated in **figure 7**. In addition, the participants were asked to mention STI episodes they individually went through in the past 12 months. 83.3% of participants who had episodes of candida albicans infection reported to have suffered more than one episode as shown in **figure 8**. The study also tried to find out if the participants and their partners suffered the same STIs. 24% (10) had the same STIs with their partners while 14 % (6) had no idea as shown in **figure 9**.

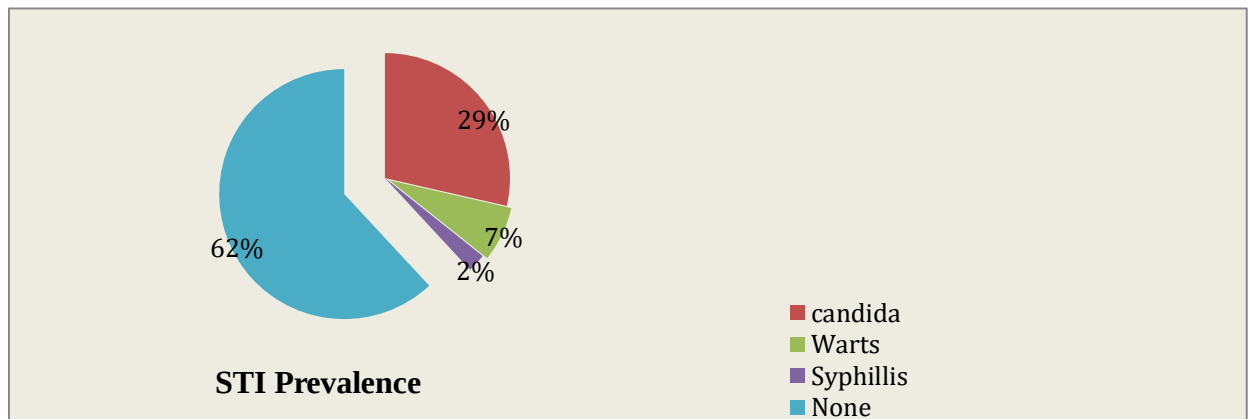


Figure 7: STI Prevalence

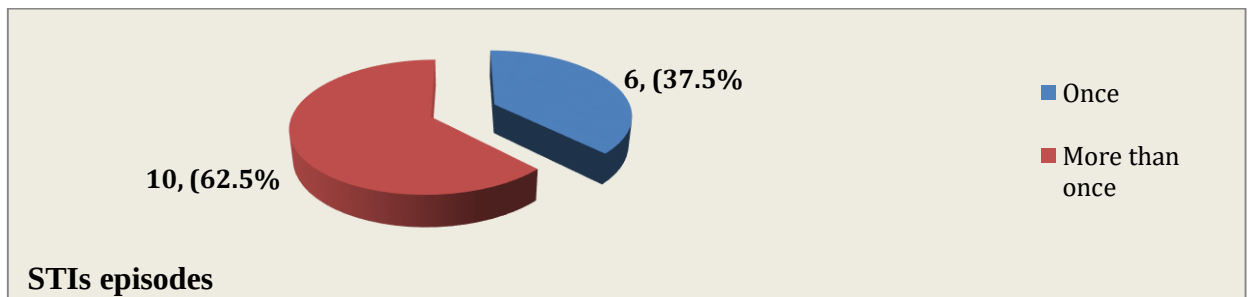


Figure 8: Self-reported STIs Episodes in WSW in BT (n=16)

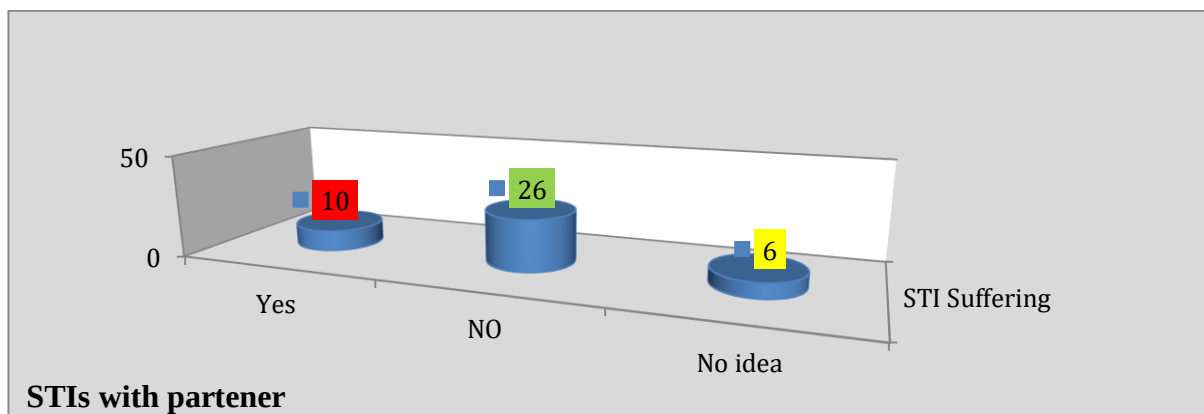


Figure 9: WSW Same STIs with Female Partner (n=42)

3.3.3 HIV and STI Knowledge

The study also tried to assess the knowledge of participants on HIV and STIs transmission. They were asked “What type (s) of sex puts you most at risk for HIV infection?” “Can you get HIV and STIs from female-female sex?”. 71.4% of the participants think Male-Female sex (Penis-Vagina sex) puts one at a greater risk of HIV and STI acquisition (**Table 8**). However, 83% think that there’s a possibility of HIV and STI transmission through female-female sex (**Table 9**).

Table 8: WSW Knowledge on Risky Act

Mentioned act	Frequency =n	Frequency%
Male to Male (anal sex)	7	16.6
Male to Female (Vaginal sex)	30	71.42
Female to Female	5	11.9

Table 9: Female- Female Sex and HIV

	Frequency	Frequency =%
Yes	35	83
No	7	16.6

The participants were also asked if they have received information on how to prevent HIV and STIs from female-female sex. Slightly over half of the respondents (59.5%) said they have received HIV and STIs messages from CEDEP.

3.4 Sexual Behaviors and HIV/STI Acquisition

To explore risky sexual behaviours and acquisition of HIV and STIs, sexual behaviours were analysed. Risky behaviours of fingering, penis-vagina sex and the use of

unsterilized sex-toys were reported to have been the most common sexual activities amongst the population.

Tables 10, 11, 12 & 13, show a descriptive analysis and percentages of the results analysed presenting 95 Confidence Intervals-CI.

Table 10: Participants Involved in Fingering Developed Warts (n=42)

	STIs (warts)		Total
	+	-	
Fingering	3	39	42

100% (whole study population) reported to engage in fingering as a sexual act. 3 participants reported to have contracted genital warts. This represents 7.1% of the study population. (95% CI (1.5%, 19.5%))

Table 11: Participants Involved in Fingering and Developed Candida (n=42)

	STIs (Candida)		Total
	+	-	
Fingering	12	30	42

12 participants of those involved with fingering had episodes of candida. Representing 28.6%. (95% CI (15.7%, 44.6%))

Table 12: Used Toys and Developed Candida (n=15)

	STIs (Candida)		Total
	+	-	
Toys	11	4	15

15 participants reported to have used unsterilized toys for sexual pleasure- 11 reported episodes of candida infection representing 73%. **(95% CI (44.9%, 92.2%)**

Table 13: Involved in Penis-Vagina Sex Developed Candida (n=11)

	STIs (Candida)		Total
	+	-	
Penis-Vagina sex	7	4	11

11 participants reported to have been involved with male partners sexually. 7 reported to have suffered from candida infection representing 63% of those involved in penis-vagina sex.

(95% CI (30.8%, 89.1%)

CHAPTER FOUR: DISCUSSION

4.1 Introduction

This study aimed at giving evidence that WSW are at risk of HIV and STI acquisition through female-female sex. Specifically, apart from exploring HIV and STI prevalence, this study has looked at sexual behaviors that may put WSW at risk. The study has also investigated the population's general knowledge on HIV and STI. Through the findings, the study aims to determine access to HIV and STI prevention services by WSW just like other key populations.

The study's findings are aligned to the Social Ecological Modified Framework-SEMF, which backs the basis of this study's argument. As the SEMF looks at HIV risk in key populations, this study also finds that HIV risk in WSW in Malawi manifests at different levels [27]. WSW face HIV and STI risk at: individual level (multiple sex partners, penis-vagina sex), Community level, (restricted access to HIV prevention strategies), policy level (legal/structural barriers in which homosexuality is criminalized), stage of the epidemic (the stage of HIV pandemic in Malawi shows that women are the most infected). This puts WSW at a risk of contracting HIV.

In addition, this study finds that from the population, risky sexual behaviours emerge- (i) multiple sexual partners (females) are common with whom they engage with in risky sexual behaviours like the use of unsterilized sex-toys and fingering and (ii) having male sex partners with whom they engage sexually without the use of condoms.

4.2 HIV and STI Prevalence

The study findings report 2% (n=1) HIV prevalence. In trying to find out the possibility of a female-female HIV infection, the self-reported participant, bisexual, did not trace at what point she got infected. The study also reports 38% (n=16) as the general prevalence of STI amongst WSW in Blantyre urban -Syphilis 2%, Candida 29% and warts 7%.

The study also reports a case of syphilis (n=1), which the self-reporting participant reported to have contracted from another female sexual partner since at that time she had no male sexual partner.

These findings are similar with findings of other studies on Sexually Transmitted Infections Among Women Who Have Sex With Women [9, 11]. Although there are more similarities between this study's results and the referred studies, the difference between the surveys on disease outcomes could be due to differences in common STIs amongst participants for the two studies.

4.3 Risky Sexual Activities

The use of fingers for sexual pleasure (fingering) and clitoris to clitoris (scissoring) was reported to have been practiced by all study participants (100%) and 29% of the participants experienced trauma/cuts during fingering at some point. 7.1% of the participants involved in fingering reported to have suffered from warts while 29% reported to have an experience of candidiasis. The trauma/cuts experience could be attributed to uncut nails, for cosmetic purposes. Winer et al found out that finger-genital transmission can be a source STIs [32]. The study further found that genital HPV types had been detected in palm or fingertip samples from patients with genital warts, in

asymptomatic men and women and in newly sexually active female university students [32].

15 participants reported use of toys for sexual pleasure as their sexual behavior. 73.3% sex toy users reported episodes of Candidiasis. Unsterilized sex toys can spread STIs amongst the users [33]. 26% of the participants had sexual encounters with male partners while 56% had sex several times with their male partners without condoms. 63.6% reported episodes of candidiasis. Penis-vagina unprotected sex is a risk for STI acquisition and women who have sex with both male and female partners pose a risk of contracting STIs from their male partners and transmit to their female partners.

This study echoes that of Bailey *et al* who found out that WSWs may have sexual histories with men and are therefore vulnerable to sexually transmitted or blood borne infections [11].

4.4 Drug and Alcohol Abuse

The study also tried to look at risky behaviours common in WSW. Since drug and alcohol abuse can also be associated with HIV acquisition, the study tried to look into drug, both injectable and non-injectable abuse among the study population. The majority of the participants (71.4 %) reported to have been involved in excessive beer drinking with more than 15 bottles of beer per sitting. The study recorded no case of drug injection. However non-injectable drugs like Marijuana (50%), Cuba (7.14%) and Cocaine (12%) were recorded as being used.

The use of drugs and alcohol is associated with lack of making sound decisions when it comes to sex [12]. With half of this study's population engaging in Marijuana and excessive drinking chances are high that some risky decisions are inevitable.

These study's findings are in-line with what Green and Feinstein (2011) found that sexual minorities, especially lesbians, gays and bisexuals-LGB, are centered on activities that involve drinking and drug use (e.g. bars, circuit parties) [34]. These communities have become increasingly diverse, this trend could lead to social networks of LGB individuals that consist of heavier substance users than those of heterosexual individuals, and also could make it more difficult for LGB individuals to avoid triggers for substance use [34].

4.5 HIV and STI General Knowledge

The study recorded a knowledge gap on risky sexual behaviors amongst WSW. 17% said only anal sex was a risk, 71% said male to female only (penis-vagina sex) and 11.9% said female-female sex was a risk for STI and HIV acquisition. It was also noted that those who said only anal sex was a risk, said so based on the information they got about MSM.

Even though, the message was correct about unprotected anal sex being the riskiest, WSW too should be told about risks associated with their activities. While WSW battle with their own perceptions of invulnerability and accepting their HIV positive status, they have to deal also with wide-ranging misconceptions about risk. Further to this, slightly over half of the participants (59.5%) reported to have received information on

STI and HIV prevention and female-female sex. And all of them got the message from CEDEP only.

In the Matebeni study it was found that five lesbian participants self-reported, with much disbelief, that their female partners could have possibly infected them[35] All these participants reported they had never been with male partners or had exposure to medical transmissions or injecting drug use. With the study participants finding it difficult to understand, the only possible route of transmission and risky behavior they could report was sex with other female [35]. There's therefore need to give WSW all the required information on HIV and STI risk.

The study also recorded 74% (n=31) participants who were being sidelined by their families due to their sexual orientations. However, only 2 (5%) of the participants faced challenges, and one was mocked by health workers when she wanted health assistance because they are trans-men. Being sidelined by social circles contributes to key populations failing to access medical care. The fear of being labeled immoral and different from what society assigns to gender makes key populations like WSW fail to seek help [17].

In addition to this, policy makers argue that in Malawi the population of WSW is not as much known and targeted by human rights activists. The study recorded that all participants knew not less than 15 WSW in Blantyre as their network size whom they mostly meet during sports, drinking joints and social media. This finding may go a long way in challenging arguments that WSW are in low numbers.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Although this study reported a 2% HIV Prevalence, it has to be noted that more than half (79%) of the study participants reported not to have gone for HTC in the past 12 months. Yet they self-reported an HIV negative status while 21% reported not to know their HIV status.

However, the study findings have confirmed findings in other studies that although WSW have a lower HIV prevalence as compared to other key populations, they may be at risk of HIV and STI acquisition. The study proves that WSW in Blantyre practice risky sexual behaviors and can contract STIs when exchanging bodily fluids via different sexual acts. Although this study has also demonstrated a low prevalence of HIV, the results should not be generalized as these were self-reporting and as earlier indicated some would possibly hide their status since there is still lack of willingness to disclose HIV status for fear of stigma and discrimination.

Even though, unprotected sexual encounter with male partners makes WSW vulnerable to sexually transmitted or blood borne infections, vaginal candidiasis, genital warts and syphilis in women who had no history of sex with men, as this study reports, this implies that sexual transmission of STIs between women is possible.

Further to this, the study has shown that WSW in Malawi engage in alcohol and non-injectable drugs abuse. This puts them at risk of engaging in risky sexual behaviors.

5.2 Recommendations

This study was conducted to provide evidence in line with HIV and STI prevention strategies for WSW as a key population. The study therefore recommends that different organizations implementing HIV prevention strategies in Malawi should include WSW in the strategies.

For instance, the use of unsterilized sex-toy, fingering and having multiple sexual partners came out as the most practiced. This suggests that there should be messages specifically targeting such sexual practices and HIV prevention. As this study reports there is a general low knowledge of HIV and STI transmission and prevention amongst WSW. With only CEDEP being the source of information for this population, a lot needs to be done so that the UNAIDS goals of leaving no one behind are achieved.

Furthermore, even though most participants did not face challenges with health workers, trans-men were reported to have been bullied/mockered by health workers. There is need for sensitizations for health workers when it comes to treating sexual minorities.

Although the exact estimation of WSW in Blantyre is not established, the study recorded that the participants had larger network sizes with not less than 15 WSW friends for each participant. This calls for efforts to reach out to this population, which may have a significant STI burden than expected, as they remain hidden.

5.2.1 Recommendation for further study

This study relied on self-reported data and as highlighted several times, such data is prone to several biases. Therefore, further studies using mixed methods i.e. using both quantitative and qualitative methods of data collection are recommended. The qualitative method will explore more details in some of the behaviours that may not have been captured with the use of this study's structured questionnaire.

REFERENCE

- [1] Mambulasa CBM. *CEDEP needs assessment for effective implementation of human rights, HIV and other health related interventions among MSM and WSW in Malawi*. Lilongwe; 2012.
- [2] Lemp GF, Jones M, Kellogg TA, et al. HIV seroprevalence and risk behaviors among lesbians and bisexual women in San Francisco and Berkeley, California. *Am J Public Health*. 1995; 85: 1549–1552.
- [3] Centers for Disease Control-CDC. *Likely female-to-female sexual transmission of HIV — Texas; 2012*. Available at: <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6310a1.htm>.
- [4] Evans AL, Scally AJ, Wellard SJ, et al. Prevalence of bacterial vaginosis in lesbians and heterosexual women in a community setting. *Sex Transm Infect*. 2007; 83: 470–475.
- [5] Chan SK, Thornton LR, Chronister KJ, et al. Likely female-to-female sexual transmission of HIV-Texas, 2012. *MMWR Morb Mortal Wkly Rep*. 2014; 63: 209–212.
- [6] Key terms and concepts in understanding gender diversity and sexual orientation among students; 2015. Available at: <https://www.apa.org/pi/lgbt/programs/safe-supportive/lgbt/key-terms.pdf>
- [7] Lefkowitz ES, Shearer CL, Gillen MM, et al. How gendered attitudes relate to women's and men's sexual behaviors and beliefs. *Sex Cult*. 2014; 18: 833–846.
- [8] United Nations Programme on HIV and AIDS-UNAIDS: Terminology guidelines; 2011. Available at: http://www.unaids.org/sites/default/files/media_asset/JC2118_terminology-guidelines_en_1.pdf

- [9] Gorgos LM, Marrazzo JM. Sexually transmitted infections among women who have sex with women. *Clin Infect Dis*. 2011; 53:S84–S91.
- [10] Hughes C, Evans A. Health needs of women who have sex with women. *BMJ*. 2003; 327: 939–940.
- [11] Bailey J V, Farquhar C, Owen C, et al. Sexually transmitted infections in women who have sex with women. *Sex Transm Infect*. 2004; 80:244-246.
- [12] Tat SA, Marrazzo JM, Graham SM. Women who have sex with women living in low- and middle-income countries: a systematic review of sexual health and risk behaviors. *LGBT Heal*. 2015; 2:91–104.
- [13] Fethers K, Marks C, Mindel A, et al. Sexually transmitted infections and risk behaviours in women who have sex with women. *Sex Transm Infect*. 2000; 76:345-349.
- [14] Maughan-Brown B, Venkataramani AS. Accuracy and determinants of perceived HIV risk among young women in South Africa. *BMC Public Health*. 2017;18: 42.
- [15] Facts and figures: HIV and AIDS prevalence and new infections. Available at: <http://www.unwomen.org/en/what-we-do/hiv-and-aids/facts-and-figures>
- [16] Becerra JC, Bildstein LS, Gach JS. Recent insights into the HIV/AIDS pandemic. *Microb cell (Graz, Austria)*. 2016; 3:451–475.
- [17] Marrazzo JM. Sexually transmitted infections in women who have sex with women: who cares? *Sex Transm Infect*. 2000; 76:330-332.
- [18] Richardson D. The social construction of immunity: HIV risk perception and prevention among lesbians and bisexual women. *Cult Health Sex*. 2000; 2:33–49.
- [19] Kwakwa HA, Ghobrial MW. Female-to-female transmission of human

- immunodeficiency virus. *Clin Infect Dis*. 2003; 36: e40–e41.
- [20] Chu SY, Buehler JW, Fleming PL, et al. Epidemiology of reported cases of AIDS in lesbians, United States 1980-89. *Am J Public Health*. 1990; 80:1380–1381.
- [21] Zaidi SS, Ocholla AM, Otieno RA, et al. Women who have sex with women in Kenya and their sexual and reproductive health. *LGBT Heal*. 2016; 3:139–145.
- [22] AVERT. HIV and AIDS in Malawi. AVERT; 2018. Available at: <https://www.avert.org/professionals/hiv-around-world/sub-saharan-africa/malawi>
- [23] *Malawi National HIV/AIDS Policy*; 2003. Available at: https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---ilo_aids/documents/legaldocument/wcms_125540.pdf
- [24] Patel P, Borkowf CB, Brooks JT, et al. Estimating per-act HIV transmission risk: a systematic review. *AIDS*. 2014; 28:1509-19. Available at: https://journals.lww.com/aidsonline/Fulltext/2014/06190/Estimating_per_act_HIV_transmission_risk___a.14.aspx
- [25] Poux S. *Social ecological model offers new approach to public health the Borgen Project*. Seattle: The Borgen Project; 2017. Available at: <https://borgenproject.org/social-ecological-model/>
- [26] Examining prevalence of HIV infection and risk factors among female sex workers (FSW) and men who have sex with men (MSM) in Swaziland; 2013. Available at: <https://www.jhsph.edu/research/centers-and-institutes/research-to-prevention/publications/Swazi-Quantitative-final.pdf> (2013).
- [27] Baral S, Logie C, Grosso A, et al. *Modified social ecological model: a tool to guide the assessment of the risks and risk contexts of HIV epidemics* [Epub

ahead of print]; 2013 May 17. DOI: 10.1186/1471-2458-13-482.

- [28] Muula A, Jumbe V, Kamba D. Technical report for the study for the on perception, barriers and facilitators to access to sexual and reproductive health services for MSM, FSWs, PIDs and TGW. *In Malawi College of Medicine technical report for the study on perception, barriers and facil.* Lilongwe; 2017. Available at: https://www.researchgate.net/publication/328488632_Technical_Report_for_the_Study_for_the_on_Perception_Barriers_and_Facilitators_to_Access_to_Sexual_and_Reproductive_Health_Services_for_MSM_FSWs_PIDs_and_TGW_in_Malawi_College_of_Medicine_Technical_Re
- [29] Wellings K1, Collumbien M, Slaymaker E, Singh S, Hodges Z, Patel D BN. Sexual behaviour in context: a global perspective. *Lancet*. 2006; 368:1706–28.
- [30] Aldrich R. Homosexuality and the city: an historical overview. *Urban Stud*. 2004; 41:1719–1737.
- [31] Cochran's Formula general tips: 2018. Available at: <https://www.statisticshowto.datasciencecentral.com/probability-and-statistics/find-sample-size/>
- [32] Winer RL, Hughes JP, Feng Q, et al. Detection of genital HPV types in fingertip samples from newly sexually active female university students. *Cancer Epidemiol Biomarkers*. 2010; 19:1682 LP-1685.
- [33] National Health Service. Are sex toys safe? NHS; 2016. Available at: <https://www.nhs.uk/common-health-questions/sexual-health/are-sex-toys-safe/>
- [34] Green KE, Feinstein BA. Substance use in lesbian, gay, and bisexual populations: an update on empirical research and implications for treatment. *Psychol Addict Behav*. 2012; 26:265–278.

- [35] Matebeni Z, Reddy V, Sandfort T, et al. 'I thought we are safe': southern African lesbians' experiences of living with HIV. *Cult Health Sex*. 2013; 15 Suppl:34–47.

APPENDICES

Appendix A: Participant's Consent Form

Title of Study: Exploring HIV risk factors among self-identified Women who have sex with Women in Blantyre, Malawi.

Principal Investigator: Winnie Agnes Botha, University of Malawi, College of Medicine

Phone number: +265 999 277 266

Study Contact email: nyabotha@gmail.com

To be read aloud to the participants or be given to them to read

General information about study:

You are being invited to take part in a research study, *Exploring HIV risk factors among self-identified Women who have sex with Women in Blantyre, Malawi*. This is an academic research for MSc Global Health Implementation to be conducted in Blantyre City

What is the purpose of this study?

The overall aim of this study is to explore HIV and STI prevalence and risk factors among WSWs in Blantyre, Malawi. The study will also assess sexual practices and knowledge on HIV and STIs among WSWs.

Where is the study being conducted?

The study is being conducted in Blantyre City, Southern region of Malawi.

What will you have to do if you take part in this study?

You will be requested to answer all questions and provide information on sexual practices you engage in, HIV and STIs knowledge and you will be required to reveal your HIV status.

Study risks

We do not anticipate any risks associated with this study however we will be asking you to share with us personal and confidential information, and you may feel uncomfortable talking about some of the topics. You do not have to answer any question or take part in the interview if you don't wish to do so, and that is also fine.

Confidentiality

All the information you give will be kept confidential and any information about you will have a number on it instead of your name. Only the researchers will know what your number is and we will lock that information up with a lock and key. We will not share the information you give to us with anyone.

Benefits of your participation

You may not directly benefit from your participation in the study, however you will contribute to improve the information available on sexual risks and access to quality health care and HIV and STIs prevalence in WSWs in Malawi.

Reimbursements

Apart from reimbursing transport costs, there will be no additional incentives paid out for participating in the study. The transport refund will be a standard amount of four thousand kwacha.

Sharing the Results

Nothing that you tell us will be shared with anybody outside the research team and your name will not be used at any point. Each participant will receive a summary of the results. We will publish the results so that other interested people may learn from the research.

Right to Refuse or Withdraw

Your joining in this study is voluntary and you can decide to withdraw from the research at any time.

Who to contact

If you have questions or require more information about this study please contact:

The Chairperson

College of Medicine Research and Ethics Committee

P/Bag 360

Blantyre

Telephone: 01 871911

Winnie Agnes Botha,

Malawi Broadcasting Corporation-MBC,

P.O Box 30133,

Chichiri,

Blantyre.

Cell +265 999 277 266

Email: nyabotha@gmail.com

Appendix B: Questionnaire

Introduction:

My name is **Winnie Agnes Botha**; I'm a University of Malawi, College of Medicine student. I'm doing a study on, *Exploring HIV risk factors among self-identified Women who have sex with Women-WSWs- in Blantyre, Malawi*. You are requested to participate. This study aims at exploring HIV and STI prevalence and risk factors, assess sexual practices and knowledge on HIV and STIs and assess risk factors associated with HIV and STIs amongst WSWs.

The study will interview self-identified WSWs. I assure you of confidentiality with whatever you say. I shall not use names but rather identification number throughout the research. I shall keep writing and recording using a recorder as we chat.

You're requested not to share with anyone details of what will be discussed in the interview.

Information required from all participants:

Day.....Month.....Year.....

UniqueID.....Interviewer

ID.....

Eligibility;

What gender were you born?

Eligible if;

Born female

Transman

Lesbians, Bisexual

Self-reporting having sex with another women in the past one year

Residing in Blantyre for the past one year

In reproductive age of 15-49

Discontinue if;

Born male

Trans-woman

Never engage in sex with another female

Not in reproductive age of 15-49

Part 1 – Demographic and Socio- Economic Information

The first questions are about your background. Everything you share with us will remain confidential, so please feel comfortable telling us about yourself.

No.	Question	Response
1.00	How old are you?	
1.01	What was your place of birth?	
1.02	What is the highest level of your education completed?	
1.03	What is your current employment status?	

1.04	Where did you grow up?	
1.05	Have you ever resided outside of Malawi in the last 12 months?	
1.06	What do you consider your sexual orientation to be?	
1.07	What do you consider your gender to be?	
1.08	What is your marital status?	
1.09	Where do you stay now?	

Part 2- To measure self-reported HIV and STIs prevalence

Now we are going to ask you about your HIV and STIs status. Please feel free to answer all questions with honesty and be assured that the information given will remain confidential.

No.	Question	Response
2.1	When did you go for an HIV test and what was the result?	
2.2	Do you have female sexual partners that are HIV positive?	
2.3	In the past 12 months have you been told that you have STIs? (if yes name them)	
2.4	Have you and your female partner suffered	

	from the same STIs?	
2.5	How many times in the past 12 months have you and your female partners suffered from STIs? (name them)	

Part 3-Knowledge, Behavior, Discrimination and Human Rights Abuses

Now we are going to ask you some private questions about sexual practices, what you know about HIV and how to prevent becoming infected with HIV. You are also going to be asked how many sexual partners you have. Again we will also ask you about your experience in access to health care, human rights violations, stigma and discrimination. If you are uncomfortable, you may always choose to refuse an answer. Remember, all of your answers will be confidential and private.

No.	Question	Response
3.1	How do you do sex with your female partner? (sexual practices mention all)	

3.2	How old were you when you first had sex with another female?	
3.3	How many female sexual partners do you have?	
3.4	Of your female partners, how many did you have sex with in the past 12 months ?	
3.5	Do you engage in sex with your female partner while in menses?	
3.6	Do you experience trauma/cuts when engaging in sex with female partners?	
3.7	How many male sexual partners do you have?	
3.8		

	How often do you use a condom when you having sex with a male partner?	
3.9	In the past 12 Months , how many times have you been involved in unprotected sex with male partners? (number of males/number of sexual encounters)	
3.10	What type(s) of sex puts you most at risk for HIV infection	
3.11	Can you get HIV and STIs from female-female sex?	
3.12		

	Do you inject drugs? (If yes with whom?)	
3.13	Have you used needles that other people had already used?	
3.14	In the past 12 months have you used any drug that was not injected like (i.e. marijuana, powdered cocaine)	
3.15	In the past 30 days , when you did drink alcohol, how many days did you drink 5 or more drinks in one sitting? (By 'drink' we mean a bottle of beer, a shot of liquor or a glass of wine)	
3.16		

	In the last 12 months , have you received information on how to prevent HIV and STIs infection from female – female sex?	
3.16b	Where did you get this information?	
3.17	Where do you meet your female sexual partners?	
3.18	Have you ever felt excluded from family gatherings as a result of your sexual orientation or practice?	
3.19	Have you ever felt afraid to seek health care services as a result of	

	your sexual orientation or practice?	
3.20	Have you ever been denied health services as a result of your sexual orientation or practice?	
3.21	Have you ever been tortured as a result of your sexual orientation or practice?	
3.22	Personal network size (How many people who do you know are (WSWs).	

-END-

Appendix C: Research Approval Letters



The Secretariat
Town Hall
City Centre
Kadungwa Street
Private Bag 57
BLANTYRE
Republic of Malawi

Blantyre City Council

All correspondence to be addressed to:

The Chief Executive Officer
Phone: +265 (0) 970 437
Fax: +265 (0) 970 437
Email: ce@blantyre.mw
www.blantyre.mw

Ref: BCC/ADM/3/1/11

11th April, 2019

Director, MSc in Global Health Implementation program
College of Medicine
University of Malawi
Private Bag 360
BLANTYRE

Dear Sir

RE: PERMISSION TO COLLECT DATA FOR ACADEMIC ASSIGNMENT

We refer to your letter dated 10th April 2019 seeking permission for Ms Winnie Agnes Botha, a student pursuing MSc Degree in Global Health Implementation at College of Medicine, to carry out her research in Blantyre City on "Exploring HIV prevalence and risk factors among self-identified women who have sex with women in Blantyre, Malawi."

The Council gives permission to Ms Botha to carry out her research in the City on condition that the information collected shall be used **STRICTLY** for academic purposes. The student is expected to carry with her this letter for identification.

Yours faithfully

Lytton S. Nkala
For: **CHIEF EXECUTIVE OFFICER**

Copy to City Clerk, the Police



The Executive Director,
Center for the Development of People
P O Bx 3251
Lilongwe
30th January 2019

Ms Winnie Agnes Botha
Malawi Broadcasting Corporation-MBC
P.O. Box 30133,
Chichiri, Blantyre 3.

Dear Madam,

APPROVAL TO CONDUCT A RESEARCH STUDY USING CEDEP "SEEDS" IN BLANTYRE

With reference to your request, dated 16th January, 2019, that you would like to use CEDEP in identifying participants/Seeds for your study "*Exploring HIV risk factors among self-identified Women who have sex with Women-WSWs- in Blantyre, Malawi*", I am pleased to inform you that your request has been approved.

You will be required, however to produce approval letter from COMREC for CEDEP to provide the required assistance and expertise. Once you have all documents in place please present this letter together with COMREC approval letter to the manager of the section you will be collecting data from.

Please share the final copy of your study with our office.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Gift Trapence', is written over a faint circular stamp.

Handwritten initials 'RP' in blue ink.

Gift Trapence

Executive Director

Appendix D: Certificate of Approval



Appendix E: Manuscript

Exploring HIV and STI prevalence, sexual practices and drug use among self-identified women who have sex with women in Blantyre, Malawi.

ABSTRACT

Problem and Background: Women who have sex with women (WSW) are mostly not included in Human Immunodeficiency Virus (HIV) and Sexually Transmitted Infections (STI) prevention interventions since female-female sex is presumed to be low risk. However, studies from other countries have reported significant STI burden in WSW. No study has been done in Malawi.

Objectives: To explore HIV, STI prevalence, drug use and risky sexual behaviours amongst WSW in Blantyre, Malawi.

Methods: This was a cross-sectional study using quantitative method. Snowball sampling technique was used to recruit study participants. Participants were recruited through the Center for the Development of People (CEDEP), a Non-Governmental Organization working with sexual minorities in Malawi. 42 WSW aged 18-49 were recruited. A structured questionnaire was administered which focused on (a) demographic characteristics, (b) exploring self-reported HIV and STI prevalence and (c) drug usage and WSW sexual practices.

Results: 42 participants were recruited with a median age of 23 years (range 18-33). Self-reported HIV prevalence was 2% (1/42). Prevalence for *Candida albicans* infection was 29% (12/42) and genital warts 7% (3/42). One participant (2%) self-reported having syphilis in the past one year and had no history of sexual contact with men. Sexual practices in the past one-year were also accessed. All study participants (100%) reported to have engaged in fingering and clitoris to clitoris sexual contact; (59%) had multiple female sex partners and (26%) were involved in female-male sex. (36%) reported using

unsterilized sex toys and (28.5%) were involved in oral sex. Drug use in the past one year was also assessed. No participants reported injected drug use. However non-injectable drugs like Marijuana (50%), Cuba (7.14%) and Cocaine (12%) were reported.

Conclusion: This was the first robust study on WSW in Malawi. It has demonstrated a low prevalence of self-reported HIV infection in WSW. However, STIs reported suggest that WSW are vulnerable to blood borne infections (syphilis). Episodes of warts and syphilis in a woman who had no history of sex with men suggest that female-female sex can transmit STIs.

Introduction

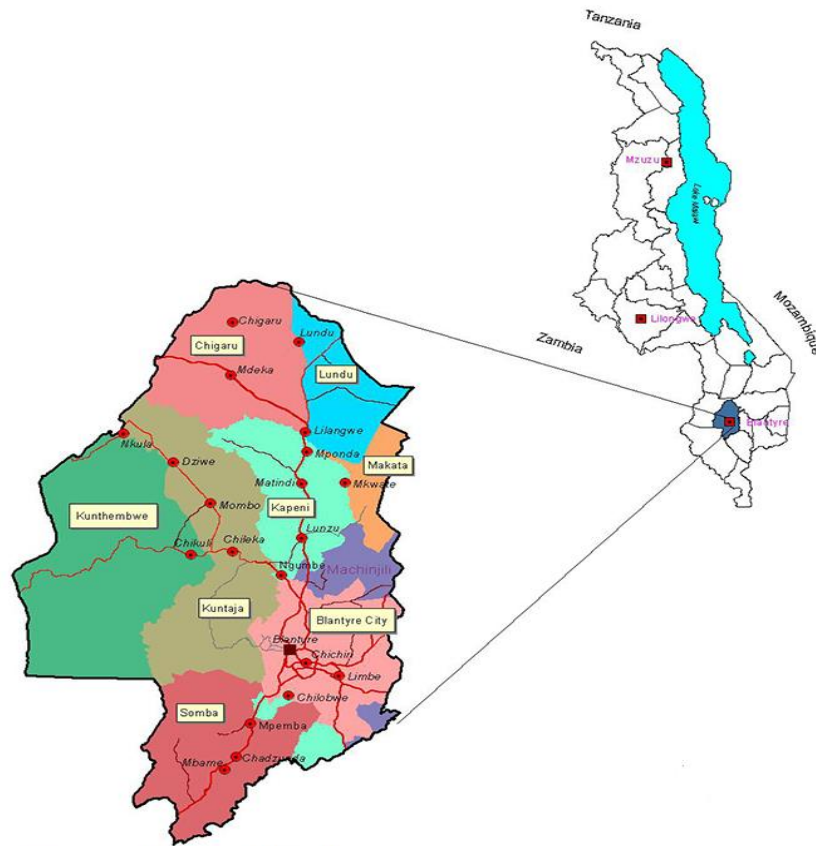
This study was undertaken to establish prevalence of HIV, STIs, drug use and sexual practices among women self-reporting having sex with other women in the past year from the time of data collection. The conclusion that WSW in Malawi are not at risk of HIV and STI acquisition, as evidenced by their exclusion from policies and programming on HIV and STIs, lack scientific backing[1]. However, epidemiological studies conducted elsewhere show that WSW can transmit STIs through female-female sex[2]. The Centers for Disease Control and Prevention (CDC) confirmed and reported a case of female-female sexual transmission in 2014[3]. Risks for HIV transmission by female-to-female sexual contact include unprotected exposure to vaginal or other body fluids and to blood from menstruation, exposure to blood from trauma during rough sex, injection and drug use, heterosexual sex, tattooing, piercing and use of shared sex toys between the partner [4, 5]. To date, there is no study conducted in Malawi to provide HIV and STI epidemiological data on which to base HIV prevention programming in WSW. It is envisaged that this study will cover that gap.

Again, as their sexual health concerns are commonly dismissed, many WSW believe they are at low risk of acquiring STIs and HIV. Contrary to this perception, research suggests that WSW engage in high-risk sexual behaviour with both male and female partners[6]. This study therefore explored HIV and STI prevalence and risky sexual behaviours amongst WSW in Blantyre, Malawi.

Methodology

Study setting

Data was collected from Blantyre Urban. The study place was selected because apart from being a commercial city and a hub of the southern region, studies show that people who engage in same sex relationships move into cities to make use of available private spaces and meeting places[7].



Source: <https://localgovt.gov.mw>

Figure 1: Map of Blantyre City

Study design, sample size and sampling technique

This study used the cross-sectional style in line with this study's objectives, cross-sectional studies are conducted to estimate the prevalence of the outcome of interest for a given population, commonly for the purposes of public health planning[7].

Since sexual minorities are a hidden population, to recruit participants the study used snowball-sampling technique through the Center for the Development of People-CEDEP, a national Non-Governmental Organization working with sexual minorities. Forty-two (42) females self-reporting engaging in sexual activities with another woman in the reproductive age category of 18-49 were recruited.

The sample size was calculated using the Cochrans' formula[9] and assumptions detailed below:

$$n = \frac{Z^2 p(1-p)}{d^2}$$

Where; n=the desired sample where eligible population > 10 000; z=standard normal deviation (1.96) corresponding to 95% confidence limit; D=degree of precision usually set at 0.05. P= prevalence/proportion. The prevalence used to calculate sample size in this study has been taken from a study conducted in South Africa, which showed HIV prevalence of 9% among WSWs.

$$\text{Thus, } n = \frac{1.96^2 \times 0.09(1 - 0.09)}{0.05^2} = 126$$

The sample size estimate is further adjusted to consider a finite population of those involved in female-female sex as follows:

$$n(f) = \frac{n}{1 + \frac{(n-1)}{N}}$$

Where; n (f)=desired sample from a finite population < 10 000; n=desired sample size for population > 10 000 and N=estimate of the population size -60. Thus, our computed new sample size is:

$$\frac{126}{1 + \frac{(126-1)}{60}} = 42$$

Total Sample size is 42

A structured questionnaire was administered focusing on three components: (a) questions on demographic characteristics of participants, (b) questions to measure self-reported HIV and STI prevalence and (c) measures of predicted multi-level sexual risk factors.

The demographic information collected concentrated on: residence, sexual orientation, age, occupation and marital status. Study participants also self-reported if ever or in the past year they have tested for HIV and STIs. They as well self-reported their HIV status and if ever or in the past one year they have had STIs.

The last part was measuring the study's hypothesised sexual risks among WSW where information like; sexual practices, number of sex partners (both male and female), sexual risks (i.e. condom use with male partners), access to health care, human rights violations, stigma and discrimination and mental health, was collected. The questionnaire was translated into Chichewa and pre-tested before data collection. Interviews were all face-to-face and informed consent was sought before the start of interview. All the interviews were conducted in spaces where the study participants felt free and safe.

Statistical analysis

In this study, factors hypothesized to be sexual risks amongst WSW are independent variables while HIV status is the outcome/dependent variable. Data was exported to STATA (STATA Corp 2005) for analysis and in results presentation, descriptive analysis was conducted.

Ethical Considerations

Informed consent was sought from the participants before administering the questionnaire. Since this is a vulnerable population who can be at risk for taking part in the study, the informed consent was done verbally. However, there was a written consent that was read out and given to participants to read and no signing of documents was done at any point. In addition, since WSW are a hidden population, and their sexual practices are criminalized, participants' privacy was observed by conducting the interviews in

private and safe places. All data collected through both questionnaires and recorders had no names. To observe confidentiality, codes or numbers were assigned to each questionnaire. Apart from reimbursing transport costs, there were no additional incentives paid out for participating in the study and ethical approval from the College of Medicine Research Ethics Committee-COMREC was sort for the study to be conducted.

Results

There were forty-two (42) participants in total aged 18-33 years with a median age of 23. On sexual orientation, 32 participants self-identified as lesbians while 10 self-identified as bisexual. On gender identification, 26 gave a self-identification of female and 16 said their gender was trans-man. There were more participants who grew up in urban areas however only two participants talked of living outside the country at least once (**Table 1**).

Table 1: Participants Demographic Characteristics (n=42)

Characteristic		
Age range (Years)	18-33	
Marital status	Married	3 (7%)
	Single	39 (93%)
Educational level	Primary	6 (14%)
	Secondary	24 (57%)
	Post-secondary	12 (28.5%)
Employment status	Employed	37 (88%)
	Non-Employed	5 (11%)

Place of growth	Urban	38 (90%)
	Rural	4 (9.5%)
Considered gender	Female	26 (61%)
	Trans-man	16(38%)
Sexual orientation	Lesbian	32 (76%)
	Bisexual	10(24%)

3.2 Risky Sexual Activities

The reported median age of female-female sexual debut was 15 (8-30). 25 (59%) of participants reported to have had more than one female sexual partner and had engaged in sexual activities with them in the last 12 months. The median number of female sexual partners was at 4.5 per person (1-11) in the past 12 months. However, the number of sexual partners one had in the past 12 months had no significant association with any demographic characteristic. 11 (26%) of participants reported to have male partners with the median number 1.5 (1-2) in the past 12 months. When asked “How often do you use a condom with male partners?” participants either remembered or lost count (**Table 2**).

Table 2: Condom Usage (n=11)

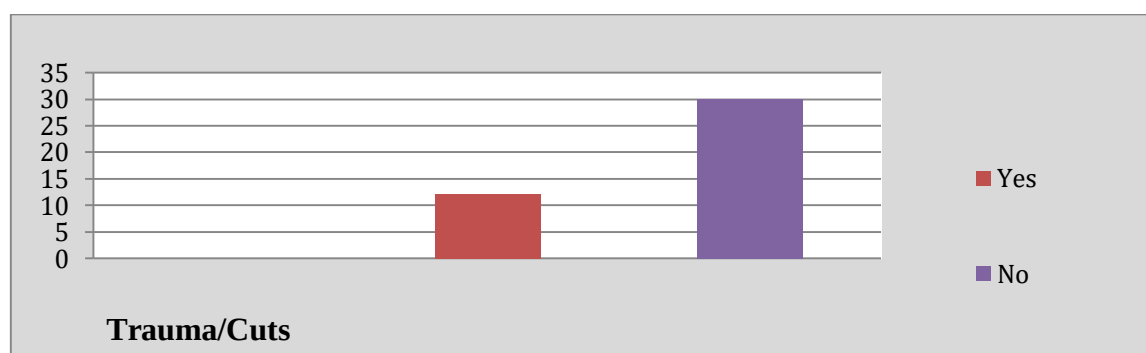
	Frequency=n	Frequency= %
Condom used not regularly	5	45
Never used	1	2
Condom Used all the time	5	45

When asked the type of sexual practices they engage in, a number of risky sexual behaviours were mentioned, i.e. having sexual contact during menses (17%), exchanging sex toys without sterilizing them (36%) as shown in Table 3 below.

Table 3: Sexual Practices WSW-BT

Sexual practice	Frequency =n	Frequency =%
Clit to clit (vagina to vagina, scissoring)	42	100
Oral Sex	12	28.57
Sex toys (plastic penis, vibrator)	15	35.71
Fingering	42	100

When asked “Do you experience trauma/cuts when engaging in sex or any other sexual activities with your female sex partners?” 28.5% of the respondents reported to have experienced trauma and cuts. See **Figure 2 and Table 4**.

**Figure 2: Trauma/Cuts experience amongst WSW in BT****Table 4: Trauma/Cuts experience amongst WSW by sexual acts (n=12)**

Sexual act	Frequency =n	Frequency =%
Clit to clit (vagina to vagina, scissoring)	0	0
Oral sex	0	0
Sex toys (plastic penis, vibrator)	0	0
Fingering	12	28.5

3.2.1 Other Risky Behaviours

Since drug and alcohol abuse can also be associated with HIV acquisition, the study asked the participants if they take alcohol (Beer, Spirits and Ciders) and drugs both injectable and non-injectable. The majority of the participants (71.4 %) reported to have been involved in excessive beer drinking with more than 15 bottles of beer (Chill, Castel, Carlsberg green and Special Brew). No participants reported injected drug use; however

non-injectable drugs like Marijuana (50%), Cuba (7.14%) and Cocaine (12%) were reported as indicated in **Table 5 and 6 Indicated** below.

Table 5: Alcohol Use

	Frequency =n	Frequency =%
Beer	30(more than 15 bottles per sitting)	71.43
Cider	6(9bottles per sitting)	14.29
Spirits	2(more than 8 shots per sitting)	4.76
NA	4(0-1 bottle or shot)	9.58

Table 6: Drug Use

	Frequency =n	Frequency =%
Marijuana	21	50
Cuba Drug	3	7.14
Cocaine	5	11.9
NA	20	47.61

3.3 HIV, STI Prevalence and Knowledge

3.3.1 HIV Prevalence

To measure HIV prevalence, (self-reported), participants were asked, “When did you go for an HIV test?” “What is your HIV status?” Using World Health Organization-WHO-recommendations on HIV Testing and Counselling-HTC, respondents who reported to have never gone for HTC over 12 months ago and those who had never been tested were categorized together as never tested. 33 (79%) of the participants reported to have never gone for HTC in the past 12 months (**Figure 3**). Additionally, 76% reported to be HIV negative, 21% reported not to know their HIV status while an HIV Prevalence of 2% was recorded (**Figure 4**).

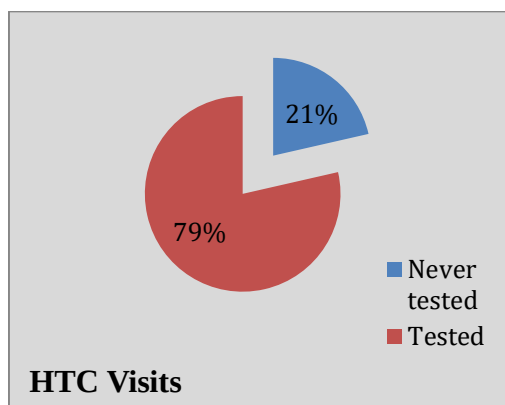


Figure 3: HTC Visits WSW BT

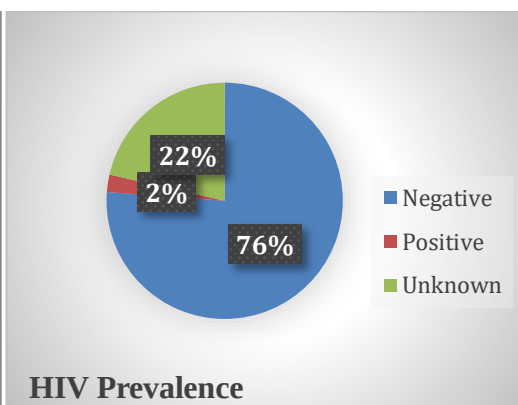


Figure 4: HIV Prevalence WSW BT

The study also asked the participants if they know their female partners' HIV status especially those that they are getting intimate with. Although the rest reported to either know or not know their partner's status, 9.5% of the respondents did not remember (unknown) the status of their sexual partners (**Figure 5**).

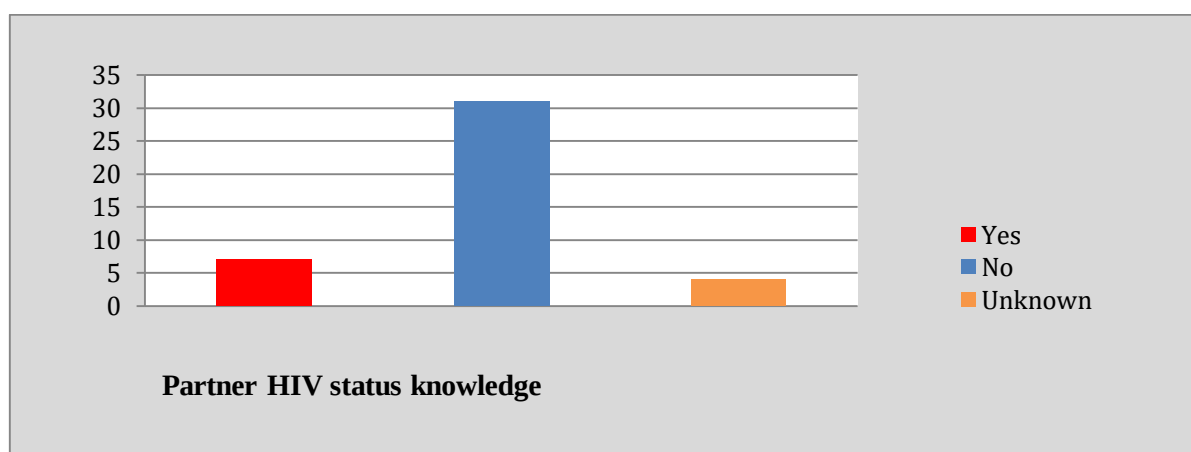


Figure 5: Partner HIV Status Knowledge

3.3.2 STI Prevalence

The study gives a general estimation of STI prevalence as shown in **figure 6**. The respondents were asked if they had STIs in the last 12 months and to name them. Candida,

syphilis and warts were reported with candida being the most reported (29%), as demonstrated in **figure 6**. In addition, the participants were asked to mention STI episodes they individually went through in the past 12 months.

83.3% of participants who had episodes of candida albicans infection reported to have suffered more than one episode as shown in **figure 7**. The study also tried to find out if the participants and their partners suffered the same STIs. 24% (10) had the same STIs with their partners while 14 % (6) had no idea as shown in **figure 8** below.

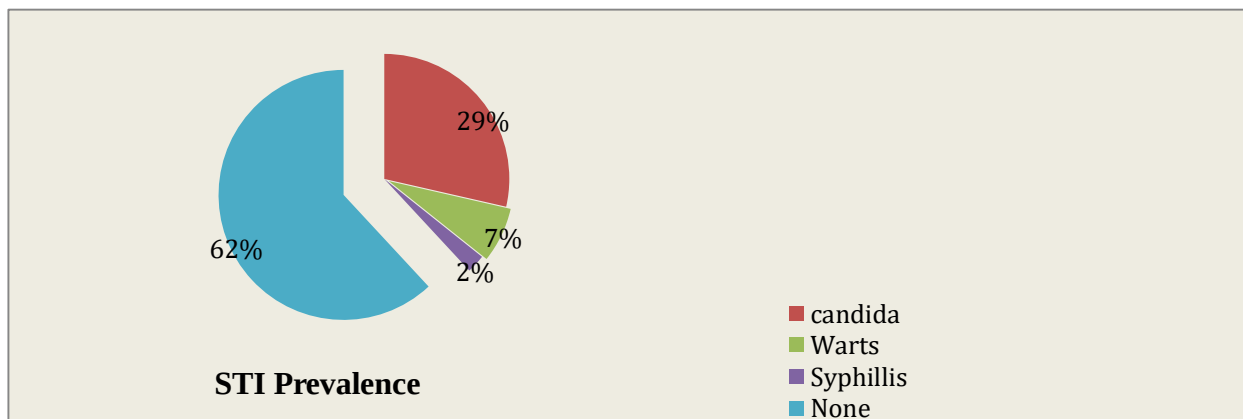


Figure 6: STI Prevalence

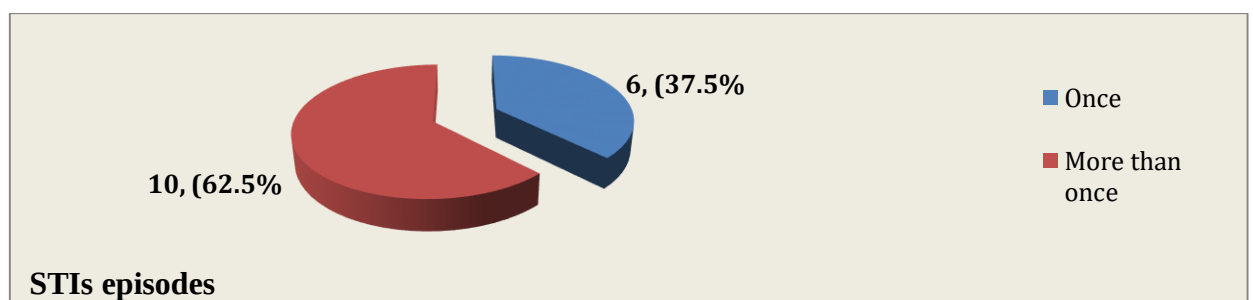


Figure 7: Self-reported STIs episodes in WSW in BT (n=16)

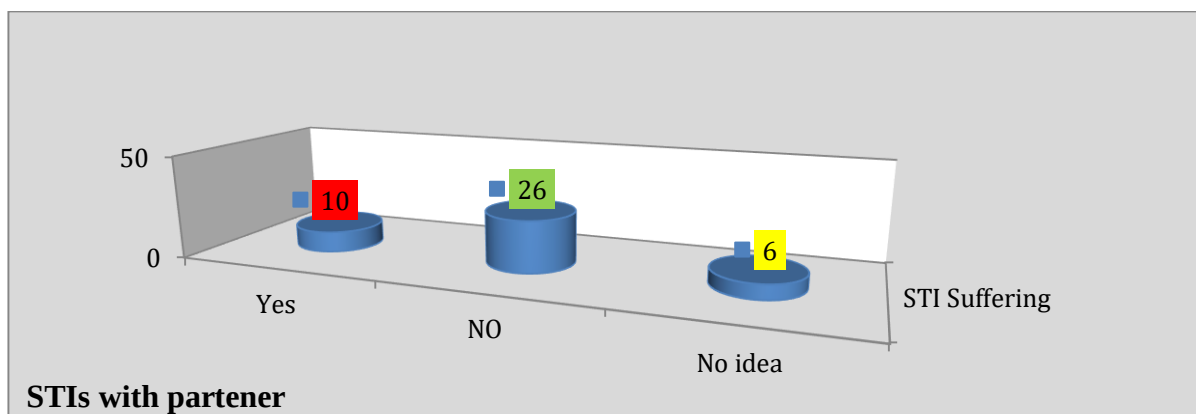


Figure 8: WSW Same STIs with Female Partner (n=42)

3.3.3 HIV and STI Knowledge

The study also tried to assess the knowledge of participants on HIV and STIs transmission. They were asked “What type (s) of sex puts you most at risk for HIV infection?” “Can you get HIV and STIs from female-female sex”. 71.4% of the participants think Male-Female sex (Penis-Vagina sex) puts one at a greater risk of HIV and STI acquisition (**Table7**). However, 83% think that there’s a possibility of HIV and STI transmission through female-female sex (**Table 8**).

Table 7: WSW Knowledge On Risky Act

Mentioned act	Frequency =n	Frequency%
Male to Male (anal sex)	7	16.6
Male to Female (Vaginal sex)	30	71.42
Female to Female	5	11.9

Table 8: Female- Female Sex and HIV

	Frequency	Frequency =%
Yes	35	83
No	7	16.6

The participants were also asked if they have received information on how to prevent HIV and STIs from female-female sex. Slightly over half of the respondents (59.5%) said they have received HIV and STIs messages from CEDEP.

3.4 Sexual Behaviors and HIV/STI Acquisition

To explore risky sexual behaviours and acquisition of HIV and STIs, sexual behaviours were analysed. Risky behaviours of fingering, penis-vagina sex and the use of unsterilized sex-toys were reported to have been the most common sexual activities amongst the population.

Tables 9, 10, 11 &12, show a descriptive analysis and percentages of the results analysed presenting 95 Confidence Intervals-CI.

Table 9: Participants Involved in Fingering Developed Warts (n=42)

	STIs (warts)		Total
	+	-	
Fingering	3	39	42

100% (whole study population) reported to engage in fingering as a sexual act. 3 participants reported to have contracted genital warts. This represents 7.1% of the study population. **(95% CI (1.5%, 19.5%))**

Table 10: Participants Involved in Fingering and Developed Candida (n=42)

	STIs (Candida)		Total
	+	-	
Fingering	12	30	42

12 participants of those involved with fingering had episodes of candida. Representing 28.6%. (95% CI (15.7%, 44.6%))

Table 11: Used Toys and Developed Candida (n=15)

	STIs (Candida)		Total
	+	-	
Toys	11	4	15

15 participants reported to have used unsterilized toys for sexual pleasure- 11 reported episodes of candida infection representing 73%. (95% CI (44.9%, 92.2%))

Table 12: Involved in Penis-Vagina Sex Developed Candida (n=11)

	STIs (Candida)		Total
	+	-	
Penis-Vagina sex	7	4	11

11 participants reported to have been involved with male partners sexually. 7 reported to have suffered from candida infection representing 63% of those involved in penis-vagina sex.

(95% CI (30.8%, 89.1%))

DISCUSSION

This study aimed at giving evidence that WSW are at risk of HIV and STI acquisition through female-female sex. Specifically, apart from exploring HIV and STI prevalence, this study has looked at sexual behaviors that may put WSW at risk. The study has also investigated the population's general knowledge on HIV and STI. Through the findings, the study aims to determine access to HIV and STI prevention services by WSW just like other key populations.

The study's findings are aligned to the Social Ecological Modified Framework-SEMF, which backs the basis of this study's argument. As the SEMF looks at HIV risk in key populations, this study also finds that HIV risk in WSW in Malawi manifests at different levels [11]. WSW face HIV and STI risk at: individual level (multiple sex partners, penis-vagina sex), Community level, (restricted access to HIV prevention strategies), policy level (legal/structural barriers in which homosexuality is criminalized), stage of the epidemic (the stage of HIV pandemic in Malawi shows that women are the most infected). This puts WSW at a risk of contracting HIV.

In addition, this study finds that from the population, risky sexual behaviours emerge- (i) multiple sexual partners (females) are common with whom they engage with in risky sexual behaviours like the use of unsterilized sex-toys and fingering and (ii) having male sex partners with whom they engage sexually without the use of condoms.

HIV and STI prevalence

The study findings report 2% (n=1) HIV prevalence. In trying to find out the possibility of a female-female HIV infection, the self-reported participant, bisexual, did not trace at

what point she got infected. The study also reports 38% (n=16) as the general prevalence of STI amongst WSW in Blantyre urban -Syphilis 2%, Candida 29% and warts 7%.

The study also reports a case of syphilis (n=1), which the self-reporting participant reported to have contracted from another female sexual partner since at that time she had no male sexual partner.

These findings are similar with findings of other studies on *Sexually Transmitted Infections Among Women Who Have Sex With Women* [12, 13] Although there are more similarities between this study's results and the referred studies, the difference between the surveys on disease outcomes could be due to differences in common STIs amongst participants for the two studies.

Risky sexual activities

The use of fingers for sexual pleasure (fingering) and clitoris to clitoris (scissoring) was reported to have been practiced by all study participants (100%) and 29% of the participants experienced trauma/cuts during fingering at some point. 7.1% of the participants involved in fingering reported to have suffered from warts while 29% reported to have an experience of candidiasis. The trauma/cuts experience could be attributed to uncut nails, for cosmetic purposes. Winer et al, found out that finger-genital transmission can be a source STIs [14]. The study further found that genital HPV types had been detected in palm or fingertip samples from patients with genital warts, in asymptomatic men and women and in newly sexually active female university students [14]

15 participants reported use of toys for sexual pleasure as their sexual behavior. 73.3% sex toy users reported episodes of Candidiasis. Unsterilized sex toys can spread STIs amongst the users [15]. 26% of the participants had sexual encounters with male partners while 56% had sex several times with their male partners without condoms. 63.6% reported episodes of candidiasis. Penis-vagina unprotected sex is a risk for STI acquisition and women who have sex with both male and female partners pose a risk of contracting STIs from their male partners and transmit to their female partners.

This study echoes that of Bailey. J. *et al* who found out that WSWs may have sexual histories with men and are therefore vulnerable to sexually transmitted or blood borne infections [12].

Drug and alcohol abuse

The study also tried to look at risky behaviours common in WSW. Since drug and alcohol abuse can also be associated with HIV acquisition, the study tried to look into drug, both injectable and non-injectable abuse among the study population. The majority of the participants (71.4 %) reported to have been involved in excessive beer drinking with more than 15 bottles of beer per sitting. The study recorded no case of drug injection. However non-injectable drugs like Marijuana (50%), Cuba (7.14%) and Cocaine (12%) were recorded as being used.

The use of drugs and alcohol is associated with lack of making sound decisions when it comes to sex [6]. With half of this study's population engaging in Marijuana and excessive drinking chances are high that some risky decisions are inevitable.

These study's findings are in-line with what Green, K., and Feinstein, B., (2011) found that sexual minorities, especially lesbians, gays and bisexuals-LGB, are centered on activities that involve drinking and drug use (e.g. bars, circuit parties) [16]. These communities have become increasingly diverse, this trend could lead to social networks of LGB individuals that consist of heavier substance users than those of heterosexual individuals, and also could make it more difficult for LGBTI individuals to avoid triggers for substance use [16].

HIV and STI general knowledge

The study recorded a knowledge gap on risky sexual behaviors amongst WSW. 17% said only anal sex was a risk, 71% said male to female only (penis-vagina sex) and 11.9% said female-female sex was a risk for STI and HIV acquisition. It was also noted that those who said only anal sex was a risk, said so based on the information they got about MSM.

Even though, the message was correct about unprotected anal sex being the riskiest, WSW too should be told about risks associated with their activities. While WSW battle with their own perceptions of invulnerability and accepting their HIV positive status, they have to deal also with wide-ranging misconceptions about risk. Further to this, slightly over half of the participants (59.5%) reported to have received information on STI and HIV prevention and female-female sex. And all of them got the message from CEDEP only.

In the Matebeni et al study it was found that five lesbian participants self-reported, with much disbelief, that their female partners could have possibly infected them[17]All these

participants reported they had never been with male partners or had exposure to medical transmissions or injecting drug use. With the study participants finding it difficult to understand, the only possible route of transmission and risky behavior they could report was sex with other female[17]. There's therefore need to give WSW all the required information on HIV and STI risk.

The study also recorded 74% (n=31) participants who were being sidelined by their families due to their sexual orientations. However, only 2 (5%) of the participants faced challenges. Health workers mocked them because they are trans-men. Being sidelined by social circles contributes to key populations failing to access medical care. The fear of being labeled immoral and different from what society assigns to gender makes key populations like WSW fail to seek help [18].

In addition to this, policy makers argue that in Malawi the population of WSW is not as much known and targeted by human rights activists. The study recorded that all participants knew not less than 15 WSW in Blantyre as their network size whom they mostly meet during sports, drinking joints and social media. This finding may go a long way in challenging arguments that WSW are in low numbers.

CONCLUSION

Although this study reported a 2% HIV Prevalence, it has to be noted that more than half (79%) of the study participants reported not to have gone for HTC in the past 12 months. Yet they self-reported an HIV negative status while 21% reported not to know their HIV status.

However, the study findings have confirmed findings in other studies that although WSW have a lower HIV prevalence as compared to other key populations, they may be at risk of HIV and STI acquisition. The study proves that WSW in Blantyre practice risky sexual behaviors and can contract STIs when exchanging bodily fluids via different sexual acts. Although this study has also demonstrated a low prevalence of HIV, the results should not be generalized as these were self-reporting and as earlier indicated some would possibly hide their status since there is still lack of willingness to disclose HIV status for fear of stigma and discrimination.

Even though, unprotected sexual encounter with male partners makes WSW vulnerable to sexually transmitted or blood borne infections, vaginal candidiasis, genital warts and syphilis in women who had no history of sex with men, as this study reports, this implies that sexual transmission of STIs between women is possible.

Further to this, the study has shown that WSW in Malawi engage in alcohol and non-injectable drugs abuse. This puts them at risk of engaging in risky sexual behaviors.

Ethics approval and consent to participate

The study protocol was approved College of Medicine Research Ethics Committee (COMREC) and all participants gave informed consent before taking part in the study.

Authors' contributions

Winnie Botha came up with the research idea and designed the study, performed the literature search and review, data collection, performed statistical analysis, interpretation

of data and wrote all drafts of the manuscript. Dr. Vincent Jumbe provided substantial feedback and supervision on both the study and the drafts of the manuscript.

Authors' information

Winnie Botha has a Bachelor of Arts Degree in Communications and she is studying towards Master of Science in Global Health Implementation at University of Malawi, College of Medicine. Dr. Vincent Jumbe has a PhD in Global health and is a lecturer at the College of Medicine, University of Malawi.

REFERENCE

- [1] Mambulasa CBM. *CEDEP needs assessment for effective implementation of human rights, HIV and other health related interventions among MSM and WSW in Malawi*. Lilongwe; 2012.
- [2] Lemp GF, Jones M, Kellogg TA, et al. HIV seroprevalence and risk behaviors among lesbians and bisexual women in San Francisco and Berkeley, California. *Am J Public Health* 1995; 85: 1549–1552.
- [3] Centers for Disease Control-CDC. *Likely female-to-female sexual transmission of HIV — Texa*; 2012. Available at: <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6310a1.htm>
- [4] Evans AL, Scally AJ, Wellard SJ, et al. Prevalence of bacterial vaginosis in lesbians and heterosexual women in a community setting. *Sex Transm Infect.* 2007; 83:470–475.
- [5] Chan SK, Thornton LR, Chronister KJ, et al. Likely female-to-female sexual transmission of HIV-Texas, 2012. *MMWR Morb Mortal Wkly Rep.* 2014; 63:209–212.

- [6] Key terms and concepts in understanding gender diversity and sexual orientation among students; 2015; Available at: <https://www.apa.org/pi/lgbt/programs/safe-supportive/lgbt/key-terms.pdf>
- [7] Lefkowitz ES, Shearer CL, Gillen MM, et al. How gendered attitudes relate to women's and men's sexual behaviors and beliefs. *Sex Cult* 2014; 18: 833–846.
- [8] United Nations Programme on HIV and AIDS-UNAIDS. Terminology guidelines; 2011. Available at: http://www.unaids.org/sites/default/files/media_asset/JC2118_terminology-guidelines_en_1.pdf
- [9] Gorgos LM, Marrazzo JM. Sexually transmitted infections among women who have sex with women. *Clin Infect Dis*. 2011; 53:S84–S91.
- [10] Hughes C, Evans A. Health needs of women who have sex with women. *BMJ*. 2003; 327:939–940.
- [11] Bailey J V, Farquhar C, Owen C, et al. Sexually transmitted infections in women who have sex with women. *Sex Transm Infect*. 2004; 80:244 LP-246.
- [12] Tat SA, Marrazzo JM, Graham SM. Women who have sex with women living in low- and middle-income countries: a systematic review of sexual health and risk behaviors. *LGBT Heal*. 2015; 2:91–104.
- [13] Fethers K, Marks C, Mindel A, et al. Sexually transmitted infections and risk behaviours in women who have sex with women. *Sex Transm Infect*. 2000; 76:345-349.
- [14] Maughan-Brown B, Venkataramani AS. Accuracy and determinants of perceived HIV risk among young women in South Africa. *BMC Public Health*. 2017; 18:42.
- [15] Facts and figures: HIV and AIDS prevalence and new infections. Available at:

<http://www.unwomen.org/en/what-we-do/hiv-and-aids/facts-and-figures>

- [16] Becerra JC, Bildstein LS, Gach JS. Recent insights into the HIV/AIDS pandemic. *Microb cell (Graz, Austria)*. 2016; 3:451–475.
- [17] Marrazzo JM. Sexually transmitted infections in women who have sex with women: who cares? *Sex Transm Infect* 2000; 76:330-332.
- [18] Richardson D. The social construction of immunity: HIV risk perception and prevention among lesbians and bisexual women. *Cult Health Sex*. 2000; 2:33–49.
- [19] Kwakwa HA, Ghobrial MW. Female-to-female transmission of human immunodeficiency virus. *Clin Infect Dis*. 2003; 36:e40–e41.
- [20] Chu SY, Buehler JW, Fleming PL, et al. Epidemiology of reported cases of AIDS in lesbians, United States 1980-89. *Am J Public Health*. 1990; 80:1380–1381.
- [21] Zaidi SS, Ocholla AM, Otieno RA, et al. Women who have sex with women in Kenya and their sexual and reproductive health. *LGBT Heal*. 2016; 3:139–145.
- [22] AVERT. HIV and AIDS in Malawi. AVERT; 2018. Available at: <https://www.avert.org/professionals/hiv-around-world/sub-saharan-africa/malawi>
- [23] *Malawi National HIV/AIDS Policy*; 2003. Available at: https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---ilo_aids/documents/legaldocument/wcms_125540.pdf
- [24] Patel P, Borkowf CB, Brooks JT, et al. Estimating per-act HIV transmission risk: a systematic review. *AIDS*. 2014; 28:1509-19. Available at: https://journals.lww.com/aidsonline/Fulltext/2014/06190/Estimating_per_act_HIV_transmission_risk___a.14.aspx

- [25] Poux S. *Social ecological model offers new approach to public health the Borgen Project*. Seattle: The Borgen Project; 2017. Available at: <https://borgenproject.org/social-ecological-model/>
- [26] Examining prevalence of HIV infection and risk factors among female sex workers (FSW) and men who have sex with men (MSM) in Swaziland; 2013. Available at: <https://www.jhsph.edu/research/centers-and-institutes/research-to-prevention/publications/Swazi-Quantitative-final.pdf>
- [27] Baral S, Logie C, Grosso A, et al. *Modified social ecological model: a tool to guide the assessment of the risks and risk contexts of HIV epidemics* [Epub ahead of print]; 2013 May 17. DOI: 10.1186/1471-2458-13-482.
- [28] Muula A, Jumbe V, Kamba D. Technical report for the study for the on perception, barriers and facilitators to access to sexual and reproductive health services for MSM, FSWs, PIDs and TGW. In *Malawi College of Medicine technical report for the study on perception, barriers and facil*. Lilongwe; 2017. Available at: https://www.researchgate.net/publication/328488632_Technical_Report_for_the_Study_for_the_on_Perception_Barriers_and_Facilitators_to_Access_to_Sexual_and_Reproductive_Health_Services_for_MSM_FSWs_PIDs_and_TGW_in_Malawi_College_of_Medicine_Technical_Re
- [29] Wellings K1, Collumbien M, Slaymaker E, Singh S, Hodges Z, Patel D BN. Sexual behaviour in context: a global perspective. *Lancet*. 2006; 368:1706–28.
- [30] Aldrich R. Homosexuality and the city: an historical overview. *Urban Stud*. 2004; 41:1719–1737.
- [31] Cochran's Formula general tips: 2018. Available at: <https://www.statisticshowto.datasciencecentral.com/probability-and->

statistics/find-sample-size/

- [32] Winer RL, Hughes JP, Feng Q, et al. Detection of genital HPV types in fingertip samples from newly sexually active female university students. *Cancer Epidemiol Biomarkers*. 2010; 19:1682 LP-1685.
- [33] National Health Service. Are sex toys safe? NHS; 2016. Available at: <https://www.nhs.uk/common-health-questions/sexual-health/are-sex-toys-safe/>
- [34] Green KE, Feinstein BA. Substance use in lesbian, gay, and bisexual populations: an update on empirical research and implications for treatment. *Psychol Addict Behav*. 2012; 26:265–278.
- [35] Matebeni Z, Reddy V, Sandfort T, et al. ‘I thought we are safe’: southern African lesbians’ experiences of living with HIV. *Cult Health Sex*. 2013; 15 Suppl:34–47.