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Factors and Levels Associated with HIV Knowledge among Non-Heteronormative Youth in South Africa

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Declaration

I, Andrea Peter, hereby declare that this research report is solely my own work. This report is being submitted to the Faculty of Humanities for the partial fulfilment of requirements for the Master of Arts Degree in the field of Health Demography at the University of Witwatersrand in Johannesburg, South Africa. I declare that this paper has not been submitted before in part or full to any other university, examination or degree.

Signature**.....**

Dedication

I dedicate this paper to my family, especially my parents and sister, for always trying to understand what my degree is about yet never fully understanding it but supported and motivated me throughout nonetheless. Thank you for always pushing me to do my best not only in my academics but in everything else in my life.

Acknowledgements

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Abstract

Introduction

Within the South African context, non-heteronormative individuals, those who do not relate to heterosexuality and mainly differ from heterosexual practices regarding their sexual orientation such as the Lesbian, Gay, Bisexual, Queer and other (LGBTQ+) communities, face great levels of social exclusion due to their sexual orientation. Much of the LGBTQ+ community remains hidden and in fear of the potentially harsh – and sometimes lethal – consequences that follow 'coming out'. Furthermore, those who identify as non-heteronormative face several sexual and reproductive health challenges. Individuals in same-sex relationships find it difficult to access safe sex measures in health clinics. In many cases, non-heteronormative individuals are unaware of the needed measures to practice safe sex to avoid health detrimental implications such as HIV.

Methodology

This study aimed to determine the demographic, socioeconomic and sexual behaviour factors that are associated with HIV knowledge among non-heteronormative youth (15-34 years old) in South Africa. The study used data from the 2017 Fifth South African National, HIV, Behaviour and Health Survey (SABSSM). The survey interviewed people 15 years and older who reside in South Africa. The study focused on non-heteronormative youth (15-34 years old) with a weighted national sample size of 365,237 individuals who indicated they had been in a same-sex relationship. Various demographic, socioeconomic and risky sexual health behaviour factors were used as independent variables to test for any association with HIV knowledge, the dependent variable. To test for association chi-square, proportion calculations and a probit regression were used to assess the level of HIV knowledge among non-heteronormative youth and the level of association with the independent variables.

Results

More than 50% of non-heteronormative youth indicated high levels of HIV knowledge, with females aged 25-29 years old having the highest level of knowledge. When running the adjusted and unadjusted probit regression, the variables sex, marital status and multiple sexual partners were shown to influence HIV knowledge. With these factors indicating a relationship with HIV knowledge among non-heteronormative youth, there is an association with the demographic, socioeconomic and risky sexual behaviour factors with HIV knowledge.

Conclusion

Although an association was found between the variables and HIV knowledge among non-heteronormative youth, it did not provide indicate a full view of the various factors that could

influence HIV knowledge among non-heteronormative population in South Africa. This study contributed data and research regarding the non-heteronormative, which has limited information available. Results indicated that there are high levels of HIV knowledge among non-heteronormative youth but further insight is required to assess where this information is from and how accessible it is.

Chapter 1: Introduction

1.1. Background

A ‘non-heteronormative identity’ is defined as an identity pertaining to individuals who do not relate to heterosexuality and mainly differ from heterosexual practices regarding their sexual orientation such as the Lesbian, Gay, Bisexual, Queer and other (LGBTQ+) communities (Mkhize & Maharaj, 2021; van der Toorn et al., 2020). It is unclear how many people identify as non-heteronormative as LGBTQ+ identities are widely stigmatised and far from being formally recognised in many cultures and societies (Daly et al., 2016). There are still many laws and policies in place that exclude minority groups like non-heteronormative individuals, which reinforces the stigma placed upon them and furthers their exclusion from society (Müller et al., 2018; Daly et al., 2016).

Individuals who identify as non-heteronormative also face several sexual and reproductive health challenges. Reproductive and sexual health measures are mainly focused on Heteronormative individuals, wherein it is generally believed that Heterosexuality is the ‘normal’ and ‘natural’ way to express sexuality, this being between two oppositely identifying gender individuals (van der Toorn et al., 2020). A previous qualitative study looking at non-heteronormative students that engaged in same-sex relationships found that it was difficult for these students to access safe sex measures in primary health clinics, and some were unaware of the necessary measures to practice safe sex in same-sex relationships (Mkhize & Maharaj, 2020). In the same study, it was found that health pamphlets and brochures do not cover the sexual health difficulties associated with non-heteronormative youth (Mkhize & Maharaj, 2020). When addressing the sexual health needs of the youth population, there is an assumption that all youth are Heteronormative and cisgender individuals - those whose gender identities correspond with their assigned sex at birth (Müller et al., 2018). Across the African continent, homophobia, the discrimination toward homosexuality and non-heteronormative individuals, is a substantial problem and causes much of the LGBTQ+ community to remain hidden due to fear of the harsh and sometimes lethal consequences that follow ‘coming out’ – which refers to the sharing of one’s non-heteronormative sexual identity with others (Currier & Migraine-George, 2017). In many African countries, homosexuality is seen as a criminal offence and is punishable by up to 14 years in prison and in some instances can lead to death (Mhaka, 2022). Although South Africa has legally recognised non-heteronormative individuals, a study found that 80% of the adult population believes that same-sex behaviour is ‘always wrong’ (Daly et al., 2016). This exacerbates the challenges faced by the non-heteronormative community because it reduces the number of spaces for the population to learn about and practice safe sex or find sexual health information that is specific to their needs.

Sexually Transmitted Diseases (STDs) and Infections (STIs) have been the cause of many health problems in any sexually active population, especially that of the Human Immunodeficiency Virus (HIV). Young people between the ages of 15-24 account for 40% of all new HIV infections globally (Tarkang et al., 2019). Gay men and men who sleep with other men have a 26 times higher chance of acquiring HIV compared to the rest of the adult male population (United Nations Aids [UN AIDS], 2021a). In 2013 only 8% of women sleeping with other women in South Africa, were aware of their HIV status and if they were positive (Matebeni et al., 2013). With these challenges and numbers in mind, it is not surprising that non-heteronormative individuals suffer dire sexual and reproductive health outcomes.

1.2. Problem Statement

To reduce HIV infection rates, the dissemination of accurate HIV prevention and management information is needed. However, there have been challenges in ensuring this is achieved. For example, there is a misconception that women who have sex with women are not at risk of being infected with HIV (Evans et al., 2020). Despite being incorrect, this idea is widespread and is reinforced by healthcare workers and the general public (Evans et al., 2020). As a result, many women (and men) do not take the risk of contracting HIV from a female, same-sex partner seriously (Evans et al, 2016). This is an illustration of how non Heteronormative individuals are rarely thought of when providing HIV-related preventive measures because they are focused on heteronormative or 'straight' individuals (Mkhize & Maharaj, 2021; van der Toorn et al., 2020)

In South Africa, HIV prevalence among young people (15-34 years old) makes up over 5% of the total population infected (Statistics SA, 2021). One study found that a very low number of youth have full knowledge of HIV, with a quarter of youth in the study having 75% accurate and only 10% had full (100%) accurate knowledge of HIV (De Wet et al., 2019). This study indicates that more is needed to increase the accuracy of HIV knowledge among the youth in South Africa and that young people affected by HIV can aid in sharing knowledge of the disease among their peers, possibly indirectly changing sexual behaviours (De Wet et al., 2019).

However, not all young people have the same exposure to knowledge and learning. non-heteronormative youth are seen to have a range of disadvantages in treatments for health outcomes in comparison to their Heteronormative peers such as mental and physical health and they remain largely excluded from sexual and reproductive health messages and services in South Africa and many other countries (Gilbey et al., 2020; Mkhize & Maharaj, 2021; van der Toorn et al., 2020). In combination with fear of discrimination, this prevents many young non-heteronormative individuals from seeking help and accessing the needed care (Gilbey et al., 2020). Considering this alongside the lack of

accurate HIV and AIDS Knowledge among non-heteronormative youth, there is a distinct need for a study to examine the specific knowledge gaps in the subpopulations of youth at risk of HIV and AIDS, particularly the non-heteronormative youth in South Africa.

1.3. Research Questions and Objectives

1.3.1 Research Question and Sub-questions

Main Research Question:

What are the demographic, socioeconomic and risky sexual behaviour factors associated with HIV knowledge among non-heteronormative youth (15-34 years old) in South Africa?

Sub-Questions:

1. What are the levels of HIV knowledge among non-heteronormative youth (15-34 years old) in South Africa?

2. What is the association between the demographic, socioeconomic and risky sexual behaviour factors with HIV knowledge among non-heteronormative youth (15-34 years old) in South Africa?

1.3.2. Research objective and sub-objectives

Main Research Objective:

To determine the demographic, socioeconomic and risky sexual behaviour factors that are associated with HIV knowledge among non-heteronormative youth (15-34 years old) in South Africa.

Sub-objectives:

1. To assess the level of HIV knowledge among non-heteronormative youth (15-34 years old) in South Africa.

2. To establish the association between the demographic, socioeconomic and risky sexual behaviour factors and HIV knowledge among non-heteronormative youth (15-34 years old) in South Africa.

1.4. Justification

Youth (15-34 years old) is a vital population to any country's future social and economic development. Youth population make up about 16% of the global population (United Nations [UN], n.d). There is anticipation that youth population will continue to grow, having an even more significant impact on societies in future (United Nations [UN], 2015). If youth has access to quality education, health care, training and job opportunities it would greatly impact the social and economic development of all countries, but in lower and middle-income countries, like South Africa, this is not the case (Müller et al., 2018). Focusing on youth and their sexual health knowledge ensures they have control and power over their sexual behaviours and enable them to contribute to society without the risk of being adversely affected by debilitating sexual health risks.

For these reasons, a study that exclusively examines the levels and factors associated with HIV knowledge among non-heteronormative youth is needed. The results from this study will assist policies and programmes targeting youth sexual and reproductive health. One programme is the 90-90-90 targets set by the United Nations (United Nations AIDS [UNAIDS], 2020). This programme targets to have 90% of people living with HIV know their status, 90% of people who know their HIV-positive status are on antiretroviral therapy (ART) and 90% of people on ART are virally suppressed (UNAIDS, 2020). This was set to be achieved by 2020 but South Africa has only achieved one of these goals two years after the intended deadline (World Health Organisation [WHO], n.d)].

In addition to the 90-90-90 targets set by the UN, this research is also pivotal for achieving Sustainable Development Goal (SDG) 3, ensuring healthy lives and promoting well-being for all at all ages but particularly Target 3.3, aiming to end AIDS epidemic by 2030 (United Nations [UN], 2023). This research assess the different healthcare challenges faced by the non-heteronormative youth in South Africa when accessing HIV resources. By uncovering the gaps in HIV education it allows for targeted interventions to be placed that can help curb the rate of transmission within the non-heteronormative community. These findings also have the potential to foster an environment of inclusivity and accessibility to HIV resources which is essential for achieving universal health coverage. By assessing and improving HIV knowledge for non-heteronormative youth, this research will assist South Africa in reaching SDG 3, specifically Target 3.3 by 2030.

On a national level, the South African National Strategic Plan (NSP) on HIV, TB and STIs will benefit from this study. The plan looks at improving the national response to HIV, TB and STIs to achieve the global health community goal of ending these threats by 2030 (South African National AIDS Council [SANAC], 2017). It focuses on ways to reduce HIV, TB and STIs in the country considering all aspects of South African society. Similar to UNAIDS, the NSP has created targets

with deadlines to ensure that progress is made in reducing these infections. By looking at HIV knowledge among non-heteronormative youth in South Africa, this study will aid in reaching these goals, particularly Goals 1, 3 and 4. Goal 1 is to Accelerate prevention to reduce new HIV and TB infections and STIs, by addressing HIV knowledge and the factors associated with it (SANAC, 2017). Goal 3 is to Reach all key and vulnerable populations with comprehensive, customised and targeted interventions (SANAC, 2017). Finally, Goal 4 is to address the social and structural drivers of HIV, TB and STIs and link these efforts to the NSP (SANAC, 2017). Not only is this research in line with national health goals within South Africa but it will also help the country in reaching international goals set by the United Nations.

Chapter 2: Literature Review and Theoretical Framework:

2.1. Review of Most Recent Literature

The sexualities of non-heteronormative individuals are seen as the distinct 'other' or 'opposite' from the sexualities of Heteronormative individuals. However, non-heteronormative identities encapsulate far more complexities than simply being considered an 'opposite' of heterosexuality. The term 'non-heteronormative' is often synonymous with other terms such as "queer", "sexuality", "gay", "LGBTQ", "lesbian" or 'homosexual"(Whittington, 2012; Walks, 2014). The common thread among these terms is that they are mainly used for individuals who have sexual and romantic relationships with those of the same sex or gender identity. However, non-heteronormative identities go beyond their sexuality and exhibit behaviours that go against accepted social 'norms' (Whittington, 2012; Marchia & Sommer, 2017). These established social norms and beliefs are strictly heteronormative due to the widespread and normalised practice of heterosexuality, where non-heteronormativity directly challenges heteronormative ideas and understanding (Walks, 2014). An illustrated example of this is readily available when one considers gender roles and expectations. When the normative understanding of gender is investigated, cisgender individuals emerge as encapsulating this norm, as well as the societal gender roles and expectations associated with them (Müller et al., 2018; Marchia & Sommer, 2017). These individuals consist of those who are born male or female and identify with the gender identity assumed to be associated with their assigned sex – this being 'man' or 'woman', respectively (Klein, 2013; Saguy et al., 2021). Cisgender individuals are expected to act according to their expected gender roles specific to being either a 'man' or a 'woman'(Müller et al., 2018; Marchia & Sommer, 2017).

Those who are assigned 'male' at birth are expected to fulfil the role and automatically take on the gender identity of being a 'man', which is associated with ideas such as being 'dominant', 'tough', being the 'provider' of their familial unit, as well as other ideas surrounding masculinity and being 'masculine' (Klein, 2013; Saguy et al., 2021). Those assigned 'female', on the other hand, are expected to adopt the gender identity of being a 'woman' and are expected to assume traditionally 'feminine' traits and behaviours such as being more 'sensitive', 'emotional', and are responsible for child-rearing (Klein, 2013; Saguy et al., 2021). Alongside these roles comes the expectation and assumption that all individuals are heterosexual – where an individual is sexually and romantically attracted to those of the 'opposite' sex and gender identity (Klein, 2013). These heterosexist and cisgender norms form part of dominant gender ideologies, which encompass the societally accepted and socially internalised gender roles that individuals 'should' occupy for society to be deemed 'correct' and 'just' in the worldview of the individuals existing therein (Saguy et al., 2021).

Outside of societal structure, these heteronormative societal norms have had a great effect on the healthcare of all individuals, particularly concerning sexual and reproductive healthcare. In the healthcare setting, a study by Holt et al. (2012) on the opinions of South African healthcare workers on women's sexual and reproductive health found that most of these workers believed that women should abstain from sex before marriage, giving contraceptive devices (such as condoms) only to women over the age of 18, and placed the blame on young women for pregnancy and HIV-related issues through thinking that these women simply 'ignore' information relating theretoward without considering other influential factors (Holt et al., 2012). Specifically, regarding HIV, gender inequality is a significant contributor to the rate of infection – whereby women are often denied sexual and reproductive rights and sex education, experience gender-based violence and have incorrect or inaccurate knowledge of the disease (United Nations Aids [UN AIDS], 2021b). As such, it is clear to see how the opinions of these healthcare workers have been influenced by Heteronormative and heterosexist gender expectations surrounding women. Indeed, however, the presence of Heteronormative assumption is not uncommonly found within the medical sphere regarding sexual and reproductive health, where it is first assumed that everyone is Heteronormative and is believed that everyone follows the associated norms and expectations, and those who seemingly stray therefrom are met with hostility (Morison & Lynch, 2016; Walks, 2014).

As heteronormativity is assumed across populations, the term 'Heteronormative' was established in an attempt to articulate and illustrate the lived experiences and oppression of the LGBTQIA+ community within society and its present gender ideologies (Machia & Sommer, 2017; Walks, 2014). non-Heteronormativity is generally understood as describing a certain category of sexual orientation, which is the sexual attraction of someone due to their gender (Bailey et al, 2016). In applying a Heteronormative lens, heterosexuality is assumed of all individuals – within which 'women' (assumed 'female' at birth) are assumed to be sexually and romantically attracted to 'men' (assigned 'male' at birth) and 'men' are assumed to be sexually and romantically attracted to 'women' behaviours (Cecilia et el., 2020). However, non-heteronormative individuals encompass the spectrum of those who are sexually and/or romantically attracted to others of their same-sex or gender identity, or those who engage in sexual or romantic relationships with others that hold a sexual orientation that cannot be defined within the limits of heterosexuality (Goldberg et al., 2019). Due to this range of sexual attraction, non-heteronormative people are met with hostility by the larger population because they are seen to 'go against' the political, social, philosophical and economic understandings held within a Heteronormative society through deviating from and challenging accepted gender ideology (Cecilia et al., 2014; Goldberg et al., 2019; Judge, 2021; Saguy et al., 2021). Unlike Heteronormative cis-gendered individuals, non-heteronormative individuals are seen to largely represent their gender identities differently (Klein, 2013; Saguy et al., 2021). This may apply to both sexual orientation or gender expression, with some non-heteronormative cisgender individuals presenting themselves as

more masculine/feminine outside of the supposed 'boundaries' of their gender roles (such as a woman dressing 'masculine', for example), some identifying separately from their assigned sex at birth (namely those in the Transgender community), and others not subscribing to any gender identity in not identifying as neither 'man' nor 'woman' (Goldberg et al., 2019; Klein, 2013; Walks, 2014). non-heteronormative individuals put to question these existing norms of gender identities and practices that have been placed in society for generations and the power dynamics that come with them (Bailey et al., 2016; Judge, 2021; Panfil, 2020). This has led them to face severe discrimination, rejection, and isolation from wider society, putting strain on them at both macro and micro levels and preventing them from readily accessing necessary resources due to widespread discrimination, as well as through catering only towards heteronormative needs (Goldberg et al., 2019; Klein, 2013; Panfil, 2020). This is a distinct issue when considering sexual and reproductive health.

In South Africa, information on the sexual and reproductive health of non-heteronormative sexual minorities is largely insufficient, with research being generally scarce (Morison & Lynch, 2016). However, the research found non-heteronormative identities remain constantly overlooked and underestimated in medical practice in the realm of reproductive health and reproductive rights due to the rigid septation (influenced by dominant gender ideologies) between 'men' and 'women' in the medical sphere (Husakouskaya, 2013; Morison & Lynch, 2016). A 2011 analysis of the sexual and reproductive health services for the South African Department of Health indicated that the existing services are not geared to successfully meet the full needs of a diverse population (Klugman et al., 2011; Morison & Lynch, 2016). This population included non-heteronormative individuals, both sexual minorities as well as gender minorities, people living with HIV, adolescents and young people (particularly women not of reproductive age), sex workers, and men (Klugman et al., 2011; Morison & Lynch, 2016). When considering non-heteronormative populations, this reality continues to be reflected in more recent research. An analysis of interview-based fieldwork between August 2012 and May 2013, conducted by Husakouskaya (2013), highlighted the perspectives of Transgender and Intersex South Africans regarding their sexual and reproductive health (Husakouskaya, 2013). Herein, participants expressed their mistrust of the public health system, fearing not being taken 'seriously' or being discriminated against through medical providers potentially seeing sexual or reproductive health issues suffered by this community as a 'consequence' for their defying heteronormative gender ideologies (Husakouskaya, 2013). This is also a distinct reality for individuals in non-heteronormative relationships with sexual minorities (Cele et al., 2015). A qualitative study by Morrison & Lynch (2016) explored perspectives and accounts of sexual and reproductive health from South African sexual minority individuals, as well as public and private healthcare workers (Morison & Lynch, 2016). It found that, within the healthcare setting, sexual minorities often experience abuse, discrimination, negativity, and stigmatisation, which is in line with other South African research on the subject (Cele et al., 2015; Cloete et al., 2011; Matebeni et al., 2013; Morison & Lynch, 2016;

Müller & Highes, 2016; Müller et al., 2018). This has led to non-heteronormative individuals being reluctant to access needed healthcare services (Morison & Lynch, 2016; Müller & Highes, 2016). Considering that literature across the globe indicates sexual orientation to be a vital determinant of health through finding links between experienced discrimination, stigmatisation, and sexual minority health outcomes, the reality of sexual and reproductive healthcare concerning non-heteronormative populations has dire consequences when considering HIV/AIDS (Morison & Lynch, 2016; Müller & Hughes, 2016).

Although HIV/AIDS is an epidemic across the globe, Sub-Saharan African countries have the highest rates of infections, as well as a great deal of research on the topic (United Nations AIDS [UNAIDS], 2021). In the latest HIV factsheet released by the United Nations, statistics regarding HIV in 2021, globally 37.7 million people globally are currently living with HIV (UNAIDS, 2021). In the latest mid-year population estimates for South Africa, it was noted that about 8.23 million people are living with HIV in 2021 Statistics South Africa [Statistics SA], 2021). This has increased drastically in the past 10 years, as in 2002, the total number of people living with HIV in South Africa was 3.8 million (Statistics South Africa, 2021). HIV prevalence has been stable over time for youth population in South Africa but it has not shown signs of decreasing either (Statistics SA, 2021). However, in Sub-Saharan Africa, young women aged 15-24 are more likely to test positive for HIV than men within the same age range, and it is estimated that just over 4000 new infections a week occurred among youth in 2020 (UNAIDS, 2021c). Preventive measures have been established among youth population to curb infections, the main advocation of practising safe sex and using a condom, with male condoms being the most easily accessible and readily available to the public (Centre of Disease Control [CDC], 2021; Mkhize & Maharaj, 2020). Other preventative measures include choosing less risky sexual activities, like oral sex, taking Pre-Exposure Prophylaxis (PrEP), which is medication to help prevent HIV in risk populations, getting regularly tested for HIV and the provision HIV treatment to control the rate of infection (CDC, 2021). Many South African public clinics and health facilities offer these resources free of charge to the public who can access information on safe sex methods for HIV prevention and treatment.

These preventative measures are mainly focused on heteronormative individuals. However, in 2017 it was noted that heterosexuals only make up 30% of new HIV diagnoses (Shepler et al., 2017; van der Toorn et al., 2020). non-heteronormative individuals are rarely thought of when providing these preventive measures because they are focused on heterosexual cisgender people (Mkhize & Maharaj, 2021; van der Toorn et al., 2020). In a study by Matebeni et al. (2013), the exclusion of Lesbians from Southern African HIV-prevention programmes is explored, where the repercussions thereof have resulted in widespread misinformation about the transmissibility of the virus within non-heteronormative women's sexual relationships with other women (Matebeni et al., 2013). This has had a direct negative effect on sexual risk assessment and sexual risk-taking within this population, as

knowledge of transmissibility and safety within these sexual relationships is omitted or ignored in the public and educational spheres (Matebeni et al., 2013). Furthermore, in a study by Mkhize and Maharaj (2021), it was noted that non-heteronormative students found it hard to find safe sex measures, like dental dams, finger cots and lubricants when going to health clinics (Mkhize & Maharaj, 2021). Furthermore, some students were completely unaware of the measures needed to practice safe sex when engaging in non-heteronormative sexual relations (Mkhize & Maharaj, 2021). This illustrates the need for accurate and inclusive HIV knowledge measures, as knowing the virus allows one to make informed decisions about sexual safety, slowing the rates of infection and risk and empowering every sexually-active individual to safely take control of their sexual life. As previously mentioned, many non-heteronormative individuals fear seeking help to find safe sex measures or access health services, for fear of discrimination and potential harm (Cele et al., 2015; Cloete et al., 2011; Gilbey et al., 2020; Matebeni et al., 2013; Morison & Lynch, 2016; Müller & Highes, 2016; Müller et al., 2018). The avoidance of seeking and utilising health services prevents non-heteronormative individuals from more readily accessing these safe sex measures, as well as potentially gaining insight into risks of the virus specific to them as this information is omitted by HIV-prevention knowledge-disseminating measures. Fear also has a significant effect on the spreading risks associated with the virus, as O'Byrne and Watts (2014) found that many non-heteronormative men avoid taking an HIV test out of fear of further stigmatisation on top of the stigmatisation to which they are already exposed (O'Byrne & Watts, 2014). This, alongside the felt inaccessibility of help-seeking behaviours, enables the virus to continue to spread undetected and puts other individuals in danger of contracting it (Gilbey et al., 2020; Mkhize & Maharaj, 2021). It is also indicative of the importance of HIV knowledge where, if sufficient and inclusive HIV knowledge was disseminated and maintained, non-heteronormative individuals would be warier of spreading the virus and take steps to ensure their own and their partners' sexual safety. This will aid in reducing the fears of HIV testing and results and in turn reducing behaviours that could put them at risk of infection.

As such, there is a distinct and urgent need to provide and reinforce accessible HIV knowledge to the non-heteronormative community. Specifically, however, this should centre the youth (15-34 years old) population, as this population is vital for the growth and success of any society, which, in this case, means they are integral to South Africa's future (UN, 2015). Young people between the ages of 15-24 account for 40% of all new HIV infections globally, with non-heteronormative individuals being a key population at risk as men and men who sleep with other men (MSM) have a 26 times higher chance of acquiring HIV compared to the rest of the adult male population (Tarkang et al., 2019; UN AIDS, 2021a). This is also recognised in the NSP, where MSM and Transgender individuals are explicitly identified as important, key populations that need to be targeted within the plan (Evans et al., 2016; SANAC, 2017). Furthermore, due to the erasure of women who sleep with other women (WSW) in HIV-related discourse, WSW cannot and should not be once more

overlooked as a ‘no-risk- group when, as found in Matebeni et al.’s study (2013), only 8% of women sleeping with other women were aware of their HIV status (Matebeni et al., 2013). As such, if non-heteronormative youth has access to resources and knowledge that allow them to take charge and make informed decisions surrounding their sexual health, this will not only aid in achieving the goals set out by the NSP but also benefit them by potentially moving them out of their key ‘at risk’ status. More broadly, this will aid in bettering the future of South African society by empowering a key population in the youth. However, to understand how to aid in improving HIV knowledge amongst the non-heteronormative youth, a holistic understanding of the various factors that affect this knowledge within the population itself must first be achieved. Demographic, socioeconomic, and risky sexual behaviour factors must thus be considered.

Demographic factors refer to the age, sex, race, and marital status of an individual. These factors are important when considering HIV knowledge, as they affect how HIV knowledge could potentially be accessed and understood. As mentioned above, Young people between the ages of 15 and 24 make up 40% of new HIV infections globally (UN AIDS, 2021a). The notability of age is further illustrated in a 2018 study concerning the prevalence of STIs and bacterial vaginosis among women across Sub-Saharan Africa, where it was indicated that there is a higher STI prevalence amongst Young women (aged between 15 and 24) than older women, with the study making specific mention to South Africa and how their findings corroborated global findings concerning higher levels of STDs and STIs within youth populations (Torrone et al., 2018). This thus indicates that age is a distinct factor when considering HIV knowledge of an individual, as one’s age may be linked to the level of HIV knowledge.

The effect of gender inequality and Heteronormative gender assumptions on the potential effect of HIV knowledge has also previously been discussed above, but is highlighted in a study by a 2011 study by Magadi (2011) on the gender disparity in HIV infections across Sub-Saharan Africa (Magadi, 2011). It was found that considering HIV risk factors alone (such as engaging in risky sexual behaviours) could not explain the high rate of HIV infections in women compared to that of men and that the gender identity of being a ‘woman’ greatly impacted the circumstances and potential risks associated with HIV infection and knowledge (Magadi, 2011). Despite being an older study, these findings have been supported in newer studies, such as Sia et al.’s (2016) study where findings indicated that, across most of Sub-Saharan Africa, the woman-favouring gender discrepancies in HIV infection rates were attributable to gender-specific issues faced by women (Sia et al., 2016). This shows that the factor of sex possibly has a distinct impact on HIV knowledge through its ideological association with gender identity, as gender discrepancies are distinctly present in HIV infection rates.

Due to dominant gender ideologies highlighting the ‘importance’ of marriage, marital status as a factor cannot be overlooked. Cultural specificities around marriage and marriage practices greatly

influence HIV infection rates, as well as HIV knowledge with the widespread assumption that marriage provides one some sort of 'safety' from potential HIV infection – which is not always correct (Ramjee & Daniels, 2013; Tenkorang, 2014). A study by Ramjee et al. (2016) on HIV risk factors and incidence rates among Young women in Durban, South Africa indicated that women who were unmarried and not cohabitating with a stable partner were more than twice as likely to be infected compared to their married counterparts (Ramjee et al., 2016). This is supported by how, in South Africa, there have been significantly higher infection rates observed in unmarried individuals compared to those married (Shisana et al., 2016). However, specific types of marital status may have a great effect on HIV prevalence, with a study by Tenkorang (2014) considering the effect of marital status on HIV risks among women in Sub-Saharan Africa finding that widowed women were more likely to contract the disease compared to never-married women (Tenkorang, 2014). This indicates the importance of considering specific marital status as a demographic factor and its potential effect on HIV knowledge. With little research conducted on non-heteronormative marriage rates and their correspondences with HIV infections or knowledge within South Africa, it is unclear if the results from previous studies can be applied to non-heteronormative marriages. The impact of sex on marital status must also be noted, where unmarried women have been seen to suffer twice the risk of infection compared to unmarried men (Sia et al., 2016).

Lastly, race is an important factor to consider when investigating HIV knowledge. Due to South Africa's history of colonialism and the oppressive Apartheid regime, race remains a distinct component that permeates every facet of South African life. In 2012, Black South Africans made up 6.2 out of the 6.4 million South Africans living with HIV – firmly showing the prevalence of HIV to be the highest within their racial group compared to the other racial groups in the country (Bell et al., 2022). Considering the country's history and using multilevel logistic regression, Bell et al.'s (2022) study found that segregation (past and present in the continued effects thereof) increases the odds of HIV infection amongst the Black South African populace (Bell et al., 2022). This is because, as articulated by Bell et al.'s (2022) study, race has a significant impact on all areas of individual life in South Africa – specifically socioeconomic factors concerning access to education and healthcare, where racist policy has deeply impacted the lived experiences and access of South Africans of Colour to favour the white minority (Bell et al., 2022; Wabiri & Taffa; 2013). Cultural specificities concerning race must also be considered, where racial identity affects specific gender ideology. An example here is the widely held (and inaccurate) perception that non-heteronormative identities are white colonial imports, thus impacting the stigma and discrimination faced by non-heteronormative individuals of colour (Monakali & Francis, 2022). As such, considering race as a demographic factor is vital within the South African context as a racial identity could have a distinct effect on the availability, understanding, and access to HIV knowledge.

Socioeconomic status is a significant determinant when considering HIV-related issues. In a study by Wabiri and Taffa (2013), the linkage between socioeconomic inequality and HIV outcomes in South Africa was analysed, wherein it was found that HIV prevalence was highest amongst the poor at 20.8% compared to the middle (15.9%) and upper (4.6%) classes – where more woman than men made up cases within the poor class (Wabiri & Taffa; 2013). The study indicates that its results point towards the current global agreement that lower socioeconomic status has a bidirectional relationship with poorer health outcomes (Bunyasi & Coetzee, 2017; Wabiri & Taffa; 2013). Specifically, it highlights the two socioeconomic factors considered in this study: education level and employment status. When considering education level, multiple studies have shown it to have a negative relationship with HIV prevalence, that as the level of education increases, the HIV prevalence decreases due to schooling positively affecting knowledge and attitudes surrounding sexual behaviour (Bradley & Greene, 2013; Bunyasi & Coetzee, 2017; Wabiri & Taffa; 2013). This thus shows the importance of education level as a factor of HIV knowledge. Regarding employment status, employment is a vital component of health as it allows for a better physical and mental quality of life for individuals with HIV by allowing more readily accessible quality healthcare (Liu et al., 2013; Rueda et al., 2011). Once more revisiting Wabiri and Taffa's findings, the importance of both factors together is illustrated. 40% of the poor respondents felt they were at risk of HIV infection, compared to only 10% of the upper respondents (Wabiri & Taffa; 2013). The effect of education on HIV knowledge, as well as the other factor of employment status, is demonstrated here, as those with higher education levels and employment statuses potentially have greater HIV knowledge and more ready access to healthcare. Indeed, only 20.5% of the poor had what can be considered as "good" access to HIV-related information compared to 79.9% in the upper and how the majority of the upper respondents underwent HIV testing at private healthcare facilities (Wabiri & Taffa; 2013). As such, both the education level and employment status of non-heteronormative individuals are important to consider. However, it must also be noted that demographic factors influence socioeconomic factors. An example here is how women in Sub-Saharan Africa are more likely to be uneducated and unemployed than men, which puts them at a higher risk of contracting HIV by predisposing them to transactional sexual exchanges and other risky sexual behaviours (Sia et al., 2016).

Although there are measures in place to limit exposure to STDs and STIs there are some sexual behaviours that place individuals at a much higher risk of contracting sexually transmitted diseases and infections. Risky sexual behaviour is considered sexual activities that expose a person to the risk of contracting STIs and STDs, negatively affecting their health and potentially having unplanned pregnancies (Chawla & Sarkar, 2019; Keto et al., 2020). Some risky behaviours include having multiple sexual partners, unprotected sex, sexual intercourse with commercial sex workers, coerced sexual intercourse, sexual intercourse for reward, anal/oral sexual intercourse, vaginal intercourse without a condom or another form of contraception, and being under the influence of alcohol while

engaging in sexual activities (Chawla & Sarkar, 2019; Keto et al., 2020). Sexual education is noted as a key contributor to decreasing risky sexual behaviour among individuals and it has been seen that knowledge about safe sex practices and HIV/AIDS transmission has been seen as greatly effective in decreasing HIV transmissions (Shepler et al., 2017). Young people are considered highly vulnerable to HIV infection due to engaging in risky sexual behaviour (Tarkang et al., 2019). Engagement in this behaviour is influenced by multiple factors such as socioeconomic circumstances, demographic factors, lack of parental/guardian control, peer pressure, lack of youth-friendly recreational facilities and limited access to accurate and personalised HIV information and prevention services (Tarkang et al., 2019; Sia et al., 2016). In the context of non-heteronormative individuals, sexual information specific to their needs is not common. There is a normative assumption of heterosexuality and heteronormativity within pervasive sexual education resources, with these resources focusing on the needs of Heteronormative individuals over those minority groups like non-heteronormative individuals (Müller et al., 2018; Shepler et al., 2017). In general, sex education is not a topic comfortable among many, especially towards youth population in fear that speaking and informing young people about sex and safe practices might prompt them to be sexually active (Tarkang et al., 2019; Müller et al., 2018). There are LGBTQ+ organisations that provide health services and information, however, they mainly work with an older population due to the fear and stigma that they are promoting alternative sexuality that is not heteronormative among young people (Müller et al., 2018). In concert with the other factors affecting engagement in risky sexual behaviours, this potentially enables non-heteronormative individuals therein – which could relate to their level of HIV knowledge through the insufficient dissemination of inclusive sexual healthcare and protective means geared theretoward. The overlap of influence must be noted in the different factors relevant to this study, where engagement in risky sexual behaviours is influenced by both socioeconomic and demographic factors.

Research examining HIV knowledge among non-heteronormative youth in South Africa reveals several significant gaps. Current studies lack comprehensive exploration into how different age groups within this community understand HIV. Additionally, factors such as gender, race, marital status, and engagement in transactional sex remain understudied in relation to their knowledge about HIV. Furthermore, there is limited understanding of how behaviours like having multiple partners, engaging in various sexual activities, using condoms, alcohol consumption before sex, and educational and employment backgrounds impact their HIV awareness. Addressing these gaps is critical for developing tailored interventions and education initiatives to provide necessary support and information for maintaining their health concerning HIV.

2.2. Theoretical framework for the study

The Social Model of Health will be used as the theoretical framework for this study. This model, originally derived from the Social Model of Disability looks at health being influenced from multiple perspectives rather than just a biomedical one (Yuil et al., 2010). This model makes inferences based on the demographics, lifestyle factors, social and community networks and lastly the general socioeconomic, cultural and environmental conditions of individuals and how these affect health (Dahlgren & Whitehead, 2007). It looks at individuals' behaviours and environments on both a microlevel and macrolevel and how this can influence health behaviours and health knowledge (Dahlgren & Whitehead, 2007; Yuil et al., 2010). The model consists of layers that depict the determinants of health, with the individual as the main influencer with a set of characteristics that cannot be changed. The remaining layers are influences that can be changed and how they contribute to health/health knowledge as seen in Figure 2.1.

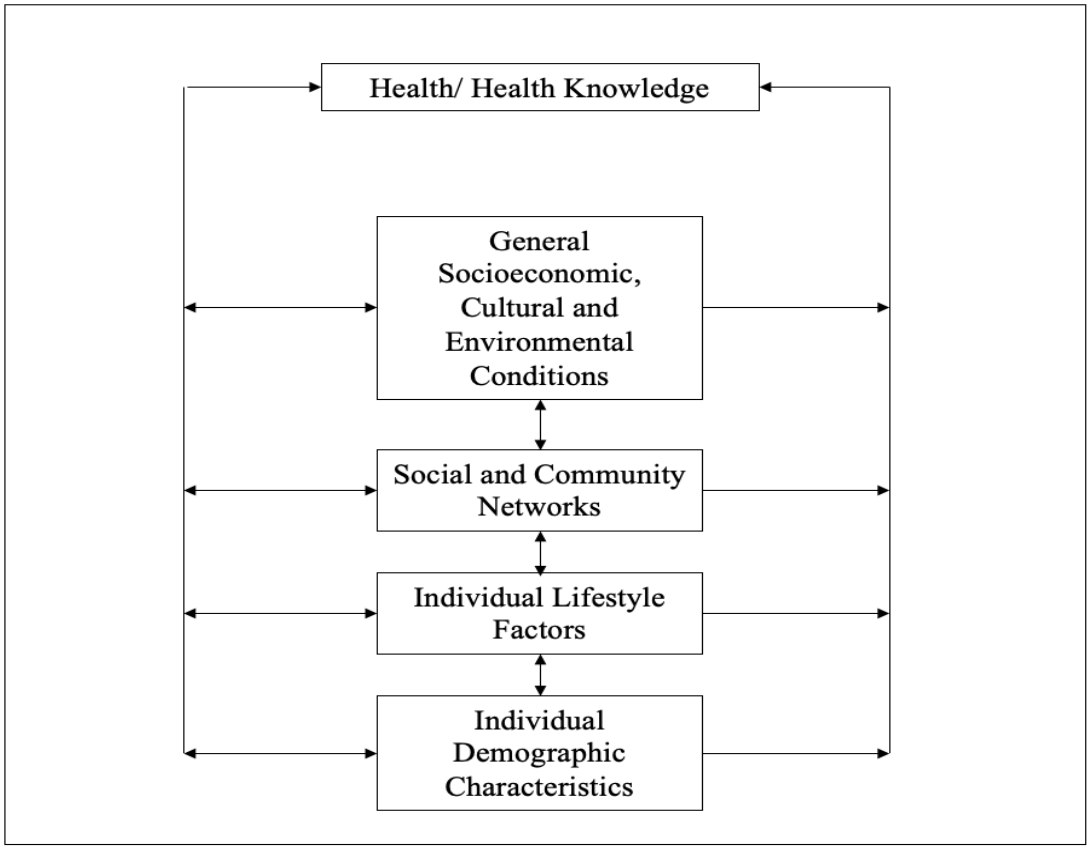


Figure 2.1: Social Model of Health *(Dahlgren & Whitehead, 2007)*

The first layer, which is at the bottom of the model, is the individual's specific demographic characteristics that cannot be changed and can contribute to health such as age and sex (Kostičová,

2015; Dahlgren & Whitehead, 2007). The next layer is lifestyle factors which are personal behaviours and ways of living that can influence health like physical activity and alcohol intake (Dahlgren & Whitehead, 2007). The social and community network layer focuses on the interactions between individuals and their community and how these interactions and 'norms' of their community affect health and health knowledge (Kostičová, 2015; Dahlgren & Whitehead, 2007). The general socioeconomic, cultural and environmental conditions look at the living and working conditions of individuals. It assesses the access to resources, services and essential goods needed by individuals to ensure good health like education, employment and healthcare resources just to name a few (Kostičová, 2015). It is important to note that these layers can affect health independently of each other and in combination with each as depicted in Figure 2.1, which is one of the reasons this model was chosen as the theoretical framework for this study.

These layers and the effect it has on health are based on the type of factors that is being done, it can be positive health factors, protective health factors and risky health factors (Dahlgren & Whitehead, 2007). Positive health factors are factors that contribute to the maintenance of good health and good health behaviour such as food security, affordable access to quality healthcare, economic security, healthy stable relationships and good physical health to just name a few (Dahlgren, & Whitehead, 2007). Protective health factors are factors that protect against or eliminate the risk of bad health among individuals (Dahlgren & Whitehead, 2007). This can include regular vaccination against infectious diseases, healthy balanced diets and social support that help prevent individuals from poor health and poor health choices. Lastly, risk factors are factors that can cause health problems and diseases that could have been prevented (Dahlgren & Whitehead, 2007). These factors can range from economic, social or environmental problems. In addition, it can be largely associated with specific lifestyle-related choices such as smoking, having unprotected sex or eating excessive amounts of junk food. These various health factors and behaviours can all contribute to health but some may promote good health among individuals and others may increase the risk of poor health.

There have been many adaptations of the Social Model of Health used in previous research, however, the main purpose of it remains the same, assessing health based on societal factors rather biomedical ones. One study suggested that the Social Model of Health might be useful in improving healthcare services for Hong Kong's population (Schoeb, 2016). The study also stated that the model redefined health and health professionals away from solely the biomedical but a more holistic and social view, suggesting health professionals spend more one-on-one time with patients to get a full understanding of their lives and communities to address certain aspects from it that can influence their health (Schoeb, 2016). Another study found that when comparing the health of HIV-positive individuals who are homeless to those who have stable housing, those who were homeless had poorer health due to the challenges of finding basic housing needs and maintaining regular care and medication intake (Centre for HIV Identification, Prevention and Treatment Services [CHIPTS] & Centre for Strengthening

youth Prevention Paradigms [SYPP], 2012). In addition, those who were homeless had a harder time accessing health care resources, medication and HIV information that aids in curbing the spread of the virus and ensuring individuals are aware of all measures and practices available to them and encourage safe health behaviours (CHIPTS & SYPP, 2012). Similarly, in another study, it was noted how poverty and factors associated with poverty also contribute to poor health decisions and the high prevalence of HIV among poorer urban communities (CHIPTS & SYPP, 2012). Besides the lack of health care access that is associated with poverty, another poverty factor noted in the study is lifestyle choices like substance abuse which can result in increased risky sexual behaviour, erratic behaviour and risk of incarceration (CHIPTS & SYPP, 2012). In addition, safe sex measures and education are not readily available, contributing to the increased risk of individuals in these communities engaging in activities that puts them at risk of contracting HIV. These can all contribute to poor health, especially among poorer urban communities where there are limited health resources and care that tackle these challenges. These studies all illustrate how health can be affected by factors outside the biomedical realm and are associated with factors mentioned in the Social Model of Health. It illustrates how poor health is not only a physical and mental body result but also associated with factors that individuals are faced with in their everyday lives.

As this study is assessing the level of HIV knowledge among non-heteronormative youth outside the biomedical sphere and looking at the demographic, socioeconomic and risky sexual behaviour of non-heteronormative youth, it falls in line with the Social Model of Health framework. The model presents the different layers surrounding individuals and what could potentially affect their health from an individual level to a societal one. Due to this, the Social Model of Health will guide in assessing if the level of HIV knowledge is due to the individual and their characteristics and lifestyle choices or if it's their community around them and the living and working environment that is affecting their level of knowledge. In addition, this model looks at how these specific layers affect health individually and in combination with each other. This will aid the study by investigating whether specific factors are influencing HIV knowledge on their own or in a combination of each other.

2.3. Conceptual framework for the study

Using the Social Model of Health, factors outside of the physical and medical health of the individual are being looked at. The Social Model of Health has been adapted for this study, using the demographic, socioeconomic and sexual behaviour factors of non-heteronormative youth and how these factors can affect health knowledge independently of each other or in combination, as seen in Figure 2.2. This adaption of the model differs from the original framework as it is using factors to test

the level of risk it has to influence HIV knowledge and result in poorer health. The original model takes into account all types of factors that can influence health both positively and negatively. This adaption on the other hand is focusing on factors that can negatively affect health, especially within the individual layer. The arrows depicted on the right side of the model illustrate the direct relationship the demographic, risky sexual behaviour and socioeconomic factors have on HIV knowledge. Each arrow has a one-way path from the specific health layer directly to HIV Knowledge.

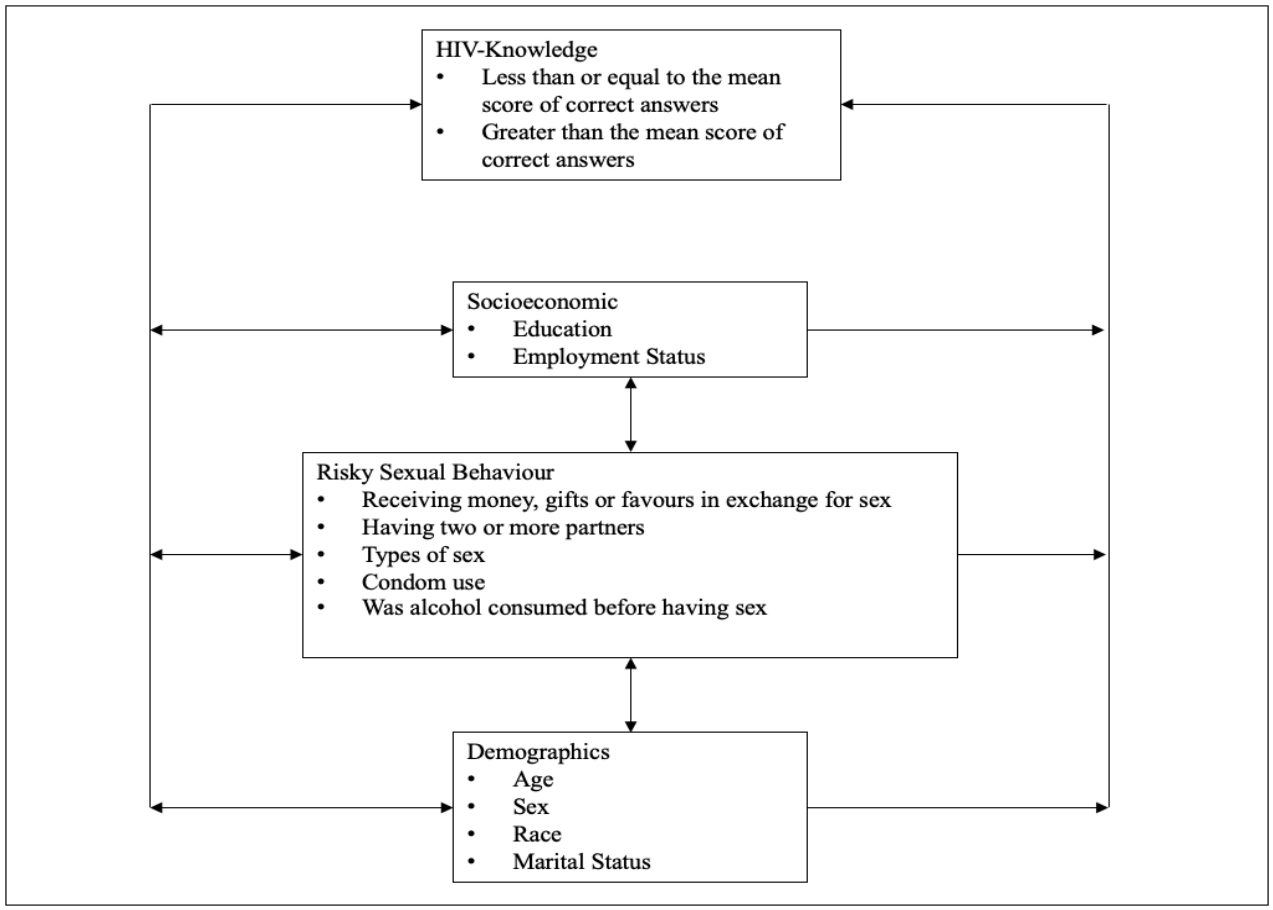


Figure 2.2 : Conceptual Framework Adapted from the Social Model of Health

On the left side of the model in Figure 2.2, the arrows presented illustrate the interrelationship each of these factors has with each other and with HIV knowledge. Following the structure of the Social Model of Health, the first layer at the bottom of the model in Figure 2.2, are specific demographic factors, these demographic factors are based on the information available from SABSSM. These areh characteristics of non-heteronormative youth that could have an effect on their level of HIV knowledge either directly or interrelated to other factors. The next layer is lifestyle factors which are focusing on risky sexual behaviour that increases the chances of exposure to HIV. The factors chosen for this layer are considered behaviours that are related to the risk of HIV infection, by using them in the study they will be used to assess the direct and interrelation to HIV knowledge and if it has a positive or negative influence on it. The final layer is the socioeconomic factors, these are factors that

can influence their access and understanding of health care and resources. This layer is greatly dependent on the economic, social and cultural context of the environment, whether it is good quality services and is easily accessible. These layers all contribute to the level of HIV knowledge among non-heteronormative youth both a direct relation and interrelated relationship.

2.4. Research hypotheses

The hypotheses being tested is assessing if there is a relationship between the various demographic, socioeconomic and risky sexual behaviour characteristics among non-heteronormative youth in South Africa and their level of HIV knowledge. By testing this we can determine not only the level of knowledge among this population but also if there are any factors that influence it. The hypotheses will be stated at:

H_0: There is no relationship between the demographic, socioeconomic and risky sexual behaviours factors with HIV knowledge among non-heteronormative youth (15-34) in South Africa.

H_1: There is a relationship between the demographic, socioeconomic and risky sexual behaviours factors with HIV knowledge among non-heteronormative youth (15-34) in South Africa.

Chapter 3: Methodology

3.1. Study design and data source

This study used secondary data set collected and captured by The Fifth South African National HIV, Behaviour and Health Survey (SABSSM) conducted in 2017. One of the main purposes of the survey was to determine the HIV knowledge, perceptions, attitudes, status and exposure to antiretroviral medicine (ARV) among South Africans (Simbayi et al., 2019). This survey is also used to identify the behaviours and social factors among South Africans that place them at risk of contracting HIV (Simbayi et el., 2019).

3.2. Study population and sample size

The South African National Youth Policy 2020-2030 defines young people between the ages of 15 and 34 years old (Department of women, youth & persons with disabilities South Africa, 2020). The SABSSM collected data from individuals aged 15 years and older, therefore the population of non-heteronormative youth in this study was 15-34 years old. In this study due to the limited questions asked in the survey regarding non-heteronormative identification, participants who indicated that either their recent, second and/or third most recent sexual partner was of the same sex were used. However, it is important to note that non-heteronormative identification is a complex process involving varying factors beyond the survey's scope and thus cannot be based solely on partner preference and gender.

The unweighted sample total of non-heteronormative youth was 13, with 9 males and 4 females. These numbers are very small and do not fully represent the non-heteronormative youth population in South Africa. Due to this, the weights developed by the HSRC were adopted in this study to have a sample size that is more appropriate to be a national representation of the non-heteronormative youth population in South Africa. The following command was applied to STATA: [iw=ibreal12_combined], this allowed for a national representation of the data to be used. It indicated the full size of all survey data and which was used to create the sample for this study.

After cleaning, organising and applying the weights command to the data using STATA, a total weighted sample of 14 638 non-heteronormative youth, 9 806 non-heteronormative males and 4 832 non-heteronormative females aged between 15-34 in South Africa had completed the section

regarding HIV knowledge and stated having a partner of the same sex in the 2017 SABSSM and was used in this study.

3.3. Variables

3.3.1 Outcome/ dependent variable

The dependent variable of this study was HIV knowledge, which is defined as having accurate knowledge of all HIV knowledge questions from the SABSSM survey. Only 9 Yes or No questions from the SABSSM survey were specifically on knowledge of HIV, question 2.2. The other questions from the HIV section were measuring the perception and attitudes towards it. The questions used in the survey can be seen in Table 3.1. The answers to all 9 questions (Yes or No) will be sorted into two categories, correct and incorrect concerning the question. All incorrect answers will be coded as (0) and correct (1) as seen in Table 3.1. This will then be used to determine the number of correct answers each participant scored. The correct and incorrect answers are based on HIV information provided by the Centres for Disease Control and Prevention (CDC). They have illustrated basic HIV information from symptoms to have HIV is transmissible, in addition, they also state what are factual and what are myths regarding HIV (Centres of Disease Control and Prevention [CDC], 2023).

Table 3.1: Questions used for Dependent Variable

Question pertaining to HIV knowledge from the survey	**Categorisation of knowledge variables: (0) Incorrect answer; (1) Correct answer**
1) Can AIDS be cured?	(0) Yes (1) No
2) Can a person reduce the risk of HIV by having fewer sexual partners?	(0) No (1) Yes
3) Can a healthy-looking person have HIV?	(0) No (1) Yes
4) Can HIV be transmitted from a mother to her unborn baby?	(0) No (1) Yes
5) Can the risk of HIV Transmission be reduced by having sex with only one uninfected partner who has no other partners?	(0) No (1) Yes
6) Can a person get HIV by sharing food with someone who is infected?	(0) Yes (1) No
7) Can a person reduce the risk of getting HIV by using a condom every time he/she has sex?	(0) No (1) Yes
8) Can male circumcision reduce the risk of HIV infection in males?	(0) No (1) Yes
9) Can the risk of HIV transmission through sex be reduced by an HIV-positive partner consistently taking drugs that treat HIV?	(0) No (1) Yes

Once sorted into the correct and incorrect answers, the mean score of the total number of correct answers out of 9 for the whole sample combined was calculated using the "mean" command from STATA. The mean score produced by STATA was 7.46 correctly answered HIV questions out of 9 among the non-heteronormative youth population in South Africa. The dependent variable was then categorised into two categories: (0) those who scored "less than/equal to the mean score of correct HIV knowledge" and (1) those who scored "greater than the mean score of correct HIV knowledge". The mean was then used as a measure and reference point to indicate those who answered exactly/less than 7.46 questions correctly out of 9 or those who scored more than that.

3.3.2. Independent variables

Table 3.2: Independent variables to be used in this study

Study Variable name	SABSSM Variable name	SABSSM categorisation	Study categorisation
Age group	age_q	Continuous: 15- 100+	(1) 15-19 (2) 20-24 (3) 25-29 (4) 30-34
Sex	sex_q	Binary: (1) Male (2) Female	(1) Male (2) Female
Race	race_q	Categorical: (1) African (2)White (3) Coloured (4) Indian/Asian (5) Other	(1) African (2) White (3) Coloured (4) Asian/Indian
Marital Status	q1_4a	Categorical: (1) Married (2) Never Married (3) Divorced/Separated (4) Widower/Widow	(1) Married (2) Never Married (3) Divorced/Separated (4)Widower/Widow
Employment Status	q1_7	Categorical: (1) Unemployed (2) sick/disabled unable to work (3)Student/pupil/learner (4)Employed/self Employed (5) other	(1) Unemployed/Student (2) Sick/Disabled and Unable to Work (3) Employed/Self-Employed
Highest Level of Education	q1_15c	Categorical: (0) Pre-school/ Gr R (1) Grade 1/Sub a/Class 1 (2) Grade 2/Sub b/Class 2 (3) Grade 3/Standard 1/Abet 1 (4) Grade 4 /Standard 2/Abet 2 (5) Grade 5 /Standard 3/Abet 2 (6) Grade 6 /Standard 4/Abet 3 (7) Grade 7/Standard 5/Abet 3 (8) Grade 8 /Standard 6/Abet 3 (9) Grade 9 /Standard 7/Abet 3 (10) Grade 10/Standard 8/Ntc 1 (11) Grade 11/Standard 9/Ntc 2 (12) Grade 12/Standard 10/Ntc 3 (13) Further studies incomplete (14) Diploma/undergraduate	(1) Primary School (2) Secondary School (3) Tertiary Studies

		degree/other post school completed (15) Further degree completed (98) Don't know	

Table 3.3: Independent variables to be used in this study continued

Study Variable name	SABSSM Variable name	SABSSM categorisation	Study categorisation
Receiving money, gifts or favours in exchange for sex	q6_5a	Categorical: (1) Yes (2) No (3) Don't Know	(1) Yes (4) No
Having two or more partners at the moment	q6_7	Categorical: (1) Yes (2) No (3) No Response	(1) Yes (2) No
Types of sex with most, second most and third most recent partner	q6_15	Categorical: Vaginal (1) Yes (2) No Anal (1) Yes (2) No Oral Sex (1) Yes (2) No	(1) Inconsistent type of sex among all 3 partners (2) Inconsistent type of sex among at least one other partner
Condom use with most, second-most and third most recent partner	q6_19	Categorical: (1) Every Time (2) Almost Every time (3) Sometimes (4) Never	(1) No Condom use among all three partners (2) Inconsistent condom use among all three partners
Was alcohol consumed before having sex with most, second most and third most recent partner	q6_25	Categorical: (1) Yes (2) No (3) Can't Remember	(1) No Alcohol Consumption (2) Consistent Alcohol Consumption (2) Inconsistent Alcohol Consumption

In Table 3.2 all the independent variables used in the study are presented both with the original variable name and categorisation and then how it was changed and re-categorized for the study. For the variables 'Types of sex with most, second most and third most recent partner'; 'Condom use with most, second most and third most recent partner' and 'Was alcohol consumed before having sex with most, second most and third most recent partner' these variables were categorised based on the participants consistency with each partner. For example, if the participants had not consumed alcohol before sex with all 3 partners then they were categorised as 'No Alcohol Consumption' if they consumed alcohol before sex with all partners then they were categorised as 'Consistent Alcohol Consumption' and if alcohol was only consumed with 1 or 2 of the partners then they were classified as 'Inconsistent Alcohol Consumption'. This categorisation was used for both Type of Sex and Condom use however, no respondent reported consistent use for either and therefore 'Consistent type of sex among 3 partners' and "Consistent Condom use' was omitted from the study. These variables

are comprised of the various demographic, socioeconomic and risky sexual behaviour questions that were asked by the SABSSM and non-heteronormative youth answered.

After cleaning and sorting the data, various categories from the different variables were omitted due to zero observations for those categories. Categories omitted were Coloureds from Race, Divorced/ Separated and Widow/Widower from Martial Status and lastly Primary School from Education Level.

3.4. Data Analysis Plan

This study is focused on understanding HIV knowledge among non-heteronormative youth (15-34) concerning their demographic, socioeconomic and risky sexual behaviour factors. All statistical testing was done using STATA 17 software.

3.4.1. Sub-Objective 1: To assess the level of HIV knowledge among non-heteronormative youth (15-34 years old) in South Africa.

To determine this objective, cross-tabulations using both Chi-Square analysis and Proportions was conducted. The Chi-Square showed at what level there is a statistical significance between each independent variable and HIV knowledge among non-heteronormative youth. In addition, the proportions were calculated using the following equation:

$$Proportions = \frac{a}{a+b}$$

$$a = Total\ number\ in\ the\ sub-population$$

$$a+b = Total\ population\ in\ sample\ including\ sub-population$$

This was then used to compare and assess the number of people who have HIV knowledge greater than the mean score of correct answers and those who have less than or equal to the mean score of correct answers. Using Chi-Squared analysis and proportions indicated the number of non-heteronormative youth who scored less than or equal to the mean score or those who scored greater and whether the independent variables had any significant influence on their level of HIV knowledge.

3.4.2. Sub-Objective 2: To establish the association between the demographic, socioeconomic and sexual behaviour factors and HIV knowledge among non-heteronormative youth (15-34 years old) in South Africa.

For this objective, due to the dependent variable being binary, a Probit Regression analysis was un on STATA. The Probit Regression model can be conducted using the following formula:

$$P(Y = 1 \mid X) = \Phi(X^T \beta)$$

Where P is the probability of the event occurring, NON is the dependent variable and Φ is the cumulative standard normal distribution function. X^T signifies the transpose of the matrix of predictors. The β parameters are estimated by the maximum likelihood (Greene, 2012).

Probit regression is used for analysing categorical data with binary outcomes, offering a valuable tool to predict the probability of an event based on multiple predictors (Greene, 2012). Its application finds justification in scenarios where outcomes are dichotomous, such as success or failure, and understanding the relationship between predictors and the probability of an event is imperative (Long, 2001). However, effective utilization of Probit regression has underlying assumptions. Notably, it assumes linearity between predictors and the logit of the outcome, necessitating a linear relationship on the logit scale (McCullagh & Nelder, 1989). Additionally, assumptions encompass independence of errors and the absence of multicollinearity among predictors to ensure stability in coefficient estimates (Hosmer, Lemeshow, & Sturdivant, 2013).

To assess the goodness-of-fit, diverse methodologies are employed. Likelihood ratio tests evaluate if predictors significantly contribute to explaining outcomes (Menard, 2002), while deviance and residual analysis detect potential discrepancies between the model and the data (Agresti, 2015). The Hosmer-Lemeshow test scrutinizes the alignment of predicted probabilities with observed outcomes across different groups (Hosmer et al., 2013). Moreover, pseudo \(R^2 \) statistics offer insights into the model's explanatory power (Long, 2001). Visual techniques, such as calibration plots or ROC curves, provide a graphical assessment of the model's predictive performance (Agresti, 2015).

This model was used to show the probability of non-heteronormative youth scoring less than or equal to the mean score of HIV knowledge or greater than it (Long & Freese, 2001). This was done using the *probit* command on STATA and interpreting the results produced there. However, when working with a Probit Model the coefficients produced have no natural meaning and the scaling is random, which does not provide accurate results to determine the probability of non-heteronormative youth scoring greater than the mean value. To help with this, marginal effects were produced after running

the initial Probit Regression on STATA. Calculating the marginal effect can be seen in the following formula:

$$marginal\ effect\ = \frac{df}{dx} = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$$

This equation is a partial derivative of *non* with respect to x and is the prediction function of f specified in the equation, this is all done on STATA using the *margins* command (Boggess (n.d). The margins command produced marginal data that allowed for not only a more accurate interpretation of the results from the study but also the probability of non-heteronormative youth scoring greater than the mean value in respect to each independent variable. This was done for both the Unadjusted and Adjusted models.

To test for multicollinearity among the study variables a correlation matrix was performed. If a value greater than 0.5 was produced for the variables it is an indication of collinearity among the variables (Laerd, n.d). The results of the correlation matrix can be seen in Appendix C which produced values greater than 0.5 for some variables and can be seen in highlighted in the matrix with red boxes. This was further investigated through a stepwise method while running the regression, this indicated that the variables Age, Education Level, Condom Use and Alcohol Consumption before sex presented collinearity and were therefore omitted from all regression analysis. When running both the adjusted and unadjusted Probit Regression, the tests produced confidence intervals in the results. However, the confidence intervals produced from Probit regressions do not provide an accurate interpretation of the probability of non-heteronormative youth scoring greater than the mean value and require further steps to be used as an accurate analysis. Due to this, marginal effects were therefore produced based on the initial results from the Probit analysis. By using the marginal effects over the coefficients intervals it not only allows for a more understandable interpretation but also indicates the probability of non-heteronormative youth scoring greater than the mean value in relation to each independent variable respectfully (Greene, 2012; Boggess, n.d).

3.5. Ethics

All data used in the study was collected by the SABSSM and not by the researcher nor is the researcher employed at the organisation. The data received and given access to is anonymised data and does not identify any study participants. An ethics waiver application was submitted to the School of Social Sciences sub-committee at the University of the Witwatersrand and was approved by the

Human Research non-Medical Ethics Committee. The following Ethics number was provided by the Committee for this research report after approval. Ethics Number: 21881/3700011.

3.6. Limitations

A limitation present in the study is that SABSSM does not provide a full representation of those who identify as non-heteronormative. The varying reasons and complexities involved with people identifying as non-heteronormative are not fully explored in the SABSSM. Only using those who indicated their recent, second and third most sexual partners are those of the same sex as them, excludes other factors that contribute to non-heteronormative identity. This excludes those whose recent, second and third most recent partner were of the opposite sex or those who are not sexually active but still identify as non-heteronormative. It also excludes the complexities of identity that come with non-Heteronormativity that are separate from sexual preferences and partners and does not fully represent the non-heteronormative youth in South Africa. Another limitation of the study is that SABSSM does not fully assess the HIV knowledge of individuals. The questions presented are only 9 questions and cannot accurately assess the full level of knowledge a person can have about HIV. This indicates that although the study is testing HIV knowledge it is not testing the full information about HIV available. In addition, a limitation to consider is the influence religion has on society and non-heteronormative individuals. The SABSSM does not ask questions about the religious views participants have which is seen as a major influencing demographic factor, especially in relation to sexual activity, sexuality and gender identity. This limits the effects demographic factors have on HIV knowledge because of the different religious practices and beliefs regarding sexual behaviours, contraceptives and non-heteronormative individuals.

Another notable limitation of using Probit regression arises from the instability of model estimates due to unevenly distributed outcomes across sub-groups. This disparity in outcome distribution within sub-groups can lead to highly unstable estimates within the Probit model. In instances where the occurrence of the event under study (such as HIV knowledge or awareness in specific sub-groups) is significantly skewed or unevenly distributed, the model's reliability in estimating coefficients and predicting probabilities can be compromised. Consequently, this study's reliance on Probit regression to analyse HIV knowledge among non-heteronormative youth in South Africa might be constrained by the challenge of obtaining reliable and stable estimates due to the uneven distribution of outcomes across sub-groups, posing a considerable limitation to the robustness and generalizability of the findings.

Chapter 4: Results

4.1. To assess the level of HIV knowledge among non-heteronormative youth (15-34 years old) in South Africa.

These outcomes are derived from data from the SABSSM, to assess understanding of HIV/AIDS among non-heteronormative youth in South Africa. The results focus on their knowledge and demographic, socioeconomic and risky sexual behaviour factors that could influence it These findings provide insights into the level of awareness and gaps in knowledge among non-heteronormative youth in South Africa regarding HIV/AIDS.

The mean value of the number of correct answers was 7.46 out of 9 questions from the SABSSM survey. Figure 4.1 illustrates that from the 14 638 sample size, there was a larger number of non-heteronormative youth who answered more questions correctly than the average score of 7.46 answers, with 63.73% non-heteronormative youth scoring greater than the mean score compared to 36.27% who scored less than or equal to the mean score of correct answers.

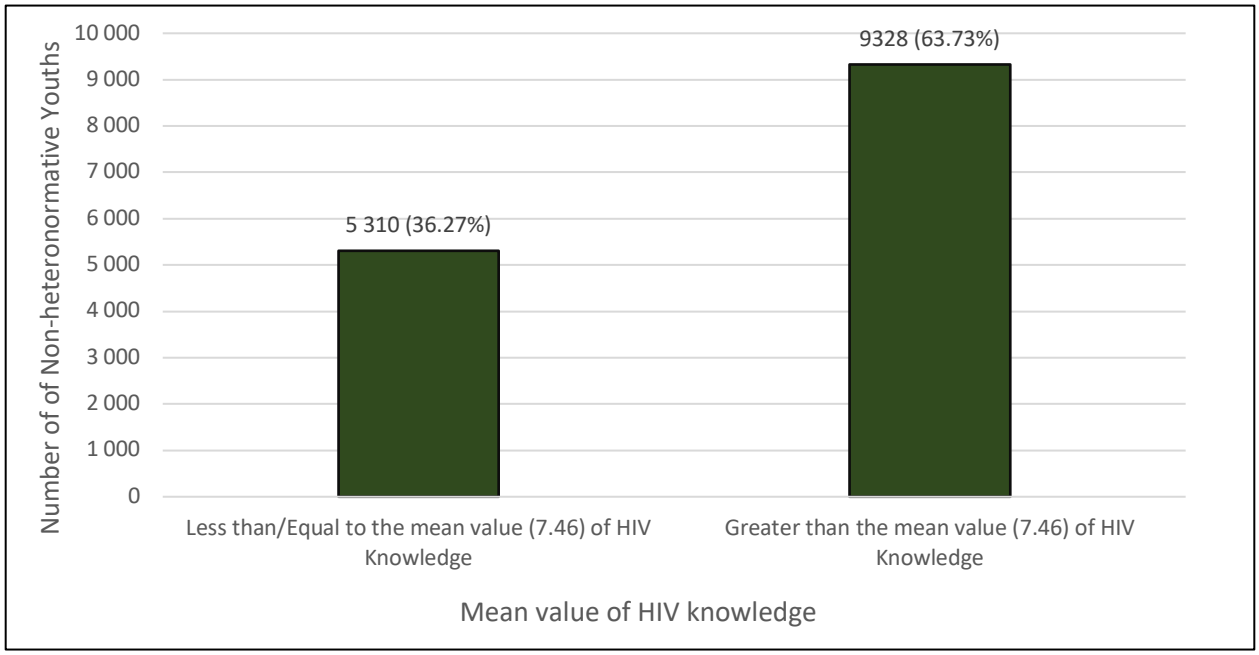


Figure 4.1 Frequency, percentage distribution of HIV knowledge among non-heteronormative youth

All the age ranges from 15 to 34 years old scored greater than the mean score of HIV knowledge as seen in Figure 4.2. All non-heteronormative youth in the age range 20-24 years old scored greater

than the 7.46 mean score of HIV knowledge and none scored less than or equal to it. In contrast, for those aged 30-34 years old, 28.36% scored less than or equal to the mean score of HIV knowledge and only 71.64% scored greater than it. Similarly, non-heteronormative Youth aged 25-29 years old, 37.17% scored less than or equal to the mean score of HIV knowledge and 62.83% scored greate than it as seen in Figure 4.2. In addition, 39.62% aged 30-34 years old scored less than or equal to the mean score of HIV knowledge and the remaining 60.38% scored greater than it. In all four age ranges, each one had a higher number of non-heteronormative youth that answered more than 7.4 questions correctly, indicating a high level of HIV knowledge among non-heteronormative youth with those aged 25-29 having a higher number of youth correctly answering.

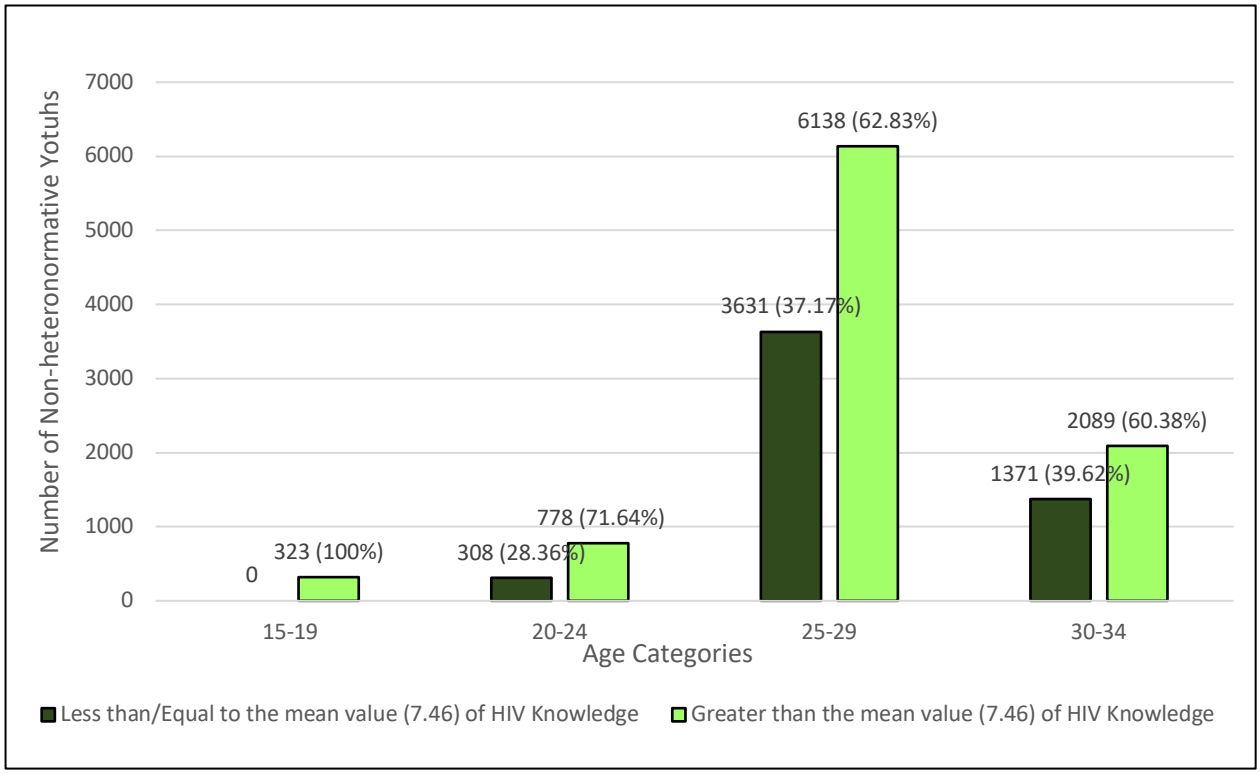


Figure 4.2 Frequency, percentage and proportion distribution of age by HIV knowledge among non-heteronormative youth

Figure 4.3 shows the HIV knowledge frequency and percentage distribution between non-heteronormative male and female youth. From the figure, it can be seen that 54.15% of males scored less than or equal to the mean score of HIV knowledge and the remaining 45.85% of males scored greater than the mean value. In contrast, 100% of all non-heteronormative youth scored greater than the mean score of HIV knowledge, suggesting that there is a higher level of HIV knowledge among females. However, it is important to mention that there were a larger number of males in the sample

than females. In Table 4.1 it can be seen that the 45.85% of males who scored greater than the mean value is about the same for the 100% of females who also scored greater.

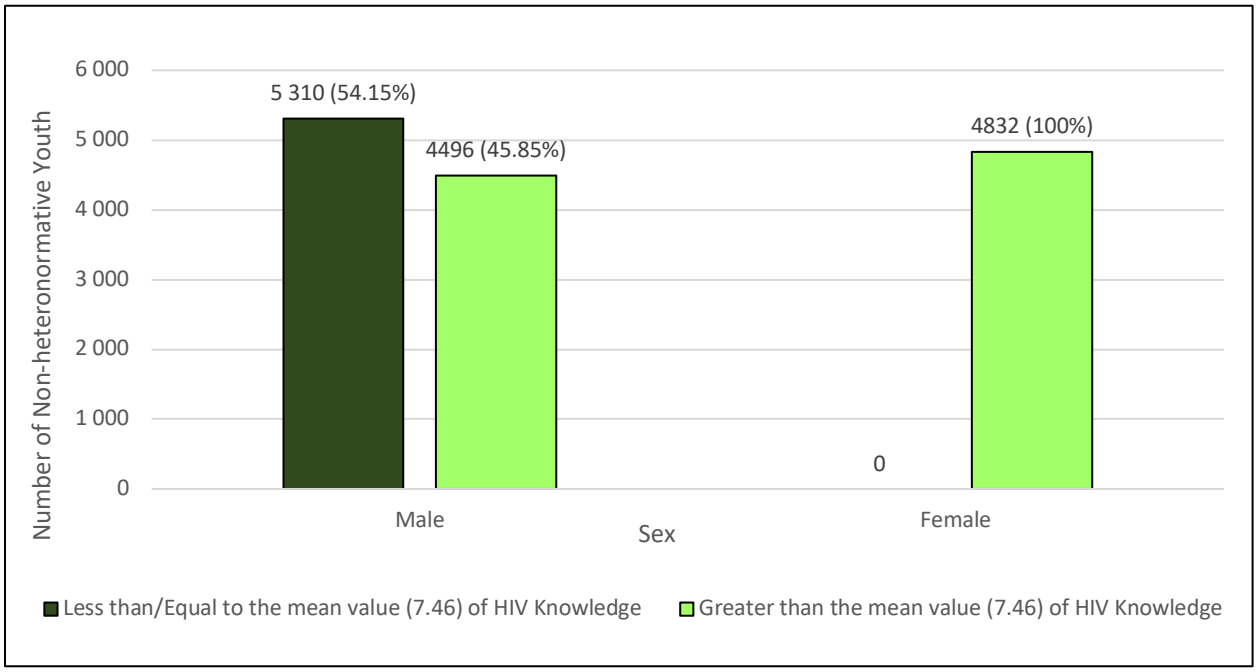


Figure 4.3 Frequency, percentage and proportion distribution of sex by HIV knowledge among non-heteronormative youth

Table 4.1 illustrates the frequency and percentage distribution with a Chi-Squared Analysis of all demographic and socioeconomic variables by HIV knowledge.

In Table 4.1 it can be seen that among African non-heteronormative youth, only 36.68% who had scored less than or equal to the mean knowledge of HIV compared to 63.32% of African non-heteronormative youth that had scored greater than the mean score of HIV knowledge. It can be noted that a larger number of African non-heteronormative youth answered more questions correctly than the mean value of HIV knowledge. In contrast, 100% of White non-heteronormative youth scored less than or equal to the mean value of HIV knowledge and 100% of Indian/Asians scored greater than the mean value of HIV knowledge as seen in Figure 4.1. Here it can be seen that all White non-heteronormative youth scored answered less than 7.46 questions correctly on HIV knowledge whereas, 100% of Indian/Asians answered more than 7.46 questions correctly.

A much larger number of non-heteronormative Youth stated they are not married compared to those who stated they are married as seen in table 4.1. However, among those who were married, none scored less than or equal to the mean value and 100% scored greater than the mean value of HIV knowledge. In contrast, among never-married non-heteronormative Youth, 48.84% had scored less

than or equal to the mean value and 51.16% scored greater than the mean value of HIV knowledge. In contrast, among never-married non-heteronormative Youth, 48.84% had scored less than or equal to the mean value and 51.16% scored greater than the mean value of HIV knowledge. Among those who never-married, there is not a large difference between the number of non-heteronormative Youth who scored less than or equal to the mean value of HIV knowledge and those who scored greater than it, indicating that those who never married an equal number of Youth who know less than or equal to the mean score of HIV knowledge and those who know more than it.

Table 4.1: **Frequency, percentage and proportion distribution with cross tabulation chi-squared analysis of all demographic and socioeconomic factors by HIV knowledge among non-heteronormative youth**

Characteristics	HIV Knowledge				P-Value	Total
	(<=) Less than/Equal to the mean value of HIV Knowledge		(>) Greater than the mean value of HIV Knowledge			**Mean=7.46**
	N	%	N	%		
HIV knowledge:	5 310	36.27%	9 328	63.73%		14 638
Age					**0.704**	
15-19	0	0	323	100		323
20-24	308	28.36	778	71.64		1085
25-29	3 631	37.17	6 138	62.83		9 770
30-34	1 371	39.62	2 089	60.38		3 459
Race					**0.363**	
African	4 954	36.68	8 550	63.32		13 504
White	356	100	0	0		356
Indian/Asian	0	0	778	100		778
Marital Status					**0.155**	
Married	0	0	3 765	100		3 765
Never married	5 310	48.84	5 563	51.16		10 872
Sex					**0.026***	
Male	5 310	54.15	4 496	45.85		9 806
Female	0	0	4 832	100		4 832
Education Level					**0.285**	
Secondary School	950	13.96	5 854	86.04		6 804
Tertiary Studies	286	100	0	0		286
Employment Status					**0.391**	
Unemployed/Student	3 653	51.26	3 474	48.74		7 127
Employed/self-employed	1 657	22.06	5 854	77.94		7 511

* Significant P<0.05; ** P-value= 0.00

For education level, 13.36% of those who only had a secondary school education level had less than or equal to the mean value of HIV knowledge whereas the remaining 86.04% had an HIV knowledge greater than the mean value. In contrast, of those who had tertiary education level, 100% scored less than or equal to the mean score of HIV knowledge whereas none scored greater than the mean score as seen in table 4.2. Youth who were unemployed or a student, 51.26% scored less than or equal to the

mean value of HIV knowledge whereas 48.74% scored greater than the mean value of HIV knowledge. In addition, only 22.06% of non-heteronormative Youth who were employed or self-employed scored less than the mean value and 77.74% scored greater than the mean value of correct HIV knowledge. This indicates that those who were employed or self-employed did have a higher HIV knowledge than those who were not employed or a student.

The variable sex is the only one that produced a p-value less than 0.05 (p-value=0.026) indicating that sex and HIV knowledge have a statistically significant relationship and that sex does influence the level of HIV knowledge. All other demographic and socioeconomic variables' produced a p-value greater than 0.05 indicating that there is no statistically significance between them and HIV knowledge when tested independently of each other.

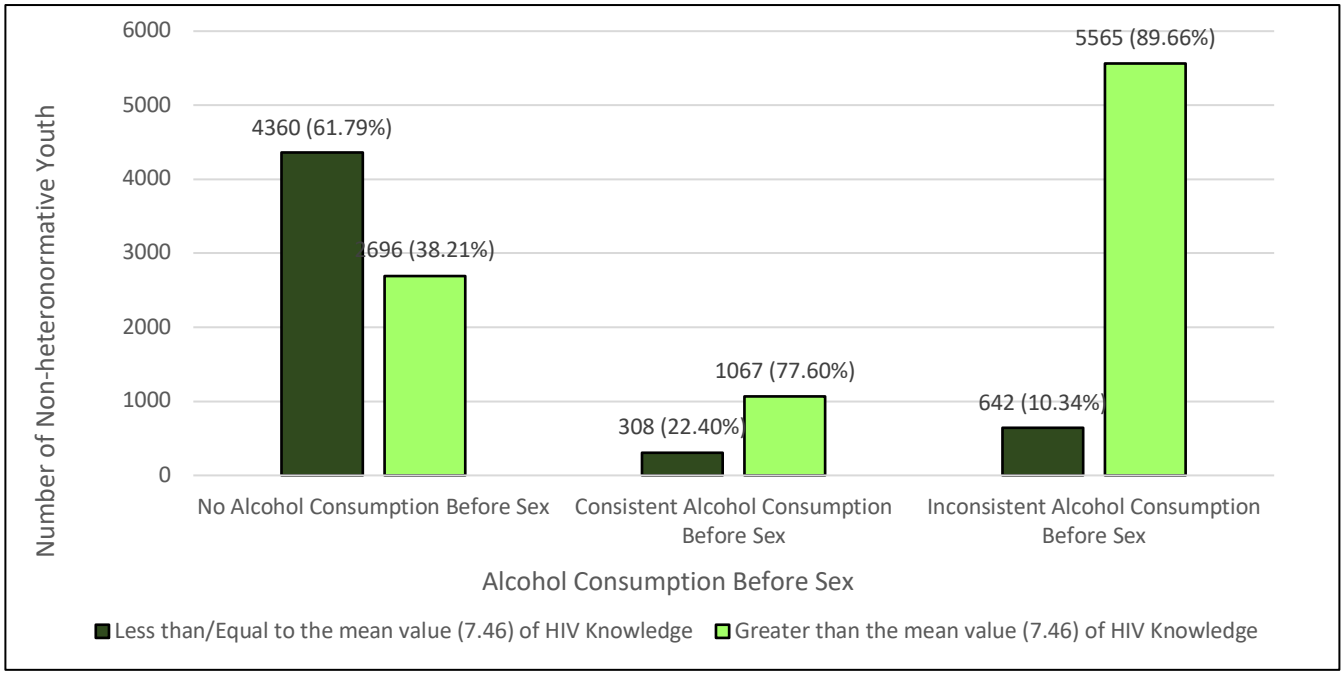


Figure 4.4 Frequency, percentage and proportion distribution of alcohol consumption before sex by HIV knowledge among non-heteronormative youth

Figure 4.4 shows the alcohol consumption before sex and the level of HIV knowledge among non-heteronormative youth. In the figure, it can be seen that 61.79% of youth who do not consume alcohol before sex correctly answered less than or equal to the mean score of 7.46 HIV questions correctly. Whereas, 38.21% of youth who do not consume alcohol before sex correctly answered more than 7.46 questions on HIV knowledge. In contrast, 22.40% of youth who consistently consume alcohol before sex scored less than or equal to the mean value of HIV knowledge compared to 77.60% of non-heteronormative youth who scored greater than it. Of those who inconsistently consume alcohol before sex only 10.34% scored less than or equal to the mean value of HIV knowledge, while 89.66%

scored greater than the mean value of HIV knowledge, as seen in Figure 4.4. It is intriguing to note that those who inconsistently and consistently consume alcohol before sex had a larger number of youths who scored greater than the mean score of HIV knowledge.

In Table 4.2 the frequency and percentage distribution with a Chi-Squared Analysis of all the risky sexual behaviour variables by HIV knowledge. In the table, it shows that 100% of non-heteronormative youth who have multiple sex partners scored less than or equal to the mean value of HIV knowledge while 0% scored greater than the mean value of HIV knowledge. Following the same trend, youth who do not have multiple partners, 17.90% scored less than or equal to the mean value of HIV knowledge compared to the 82.10% who scored greater than the mean value of HIV knowledge. It is interesting to note that all those who do engage with multiple partners have a higher level of HIV knowledge compared to those who do not have multiple partners. For condom use, about 286 stated they have no condom use among all partners and 14 352 say they have inconsistent condom use among partners. Of the 286 non-heteronormative youth who do not use a condom, 100% of them scored less or equal to the mean value of correct HIV knowledge and no one scored greater than it. In contrast, 35% of non-heteronormative youth who inconsistently use a condom with all their partners scored less than or equal to the mean value while the remaining 65% scored greater than the mean value of HIV knowledge. non-heteronormative youth who receive money, gifts or favours in exchange for sex had 13.71 who scored less than the mean value of HIV knowledge while 86.29%% scored greater than the mean value of HIV knowledge. In comparison, non-heteronormative youth who does not receive money, gifts or favours in exchange for sex, 40.02% scored less than or equal to the mean value while 59.98% scored greater than the mean value of HIV knowledge. When speaking of the variable type of sexual engagement, it refers to the different types of sex that individuals can engage in (Vaginal, Oral and Anal) and if it differs among the partner(s). In table 4.2 it can be seen that

When running the Chi-Squared analysis for all risky sexual behaviours and HIV knowledge, only the variable multiple sexual partners produced a p-value less than 0.05 (p-value = 0.033) indicating a statistically significant relationship. This means that multiple sexual partners do influence the level of HIV knowledge among non-heteronormative youth. 42.31% non-heteronormative youth that had inconsistent types of sex among three different partners, either Vaginal; Oral or Anal sex had scored less than or equal to the mean value of HIV knowledge. The remaining 57.69% non-heteronormative youth who had inconsistent sex among three partners scored greater than the mean value of HIV knowledge. However, for those who had inconsistent sex with just one other partner, only 29.40% scored less than or equal to the mean value whereas 70.60% scored greater than the mean value of HIV knowledge.

Table 4.2: **Frequency, percentage and proportion distribution with cross tabulation chi-squared analysis of all risky sexual behaviour factors by HIV knowledge among non-heteronormative youth**

Characteristics	HIV Knowledge				P-Value	Total
	(<=) Less than/Equal to the mean value of HIV Knowledge		(>) Greater than the mean value of HIV Knowledge			**Mean=6.54**
	N	%	N	%		
HIV knowledge:	5 310	36.27%	9 328	63.73%		14 638
Multiple Partners					**0.033***	
Yes	3 276	100	0	0		3 276
No	2 034	17.90	9328	82.10		11 362
Condom Use					**0.261**	
No Condom Use among all partners	286	100	0	0		286
Inconsistent Condom Use among all partners	5 024	35.00	9 328	65.00		14 352
Receiving money, gifts or favours in exchange for sex					**0.906**	
Yes	286	13.71	1 800	86.29		2 086
No	5 024	40.02	7 528	59.98		12 552
Types of Sexual Engagement					**0.797**	
Inconsistent type of sex among all 3 partners	3 297	42.31	4 496	57.69		7 793
Inconsistent type of sex among at least one other partner	2 013	29.40	4 832	70.60		6 844
Alcohol Consumption before sex					**0.719**	
No Alcohol Consumption before sex	4 360	61.79	2 696	38.21		7 056
Consistent Alcohol Consumption before sex	308	22.40	1 067	77.60		1 374
Inconsistent Consumption of Alcohol before sex	642	10.34	5 565	89.66		6 207

* Significant P<0.05

4.2. To establish the association between the demographic, socioeconomic and sexual behaviour factors and HIV knowledge among non-heteronormative youth (15-34 years old) in South Africa.

Table 4.3 presents the unadjusted Probit Regression Analysis of the remaining independent variables. When running the analysis, the marginal effect was produced and used to analyse and adequately interpret the probability of non-heteronormative youth scoring greater than the mean value of HIV knowledge. In Table 4.3 it can be seen that when each variable ran independently, p-values of 0.000 were produced indicating a statistically significant relationship between them and HIV knowledge when tested independently of each other.

Table 4.3: Unadjusted probit regression model of independent factors by HIV knowledge among non-heteronormative youth

Characteristics	Marginal effect	P-Value	95% Confidence Interval
Race			
RC: African			
White	-0.911	0.000*	-0.91571 ~ -0.90568
Indian/Asian	-0.911	0.000*	-0.91560 ~ -0.90578
Sex			
RC: Male			
Female	-0.909	0.000*	-0.10435 ~ -0.07745
Employment Status			
RC: Unemployed/Student			
Employed/self-employed	0.249	0.000*	0.2370 ~ 0.2607
Marital Status			
RC: Married			
Never Married	-0.215	0.000*	-0.22291 ~ -0.20746
Multiple Sexual Partners			
RC: Yes			
No	-0.093	0.000*	-0.10538 ~ 0.81421
Types of Sexual Engagement			
RC: Inconsistent type of sex among all 3 partners			
Inconsistent type of sex among at least one other partner	-0.901	0.000*	-0.10212 ~ -0.07815
Receiving money, gifts or favours in exchange for sex			
RC: Yes			
No	-0.186	0.000*	- 0.19320 ~ -0.17958

* Significant P-value <0.05

In regards to race, White and Indian/Asian non-heteronormative youth had 91.1% [CI: -0.91571 ~ 0.90568 | CI: -0.91560 ~ -0.905.78] decreased probability of scoring greater than the mean value of HIV knowledge compared to African non-heteronormative youth. Similarly, the probability of scoring greater than the mean value of HIV knowledge decreased by 90.9% [CI: -0.10435 ~ 0.07745] for female non-heteronormative youth compared to males. In contrast, those who are employed or self-employed have a 24.9% [CI: 0.2370 ~ 0.2607] increased probability of scoring greater than the mean score of HIV knowledge than those who are unemployed/student. In addition, for those who never married the probability of scoring greater than the mean value of HIV knowledge was decreased by 21.5% [CI: -0.22291 ~ -0.20746] when compared to those who are married.

Taking a look at risky sexual behaviour factors in Table 4.3, non-heteronormative youth who do not have multiple sexual partners had a 9.3% [CI: -0.10538 ~ 0.81421] decreased probability of scoring greater than the mean value of HIV knowledge when compared to non-heteronormative youth who do. Similarly, those who are engaging in inconsistent types of sex with at least one other partner had a 90.1% [CI: -0.10212 ~ -0.07815] decreased probability of scoring greater than the mean score of HIV knowledge. Lastly, those who do not receive money, gifts or favours in exchange for sex have an 18.6% [CI: -0.19329 ~ -0.17958] decreased probability of scoring greater than the mean value of HIV knowledge compared to those who do receive money, gifts or favours in exchange for sex. Race, sex and Type of Sexual Engagement produced a strong negative relationship with HIV knowledge, as HIV knowledge increases these independent variables decrease respectively. All variables, except employment status, when tested independently of each other, produced an inverse significant relationship with HIV knowledge and indicated that these variables have an association with HIV knowledge respectfully, as seen in table 4.3.

Table 4.4 shows the adjusted Probit Regression Analysis where all the independent variables were tested in the presence of each other. Unlike the unadjusted model, the adjusted model produced only three significant independent variables: race, marital status and multiple sexual partners. They all produced a p-value of 0.000 which is less than the threshold of 0.05 indicating the relationship between these variables and HIV knowledge is statistically significant. Table 4.4 shows that for race, the probability of White non-heteronormative youth scoring greater than the mean value decreases by 67.5% [CI: -370.08810 ~ 368.73730] when compared to African non-heteronormative youth. In contrast, Indian/Asian non-heteronormative youth have a 7% [CI: -24.57781 ~ 24.73599] increased probability than African non-heteronormative of scoring greater than the mean value of HIV knowledge. Unlike the unadjusted model, the adjusted model only produced one inverse relationship and one positive relationship for race and HIV knowledge indicating that White youth have a much lower chance of scoring greater than the mean value of HIV knowledge compared to African and

Indian/Asian non-heteronormative youth. In addition, the p-value produced is greater than 0.05 indicating that there is no statistical relationship between HIV knowledge and race when in the presence of other variables respectfully.

Moving on to sex, in table 4.4 it can be seen that female non-heteronormative youth have a 65.6% [CI: -0.80678 ~ 00.50481] decreased probability of scoring greater than the mean value of HIV knowledge than males. This is the same in the unadjusted model that showed a large decreased probability of females scoring greater than the mean value than males. This along with a p-value of 0.000 indicates that sex and HIV knowledge have an inverse statistically significant relationship with HIV knowledge when in the presence of other variables.

The adjusted employment status produced similar results to the unadjusted results, with employed/self-employed non-heteronormative youth having a 27.8% [CI: -325.61460 ~ 326.17130] increased probability of scoring greater than the mean value of HIV knowledge compared to those who are unemployed/student. In contrast to the unadjusted model, the adjusted model produced a p-value greater than 0.000, therefore stating that employment status has no significant relationship with HIV knowledge when in association with other characteristics.

Both marital status and multiple sexual partners produced a p-value of 0.000 showing a statistically significant relationship between them and HIV knowledge. However, non-heteronormative youth who never married had a 41.7% [CI: -0.45178 ~ 326.17130] decreased probability of scoring greater than the mean value of HIV knowledge than those who are married. Similarly, those who do not have multiple sexual partners had a 45.8% [CI: -0.54235 ~ -0.03946] decreased probability of scoring greater than the mean value than those who do have multiple sexual partners. In both the adjusted and unadjusted model (Table 4.3) marital status and multiple sexual partners produced similar results as in the adjusted results (Table 4.4).

Table 4.4*: *Adjusted probit regression model of independent factors by HIV knowledge among non-heteronormative youth

Characteristics	Marginal effect	P-Value (0.00)**	95% Confidence Interval
Race			
RC: African			
White	-0.675	**0.997**	-370.08810 ~ 368.73730
Indian/Asian	0.079	**0.995**	-24.57781 ~ 24.73599
Sex			
RC: Male			
Female	-0.656	**0.000***	-0.80678 ~ 00.50481
Employment Status			
RC: Unemployed/Student			
Employed/self-employed	0.278	**0.999**	-325.61460 ~ 326.17130
Marital Status			
RC: Married			
Never Married	-0.417	**0.000***	-0.45178 ~ -0.38235
Multiple Sexual Partners			
RC: Yes			
No	-0.458	**0.000***	-0.54235 ~ -0.03946
Types of Sexual Engagement			
RC: Inconsistent type of sex among all 3 partners			
Inconsistent type of sex among at least one other partner	-0.582	**1.000**	-191.85410 ~ 191.73770
Receiving money, gifts or favours in exchange for sex			
RC: Yes			
No	0.582	**1.000**	-195.82740 ~ 191.94380

* Significant P-value <0.05 ; ** P-value of Probit Regression

Both marital status and multiple sexual partners produced a p-value of 0.000 showing a statistically significant relationship between them and HIV knowledge. However, non-heteronormative youth who never married had a 41.7% [CI: -0.45178 ~ 326.17130] decreased probability of scoring greater than the mean value of HIV knowledge than those who are married. Similarly, those who do not have multiple sexual partners had a 45.8% [CI: -0.54235 ~ -0.03946] decreased probability of scoring greater than the mean value than those who do have multiple sexual partners. In both the adjusted and unadjusted model (Table 4.3) marital status and multiple sexual partners produced similar results as in the adjusted results (Table 4.4).

Unlike marital status and multiple sexual partners both, types of sexual engagement and receiving gifts, money or favours in exchange for sex produced p-values greater than 0.000, which signifies that both these variables do not have a significant effect on HIV knowledge. non-heteronormative youth who engage in inconsistent types of sex with at least one other partner has a 58.2% [CI: -191.85410 ~ -191.73770] decreased probability of scoring greater than the mean value of HIV knowledge compared to those who have inconsistent types of sex with three other partners. In contrast, those who do not receive, money, gifts or favours in exchange for sex have a 58.2% [CI: -195.82740 ~ 191.94380] increased probability of scoring greater than the mean value of HIV knowledge than those who do. Similarly to the unadjusted model (Table 4.3), types of sexual engagement produced an inverse relationship with HIV knowledge but produced a p-value of 0.000. In contrast, those receiving money, gifts or favours in exchange for sex produced a statistically significant inverse relationship in the unadjusted model (Table 4.3) but in the presence of other variables, an insignificant positive relationship was produced with HIV knowledge.

Chapter 5: Discussion

This study was developed and aimed to assess the various demographic, socioeconomic and risky sexual behaviour factors that can influence HIV knowledge among non-heteronormative youth and whether they significantly affect the level of HIV knowledge among them. It is interesting to note that with the exception of the factors: sex, marital status and having multiple sexual partners, there was no significant association found between race, employment status, types of sexual engagement and receiving money, gifts or favours in exchange for sex and HIV knowledge in the regressions from this study. This observation is quite fascinating, especially noting that over 50% of the sample had scored greater than the mean score indicating high levels of HIV knowledge among non-heteronormative youth in this study. Knowledge of HIV has been noted as one of the key contributors in combating the spread of HIV with the hopes of it influencing and changing sexual behaviours and encouraging safe sex practices (De Wet et al., 2019; Shepler et al., 2017; Paschen-Wolff et al., 2020). A study found that South African youth had low levels of accurate HIV knowledge and that increasing HIV knowledge among young people will hopefully decrease the rate of infections (De Wet et al., 2019). However, not all young people in South Africa have the same access to knowledge and learning. non-heteronormative youth are considered to be at a disadvantage in accessing healthcare and information compared to heteronormative individuals. Physical, mental, sexual and reproductive health services rarely include or have limited information and data available for non-heteronormative individuals (Gilbey et al., 2020; Mkhize & Maharaj, 2021; van der Toorn et al., 2020). This lack of HIV awareness and safe practices is furthered spread by misinformation myths among the non-heteronormative community, creating the illusion that certain individuals or practices have a lower risk of contracting HIV when this is not the case (Matebeni et al., 2013). This coupled with the fear of homophobia and discrimination deters many young non-heteronormative youth from seeking help, ensuring they are practising safe sex measures and thus placing themselves in high-risk situations. Due to this, the lack of non-heteronormative sexual and reproductive-specific information and the lack of non-heteronormative data it is important to assess the various factors that may influence HIV knowledge among non-heteronormative youth in South Africa. Focusing on non-heteronormative youth and improving their sexual health knowledge, will assist in them having control and power over their sexual behaviours, being included in preventive measures and enabling them to fully contribute to society without the risk of being affected by sexual health risks.

Furthermore, many studies have emphasised the impact of various risky sexual behaviours, employment status and most importantly education level on HIV knowledge among youth populations, yet, these factors did not show any influence on HIV knowledge among the non-heteronormative youth (Bunyasi & Coetzee, 2017; Wabiri & Taffa; 2013; De Wet et at., 2019;

Agüero & Bharadwaj, 2014). This is especially surprising for education level as it has a direct effect on HIV prevalence, as the level of education increases, HIV prevalence decreases due to increased knowledge and access to accurate sex education and safe sex measures allowing individuals to practice safe sex methods (Agüero & Bharadwaj, 2014; Bunyasi & Coetzee, 2017). In contrast, the results from this study show that there was no significant relationship between the two and that education did not influence HIV knowledge. A possible reason education could not have a significant effect on HIV knowledge in this study is that there are no specific education programs in mainstream schooling that caters for non-heteronormative sexual needs which could cause non-heteronormative youth to be misinformed or to seek information elsewhere. In addition, safe sex measures like dental dams, female condoms, douches and other non-heteronormative safe sex measures are not widely known or easily accessible in healthcare practices, making it difficult for individuals to not only find these measures but to use them correctly (Johnson et al., 2022). Further insight would be necessary to determine the link and the effect between education and HIV knowledge among non-heteronormative youth, in addition, to determining what other possible sources are non-heteronormative individuals use to acquire accurate safe sex knowledge.

Although there were a limited number of factors to show a significant effect on HIV knowledge, it still showed an indication and contributed data of what can influence HIV knowledge among the non-heteronormative community. One factor was the sex of the participants, in both the adjusted and unadjusted Probit regression, sex was shown to have a significant (P-Value = 0.000) relationship with HIV knowledge. In addition, the results showed that all female non-heteronormative youth in the sample were seen to have higher levels of HIV knowledge compared to males as seen in Table 4.4. This result is surprising in some ways, one being that in 2020 UN Aids released a progress update on HIV knowledge among young men and women in Africa and showed males having higher levels of HIV knowledge (UN Aids, 2020b). The update showed that only 39% of young women in both Eastern and Southern Africa and 28% in Western and Central Africa had high levels of HIV knowledge whereas nearly 50% of young males in Eastern and Southern Africa and 31% in Western and Central Africa had high levels of HIV knowledge (UN Aids, 2020b). The results from UN Aids (2020b) report indicated that young males in Africa have a higher level of HIV knowledge in comparison to young females and that HIV knowledge is increasing at a much slower rate for females. This is further supported by studies that were conducted within Africa, one in Uganda and the other in South Africa, which had results indicating that young males had higher levels of HIV knowledge compared to young females (Nabunya et al., 2022; Shamu et al., 2020). It was also noted that young females were more likely to believe in HIV misconceptions and myths such as contracting HIV through a mosquito bite or sharing food and/or washing facilities with an HIV-infected person (Nabunya et al., 2022; Matebeni et al., 2013). These findings emphasise the different levels of HIV knowledge and beliefs among young adults and that females are seen to have lower levels of HIV

knowledge, potentially impacting their behaviour and safe sex measures. In contrast, results from the analysis conducted in this study indicated the inverse for non-heteronormative youth, that females have a higher level of HIV knowledge than males.

The difference between the results and other trends and patterns could be due to the laws and social stigma against non-heteronormative individuals in the different African countries making it difficult to properly assess HIV knowledge within the non-heteronormative sub-population. Thus, it could be assumed the statistics from these other studies are based on young individuals that primarily engage in heteronormative relationships as the studies did not show any indication of taking sexuality as a factor, providing a more generalised result. However, a study that was conducted to assess the level of HIV knowledge among young non-heteronormative females indicated that over 60% non-heteronormative females had high levels of HIV knowledge transmission (Paschen-Wolff et al., 2019). This finding aligns with the study results indicating that HIV knowledge levels among non-heteronormative females are relatively high and accurate. Again, this result is quite surprising, not only due to the trends of previous studies showing males having higher levels of knowledge but also because many non-heteronormative females have found it difficult or impossible to get HIV information specifically for women who have sex with women (Paschen-Wolff et al., 2019; Matebeni et al., 2013). HIV/Aids campaigns or programs that are designed for non-heteronormative communities are mainly targeted at men who have sex with other men as they are classified as an 'at-risk population' and are 26 times more likely to acquire HIV (UN Aids, 2021a). Due to this higher risk, HIV information that is available to non-heteronormative individuals has mainly been targeted towards non-heteronormative males, excluding other non-heteronormative individuals and their sexual health needs. So it is fascinating to see that regardless of the lack of specific HIV information young non-heteronormative females have high levels of accurate HIV knowledge but further insight will be needed to assess where this information is coming from and how accessible is it.

The relationship between marital status and HIV knowledge is a complex one, the trends and patterns found between HIV knowledge and marital status are not only a direct cause and effect but rather an influence of various other factors as well. The results from this study showed that all non-heteronormative youth who were married had higher levels of HIV knowledge compared to those who were never married. However, there are many factors to consider when assessing the relationship between HIV and marital status, as there are many aspects that can influence not only an individual's knowledge of HIV but their risk of infection. Older studies have indicated how marriage and marriage practices within different cultures influence HIV infections and knowledge and that many believe marriage provides protection against sexual diseases and infections which is not true (Ramjee & Daniels, 2013; Tenkorang, 2014). Studies also believe that unmarried individuals and especially women have twice the risk of infection compared to their male counterparts, in contrast, another study states that married couples have higher levels of HIV knowledge (Sia et al., 2016; Nabukenya et al.,

2020; Hasan et al., 2022). The results from this study, however, indicated that all non-heteronormative females had high levels of HIV knowledge and that includes both married and unmarried non-heteronormative females whereas only 50% of married and unmarried males have high levels of HIV knowledge. This supports the argument that married couples have high levels of HIV knowledge, as married non-heteronormative young individuals from this study are seen to have high levels of HIV knowledge. Many studies noted the importance of education in having high levels of HIV knowledge, married individuals with a secondary education level or higher were more likely to have accurate HIV knowledge and less likely to believe myths (Hasan et al., 2022; Nabukenya et al., 2020; Sia et al., 2016). Exposure to social media, age, wealth status and residential area was also shown to also have an influence on married individuals' level of HIV knowledge (Hasan et al., 2022; Nabukenya et al., 2020). However, more insight is needed among never married non-heteronormative youth, especially among males as they showed to have lower levels of HIV knowledge in the study. Assessing the various education levels, media exposure, wealth status and residential area may assist in understanding the different levels of HIV knowledge among married and never married non-heteronormative youth.

With marital relationships, it is important to note that there are different dynamics between heteronormative and non-heteronormative relationships and expected relationship roles. In heterosexual relationships, in which a cisgender male is with a cisgender female there are societal gender roles and expectations that come with them (Müller et al., 2018; Marchia & Sommer, 2017). Cisgendered males are expected to take on the provider role having all the masculine and dominant traits associated with that (Saguy et al., 2021). Cisgendered females, in contrast, are expected to take on the caregiver role of being more sensitive, and softer and assume the traditional feminine role and behaviours (Saguy et al., 2021). In some instances, due to males being seen as more dominant and females as more sensitive and coupled with other gendered inequalities within society, males tend to be seen as the head of the family and many females are dependent on them for survival (Sia et al., 2016; Hasan et al., 2022). This can cause a sense of hierarchy, especially within marriages, where the husband's needs are seen as a priority and the wife as second (Sia et al., 2016; Hasan et al., 2022). This sense of hierarchy and dependency can deter many females from not only having personal growth in their career or education but also from negotiating safe sex practices and measures with their husbands in fear of not only losing their support but also due to the high social, political and economic standing males have in comparison to females (Sia et al., 2016). However, it is important to note that as time changes these inequalities are changing as well and cannot be applied to all instances especially, non-heteronormative relationships. Non-heteronormative individuals by existence challenge the heteronormative norms and ideologies that are expected in society, with this they also challenge the gender roles expected within relationships (Müller et al., 2018; Sia et al., 2016; Saguy et al., 2021). Non-heteronormative relationships differ as there are no assigned gender roles or

expectations, thus there is no hierarchal or expected behaviour within the relationship based on gender identity (Goldberg et al., 2019; Sia et al., 2016). This lack of gender roles or expectations could explain the difference in HIV knowledge among non-heteronormative married couples compared to heterosexual couples. The dynamics within non-heteronormative relationships are less restrictive than heterosexual ones as there is no fear of stepping into the other's role or dependency on the other. This in turn can allow for more self-growth and negotiation of sexual practices and measures. Further insight is needed to fully assess the impact of non-heteronormative relationship dynamics and whether it has an impact on HIV knowledge and safe sex practices.

Lastly, another factor that showed to have a significant influence on HIV knowledge was multiple sexual partners. None of the non-heteronormative youth who stated to have had multiple sexual partners scored greater than the mean value of HIV knowledge, whereas more than 80% of those who did not have multiple sexual partners scored greater than the mean value. This result indicates that those who have high levels of HIV knowledge do not engage in risky sexual behaviour like having multiple sexual partners, suggesting that individuals with high levels of HIV knowledge are less likely to have multiple sexual partners. Studies found that risky sexual behaviour, like having multiple sexual partners, among youth population has a negative impact on health and can cause individuals to be at a higher risk of HIV infection (Chawla & Sarkar, 2019; Keto et al., 2020; Tarkang et al., 2019). In contrast, another study that looked at knowledge among non-heteronormative and Heteronormative individuals found that risky sexual behaviours do not have an influence on HIV knowledge (Shepler et al., 2017). In both instances, it was noted how sexual education is a key factor in decreasing risky sexual behaviour among youth and knowledge about safe sex practices and HIV had a positive effect in decreasing HIV transmissions. (Shepler et al, 2017; Chawla & Sarkar, 2019; Keto et al., 2020). This suggests that an increase in sexual education and HIV knowledge can aid in decreasing the engagement in risky sexual behaviours which in turn can help in reducing the spread of STDs/STIs. From this study, the results showed that those who were engaging in risky sexual behaviour by having multiple sexual partners had lower levels of HIV Knowledge whereas those who did not have multiple partners had higher levels of HIV knowledge. This falls in line with the argument that risky sexual behaviour and sexual education like HIV knowledge influence each other and have a positive effect on health and health behaviour among non-heteronormative youth in South Africa. However, it is important to note that engagement in risky sexual behaviours is also strongly influenced by both socioeconomic and demographic factors and is not solely influenced on sexual education (Chawla & Sarkar, 2019). In addition, this finding coupled with the low levels of HIV knowledge among never-married non-heteronormative youth further stresses the risk that unmarried youth with multiple partners have to HIV exposure and the need for preventive measures.

The results illustrated how each factor directly and indirectly related to HIV knowledge. The factors that showed to have a significant relationship with HIV knowledge were also found to be influenced

by various other factors that impacted the level of HIV knowledge. Due to both the direct and indirect relationship between the various factors and HIV knowledge, the Social Model of Health was a suitable framework to illustrate both the direct and indirect influence on HIV knowledge and health and how each factor was related to the other and HIV knowledge. The framework also indicated how the different layers presented in the model impacted health differently, how some effects are based on personal choices and characteristics while others are caused by the social, cultural and physical environment around individuals. This was quite beneficial for the study as it brought a more in-depth analysis and when addressing concerns that contribute to lower levels of knowledge it will help in deciphering which layer, based on the model, needs to address in order to see improvements.

5.4. Hypothesis Testing and Strengths

The hypothesis for this study is:

H_0: There is no relationship between the demographic, socioeconomic and risky sexual behaviours factors with HIV knowledge among non-heteronormative youth (15-34) in South Africa.

H_1: There is a relationship between the demographic, socioeconomic and risky sexual behaviours factors with HIV knowledge among non-heteronormative youth (15-34) in South Africa.

This hypothesis was tested with the unadjusted and adjusted Probit Regression model. The result of both models indicates high levels of HIV knowledge among non-heteronormative youth but with no association to the demographic, socioeconomic and risky sexual behaviour factors, with the exception of three. The study rejects the null hypothesis: There is some relationship between the demographic, socioeconomic and risky sexual behaviours factors, particularly the variables: sex, marital status and multiple sexual partners with HIV knowledge among non-heteronormative youth (15-34) in South Africa.

There are several strengths in the design and results of this study. The first key strength to note is that this study was able to contribute and expand the inclusion of the non-heteronormative community in sexual and reproductive research. Although there are some groups within the non-heteronormative community that are seen as at risk of HIV and have been subject to much sexual and reproductive research, there is still very limited research available on the community and their sexual and reproductive needs. This research aids in closing that gap and finding areas where further insight is needed and will assist in fully understanding the sexual and reproductive needs of the non-heteronormative community. This research also provided an indication on the level of HIV knowledge among this group that was not previously known and provides areas that further research is needed to fully assess all aspects of HIV knowledge among non-heteronormative youth.

Another strength of this study is the use of data from the SABSSM results to create a non-heteronormative sample for this study. There are not many surveys that ask sexualities of participants and the SABSSM does not explicitly ask if any individuals are non-heteronormative but rather the sample had been created based on the gender participants stated they were and what the gender of their recent partners were. If participants stated that any of their recent, second or third most recent partners were of the same gender they were included in the study. By reworking the data available the study sample was able to be formed to create a non-heteronormative sample to represent the non-heteronormative population in South Africa, which was available before. Following this, the methods used in this study to not only create a specific sample group but also the research design and method

of analysis is replicable and can be applied to other studies. The process of adapting the data to create representations of minority groups, like the non-heteronormative community, can be used in other studies for other populations that have limited data.

Chapter 6: Conclusion and Recommendations

This study indicated, with the limited data available, a significant relationship was found with HIV knowledge with the variables sex, marital status and multiple sexual partners. However, more data on the non-heteronormative community is needed in order to have more significant results in future research. Although the factors sex, marital status and multiple sexual partners showed to have a significant influence over HIV knowledge as discussed above, there was no clear indication of what was influencing non-heteronormative youth in having accurate and high levels of HIV knowledge but this report did provide insight and data regarding non-heteronormative youth and HIV. There are resources and data available regarding HIV and its impact it has on populations, however, they are mainly centred around the needs of heterosexual individuals, with minority groups like non-heteronormative youth not seen as a priority. So although there was no clear association found between the demographic, socioeconomic and risky sexual behaviours with HIV knowledge, this report contributes towards the limited data of the non-heteronormative community. In addition, it is a step towards the inclusion of the non-heteronormative community in sexual health measures which has been lacking.

The lack of inclusion of the non-heteronormative community in sexual health measures is furthered by the limited number of national surveys that ask questions relating to sexuality and gender identity, the SABSSM is one of the few surveys that do. This report will not only aid in understanding the gaps in resources and data for the non-heteronormative community but also indicates the importance to include non-heteronormative individuals in national surveys, as their sexual healthcare needs differ from Heteronormative ones. Including non-heteronormative individuals in national surveys will provide data and insight into their needs which can result in HIV preventative measures and knowledge that is specific to them. In turn, this could aid in increasing the probability of reaching HIV target goals set by both international organisations and the South African government.

The United Nations' programme 90-90-90, aimed at having 90% of those living with HIV know their status, on ART and being virally suppressed (UNAIDS, 2020). These goals were set to be achieved by 2020 but South Africa was unable to reach all of these goals. Although the deadline had passed, these goals are still important and this study can aid South Africa in achieving them. Increasing HIV-related data and research among non-heteronormative individuals will aid in understanding what issues are causing infections among this population and thus allow for appropriate measures to be developed. This in turn means that South Africa can make progress in achieving the 90-90-90 target set by the United Nations, by promoting testing among non-heteronormative youth, introducing target methods to prevent the spread of the virus and encouraging ARTs to become virally suppressed. But in addition, curb the high rate of infections among youth population in South Africa.

For national goals, the South African government has the NSP for HIV, with various goals set to be achieved by 2030. These goals are aimed at reducing HIV, TB and STIs in the country and looking at all aspects of society. This study contributes to the efforts of reaching the goals set up by the NSP, specifically goals 1, 3 and 4. Goal 1 is aimed at accelerating prevention to reduce infection through HIV knowledge and factors related to it, while goal 3 is aimed at reaching all key and vulnerable populations with targeted interventions (SANAC, 2017). The research from this report can be used to address the various factors that showed to have an influence on HIV knowledge and debunk myths associated with HIV. By addressing these issues South Africa can progress in ensuring HIV knowledge is accurate and accessible as well as creating interventions that are targeted towards minority populations like the non-heteronormative community, thereby making progress on goals 1 and 3 from the NSP. Lastly, goal 4 is aimed at addressing social and structural drivers of HIV, TB and STIs (SANAC, 2017). By assessing the factors that influence the level of HIV knowledge among non-heteronormative youth it can help identify areas of sexual education and resources that are insufficient in preventing the spread of HIV among minority groups like the non-heteronormative community. It will aid in identifying areas where non-heteronormative individuals feel they are unable to access measures and information due to the fear of social stigma and discrimination. Social exclusion and stigma can reinforce the social and structural drivers that prevent many of the non-heteronormative youth from seeking health care services and accessing sexual health information. This is specifically reinforced by homophobia that is still largely present in South Africa and forces many non-heteronormative individuals from 'coming out' and not only preventing them from seeking specific sexual health education but also from living openly and authentically. By increasing awareness of these discriminating social and structural drivers placed on non-heteronormative individuals, it will aid in promoting many to feel comfortable to live authentically as themselves and to access health care and health information without fear of discrimination or homophobia which in turn can help to increase HIV knowledge and decrease HIV infections.

There is limited data and academic research available regarding non-heteronormative youth sexual and reproductive health, which restricts research and in-depth analysis that can be conducted for this population group. Due to this, the size of the non-heteronormative community, and their characteristics or needs within South Africa are unclear. Further research needs to be conducted on non-heteronormative youth not only to increase their presence in research literature but also to assess the size of the non-heteronormative community, the relationship they have with society and how it could potentially influence the various factors in it. This increase in research and data will also allow for significant results to be produced in studies as there will be more accurate and representative data available on the non-heteronormative community. In addition, further studies are needed on women sleeping with women to fully assess their HIV knowledge and also the prevalence of HIV among this group, as there is limited research on this group. Another population group that is suggested for

further studies is the Coloured non-heteronormative community. Although they were not part of the final study due to having zero observations in the study, this suggests that further studies are needed to gather data on this population as there seems to be a very limited amount available. This will provide further insight into the Coloured population regarding their HIV knowledge and the measures which they practice and may need. It was also found that measures should be targeted at Young White non-heteronormative females as they had decreased chance of scoring greater than the mean value of HIV knowledge compared to males.

Programs are needed that focus on the non-heteronormative community, which is aimed at assessing and surveying this community and increasing the availability of data. This data will provide opportunities for further research to be conducted, inform policies based on the needs of the community and be included in National programs. This data and research will also assist in political, economic and social inclusion and address the stigma placed on non-heteronormative individuals. Although South Africa has constitutional laws that protect non-heteronormative individuals, homophobia is still widely present in the country. Due to this, it is suggested that programs be created in collaboration with members of the non-heteronormative community. One major feature of the non-heteronormative population is the sense of community among them, including them in the formation of programs creates a level of trust and inclusion that cannot be found elsewhere. By doing so there is a high guarantee that the needs of the non-heteronormative community will be met while ensuring the safety and privacy of these individuals. In addition, the knowledge that other non-heteronormative individuals were involved creates a higher success rate for these programs being successful. The creation of this program can help promote inclusion in society, create awareness of their needs and promote sexual and reproductive health measures that are specially designed for them.

An SMS line or something similar in nature that ensures privacy and anonymity is suggested which allows for quick and accessible information regarding sexual health. Given the fluidity non-heteronormative individuals have with their sexualities and themselves, they require specific sexual and reproductive health information and resources that is different from what is already available. In creating this secure and private information point, it should primarily focus on sexual and reproductive information that is tailored for non-heteronormative individuals. Implementing a non-heteronormative information point ensures privacy and anonymity among those who access it, reduces the risk of discrimination, promotes help-seeking behaviours and allows for safe access to accurate non-heteronormative sexual and reproductive health information. This intervention should not neglect other ethnicities such as Indians/Asians, African and especially Coloured non-heteronormative youth as there is limited data available in this study of their level of Knowledge and further research is needed. Focus also needs to be on females who have never been married as the findings from the study showed low levels of HIV knowledge. The information on the SMS line will also inform the

risk of engaging in risky sexual behaviours and how it can increase the risk of infection if not using safe sex measures.

Another recommendation would be training healthcare professionals in sexual and reproductive health that is specific for non-heteronormative Individuals. In some instances, it was found that there was a lack of information available that was specific to non-heteronormative individuals which resulted in many being unaware of the risk of engaging in these practices and the availability of safety measures. It is also recommended to place a safety officer or liaison at health care practices that not only provide needed training for health professionals but also ensure that non-heteronormative individuals are not subject to discrimination and promote social inclusion. These officers or liaisons would ideally be non-heteronormative individuals as they would minimise the fear of discrimination or homophobia and promote a safe environment for young non-Heteronromaitve individuals to seek help. This will aid in the promotion of help seeking-behaviours among non-heteronormative youth who avoid seeking help for fear of judgment and discrimination but also allows for job creation among non-heteronormative individuals.

Lastly, the SABSSM 2017 is one of the few surveys that ask questions relating to sexuality in South Africa but interestingly enough it did not ask participants questions regarding their religious preferences. Given the different religious views towards homosexuality and sexual activity, it would have been interesting to see the impact religious views would have on HIV knowledge among non-heteronormative youth. It is suggested that in the next SABSSM survey, questions related to religious views and practices be included as it will provide a wider scope on the socioeconomic factors that influence health and health behaviour towards sexual health and non-heteronormativity within South Africa.

The 2017 SABSSM survey gauges HIV knowledge based on 9 “Yes” or “No” questions and participants answered based on the answers available. These 9 questions cannot fully assess HIV knowledge among individuals. Further research is recommended on HIV knowledge that fully examines the HIV knowledge among respondents. A qualitative study is suggested as it individuals time to fully respond to questions in their own words that represents their level of HIV knowledge and can be determined as accurate or inaccurate. In addition, it allows respondents to explain how they gathered their knowledge and what may have influenced it. It will also be interesting to observe how their sexual activity may have changed since ‘coming out’ and whether it has influenced their knowledge of sexual health. This study would require in-depth interviews with non-heteronormative Individuals who are comfortable speaking about themselves and their sexuality openly, which may be difficult to find.

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Appendix A: Literature Review Matrix

Title	Author(s) and Year	Journal	Data Source and Methods of Analysis	Main Results	Gaps in the study
Sexual rights but not the right to health? Lesbian and bisexual women in South Africa's National Strategic Plans on HIV and STIs	Felicity Daly; Neil Spicer & Samantha Willan (2016)	An International Journal on Sexual and Reproductive Health and Rights	25 In-depth interviews with women who have sex with women. The interview findings was categorised into 4 themes: Action Power; Ideas; Political Context and Issue Characteristics	The article shows epidemiological and structural drivers of lesbian and bisexual women's vulnerability to HIV and STIs. How the four themes have influenced and affected their access to health care. In addition, if their expressed vulnerability in policy reforms have made an impact on their right to claim good health measures.	
Meeting the Sexual Health Needs of LGBT Youth: Perceptions	Sthembiso Pollen Mkhize & Pranitha Maharak	Journal of Social Service Research	12 Interview with LGBT university students aged 18-24 in	The results identified several social, cultural, and economic	Due to the discrimination against sexual minorities in the rest of Africa,

and Experiences of University Students in KwaZulu-Natal, South Africa	(2020)		KwaZulu-Natal. The interviews were analysed in three stages. First being transcribing the interviews to easily understand. Seocnd was code line by line. Third was categorising the codes in salient and discrete themes.	aspects that influenced the use of sexual health services among LGBT students. These aspects evaluated some predisposing, enabling and need factors	the study cannot be completely generalised. Information about LGBTQ are not easily accessible in the rest of Africa making it hard to get a full understanding of the health needs of the LGBT Youth.
HIV Risk Among Men Who Have Sex With Men, Women Who Have Sex With Women, Lesbian, Gay, Bisexual and Transgender Populations in South Africa: A Mini-Review	Meredith G. B. Evans1,, Allanise Cloete, Nompumelelo Zungu and Leickness C. Simbayi, (2016)	The Open AIDS Journal	Peer-reviewed empirical social and behavioral articles on HIV prevalence and risk focusing on MSM, WSW, and LGBT populations published since 2006 were included in this mini-review	A total of 35 articles were included: 30 on MSM, gay, and/or bisexual male-identified populations, three on WSW, lesbian, and/or bisexual female-identified populations, two on LGB Youth, and none on	There is a limited amount of research available on non-heteronormative individuals and HIV. There is especially a small amount on lesbians and other women sleeping with women and HIV in South Africa.

				transgender populations.	
"Lesbian"/female same-sex sexualities in Africa	Ashley Currier & Thérèse Migraine-George (2017)	Journal of Lesbian Studies	An Article speaking on lesbian sexualities in the context of Africa. This article contextualizes the state of research on African lesbian sexualities.		When speaking of creating a new discourse on Lesbian it mainly just summarises works already been created that explores lesbianism in the African context and how it has been interpretated. However, it just merely provides an overview on this discourse and does critically analyse the works and effective of it in the African context.
Not quite over the rainbow: the unrelenting and insidious nature of heteronormative ideology	Jojanneke van der Toorn, Ruthie Pliskin and Thekla Morgenroth (2020)	Current Opinion in Behavioral Sciences	An article speaking about the nature of heteronormative ideology, review some of the social-psychological	Argue that there is a threat reactions to non-heteronormative behavior reinforce	Although the authors provide direction for future research, the recommendations they provide does not help in

			mechanisms that contribute to its maintenance. It also provides directions for future research that could inform efforts to combat it..	heteronormative beliefs and that interventions are needed to address both prejudice and its underlying mechanisms.	the efforts to combat heteronormative ideology. The recommendations are based on research done already but no new ways were offered by the authors.
The no-go zone: a qualitative study of access to sexual and reproductive health services for sexual and gender minority adolescents in Southern Africa	Alex Müller, Sarah Spencer, Talia Meer, and Kristen Daskilewicz (2018)	Reproductive Health	The authors analysed data from fifty in-depth qualitative interviews with representatives of organisations working with adolescents, sexual and gender minorities, and/or sexual and reproductive health and rights in Malawi, Mozambique, Namibia, Zambia and	The sexual minorities in these countries experienced double marginalisation when acquiring reproductive health service. There was a fear on LGBT organisations of being identified as 'homosexual recruiters' but LGBTQ Youth struggled in finding resources suited for them.	The information gathered was not from the adolescent themselves but rather organisations affiliated with them. Although these organisations are aimed at helping LGBTQ adolescent it may distort the real experience among these teenagers. In addition, the research only looked at urban areas and not the rural ones

			Zimbabwe.		which have less resources and different experiences then those in urban ones.
Risky Sexual Behaviours and Knowledge of HIV/AIDS Transmission in a Community Sample: Sexual Orientation, Race, and Gender	Dustin K. Shepler; Kevin P. Johnson; Alicia A. Width (2017)	Journal of Social, Behavioural and Health Sciences	Differences in knowledge of HIV/AIDS transmission and engagement in risky sexual behaviours among men and women; lesbian, gay, and bisexual and heterosexual people; and White and Black people were examined	Knowledge of HIV/AIDS transmission was not related to sexual orientation or gender participants. Differences in what types of risky sexual behaviour people participated in existed based on sexual orientation.	The sample used in this study was only 328. Although it had a wide representation of gender, sexuality and race it seems a small sample group being used to represent multiple population groups. In addition, the sample group was collected from a LGB pride event where may had specific requirements in order to attend excluding those who are LGB but did not attend

					the event.
Defining “High-risk Sexual Behavior” in the Context of Substance Use	Nishtha Chawla; Siddharth Sarkar (2019)	Journal of Psychosexual Health	The review aims to study the different definitions of high-risk sexual behaviour available in literature, the differences in the prevalence of various risks associated with risky sex in substance-using.	The association between high-risk sexual behaviour and substance use has been well established. Further research is warranted to obtain a clear definition which has greater precision and clinical utility.	Although the author reviewed the different definitions of risky sexual behaviour, there is no clear one that can be used as a generalised definition across all populations. The author does not take into the account the different cultural beliefs and practices that influence sexual behaviours among the different populations.

Appendix B: Correlation Matrix

```
. pwcorr age sex race edu_level marital_status employment_status recieving_gifts multiple_partners sex_type condom_use alcohol_use, obs star (0.05)
>  sig

             |      age      sex     race edu_le~l marita~s employ~s reciev~s
-------------+---------------------------------------------------------------
         age |   1.0000
             |
             |       13
             |
         sex |   0.0619   1.0000
             |   0.8408
             |       13       13
             |
        race |  -0.3044   0.3590   1.0000
             |   0.3120   0.2283
             |       13       13       13
             |
   edu_level |  -0.0788  -0.2928  -0.1429   1.0000
             |   0.8528   0.4816   0.7358
             |        8        8        8        8
             |
marital_st~s |  -0.0396  -0.6396*  0.1597   0.2182   1.0000
             |   0.8978   0.0186   0.6022   0.6036
             |       13       13       13        8       13
             |
employment~s |   0.6447*  0.3858  -0.3468   0.2928  -0.4606   1.0000
             |   0.0174   0.1930   0.2456   0.4816   0.1132
             |       13       13       13        8       13       13
             |
recieving_~s |  -0.2969   0.2843   0.1597  -0.6547  -0.1818  -0.4606   1.0000
             |   0.3245   0.3466   0.6022   0.0781   0.5522   0.1132
             |       13       13       13        8       13       13       13
             |
multiple_p~s |  -0.0509   0.3651   0.2052  -0.6547  -0.2335   0.1409   0.2725
             |   0.8690   0.2199   0.5013   0.0781   0.4425   0.6462   0.3678
             |       13       13       13        8       13       13       13
             |
    sex_type |   0.2865   0.6172*  0.3468   0.2928  -0.3948   0.5476   0.0329
             |   0.3426   0.0246   0.2456   0.4816   0.1819   0.0527   0.9150
             |       13       13       13        8       13       13       13
             |
  condom_use |  -0.0268   0.1925   0.1081  -1.0000* -0.1231  -0.3118   0.6770*
             |   0.9307   0.5288   0.7251   0.0000   0.6887   0.2997   0.0110
             |       13       13       13        8       13       13       13
             |
 alcohol_use |   0.2117   0.3801   0.1068   0.2673  -0.4862   0.5278  -0.4862
             |   0.4874   0.2002   0.7284   0.5222   0.0921   0.0638   0.0921
             |       13       13       13        8       13       13       13
             |

             | multip~s sex_type condom~e alcoho~e
-------------+------------------------------------
multiple_p~s |   1.0000
             |
             |       13
             |
    sex_type |   0.2254   1.0000
             |   0.4591
             |       13       13
             |
  condom_use |   0.5270  -0.2673   1.0000
             |   0.0642   0.3774
             |       13       13       13
             |
 alcohol_use |   0.2082   0.5278  -0.3291   1.0000
             |   0.4949   0.0638   0.2722
             |       13       13       13       13
             |

.
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Appendix C: Plagiarism Declaration

DEMOGRAPHY AND POPULATION STUDIES

ASSESSMENT COVER PAGE

STUDENT NO :	1867296
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- ☑ Submitted on Turnitin
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- ☑ Bibliography/references list attached
- ☑ Spell check
- ☑ Grammar check