KNOWLEDGE, ATTITUDES AND PRACTICES REGARDING HIV PRE-EXPOSURE PROPHYLAXIS AMONG ADOLESCENTS IN SECONDARY SCHOOLS, GROOTFONTEIN DISTRICT OTJOZONDJUPA REGION.

A THESIS SUBMITTED IN PARTIAL FULFILLMENT

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ABSTRACT

Introduction: Adequate knowledge, attitude, and practice of HIV Pre-Exposure Prophylaxis (PrEP) are crucial for HIV prevention, especially in regions with high infection rates. Despite its life-saving potential, there remains a glaring gap in school-based PrEP education in Namibia, leaving adolescents under-informed and vulnerable. This study aimed to assess knowledge, attitude, and practice regarding HIV PrEP among adolescents in secondary schools in Grootfontein district, Otjozondjupa region, Namibia.

Methodology: The study used a quantitative, cross-sectional design, 341 learners were sampled from three secondary schools. Non-probability judgmental sampling selected the schools, followed by stratified random sampling to select the learner's respondents.

Results: The findings showed that most respondents were females (62.2%), aged 15-19 years (79.5%). About 54.5% had never heard of HIV PrEP, and only 15.2% knew that PrEP is specifically for HIV-negative individuals. While 49.5% recognized PrEP as an antiretroviral treatment for HIV Prevention, 39.9% were unsure. A majority (39.3%) understood PrEP's use when at risk of HIV, and 45.2% would feel comfortable discussing PrEP with healthcare providers. Additionally, 42.8% indicated they would recommend PrEP to a friend or partner, with 51.6% agreeing it is essential for adolescents to have access to PrEP.

Conclusion: The study found significant links between demographic factors and HIV PrEP-related knowledge, attitudes, and practices. Despite positive attitudes, gaps in knowledge and practice persist, underscoring the need for targeted, school-based sexual education interventions.

Keywords: Adolescents, knowledge, attitudes, exposure, prophylaxis, human immunodeficiency viruses.

LIST OF CONFERENCE PROCEEDINGS

Namibia Trials of Excellence in Southern Africa 2nd Scientific Symposium

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LIST OF ABBREVIATIONS AND ACRONYMS

ARV- Antiretroviral

CDC- Communicable Disease Centre

MOHSS- Ministry of Health and Social Services

MOEAC- Ministry of Education, Arts and Culture

NMRC- Namibian Medicines Regulatory Council

PrEP- Pre- Exposure Prophylaxis

STIs- Sexually Transmitted Infections

WHO- World Health Organization

AIDS- Acquired Immuno Deficiency Syndrome

HIV- Human Immunodeficiency Virus

TDF- Tenofovir Disoproxil Fumarate

FTC- Emtricitabine

3TC- Lamivudine

KAP- Knowledge Attitude Practices

DEC- Departmental Ethical Committee

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DEDICATION

I dedicate this thesis to my family, who have been a pillar of strength whenever I felt like giving up. Mr. Rainhold Ndaikile for always pushing me and all the Secondary School leaners in Grootfontein district, thank you all for making it possible for this thesis to be a success.

DECLARATION

I, MUTANGARA ASTERIA M, hereby declare that this study is my own work and is a true reflection of my research, and that this work, or any part thereof, has not been submitted for a degree at any other institution.

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CHAPTER ONE

INTRODUCTION AND BACKGROUND

1. Introduction

HIV stands for Human Immune Deficiency Syndromes which is a virus that damages the white cell counts and weakens the human body to fight infections and diseases (1). HIV Pre-exposure prophylaxis (PrEP) is the use of antiretroviral (ARV) oral drugs by people who are not infected with HIV to prevent the acquisition of HIV (2). Adolescents are the young people in the age group of 10-19 years. This age group is regarded to be in a vulnerable state because of high rates of injuries, mental health issues, substance use, and sexual/reproductive health conditions. The concern regarding knowledge, attitude, and practice of HIV PrEP among adolescents is the global concern (3,4). There were 3.9 million adolescents aged 10-24 years living with HIV and AIDS across the globe in 2017, 1600 new infection daily and one death after every ten minutes (5). Therefore, this study focused on the knowledge, attitudes, and practices of adolescents regarding HIV PrEP at secondary schools in Grootfontein district, Otjozondjupa region.

1.1.Background

Several systematic reviews and meta-analysis revealed that HIV PrEP is highly effective (2–4). However, HIV PrEP is regarded only effective based on adherence and should not be a replacement for other preventative measures such as condomising. HIV PrEP is recommended to be used by people at risk of HIV infections such as sex workers, men who have sex with other men, people that inject each other with drugs or share injections,

alcohol abusers and anyone at risk of getting involved in sexual activities with an unknown person (2,5).

Adolescents involve the interaction between fundamental biological and cognitive developmental processes, and the unique environment inhabited by the adolescent (6). World Health Organization categorized the adolescence age to be between 10 and 24 years old (7). The population was 2,113,077 in 2013 (8), with adolescents aged 10-24 years constituting 33% (9). Adolescence has increased the likelihood of risk-taking behavior and related poor health outcomes which expose them to illness and infections such as HIV (10). Based on their risk behaviors, the adolescents become a target of HIV PrEP preventative programs to prevent young people from getting infected with HIV and to combat the spread of HIV among adolescents (11). Majority of adolescents aged 10-24 years are school going who are in their secondary school face. Therefore, this study focused on the knowledge, attitude, and practice of adolescents regarding HIV PrEP at secondary schools in Grootfontein district, Otjozondjupa region, Namibia. World Health Organization has an agenda to combat the spread of HIV and AIDS by the year 2030. To meet the target across the globe WHO implemented PrEP to be used by adolescents (4). Several programs have been put in place to assist and halt the spread of the virus. However, this was met with challenges mainly the knowledge of HIV PrEP among the adolescent (6).

Approximate 80% of adolescents are living in developing countries, mostly in Africa (7). Data indicates that more than two-third of the HIV infections are from African countries (3). African adolescents have poor knowledge, attitudes, and practices of HIV PrEP (15-16). However, a study done in Ethiopia found more than 80% of the secondary school adolescents to have knowledge regarding HIV and AIDS but bad attitudes towards it –

which can be a bad indicator for PrEP practice (8). Another study done in Ethiopia shows how students reveal high risk behaviors and HIV PrEP preventative mechanisms but none mention PrEP as a preventative measure (9). Therefore, Africa joins the world in the struggle towards PrEP awareness among adolescents to prevent the spread of the HIV infection (6).

Namibia recorded an estimate of 220 000 people living with HIV, both adults and children in 2022. It is estimated that the adolescents living with HIV and AIDS were 11,057 in Namibia in 2017(10). Namibia observed a decline a positive decline in new HIV infections, however, declared an unfished fight against HIV and AIDS until its eliminated (11). Even if Namibia has high number of adolescents living with HIV AIDS, a study done at the University of Namibia, Rundu campus indicated that only 45% of the young people aged 18-24 heard about HIV PrEP (12). On the other hand, the same study positively indicated that 88% of the respondents were willing to use PrEP after they were informed of the HIV PrEP (12). Furthermore, this shows that putting effort on educating adolescents regarding HIV PrEP will have significant impact on HIV PrEP uptake.

There appears to be a scarcity of published literature regarding PrEP among adolescents in Grootfontein district. However, adolescents from secondary schools in Grootfontein district are not left behind by risk factors facing adolescents across the globe. Grootfontein is a town with common urban challenges such as early sexual activities before the age of 15 (10), and drugs and alcohol abuse among others. Based on the above background this study aimed on assessing the level of knowledge, attitude, and practice of HIV PrEP among adolescents at secondary schools in Grootfontein district, Otjozondjupa region. The main target was to provide recommendations on how to combat the spread of HIV

and AIDS among adolescents in Grootfontein district, in line with eliminating HIV as a public health threat by 2030 (13).

1.2. Statement of the problem

The health information system at Ministry of Health and Social Services, Grootfontein district indicated that between January 2020 and January 2022, 6826 adolescents were treated with STIs. On the other hand, another unpublished data from the Global fund district office in Grootfontein, indicated 807 new HIV infection among adolescents between January 2019-January 2022. Unfortunately, only 44 adolescents took PrEP among the period of January 2019-January 2022. On the other hand, the researcher has observed how the adolescents of Grootfontein district indulge in risky social behaviours that puts them on a risk of acquiring HIV such as alcohol and drug abuse, multiple sexual partners and unprotected sex as reported during consultations for those diagnosed with STIs. The researcher became concerned about the adolescent's risk of getting infected with HIV infections. Most of the adolescents are in secondary schools. HIV and AIDS among the school going adolescents is associated with the demand of education by reducing the number of students attending education, poor performance due to stigma, discrimination in the school environment, silence, and isolation (9). On the other hand, families with HIV/AIDS infected adolescents will be stigmatised, get poor as many children fails to complete school due to health challenges and the community will have an increased number of poor mental and physical health (13). These disadvantages are of public health concern which requires combined efforts to combat the spread of HIV infection and develop health families and communities. Henceforth, this prompted the researcher to conduct the study to assess the level of knowledge, attitude, and practice

regarding HIV PrEP among adolescents in secondary schools, Grootfontein district, Otjozondjupa region.

1.3. Aim of the Study

The aim of this study was to assess and determine the level of knowledge, attitudes, and practices regarding HIV PrEP among adolescents in secondary schools, Grootfontein district, Otjozondjupa region.

1.4.Objectives of the study

The study was guided by the following objectives:

- To assess the level of knowledge regarding HIV PrEP among adolescents in Secondary Schools, Grootfontein District: Otjozondjupa Region.
- To determine the attitudes regarding HIV PrEP among adolescents in Secondary Schools, Grootfontein District: Otjozondjupa Region.
- To assess the extent of practices regarding HIV PrEP among adolescents in Secondary Schools, Grootfontein District: Otjozondjupa Region.
- To analyze the relationship between knowledge, attitude, and practice regarding HIV PrEP among adolescents in Secondary Schools, Grootfontein District: Otjozondjupa Region.

1.5. Significance of the study

Policy makers: The findings of this study will serve as guidelines for information and help the policy makers on the strategies to increase the uptake of PrEP among adolescents, to prevent HIV/AIDs spread in Grootfontein district.

MOHSS: The study findings might strengthen the implementation of HIV PrEP programs to combat the spread of HIV and AIDS among adolescents in Grootfontein district.

MoEAC: The study findings might strengthen health education curricula by incorporating comprehensive sexual health education, including information on PrEP, HIV PrEP prevention, and sexual health.

Setting: The study implanted knowledge in the respondents regarding HIV PrEP.

Researcher: The study served as self-awareness and contributed to the body of knowledge as it provided data on knowledge, attitude, and practice of PrEP among adolescents in Grootfontein district.

1.6. Operational definition

Knowledge

Knowledge is the information, understanding or skills gained by an individual through education or experience (14). In this study, knowledge was the information and understanding held or gained by the adolescent learners at the secondary schools in Grootfontein district.

Attitude

Attitude is the way one think and feels about something (14). In this study the attitude was the way the learners thought or felt about HIV PrEP medication.

Practice

Practice is involved with real situation instead of ideas or theories (14). In this study, practice involved the real situation of using HIV PrEP medication.

HIV/AIDS

HIV stands for human immunodeficiency virus, which is the virus that weakens the immune system, ultimately leading to acquired immunodeficiency syndrome (AIDS) (15). HIV can infect any population, and this study referred to the exposure of HIV infection among adolescents.

Pre-exposure prophylaxis

Pre-exposure prophylaxis (PrEP) is the use of antiretroviral drugs before HIV exposure by people who are not infected with HIV in order to prevent or block the acquisition of HIV (11). PrEP in this study meant the TDF/FTC (300mg/200mg) one tablet taken once a day or TDF/3TC (300mg/300mg) one tablet taken once a day to prevent HIV infection as approved in Namibia.

Adolescents

Adolescents are the young people in the age group of 10-19 years (16). In this study adolescents meant the young people of the age group 10-19 years schooling at any secondary schools in the Grootfontein district.

Secondary schools

Secondary schools are schools with grade 8-12 (17). Secondary schools in this study referred to those schools with grade 8-12 within the Grootfontein district.

1.7.Outline of chapters

The chapters of this study were outlined as follows:

Chapter one of this study presented the introduction and background of the study. In this chapter, the problem statement, aims and objectives, and significance of the study were outlined. The chapter concluded with the operational definitions of the terms derived from the title of the study.

Chapter two discussed the literature reviewed by the researcher concerning the knowledge, attitude and practice of adolescents regarding HIV PrEP.

Chapter three provided the methodology of the study. In this chapter, research design, population, sampling and sample size, reliability and validity, and data analysis were discussed. The chapter concluded with the ethical principles that guided and applied in this study.

Chapter four presented the findings of the study in the graphs and tables forms. The descriptions statistics are also followed.

Chapter five discussed the findings of the study. The findings were discussed as presented in chapter four. Chapter six was the last chapter of the study which provided the conclusion based on the objectives of the study – whether they were met or not, limitation and recommendations based on the findings of the study.

1.8. Summary

This chapter was the first chapter of the study. The chapter introduced the study and provided the background, the problem statement, purpose of the study, research

objectives, significance of the study and definition of concepts. Furthermore, the chapter outlined the problem statement, aim, objective and significance of the study. The study concluded with the operational definitions and outlined the chapters of the study. The following chapter presents the literature review based on the title and objectives of the study.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1. Introduction

The previous chapter covered the background, the problem statement, purpose of the study, research objectives, significance of the study and definition of concepts. Meanwhile, this chapter reviewed literature by other researchers in relation to the knowledge, attitude and practice regarding HIV PrEP. Literature review is a process of reading, analyzing, evaluating and summarizing scholarly materials about a specific topic (27). While other authors have defined literature review as the process of reading and analyzing written articles or books that have shared facts about the research topic (18). This study searched on books, articles and journals related to the title of the study. The researcher searched academic websites; the key words derived from the title of the study. The researcher also used all the supporting and contrasting information to this study. The literature in this chapter was based on the following themes: an overview of HIV PrEP among adolescents, knowledge of HIV PrEP, attitude regarding HIV PrEP among adolescents as well as practice of HIV PrEP among adolescents.

2.2. Overview of HIV PrEP among adolescents

Pre-exposure prophylaxis of HIV infection is the use of antiretroviral (ARV) drugs by people who do not have HIV infection to prevent the acquisition of HIV (2). Pre-exposure prophylaxis (PrEP) is highly effective in preventing new Human Immunodeficiency Virus (HIV) infections and is recommended by the World Health Organization (WHO) as a key prevention strategy (19). The HIV PrEP regime is TDF 300 mg + FTC 200 mg that is

taken once a day which is given to any individual who is tested negative and is at risk of HIV infection (2). When an individual is exposed to HIV through sex, injection for drug use or any other way, these medicines can help to keep the virus from establishing a permanent infection. PrEP reduces the risk of getting HIV from sex by about 99%, while HIV from injection drug use by at least 74% (20). HIV PrEP has become a powerful tool in global efforts to reduce new HIV infections, particularly among all human races.

HIV PrEP is one of the most recommended extensive HIV PrEP prevention strategies by WHO (4). Since adolescents are the key demographic in the fight against HIV infections, especially in sub-Saharan Africa, HIV PrEP offers the best protection against the spread of the virus in this age group (21). Due to the adolescent's promiscuity they tended to early initiate sexual activity as its one of the highly risk factors, among others such as limited access to healthcare services and increased vulnerability to peer pressure, which may lead to unsafe behaviors such as unprotected sex or drug use (22). In this regard, HIV PrEP provides a comprehensive protection for adolescents who finds it difficult to consistently use condoms nor abstain from sex.

For HIV PrEP to be effective, intake of a daily dosage is very essential, if the dose is not taken as prescribed it lowers the effectiveness of HIV PrEP and the individual runs a risk of HIV contractions even though they keep on taking the drug (23). Therefore, in addition to educating adolescents about HIV PrEP, it is important to alert adolescents about the importance of daily intake of HIV PrEP. Furthermore, the effectiveness of PrEP among adolescents is recommended to be used parallel with the use of condoms as a comprehensive preventative measure, to provide dual protection against HIV and other sexually transmitted infections (STIs) (9).

Even though PrEP is regarded effective among adolescents, there are several challenges faced by adolescents regarding PrEP uptake. Adolescents are faced by the problem of lack of awareness regarding PrEP, stigma, or misconceptions about the medication (24). Moreover, adherence to taking a dose of a daily tablet can be challenging for a young person, especially those who do not fully understand the importance of HIV PrEP and its daily use (25,26). In the same vein there are still challenges with lack of healthcare support and fear of disclosure can also affect the adolescent from accessing this drug or medication and to adhere to it (26). To eliminate these challenges, there is a need to strengthen awareness and education campaigns in schools and the community at large by making sure that accurate information about HIV PrEP, its benefits, and the importance of adherence is addressed in detail and will empower adolescents to take control of their sexual lifestyle (27). Additionally, making HIV PrEP freely accessible in adolescent-friendly corners in each healthcare facility, where young people can receive confidential, nonjudgmental care, is very crucial to increasing the uptake among adolescents (28). On the other hand, Integrating HIV PrEP into other HIV prevention programs such as counseling, condom distribution, and sexual health education in school health will ensure that adolescents receive inclusive care that equips them with proper tools to protect themselves from HIV (21). Henceforth, it's an indispensable element of the global HIV Prevention strategy, HIV PrEP could significantly reduce the rate of HIV new infections among adolescents by 2030.

2.3. Knowledge of HIV PrEP among adolescents

HIV Pre-exposure prophylaxis (PrEP) is an HIV prevention strategy where individuals who do not have HIV, take a daily medication to reduce their risk of infection (2). Despite

HIV PrEP being the center of attention globally, knowledge on HIV PrEP and its usage remains low across the globe. Researchers have different findings regarding knowledge of adolescents on HIV PrEP (29–31). Moreover, a study done in the U.S found that 70% young men have heard of HIV PrEP but were not sure where to get it nor how it worked (3). This indicates that even in well developed countries where HIV PrEP is redly available, much still needs to be done regarding adolescents' knowledge (3). Meanwhile a study done in south Africa found that there was only 49% awareness of HIV PrEP among the youth, and this played a major role on them not to use it as they lacked knowledge (3).

A study done in Rundu, Namibia among adolescents revealed 45% of them had awareness and knowledge regarding HIV PrEP (12). In contrast, a significant low level of knowledge was noted among adolescents, where 54.5% of respondents have never come across the word HIV PrEP (32). A similar study also revealed that a reasonably large proportion of those who have heard of PrEP did not know that an individual need to be tested for HIV before HIV PrEP is prescribed. The low level of knowledge on these adolescents may be attributed to the fact that very few information campaigns have been conducted by the Ministry of Health and Social Services and other health-related stakeholders in Namibia to inform the public about the PrEP strategy (33). In summary, while some progress has been made in raising awareness of PrEP among adolescents, much remains to be done. A concerted global effort is needed to close the knowledge gap and ensure that adolescents, particularly those in at-risk populations, are well-informed about PrEP as an HIV Prevention option.

2.4. Attitude of HIV PrEP among adolescents

The literature review identified that adolescents has different attitudes towards HIV PrEP. Some adolescents are found to possess adequate knowledge regarding PrEP, however, the attitude towards it is negative (9). In a study done in Ethiopia, found about 85.5% of the respondents who had knowledge regarding PrEP had a negative attitude towards it (8). While a study done at Nevada university in Las Vegas among adolescents aged 18-24 years found many adolescents not willing to use HIV PrEP (34). This study revealed that, about 50.1% of them had knowledge with only 44.1 % who were willing to take HIV PrEP (34). Another researcher also found the adolescents in Asian to be unwilling to use HIV PrEP, citing lack of confidence in the efficacy of HIV PrEP, fear of side effect, adherence requirements, stigma and cost (35).

Another study conducted in South Africa revealed that 51.0% of the youth expressed unwillingness to use HIV PrEP, with reasons of being concerned with the side effects of the medication as well as other factors such as stigma (36). Despite the studies revealing high level of unwillingness to use PrEP among adolescents, one study unveiled that the high level of willingness to use HIV PrEP is noted after adolescents are made aware of it (12). However, a study done in Namibia indicated more than 80% willing to use HIV PrEP after being made aware of its efficiency – which shows a sign of positive attitudes among adolescents in Namibia (12).

2.5. Practices of HIV PrEP among adolescents

Study show that while HIV PrEP uptake is increasing in countries with established healthcare systems such as the United States, Australia, and parts of Europe it remains a challenge for Sub- Sahara Africa (37). There has been a positive use of other HIV

Preventative methods those that are known to adolescents such as condoms and avoiding sex with commercial sex workers (8). Despite the growing recognition of HIV PrEP as an effective HIV Prevention method, its use among adolescents remains limited in most countries in Africa due to a variety of factors (37). A systematic review showed that HIV PrEP uptake among adolescents, even in high-risk groups, was relatively low, primarily due to barriers related to access, knowledge, and stigma (38).

However, there is an observed low uptake of PrEP among adolescents due their low level of knowledge, awareness and other factors and for those who are aware have no idea where to access HIV PrEP (30). A study done in the United States, showed that one of the factors prevent adolescents from accessing or using HIV PrEP is the parental consent law in the uptake (39).

Other factors to practice are stigma around HIV, sexuality, and HIV PrEP use also poses a significant barrier to PrEP uptake among adolescents. The same study also found that fear of being stigmatized by peers or healthcare providers often discourages adolescents from seeking out HIV PrEP (39). Additionally, there are also concerns regarding confidentiality, particularly in cases where parental consent is required, which further contributes to the reduction in the likelihood of using HIV PrEP.

2.6. Theoretical framework

Theoretical framework or model entails a systematic abstraction of reality that serves some purpose, whereby, systematic implies a specific organizational pattern; abstraction means representation of reality and include description, explanations, prediction of phenomena and control of reality (41). Descriptions of theories or models are crucial in providing a conceptual framework for this study research problem, objectives, and study

design (41). This study was guided by the Health Belief Model which is discussed below based on its meaning and application to this study.

2.6.1. Health Belief Model

The Health Belief Model was developed by American psychologists in 1950s with the aim of enhancing the effectiveness of health programs (42). This model is incorporated into interventions to increase knowledge of health challenges, enhance perceptions of personal risk, encourage actions to reduce or eliminate the risks (43). This model entails encouraging people to seek necessary care by understanding and motivating their behaviour towards that care (44). The Health Belief Model guided this study in promoting HIV PrEP program among the adolescents with the aim of reducing the risk of spreading HIV among the high-risk groups. The model assisted in aligning the questionnaire items and data analysis with key constructs of the HBM. This alignment allowed for a structured analysis of how knowledge, attitudes, and practices are shaped by health beliefs, ultimately informing strategies to strengthen school-based HIV prevention efforts.

2.7 Summary

The foundation of these study was established through a comprehensive review of the background, problem statement, and objectives related to the knowledge, attitude and practice regarding pre-exposure prophylaxis (PrEP) among adolescents in secondary schools, Grootfontein district: Otjozondjupa Region. The importance of understanding and addressing the gaps in PrEP awareness and usage in this demographic has been highlighted as a critical step in mitigating the global HIV epidemic, especially among at-risk adolescents. The next chapter dwelled deeper on the various methods that were used to collect as well as to analyze data, it also presented the population of the study as well

as the sample and how it was derived. Lastly, how reliability and validity was ensured and the ethical principles that the researcher used to guide the study.

CHAPTER THREE

RESEARCH METHODS

3.1. Introduction

The previous chapter presented the literature reviews on knowledge, attitude and practice regarding HIV PrEP among Adolescents. This chapter discusses the various methods that were used to collect as well as analyze data. Additionally, this chapter presents the population of the study as well as the sample and how it was derived. Lastly, it presents how reliability and validity was ensured and the ethical principles that the researcher used to guide the study.

Research design is a plan or blueprint on how the researcher intends to conduct the research (41). This study employed a cross -sectional, analytical research design utilising a quantitative research approach.

3.2.1. Quantitative research approach

Quantitative research approach emphasizes objective measurements, and the numerical analysis of data collected through questionnaires or by manipulating pre-existing statistical data using computational techniques (18). Quantitative research approach was used because of its suitability in determining the knowledge, attitude, and practice of the respondents (45). On the other hand, it helps in obtaining statistical findings that may increase chances of generalisability of the findings (46). Quantitative research approach was used to determine the numeric descriptions of the knowledge, attitude, and practice of adolescents in Grootfontein district at a specific period without making any inferences or offer any causes of their level of knowledge, attitude, and practice.

3.2.2. Analytical Cross – sectional research design

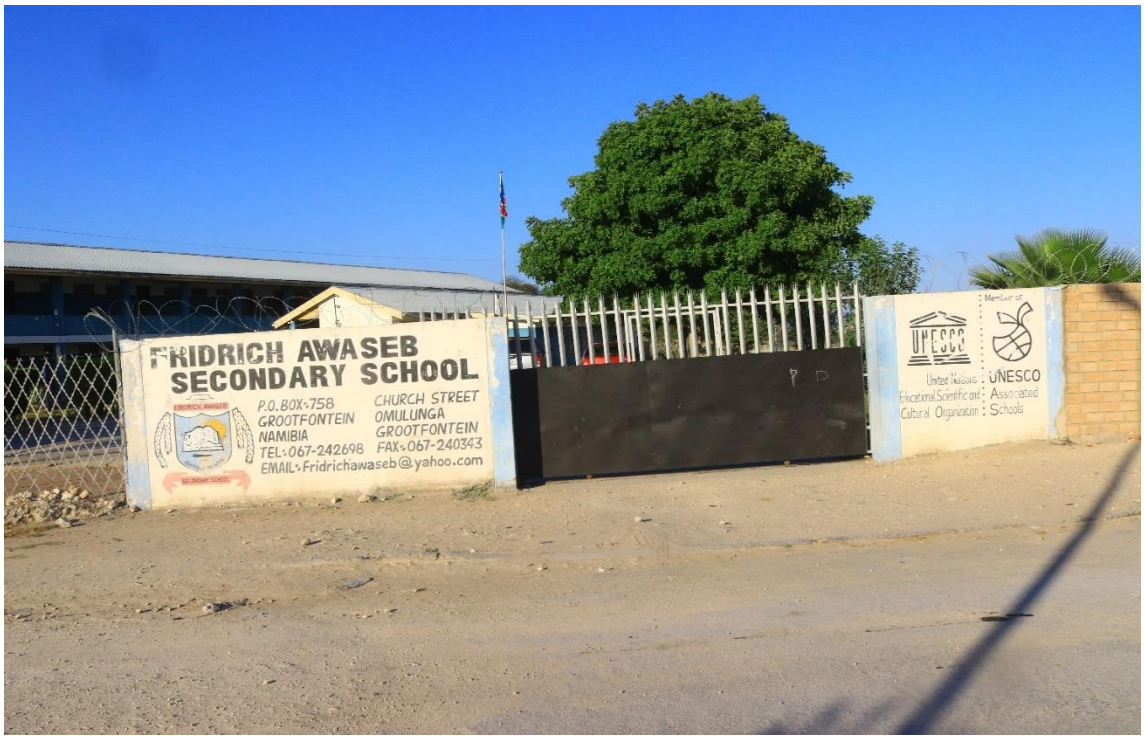
This design is the most used design which seek to gather data from different respondents at the same time or over a relatively short period of time (41). In this study analytical cross-sectional design was used by means of handing out questionnaires to the adolescents in each selected secondary Schools in Grootfontein district, to comprehensively assess and determine the level of knowledge, attitude, and practice regarding HIV PrEP. The researcher further applied analytical skills to compare and analyse the relationship between knowledge, attitude, and practice regarding HIV PrEP among adolescents in Secondary Schools, Grootfontein District: Otjozondjupa Region, with respect to their gender, age, current Grade, and religious background. Therefore, this design played a crucial role in analysing the relationships among independent and dependent variables, as well as the interrelationships among dependent variables - knowledge, attitude and practice.

3.2. Population

A population is a group of elements about which you might later make claims or a larger group of objects from where you will choose the sample size (41). The population for this study was adolescents from the three secondary schools in Grootfontein district, Otjozondjupa region.The three selected schools were chosen based on their heightened exposure to HIV risk factors and access to information regarding HIV PrEP. Otjiwanda Secondary School had a total number of learners of 822, while Friedricks Awaseb Secondary School had a total number of 680 and Grootfontein High School had a total number of 807 learners. Therefore, the total populations of this study were 2309 adolescents at all the three secondary schools in Grootfontein.

3.3.Study setting

A study setting is defined as the specific environment or context within which a study is conducted, including physical, social, and organizational factors that may influence the study's implementation and findings (18). The setting of this study was the three secondary schools located within Grootfontein town in Grootfontein district, Otjozondjupa Region. Otjiwanda secondary school was comprised of 822 learners with grade 8-12, located in the town centre while Friedricks Awaseb secondary school had 680 with grade 8-11 located in the suburbs of Grootfontein town and Grootfontein High School had 807 learners with grade 8-12 located in town.



On the other hand, Grootfontein is a town situated 542 KM from the capital city Windhoek with a total population of 36951 (47). It is one of the three towns in the Otavi Triangle, North-East of Otjiwarongo on the B8 Trans Caprivi National Road. Grootfontein is a vibrant town nestled in the heart of Otjozondjupa Region, known for its agricultural significance and the biggest military base. The town serves as a hub for surrounding farms, offering essential services and educational opportunities including Secondary Schools that cater to a diverse adolescent population. Grootfontein has several leisure and entertainment centers such as parks, bars and clubs accessible to adolescents from the age of 18 and above. However, the town only has one state clinic and one state Hospital.

3.4. Sample and sampling method

Sampling is the process by which you select several individual cases from a larger population (48). This study used the judgmental sampling method of non-probability sampling, to select the three secondary schools in Grootfontein town within Grootfontein district. The three chosen schools were selected due to their exposure to high-risk factors and the availability of HIV PrEP information. The study also used the stratified random sampling of the probability random sampling to select the adolescents from selected schools to participate in the study. Stratified random sampling is a method of sampling in which the population is divided into subgroups or strata based on certain characteristics that are important to the study (41,49). Within each stratum, individuals were randomly selected to ensure representation from each subgroup in the final sample (50). With,

stratified random sampling the researcher divided the population in strata – every school was regarded as a stratum. Then with each stratum (secondary school), the researcher further divided the population of each school into smaller stratum (Grades) which was 5 stratums, which comprised of Grade 8- 12, than random sampling was applied to select the respondents.

Sample size is the number of adolescents who were elected to participate in the study (48). The Yamane formula was used to calculate the sample size at 95% confidence level with 0.05% precision. n= $N/(1+Ne^2)$, n= sample, N= population size, e=level of precision.

n= $N1+N(e)^2$

n= 2309/ (1+2309(0.005))

n= 341

Therefore, the sample size of the study was 341 learners from the three selected secondary schools in Grootfontein district. To calculate the sample size per stratum, the researcher used the following formula: $\frac{Size\ of\ the\ sample}{Size\ of\ population}$. $\frac{341}{2309}$ = 0.14768. The answer from the stratified formula was multiplied by the population of each stratum to determine the number of respondents from each school. Otjiwanda secondary school had 822 learners, therefore, 822 X 0.14768= 121 learners, while Friedricks Awaseb secondary had 680 learners, 680 X 0.14768 = 101 learners and Grootfontein high school had 807 learners, 807 X 0.14768 = 119 learners. With their age groups ranging from 14-19 years of age. Therefore, the researcher employed 121 respondents from Otjiwanda secondary school, 101 respondents from Friedricks Awaseb Secondary School and 119 respondents from

Grootfontein high school based on the stratified formula and the researcher obtained a fair sample size representation from all the three selected schools.

3.5. Data collection

Data collection is the most crucial part of every study which refers to the systematic process of gathering and measuring information on variables of interest in a consistent, structured, and objective manner (51). During this process, the researcher explained how empirical data was collected to answer research objectives and evaluate outcomes (52). The quality and reliability of collected data significantly influenced the validity and credibility of research findings and conclusions (53). Data collections were discussed based on the research instrument, the pilot study and the data collection procedure.

A fishbowl technique was employed to get a sample required from each class. Small papers were written number one while the other small papers were written number two, folded into smaller pieces and put in a small bowl. Learners were briefed on the purpose of the research, objectives and the ethical considerations before they were asked to pick one small paper each. The bowl was shaken to mix the numbers and learners were asked to pick one paper each. Every learner who picked number one was employed into the study while all who picked number two were excluded from the study, the process was repeated at each school.

3.6.1. Research instrument

A research instrument is a tool or device used to collect data systematically for research purposes (54). It includes a wide range of methods and materials designed to measure variables and gather information in a reliable manner (50,55). This study employed a questionnaire to measure variables and gather information. A questionnaire is a research instrument consisting of a series of questions and prompts designed to gather information from respondents (48). The questionnaires comprised of four sections, section A with demographic data, section B assessing the level of knowledge, Section C, determining the attitude and Section D the extend of practice regarding HIV PrEP among adolescents at secondary schools in Grootfontein districts, Otjozondjupa region. The questions were closed ended questions with Likert scales, yes or no and multiple-choice questions. The questionnaires were filled in within 15 minutes of the learner's time. The researcher administered the questionnaires and was available at all time to clarify and answer questions, because some of respondents were minor and with lower level of education. All questionnaires were formulated in English language which is the official language in Namibia and being used in secondary schools as a mode of learning.

3.6.2 Pilot study

A pilot study is defined as a small-scale preliminary investigation which is conducted before a full-scale research project (56). Its primary purpose was to evaluate the feasibility of the main study, refine research methodologies, identified potential issues or challenges, and made necessary adjustments to improve the quality and efficiency of the main study (18,50). The researcher conducted a pilot study on 1 October 2024. The pilot study was done on 34 learners who were available during break time at Friedricks Awaseb

Secondary School. There was a total of 68 learners, A fishbowl technique was employed to get a sample of 10% from the sample size of 341 total study sample, which was 34 learners. 34 small papers were written number one while the other 34 small papers were written number two, folded into smaller pieces and put in a small bowl. Learners were briefed on the purpose of the research, objectives and the ethical considerations before they were asked to pick one small paper each. Learners who participated in pilot study were not selected to participate in the data collection of the main findings.

The bowl was shaken to mix the numbers and learners were asked to pick one paper each. Every learner who picked number one was employed into the pilot study while all who picked number two were excluded from the study. The respondents were then given the consent to sign, and they were informed to withdraw from the study at any given point in time, if they felt uncomfortable. The feasibility of the data collection instrument used in the main study was evaluated to identify potential issues or challenges that could have been encountered during data collection in the main study and to make necessary adjustments to improve the quality and efficiency of the main study. Respondents took 15 minutes to answer the questionnaires and returned it back. All 34 questionnaires were returned but one of the questionnaires was returned unanswered.

Data were entered into excel sheet than copied into SPSS, the Cronbach's Alpha test was done for questions measured under the same underlying construct in Sections. Demographic data represented 69.7% female and 30.3% male respondents from the sample who participated in the study. The mean age of respondents was 18.52 years with a median and mode of 19 years and all respondents that participated in the study were in

grade 11 with a standard deviation of 1.064 indicating moderate to low deviation from the mean. A construct would be identified as reliable if the Alpha α is greater than 0.70, in which Section B comprised of questions with the purpose of assessing the respondent's level of Knowledge regarding HIV PrEP-Exposure Prophylaxis, which scored Cronbach Alpha of $\alpha = 0.530$, that suggested poor internal consistency among the items and the items within the section were reviewed and scales were adjusted. While Section C comprised of questions with the purpose of determining the respondent's attitude regarding HIV PrEP-Exposure Prophylaxis, Cronbach's alpha of $\alpha = 0.582$ was found suggesting poor internal consistency among the items and items within the section were reviewed and scales were adjusted. Section D was found to be reliable and left unchanged.

3.6.3 Data collection Procedure

Before data collection, the researcher obtained the ethical clearance certificate from the University of Namibia, Departmental Ethical Committee (DEC). Furthermore, the researcher also obtained permission from the executive directors of the Ministry of Health and Social Services (MoHSS) and the Ministry of Education, Arts and Culture (MoEAC). The researcher also sought permission from the school managements, respondents above the age of 18 and from the respondents below the age of 18 years. Each of the three schools appointed a focal teacher who is a member of the school board to sign the consent forms for the learners under the age of 18, as the study was regarded as low risk.

Data was collected by the researcher from the three selected schools, namely: Otjiwanda Secondary, Friedrick Awaseb Secondary School and Grootfontein Secondary School. The researcher collected data on knowledge, attitude and practice regarding HIV PrEP among adolescents in secondary schools, Grootfontein district: Otjozondjupa Region.

The researcher visited the schools two days before the data collection date to familiarise with the settings and to randomly select the respondents by using fishbowl technique. Friedrick Secondary School was visited on the 30th September 2024 & 1st October 2024, Otjiwanda Secondary School was visited on 2nd October 2024 & 3rd October 2024, while Grootfontein Secondary School was visited on 4th October 2024 & 7th October 2024. After selecting the respondents in each school, the researcher handed out leaflets with information regarding the study that comprises of the title, aim, objectives, significance and researcher's contact details. Subsequently, the researcher handover consent forms to the selected respondents below the age of 18 years, to give to the focal teacher who was acting on behalf of the parents to sign.

The researcher collected data from the 8st to 11th of October 2024. The collection of data took place at each selected school, in the Hall, 30 minutes before break time. This was done with the permission of the affected period teachers. On the dates of data collection, the researcher obtained consent from all respondents including the consent forms signed by focal teachers (guardians) of respondents below the age of 18 years. The respondents who are above the age of 18 were given both consent and questionnaires at the same time. The researcher then went ahead to hand out questionnaires to the under 18 years respondents. The questionnaires took 15 minutes to be completed. The researcher was available at all times to answer questions and gave clarifications that were needed and collected the questionnaires back from the respondents the same day upon completion. The process was repeated at each of the three Schools where the researcher was collecting data. The questionnaires were kept separate from any document with respondents' names such as informed consent.

3.7 Data analysis

Data analysis entails organizing, categorizing, ordering, manipulating, and summarizing data to make sense out of them (41). The data analysis took place immediately after data collection from the 11th October 2024 to 14th October 2024. The data for this study was numeric by nature, therefore, the researcher first converted the raw data into Microsoft excel. Furthermore, the researcher organized and analysed the data using the SPSS with the help of the biostatistician. Data was analysed using SPSS version 23. Firstly, data cleaning was done and checking for missing data before analysis was carried out. Frequency descriptive statistics were done for the socio-economic demographic variables like gender, age, grade and religion of the respondents to assess the rate of respondents. Secondly, specific objectives analysis was done to assess the knowledge, attitude and practice about HIV PrEP among adolescents in secondary schools in Grootfontein using frequency tables.

Lastly, Chi-square analysis was employed to examine associations between categorical variables, specifically knowledge, attitudes, and practices regarding HIV PrEP among adolescents in secondary schools. Although some cells had low expected frequencies, Chi-square was retained due to its suitability for identifying patterns and relationships in categorical data within a cross-sectional design. To minimize the effect of low cell counts, categories were carefully grouped to ensure statistical relevance without compromising the integrity of the data. The results were interpreted with caution, acknowledging the potential limitations in generalizability and statistical power due to low frequencies in certain subgroups. Despite this, Chi-square remained the most appropriate non-parametric

test to explore associations in this data set. Then data was then presented in tables and graphs form.

3.8 Data quality

Validity and reliability are the key criteria of assessing data quality in research., Instrument validity refers to the accuracy of what the tool measures, while reliability refers to the consistency of the measurement tool over time (41). In this study the researcher ensured both validity and reliability and made sure that the data collected was of good quality.

3.8.1 Content Validity

The researcher ensured that the instrument was aligned to the Health Belief Model theoretical framework, which guided this study in promoting the HIV PrEP program among adolescents with the aim of reducing the risk of spreading HIV among the high-risk groups (35). The model assisted in aligning the questionnaire items with key constructs of the HBM andthan questionnaire was also reviewed by the supervisor who is an expert in the field to ensure it measured all relevant dimensions of the concept. The researcher also conducted a thorough literature review and identified key variables and constructions that were included in the study.

3.8.2 Statistical conclusion validity

The researcher also ensured that the relationship between variables was statistically significant and not due to chance, the researcher further used the Taro Yamane formula to

ensure that the study had adequate sample size in order for it to detect an effect on the tool and it was found to be valid.

3.8.3 Reliability

In this study, reliability was ensured by conducting a pilot study to 34 learners who met the inclusion criteria. The pilot study was crucial to identify whether the questions in the instrument were able to obtain the information required by the study. The data from the pilot study was entered into excel sheet and analysed by the use of Cronbach alpha to check for reliability and adjustments were done on the tool. Cronbach alpha was used by the researcher to demonstrate that the questionnaire was fit for purpose or reliable enough to measure what it was intended to (57). The findings of the study illustrated that the majority of the sections were understood and could collect the intended information. However, few sections indicated moderated reliability, whereby questions were reformulated till it gave a satisfactory sign of reliability.

3.9 Research ethics

Research ethics involves the application of fundamental ethical principles to research activities and research objects (49). Ethical clearance was attained from the University of Namibia decentralized ethical committee (Annexure A). The study also obtained permission from the Ministry of Health and the Ministry of education directors. The researcher further acquired permission from school principals. The study maintained and respected ethical principles at all stages of the research such as autonomy, principle of respect of person, beneficence, and justice.

3.9.1 Principle of autonomy and respect of persons

Autonomy is a philosophical ethical principle that embodied respect for persons and emphasizes the right of individual to make their own independent choices or decisions without undue influences or coercions (46). When a researcher asks for permission and respects the decision of an individual it demonstrates how the researcher values a person as an individual with complete control over their lives (57). Autonomy has limitations such as mental health, social status such as marriage and age such as minors. In terms of limitations such as by age, parents and legal guardians have the mandate to give permission (58). In this study, the researcher obtained written informed consent from the focal teacher (guardians) of the learners who were willing to participate in the study. The researcher asked first the permission from the learner, after they agreed, then sent the consent for the focal teacher to sign. In cases where the learners refused to participate, the researcher respected their decision. The researcher in any way did not try to influence learners to participate in the study out of their will.

On the other hand, the researcher respected the respondent's dignity by ensuring anonymity and confidentiality. Violating respondents' identity and sensitive information shared may damage their emotional, relational, physical, and occupational well-being. On the other hand, respondents may also be exposed to exploitation by researchers or third party for marketing after sharing their contacts (59). The researcher ensured anonymity by ensuring that the respondents did not write their names on the questionnaire and the names provided on the consent forms were not attached or matched to their responses in

any way. Confidentiality was ensured by not exposing or divulging personal information such as names and contact details to anyone else except the researcher's supervisor. Furthermore, the respondents were assured that the personal information provided was to be safely discarded (tearing the papers in small pieces or putting them on fire) after the research process is completed.

3.9.2 Principle of beneficence and non-maleficence

Beneficence is the ethical principle that emphasizes the ethical obligation of doing good to the respondents or generating benefits for the respondents(46,57,58). This study had no direct benefits such as money, incentives or awards to be won. Hence, the researcher explained to all respondents that there were no direct benefits, however, the findings of the study might help increase the level of knowledge, attitude and practice regarding HIV PrEP usage, which might as well reduce the spread of HIV in the district. In this regard the researcher took time to address all the respondents' questions after answering the questionnaires, which by far increased their level of knowledge regarding HIV PrEP.

Non-maleficence refers to the principle of avoiding harm or not to harm the respondents in any way, either physical, emotional, or psychological (60). In social science research, harm may be difficult to eliminate such as asking people to remember emotional memories, asking questions in a group that may embarrass one respondent or focus group discussion where one may feel less intelligent (59). To minimize such risks, a pilot study was conducted using the same questionnaire as in the main study. This allowed the researcher to assess whether the questions were clearly understood and free from emotionally or socially sensitive content, particularly for adolescent learners.

Furthermore, no HIV testing or investigations were conducted during the study, thereby eliminating the risk of harm from disclosing or discovering respondent's HIV status. These measures ensured that the dignity, privacy, and emotional well-being of all respondents, especially those living with HIV were safeguarded throughout the research process.

3.9.3 Principle of justice

Principles of justice is the philosophical ethical principle that requires that researchers treat respondents with fairness and equity during all stages of research (46). All learners who were willing to participate had a chance to be selected to participate in the study. Schools were divided in strata and the calculation were made based on the number of learners per school that ensured fairness in numbers of respondent per school. Furthermore, respondents were selected using a random sampling according to the number of respondents needed in each school.

3.10 Summary

In summary, this chapter outlined the research methodology for assessing knowledge, attitude, and practice regarding HIV PrEP among adolescents in Grootfontein district. The study used a quantitative, analytical cross-sectional design, gathering data from 341 students across multiple schools via structured questionnaires. A stratified random sampling approach ensured balanced representation, and data were analysed with SPSS to explore relationships between key variables. Ethical standards were rigorously maintained, with anonymity, confidentiality, and informed consent from both learners and the focal teachers. The study upheld principles of autonomy, beneficence, non-

maleficence, and justice to provide a fair and safe research environment. The following chapter presented the analysed results, illustrating key findings with descriptive statistics, tables, and graphs.

CHAPTER FOUR

RESULTS

4.1.Introduction

The previous chapter discussed the research methodology which includes research design, research methods, research population, sampling and sample size, data collection and data analysis method. This chapter presented the results of the study, how collected data were coded and analysed. Descriptive statistics was used on demographic data, socio economic status and information on knowledge regarding HIV PrEP among respondents and it than further used the analytical cross- sectional design to describe the relationships between the variables. Data was then presented in tables and graphs forms and described thereof.

4.2.Results

The results of this study were presented as how they were collected. The presentation started with the data obtained from section A regarding socio-demographic data. Consequently, other data pertaining to all objectives from section B to D and their relationships were discussed as analysed. There were 341 questionnaires from the respondents which were analysed and presented here.

4.2.1. Socio- demographic variables analysis

Socio- demographic variables identified were the gender, age, grade and religion. The findings according to these variables are presented below in different figures.

4.2.1.1.Gender

The first question entails identifying the gender of the respondents to identify the inferential regarding gender and HIV PrEP. All respondents answered this question, and their responses are presented in figure 4.2.1.1 below.

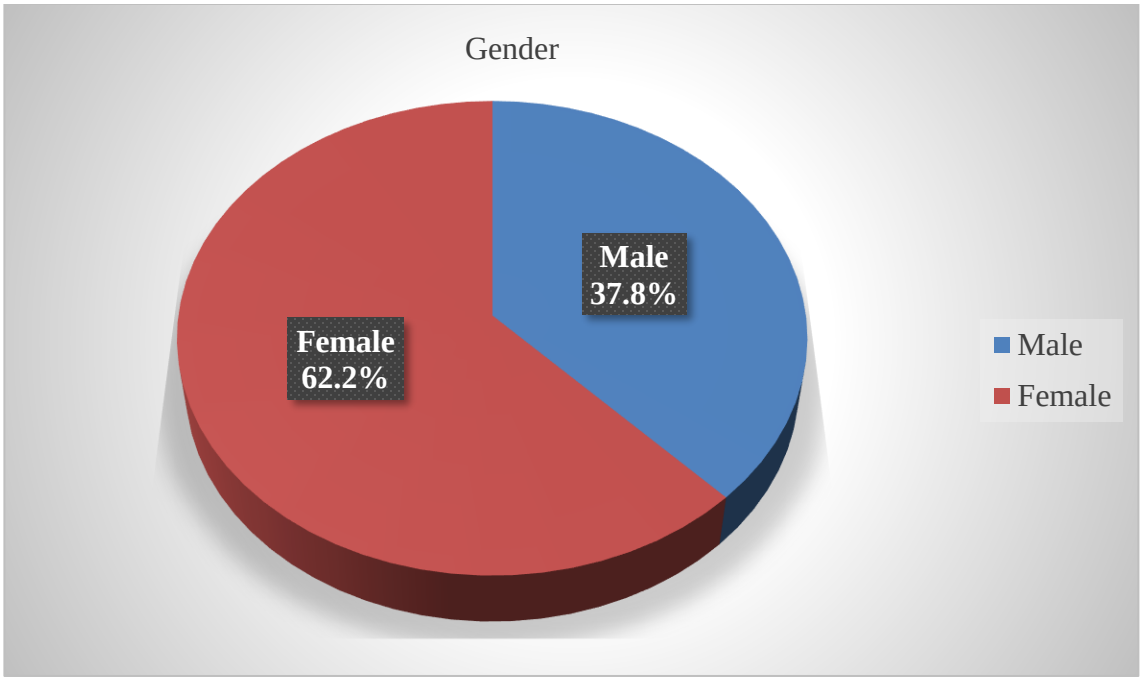


Figure 4.2.1.1. Gender of the respondents

The majority of the 341 respondents were females, totaling to 62.2% (212) while males comprises of 37.8% (129).

4.2.1.2.Age

The respondents were asked to indicate their age range. Age range was necessary to determine the category of adolescents and relationship of age to other variables. The responses of the respondents are recorded below in figure 4.2.1.2.

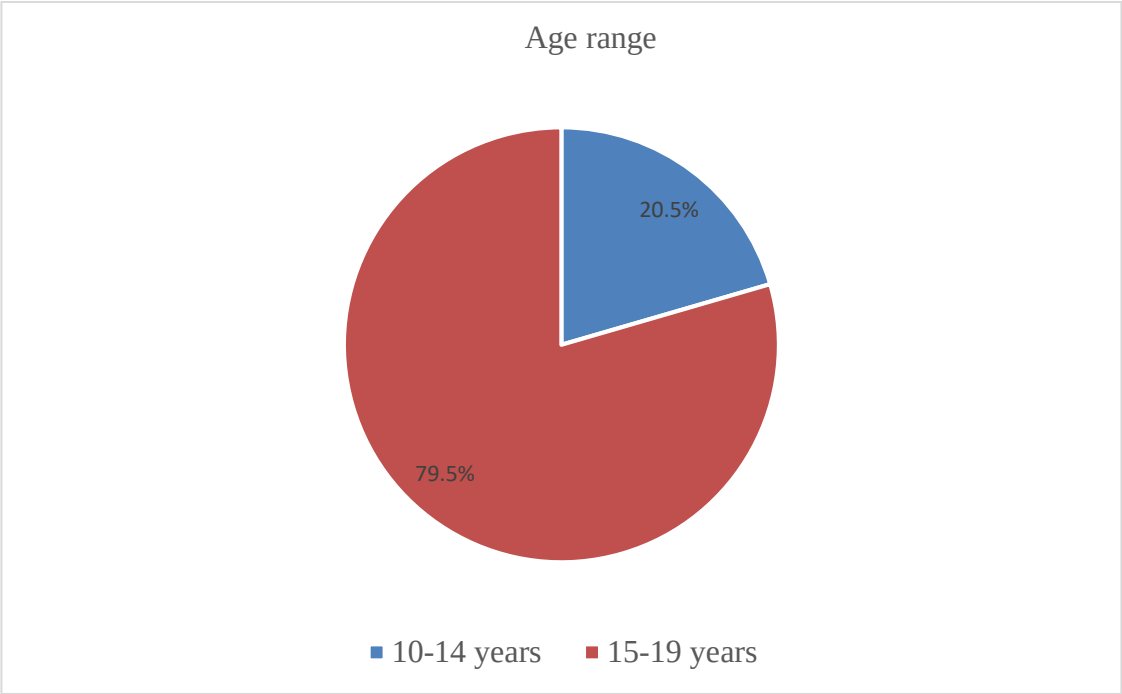


Figure 4.2.1.2. Age range of the respondents

Figure 4.2.1.2 above shows that most of the respondents were aged between 15-19 years, with a rate of 79.5% (271). Respondents aged between 10-14 years comprised of 20.5% (70).

4.2.1.3.School Grade

School grades entail identifying which grade the learners were enrolled in during the data collection of the study. The responses are analysed and presented in figure 4.2.1.3 below.

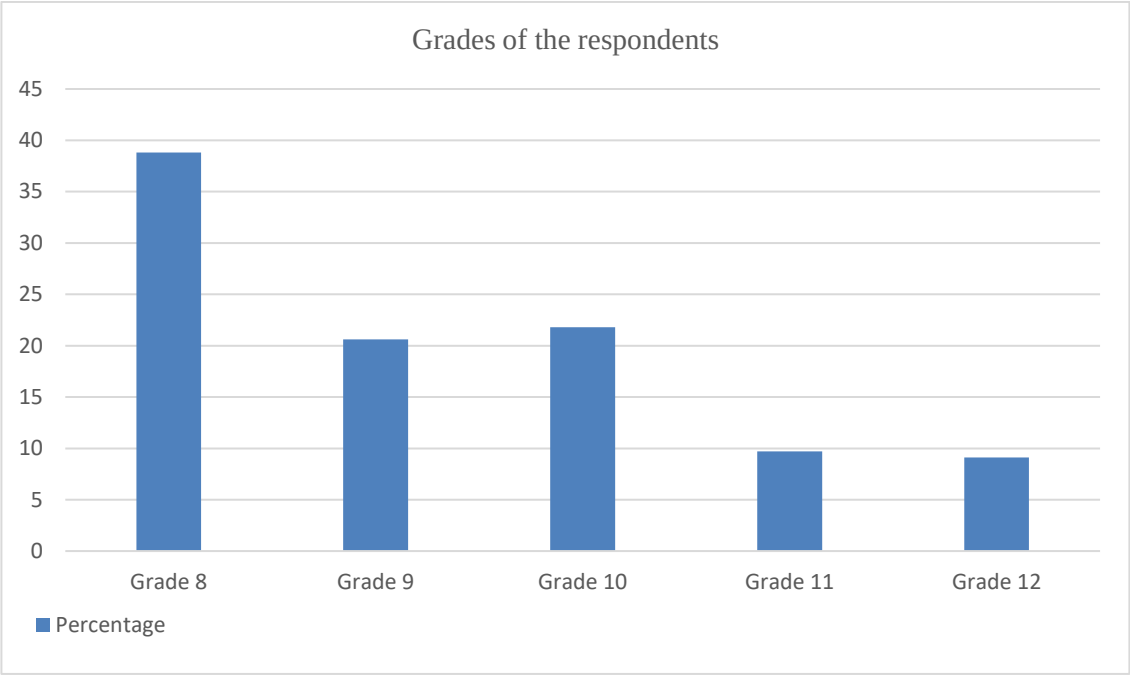


Figure 4.2.1.3. Grades of the respondents

Figure 4.2.1.3 above shows that most of the respondents were in grade 8, with 38.7% (132 respondents) followed by grade ten with 21.8% (74) and Grade 9 with 20.6% (70). The least grades to be represented were adolescents from grade 11 and 12 who scored 9.7% (33) and 9.1% (31) respectively.

4.2.1.4.Religion

Regarding religion, respondents were asked to identify their religion. Different options were asked for respondents to choose between atheist, Christian, Muslim and others. Their responses are presented and described in figure 4.2.1.4 below.

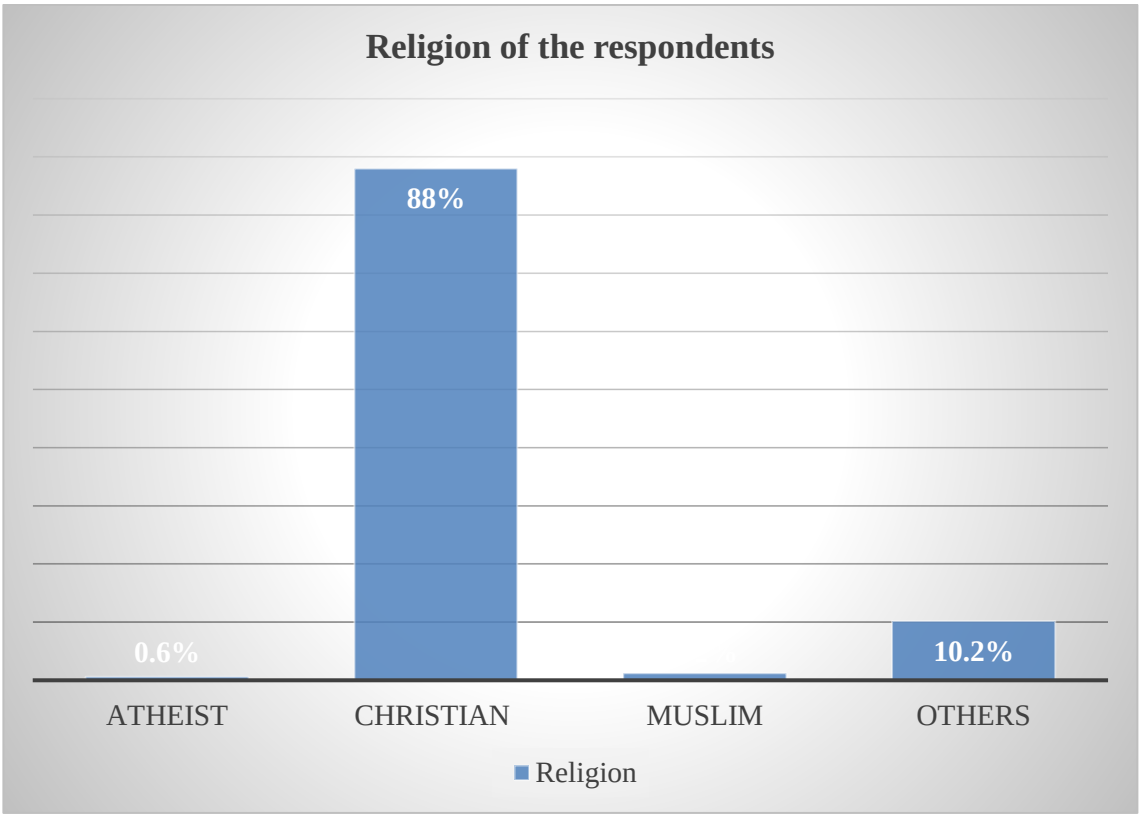


Figure 4.2.1.4. Religion of the respondents

Figure 4.2.1.4 Shows that the majority of the respondents were of the Christian religion, comprising 88% (300) respondents, followed by other religions with 10.2% (35) respondents and 1.2% (4) respondents. The least religion is Atheist with 0.6% that comprises of 2 respondents.

4.3 Level of knowledge regarding HIV PrEP among adolescents in Secondary Schools, Grootfontein District: Otjozondjupa Region.

Table 4.3.1. Level of knowledge regarding HIV PrEP among adolescents in Secondary schools, Grootfontein District: Otjozondjupa Region

Questions	Responses	Frequency	Percentages
Have you ever heard of HIV PrEP	Yes	155	45.5%
	No	186	54.5%
I can only get HIV PrEP if I am Negative	Yes	52	15.2%
	No	153	44.9%
	Not sure	136	39.9%
Is HIV PrEP an antiretroviral treatment used to prevent HIV	Yes	169	49.5%
	No	63	18.5%
	Not sure	109	32.0%
I can only use HIV PrEP if I am at risk of getting HIV. E.g multiple sexual partners, men to men sex, commercial sex workers, alcohol and drug abuse	Yes	134	39.3%
	No	99	29.0%
	Not sure	108	31.7%

The results in Table 4.3.1. shows that many of the respondents (54.5%) never heard about HIV PrEP compared to 45.5% who have heard of HIV PrEP. Few of the respondents (15.2%) knew that they can only get HIV PrEP when HIV negative, while majority 44.9% indicated that they can not only get HIV PrEP if negative and 39.9% said they are not sure

whether to get HIV PrEP only when negative or not. The results also revealed that, majority of the respondents (49.5%) knew that HIV PrEP is an antiretroviral treatment used to prevent HIV, while 18.5% of the respondents indicated that HIV PrEP is not an antiretroviral treatment used to prevent HIV and 32% were not sure whether HIV PrEP is an antiretroviral treatment used to prevent HIV or not. Lastly, the results illustrated that the majority of the research respondents (39.3%) knew that one can only use HIV PrEP when at risk of getting HIV. While 29.0% didn't know that one can only use HIV PrEP when at risk of getting HIV and 31.7% were not sure whether one can only use HIV PrEP when at risk of acquiring HIV or not.

4.4 Attitude regarding HIV PrEP among adolescents in Secondary Schools, Grootfontein District: Otjozondjupa Region.

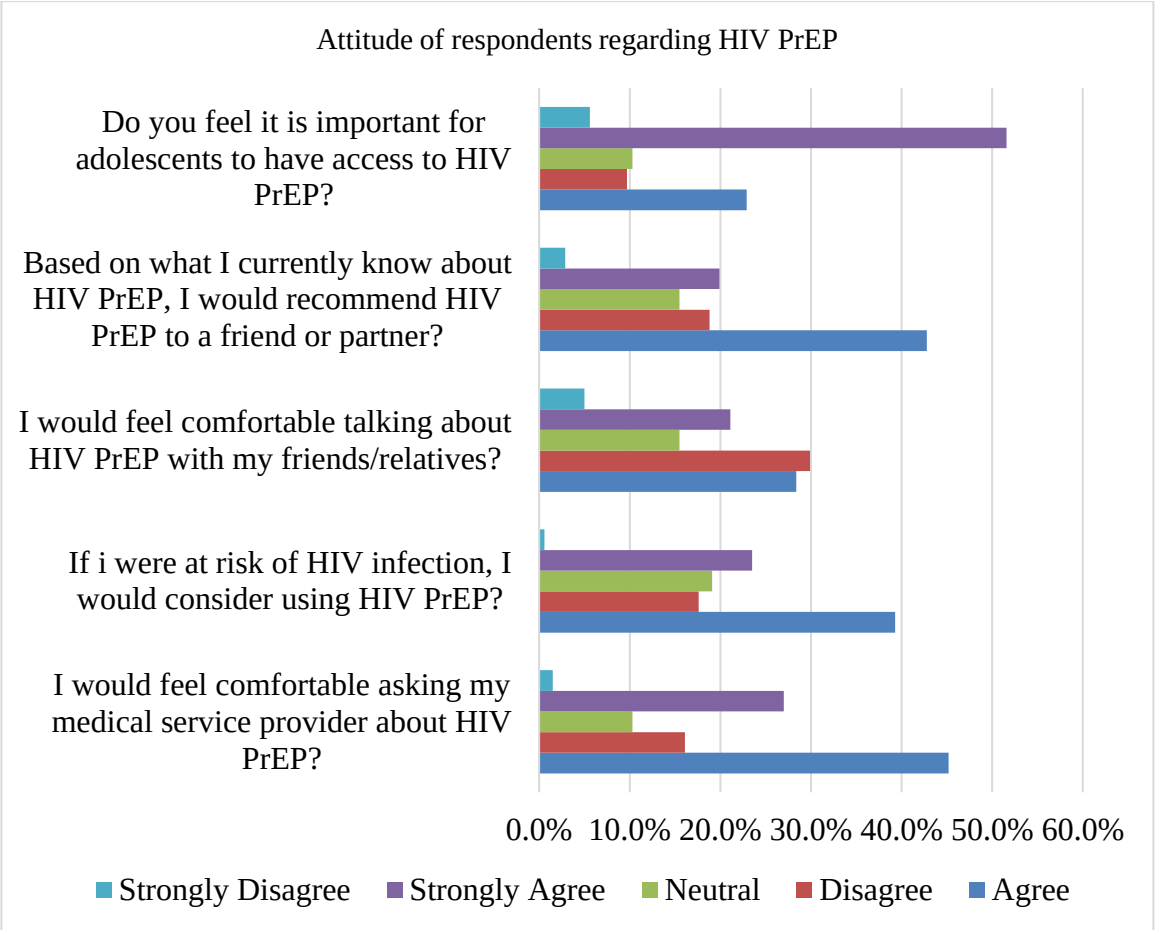


Figure 4.4.1 Attitude of respondents regarding HIV PrEP

The results in figure 4.4.1 show that the majority (45.2%) comprises of 154 respondents indicated that they would feel comfortable asking their medical service provider about HIV PrEP. 16.1% (55) of the respondents disagreed on feeling comfortable to ask their service provider about HIV PrEP, while 10.3% (35) where neutral meaning not sure whether their comfortable or not to ask about HIV PrEP from their service provider. Out of the whole number of respondents 27% (92) of them were very sure or strongly agree to

ask their service provider about HIV PrEP and only 1.5% (5) of the respondents strongly disagreed to asking their service provider about HIV PrEP.

When they were asked if they were at risk will they consider taking HIV PrEP, 39.3% (134) indicated that if they were at risk of HIV infection, they would consider using HIV PrEP, while 17.6% (60) respondents disagreed of considering to take HIV PrEP if they were at risk, 19.1% (65) were neutral or not sure whether to opt on taking HIV PrEP when at risk or not and 23.5% (80) strongly agreed on considering to take HIV PrEP when at risk, last but not least 0.6% (2) of the respondents strongly disagree on the notion of taking HIV PrEP when at risk of acquiring HIV infections. The results also showed that 28.4% (97) of the respondents indicated that they would feel comfortable talking about HIV PrEP with their friends/ relatives, while 29.9% (102) disagreed to talk about HIV PrEP with friends or relatives, 15.5% (53) respondents were not sure whether to talk about it with friends and relatives or not. 21.1% (72) of the respondents strongly agreed to talking about HIV PrEP with friends or relatives while 5% (17) strongly disagreed on the notion of discussing about HIV PrEP with friends/ relatives.

Additionally, 42.8% (146) majority of the respondents indicated that based on what they know about HIV PrEP, they would recommend HIV PrEP to a friend or partner, 18.8% (64) choose not to recommend it, 15.5% (53) respondents were neutral not sure whether to recommend HIV PrEP or not and 19.9% (68) strongly agreed on recommending HIV PrEP to their friends/ partner while 2.9% (10) of the respondents strongly disagreed on recommending it to any of their friends nor partner. Majority of the respondents (51.6%) strongly agree that they feel it is important for adolescents to have access to HIV PrEP, while 22.9% (78) just agreed with 10.3% (35) of the respondents not being sure and 9.7%

(33) disagreed of adolescents getting access to HIV PrEP, with the least of 5.6% (19) respondents strongly disagreed that they feel it is important for adolescents to have access to HIV PrEP.

4.5 Assess the extent of practice regarding HIV PrEP among adolescents in Secondary Schools, Grootfontein District: Otjozondjupa Region.

Table 4.5.1. Practice of respondents regarding HIV PrEP

Questions	Responses	Frequency	Percentages
Have you ever used HIV PrEP before?	Yes	6	1.8%
	No	335	92.2%
If yes in your response to question 1, what was the reason for taking HIV PrEP?	Do not use condom always	1	16.7%
	Do not know HIV status	4	66.7%
	Partner HIV Positive	0	0.0%
	Others	1	16.7%

The results in Table 4.5.1 shows that the majority 92.2% (335) of the respondents indicated that they had never used HIV PrEP, while only 1.8% (6) of the respondents have used HIV PrEP before. The results also show that out of those who had used HIV PrEP before, 66.7% (4) did not know their partners HIV status and 16.7% (1) did not use condom always and other reasons respectively.

4.6 Analyze the relationship between knowledge, attitude, and practice regarding HIV PrEP among adolescents in Secondary Schools, Grootfontein District: Otjozondjupa Region.

Table 4.6.1 Association between socio-demographic factors and HIV PrEP KAP

Variables	Knowledge score		P-Value	Attitude Score					P-Value
GENDER	Yes	No		Agree	Disagree	Neutral	Strongly agree	Strongly disagree	
Female	105	107	0.018	82	39	32	58	0	0.04
Male	50	79		52	21	32	22	2	
AGE	_	_	_	_	_	_	_	_	_
10-14	23	47	0.033	28	19	5	18	0	0.186
15-19	132	139		126	36	30	74	5	
GRADE	_	_	_	_	_	_	_	_	_
8	44	88	0.005	61	35	10	25	1	<0.0001
9	32	38		27	14	3	25	2	

10	38	36		40	4	5	24	1	
11	18	15		10	2	8	11	2	
12	22	9		16	0	8	7	0	
RELIGION	_	_	_	_	_	_	_	_	_
Atheist	1	1	0.045	1	0	0	1	0	0.318
Christian	141	159		127	50	49	72	2	
Muslim	1	3		1	2	0	1	0	
Others	12	23		11	8	11	5	0	

The results in Table 4.6.1 shows the relationship between gender, age, grade, and religion with adolescents' knowledge, attitude, and practice regarding HIV PrEP among adolescents in secondary schools, Grootfontein district: Otjozondjupa region.

Knowledge and gender scores:

Females showed higher knowledge levels than males, with 105 females and 50 males scoring "Yes." This difference was statistically significant with a p- value of ($p = 0.018$). Moreover, the relationship between knowledge and age, among adolescents aged 15-19 had higher knowledge scores than those aged 10-14, with a statistically significant difference with a p- value of ($p = 0.033$). Meanwhile on knowledge and grade, Knowledge

scores varied by grade, with learners in higher grades generally displaying greater knowledge and the difference across grades was statistically significant with the p- value of ($p = 0.005$). The result also showed the relationship between knowledge and religion, Christian learners had a slightly higher knowledge score than students from other religions, with a significant p-value of ($p= 0.045$).

Attitude Scores:

Females demonstrated a more positive attitude, with a notable number agreeing or strongly agreeing with positive statements about HIV PrEP with the p- value of ($p = 0.04$). In addition, the relationship between attitude and age showed some variance, with older learners (15-19) generally having more favorable attitudes, this was not statistically significant with a p- value of ($p = 0.186$). Furthermore, a significance was noted across grades with grade 8 learners showing more diverse attitudes with a p- value of ($p < 0.0001$). It's equally- important that no statistically significance was noted between attitude and religion, even though attitudes varied across religious groups ($p = 0.318$).

Practice Scores:

On practice and gender, both males and females had low practice scores, with no significant difference between them with a p- value of ($p = 0.815$). Equivalent relationship was noted between practice and age, there was no statistically significant difference in practice scores across ages with the p- value of ($p = 0.656$). The same as practice and grade with no significances with the p- value of ($p = 0.776$). Lastly, no significant effect was noted between practice and religion which scored ($p = 0.348$).

Table 4.6.2 Relationship between Knowledge and Attitude regarding HIV PrEP

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	67.330[a]	14	.000
Likelihood Ratio	35.437	14	.001
N of Valid Cases	341		
a. 16 cells (66.7%) have expected count less than 5. The minimum expected count is .01.			

Table 4.6.2 above showed Chi-Square tests that indicated a significant association between the variables, that's knowledge and attitude regarding HIV PrEP.

Pearson Chi-Square Value (67.330, df = 14, p = .000): This test evaluated if there was a statistically significant relationship between categorical variables. A p-value of .000 indicated a highly significant association at a 95% confidence level, meaning there was less than a 0.1% probability that this result is due to chance.

Likelihood Ratio (35.437, df = 14, p = .001): Similar to the Pearson Chi-Square, the likelihood ratio tested for association. With a p-value of .001, this also showed a statistically significant association between variables.

Expected Counts: It is noted that 66.7% of cells (16 out of 24) had an expected count less than 5, with a minimum expected count of .01. This suggested that some cells had low expected frequencies, which may have impacted the reliability of the Chi-Square test

results. When expected counts are low, the Chi-Square test assumptions may not be fully met, potentially influencing the robustness of the findings.

Table 4.6.3. Relationship between Knowledge and practice regarding HIV PrEP

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	21.916[a]	6	.001
Likelihood Ratio	9.633	6	.141
N of Valid Cases	341		
a. 9 cells (75.0%) have expected count less than 5. The minimum expected count is .03.			

Table 4.6.3 above showed results for Chi-Square tests, examining the association between categorical variables in a study that is knowledge and practice regarding HIV PrEP.

Pearson Chi-Square (Value = 21.916, df = 6, p = .001): The Pearson Chi-Square test indicated a significant association between the variables ($p < .05$), suggested that the relationship observed is unlikely to be due to random chance. The low p-value (.001) meant there is strong evidence of a statistically significant relationship at the 95% confidence level.

Likelihood Ratio (Value = 9.633, df = 6, p = .141): The Likelihood Ratio test, which is also used to evaluate association, showed a p-value of .141. This result was not statistically significant ($p > .05$), meaning it did not show the same level of association between variables as the Pearson Chi-Square.

Expected Counts: The table indicated that 75% of the cells (9 out of 12) have an expected count less than 5, with a minimum expected count of .03. Such low expected counts can affect the reliability of Chi-Square results, as this test assumed that most expected counts should have been 5 or more for robust findings.

Table 4.6.4. Relationship between Attitude and Practice of HIV PrEP

Chi-Square Tests			
	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	29.855[a]	12	.003
Likelihood Ratio	15.120	12	.235
N of Valid Cases	341		
a. 17 cells (81.0%) have expected count less than 5. The minimum expected count is .01.			

The table above showed the results from Chi-Square tests that evaluated associations between categorical variables in a study sample of 341 cases.

Pearson Chi-Square (Value = 29.855, df = 12, p = .003): This test revealed a statistically significant association (p = .003), that indicated a meaningful relationship between the variables at the 95% confidence level. The low p-value (< 0.05) suggested that the association observed is unlikely to be due to chance.

Likelihood Ratio (Value = 15.120, df = 12, p = .235): The Likelihood Ratio test, was also used to check for association, that yielded a p-value of .235. This value is not statistically significant, that suggested that this test did not indicate a strong association between the variables.

Expected Counts: The table noted that 81% of the cells (17 out of 21) had expected counts below 5, with the lowest being .01. Low expected counts can limit the robustness of the Chi-Square test, as it relied on expected values of 5 or more in most cells for more reliable results.

4.7 Summary

In conclusion, this chapter analysed the results of the study are analysed and presented it in tables and graphs. It began with a socio-demographic overview, noted that the majority of respondents were female, aged 15-19, in grade 8, and primarily Christians. Knowledge regarding HIV PrEP is moderate, with only 45.5% of respondents having heard of it. Attitudes are largely positive, with 51.6% of respondents believing adolescents should access PrEP. However, practical experience is limited, as only 1.8% reported using PrEP. The Statistical analysis revealed a significant relationship between gender, age, and knowledge levels, and a strong association between knowledge and attitudes towards PrEP. The following chapter discussed the findings by means of comparisons of the present study with those of other relevant researchers on knowledge, attitude and practice regarding HIV PrEP.

CHAPTER FIVE

DISCUSSION OF RESULTS

5.1.Introduction

The previous chapter presented the results of the entire data analysis conducted, while this chapter discussed the findings by means of comparisons of the present study with those of other relevant researchers on knowledge, attitude and practice regarding HIV PrEP. These discussions were compared to the literature published by other authors to identify if there are any similarities or differences in findings. The study sought to assess the level of knowledge, attitude and practice regarding HIV PrEP among adolescents in Secondary Schools, Grootfontein District: Otjozondjupa Region. Various level of knowledge and attitude with various elements of knowledge and attitudes on HIV PrEP were established as follow:

5.2.Discussions of results

This study aimed to assess the knowledge, attitude, and practice (KAP) regarding HIV PrEP-exposure prophylaxis (PrEP) among adolescents in secondary schools, Grootfontein District: Otjozondjupa Region. The results of this study were discussed according to different headings as data was collected and presented.

5.2.1. Socio-Demographic data

5.2.1.1.Gender

The study found that most of the respondents were female with 62.2% compared to males with 37.8%. The level of HIV PrEP knowledge was found not to be significant across the gender. This finding aligns with the study done at the university of Namibia, Rundu campus with the findings that suggested a higher female representation in studies on HIV PrEP (32). Other studies also found that females may be more responsive to HIV PrEP

prevention initiatives, particularly in adolescent demographics, as they are generally more engaged in health education programs and screenings than their male counterparts (32,62). This tendency might be due to the increased HIV vulnerability in females, as well as targeted educational campaigns in schools and communities that often emphasize HIV PrEP prevention strategies for women.

In contrast, males tend to exhibit lower engagement, as observed in the study. Another researcher reported that many young men lack awareness of PrEP or perceive less personal risk, resulting in lower participation (35). Cultural and societal factors, such as gender norms that emphasize female responsibility in sexual health, also contribute to higher female representation (39). This study findings align with the broader trend of gender disparity in HIV PrEP awareness and engagement, suggesting a need for gender-sensitive approaches to boost male participation and awareness about HIV PrEP.

This clearly suggest that a comprehensive HIV PrEP awareness school programs is necessary to increase the adolescents' knowledge on HIV PrEP and to encourage the use of HIV PrEP among all demographics at risk of HIV infections. The gender of the respondents in this study is another proof that females are in high number in schools in comparison to the male gender (61). This could be the evidenced based on the data found that many women graduate in comparison to men at local universities almost every year (61).

5.2.1.2.Age

It also merged from the study that most of the respondents were aged between 15-19 years with a rate of 79.5%, compared to those aged between 10-14 years of age with the rate of

20.5%. The level of HIV PrEP knowledge was found not to be significant across the age group either. This concurs with the study done in South Africa, that also found no significance of awareness of PrEP among the age groups. (3). The age of the respondents in this study is adequate and in correlation to the grades of the respondents. In Namibia, school going age till matriculation is expected to be from 14-24 years of age (17). On the other hand, young women are in high number in population, in comparison to men (47). On the other hand, it is also undeniable that as an African culture, many male young people are engaged in hard labour and looking after animals which leads to them not getting enough time to attend to school in comparison to the female gender (8).

5.2.1.3.Grade

The study also found data on school grades indicating a concentration of respondents in lower secondary grades, with the largest group in Grade 8 (38.7%), followed by Grade 10 with (21.8%), Grade 9 (20.6%) and the lowest respondents were grade 12 rating to 9.1%. No HIV PrEP knowledge significances were also found across the grades and no study have been found to contrast nor support these findings.

Research has shown that early adolescence, generally encompassing learners in Grades 8 through to grade 10, this stage is regarded as a formative stage for attitudes toward sexual health (66). The researcher further found that adolescents in lower grades are more receptive to information about sexual health due to increased curiosity, combined with lower exposure to sexual activity compared to older peers (66). Consequently, reaching students in this age range can be especially impactful for instilling proactive health behaviors, such as HIV PrEP awareness (66).

The lower representation of respondents in Grades 11 and 12 (9.7% and 9.1% respectively) aligns with findings from other researcher, who reported that older adolescents in higher grades often demonstrate a decline in participation in health surveys and prevention programs (66). This decrease may be attributed to various factors, including the perception of invulnerability to health risks, a reduced prioritization of school-led health programs, or engagement in outside activities. These trends underscore the importance of targeted interventions in lower secondary grades where learners may be more receptive to PrEP education, as older learners may require alternative engagement strategies to improve their awareness and participation in HIV prevention efforts.

Thus, the study's findings underscore the efficacy of focusing HIV PrEP education on younger adolescents, where engagement is higher, while recognizing the need for more tailored approaches for learners in upper grades, who are less represented but may face increasing risk of exposure to HIV.

5.2.1.4.Religious background.

It became so evidenced in the study that majority of the respondent were Christians rating at 88% compared to other religions with 10%, Muslim 1.2% and Atheist with rating of 0.6%. however, no significances have been found across the religion and no similar studies have been found to support the findings nor contrast the study findings. This demographic profile aligns with the broader religious landscape in many regions, particularly in African where Christianity tends to be the dominant religion among the human race. The lower representation of Muslim and Atheist respondents may reflect district religious demographics as these religions are hardly seen being practiced in Grootfontein.

Religious association can significantly influence adolescents' health beliefs and practices, especially regarding HIV prevention. Secondly, religious communities, particularly Christian groups, often play a crucial role in shaping moral perspectives on topics like sexual health and HIV prevention. For instance, some Christian article of faith emphasizes abstinence, which could shape adolescents' insights of preventive measures like HIV PrEP. However, some adolescents within Christian communities may have had greater hesitation toward HIV PrEP, with concerns of moral implications and a fear of stigma within their religious community.

In sum, while the strong Christian representation among respondents aligns with demographic expectations, these findings underscore the importance of culturally sensitive approaches when promoting HIV PrEP, particularly in religiously diverse settings. Integrating religious leaders and culturally appropriate messaging could enhance the acceptability and impact of HIV prevention programs across different faith communities. It is equally- important to also suggest that for HIV PrEP interventions to be broadly effective, a modified outreach strategy must be considered were the diverse religious beliefs and cultural contexts of minority groups are embraced.

5.2.2. Knowledge regarding HIV PrEP

The results indicated a significant deficiency in knowledge regarding HIV PrEP, diverse attitudes toward its application, and notably low participation in preventive measures. These findings are consistent with earlier studies conducted throughout Africa, which have identified similar trends of inadequate awareness and prevalent misconceptions surrounding HIV transmission and prevention (62). The primary aim of this research was to evaluate the level of knowledge regarding HIV PrEP-exposure prophylaxis (PrEP)

among adolescents. The findings revealed a significant deficiency in awareness, as 54.5% of respondents indicated they had never encountered the term PrEP.

This lack of knowledge is particularly concerning in light of the high-risk behaviors observed in this demographic, including unprotected sexual activities and multiple sexual partners. Similar investigations conducted in Ghana and South Africa have documented comparably low levels of awareness regarding HIV Prevention strategies among adolescents, which poses a substantial obstacle to effective HIV PrEP prevention efforts (62,63). Additionally, only 49.5% of the respondents recognized that PrEP is an antiretroviral medication designed to prevent HIV, while a notable 32% expressed uncertainty about its function. These outcomes align with research findings from Gabon and Cameroon, where many respondents exhibited misconceptions about HIV transmission and prevention methods (64). This lack of knowledge represents a major barrier to effective PrEP adoption and affirms the need for targeted educational interventions.

A significant number of adolescents are aware of conventional HIV transmission methods, including multiple sexual partners, sharing of sharp objects and mother-to-child transmission. However, there exists a concerning gap in their understanding of more intricate preventive strategies, such as pre-exposure prophylaxis (PrEP). This deficiency in knowledge within this vulnerable demographic highlights the critical necessity for focused educational initiatives that deliver precise and comprehensive information regarding PrEP (34,65).

5.2.3. Attitude regarding HIV PrEP

The second objective of this study focused on the attitude of adolescents towards pre-exposure prophylaxis (PrEP). Although the level of knowledge regarding PrEP was found to be limited, the overall attitudes were predominantly positive. However, even though the study revealed generally positive attitude toward HIV PrEP and a very notable low rates of actual usage that indicated a disparity between attitudes and behaviors. Despite the study finding that there's willingness to use HIV PrEP prevention measures, there is still external barriers preventing these attitudes from translating into action.

This study found, 45.2% of respondents reported feeling at ease when considering inquiries about PrEP with their healthcare providers. This finding is promising, indicating that with appropriate educational initiatives, adolescents may be open to integrating PrEP into their HIV prevention strategies. Comparable research conducted in South Africa and Ghana has revealed that when adolescents receive sufficient information, they are more inclined to participate in HIV preventive efforts (63,66). Not forgetting that this Programs should incorporate trusted figures, such as community leaders and healthcare workers cause their regarded as trusted sources in the community and they become instrumental in facilitating informed health decisions.

Nonetheless, it is also important to note that 28.4% of respondents indicated discomfort in discussing PrEP with friends or family, that emphases the ongoing stigma associated with sexual health discussions. This stigma represents a considerable obstacle, as documented in various studies throughout Africa, where feelings of shame and fear of judgment frequently hinder individuals from pursuing essential preventive healthcare (67). It has been reported by other researchers with analogous findings, emphasizing the

necessity for thorough educational initiatives to address these misunderstandings (66). While the understanding of PrEP was determined to be somewhat restricted, the general attitudes towards it were largely favorable. This observation is consistent with the research conducted in South Africa on high school learners regarding HIV and AIDS, which stated that attitudes were linked to a range of demographic variables (66).

This study highlights significant gaps in adolescent knowledge about HIV PrEP, matches the trends across the African continent and calling for a necessity to a focused, culturally relevant, and youth-targeted educational programs. With the right strategies in place, addressing these deficiencies can result into an improved PrEP uptake, reduce HIV transmission, and ultimately support healthier decision-making in this vulnerable age group.

5.2.4. Practice regarding HIV PrEP

The study revealed that a vast majority of adolescents in the study (92.2%) had never used HIV PrEP, with only 1.8% having ever used it. This low adoption rate aligns with findings from other studies, which report similar patterns of limited PrEP usage among adolescents across sub-Saharan Africa (65). A combination of factors contributes to this, including limited awareness, access issues due to limited health facilities as Grootfontein district only have one clinic caretering for a total population of 36951, and social stigma as well (47). The low up take could have been also impacted by the long distance to health facilities to access services.

The study revealed that 66.7% of the respondents who reported having used PrEP, the primary reason cited was uncertainty regarding their partner's HIV status. This finding

reflects a common scenario among adolescents, who may lack open communication with their partners about HIV status, making them more vulnerable to potential HIV exposure. The frequency of this reasoning aligns with other researchers, who found that adolescents reported similar concerns over unknown partner statuses as a motivation for engaging in HIV preventive behaviors (30).

In addition, 16.7% of respondents who used PrEP mentioned inconsistent condom usage as a reason, which highlights a gap in adherence to other preventive strategies. This is consistent with findings on the study done among university students in regard to their attitudes and beliefs that influenced their decision to take PrEP, where some adolescents rely on PrEP as a safety net for when other preventive measures, like condom use, are inconsistently applied (34). However, this reliance could inadvertently reduce condom use, which remains a critical element of comprehensive HIV prevention.

The study also showed that none of the respondents who used PrEP cited having an HIV-positive partner as their reason, suggesting that among these adolescents, PrEP is not yet widely regarded as a tool for serodiscordant relationships. This finding may indicate that awareness and education regarding PrEP’s role in protecting against HIV within serodiscordant relationships are under-emphasized. A Study done in South Africa highlighted that adolescents often lack knowledge about PrEP's potential benefits in cases where one partner is HIV positive (36).

Overall, the findings underscore the need for targeted health service delivery, like initiation of HIV PrEP availability at Schools. This act will reduce the walkable distance to access PrEP and reduce the stigma of being seen at the health facility access PrEP.

5.2.5. Association between the variables

The relationship between knowledge and attitude is evident in this research, indicating that individuals with a higher level of knowledge are more inclined to hold positive attitude towards PrEP. This finding implies that enhancing adolescents' comprehension of HIV PrEP prevention may foster more positive perceptions and, consequently, increase the adoption of PrEP (36).

The study examined the prevalence of HIV PrEP utilization among adolescents. The results indicated a markedly low adoption rate, with merely 1.8% of respondents acknowledging their use of PrEP. This finding aligns with similar research conducted in various African nations, where the availability of HIV Prevention resources, including PrEP, is severely restricted despite extensive awareness initiatives (36). The limited uptake observed in this study may be linked to several factors, including insufficient knowledge, societal stigma, and practical obstacles such as the accessibility (64).

Furthermore, among the small number of respondents who reported using PrEP, the majority did so due to uncertainty regarding their partner's HIV status. This highlights the critical need for comprehensive sexual education that promotes the consistent and correct application of preventive strategies, even in contexts perceived as low risk (62). Consistent with findings from studies in Gabon and Cameroon, misunderstandings surrounding HIV transmission and prevention methods can contribute to hazardous sexual practices, including inconsistent condom use and non-adherence to PrEP protocols (67,68).

A notable correlation was identified between knowledge, attitude, and practice related to PrEP in this research. Respondents who exhibited a higher level of understanding regarding PrEP were more likely to hold favorable attitudes towards its utilization and

demonstrated a greater weakness to engage in preventive behaviors ($p < 0.0001$). These results align with findings from other investigations conducted in South Africa and Ghana, which have established that knowledge serves as a fundamental catalyst for behavioral change in the context of HIV PrEP (22). Furthermore, the study affirmed that prevalent misconceptions and insufficient access to reliable information continue to impede the efficacy of HIV Prevention strategies. As highlighted in various African studies, it is essential to address these knowledge deficiencies to enhance attitudes and promote the uptake of preventive measures such as PrEP (36).

Furthermore, this study underscores the necessity of public health initiatives to improve access to PrEP for adolescents, especially those involved in high-risk activities. By enhancing knowledge, tackling cultural hindrance, and facilitating greater accessibility to PrEP, there exists a significant opportunity to lower the incidence of HIV within this at-risk age group. The strong correlation between knowledge, attitudes, and practices identified in this study resonates with findings from other areas. It highlights the vitally importance for comprehensive HIV PrEP Prevention strategies that empower adolescents to manage their sexual health effectively.

5.3.Summary

This chapter discussed the finding on knowledge, attitude, and practice related to HIV PrEP among adolescents in Grootfontein District. Findings revealed limited knowledge of PrEP, with low up take of HIV PrEP among the respondents, despite overall positive attitudes. Gender and age differences were noted, with females more likely to engage in health education, and younger adolescents displaying greater curiosity about HIV prevention. Cultural, logistical, and stigma-related barriers hindered PrEP adoption, while

many respondents cited uncertainty about partners' HIV status as a key motivator. The study emphasizes targeted, culturally-sensitive education to bridge knowledge gaps and promote PrEP uptake in at-risk groups. The last chapter addressed conclusions, limitations and recommendations based on the study objectives and study findings.

CHAPTER 6

CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

6.1.Introduction

The previous chapter presented the discussions of findings by means of comparisons of the present study with those of other relevant researchers on knowledge, attitude and practice regarding HIV PrEP. In this chapter the researcher made conclusions, limitations and recommendations based on the study objectives and study findings.

6.2.Conclusions

This study examined the knowledge, attitude and practice (KAP) regarding HIV PrEP-exposure prophylaxis (PrEP) among adolescents in secondary schools, Grootfontein District: Otjozondjupa Region. Conclusions of this study were made based on the objectives of the study and the study findings. The findings underscore the necessity for focused educational initiatives that deliver accurate information about HIV PrEP, dismiss misconceptions, and confront the stigma associated with HIV PrEP. By enhancing knowledge and facilitating access to preventive measures such as HIV PrEP, it is feasible to encourage safer sexual behaviors and mitigate HIV transmission among adolescents in the Grootfontein District.

6.2.1. Knowledge regarding HIV PrEP

The study provided important insights into adolescents' knowledge, attitude, and practice regarding HIV PrEP in the Grootfontein District.The results indicated notable deficiencies in knowledge, with a considerable number of adolescents lacking awareness of HIV PrEP and its significance in HIV Prevention. The findings underscore a disparity between knowledge and actual use of PrEP, as well as several influencing factors, such as gender, age, cultural beliefs, and accessibility challenges.

6.2.2. Attitude regarding HIV PrEP

While some respondents exhibited favorable attitudes towards HIV PrEP, these attitudes did not consistently lead to preventive behaviors, as demonstrated by the low adoption rates of HIV PrEP among the cohort. Widespread misconceptions regarding HIV transmission and prevention, including confusion about the appropriate circumstances for HIV PrEP usage, were evident, highlighting the necessity for improved sexual health education. Additionally, the study affirmed the enduring stigma associated with HIV discussions, which hampers adolescents' willingness to pursue HIV PrEP and adopt safer sexual practices. Despite generally positive attitudes, stigma and misunderstandings continue to obstruct effective HIV Prevention efforts within this demographic.

6.2.3. Practice regarding HIV PrEP

The study highlights a critically low uptake of HIV PrEP among adolescents, primarily due to limited awareness, access barriers, and social stigma, despite clear risk factors like unknown partner HIV status and inconsistent condom use. These findings underscore the urgent need for school-based PrEP services to bridge access gaps and reduce stigma, ensuring more effective HIV prevention among youth.

6.2.4 Association between the variables

This study revealed a strong link between knowledge, attitudes, and practices toward HIV PrEP, showing that adolescents with greater understanding are more likely to adopt positive behaviors and use prevention strategies. To boost PrEP uptake and reduce HIV risk among youth, there is a pressing need for targeted public health interventions that enhance knowledge, reduce stigma, and improve accessibility especially in high-risk adolescent populations.

6.3.Limitations

Limitations are possible weaknesses and shortcomings that the researcher identified during the research study (41). This study only dealt with a small sample size which may not be representative of all the youth in the country. The rate of HIV PrEP knowledge, attitude and practice observed in this sample, may therefore not be generalized outside this study. Regarding the research instrument, the questionnaire consisted of close-ended questions by far, this meant limited response by respondents. Additionally, discussing a sexual related topic is considered a taboo in the African context; therefore, although the respondents were anonymous, there might have been information bias, because some learners were hesitant to report on sensitive information regarding the issue.

6.4.Recommendations

6.4.1. Policy makers

In attempt to addressing the identified gaps, it requires policy makers to do adjustments on policy on reducing the legal age barriers to access PrEP for adolescents. Secondly, a School-based HIV PrEP distribution is recommended to reduce the significant barriers to accessing HIV PrEP through traditional healthcare systems.

6.4.2. Ministry of health and social services

The study recommended the necessity for culturally sensitive and demographically tailored health education programs to enhance awareness and encourage PrEP use among at-risk adolescents. The Programs should integrate family and community involvement and it should be focused on reducing stigma. This could foster a supportive environment that encourages open discussions around sexual health and preventive measures like PrEP.

6.4.3. Ministry of Education Arts and Culture

A collaboration between MoHSS and MoEAC is needed to adopt educational efforts to different cultural contexts on school-based sexual education programs and it should be strengthened to address the identified knowledge deficiencies, especially concerning the role of PrEP in HIV Prevention, while also promoting positive attitudes toward HIV prevention methods.

School-based HIV PrEP Distribution is recommended to reduce the significant barriers to accessing HIV PrEP through traditional healthcare systems, the ministry of education is encouraged to work with healthcare providers to explore school-based or community-centered PrEP distribution, making it more accessible to learners. If these recommendations will be adopted MoEAC will help to keep learners healthy and in school, improving their chances of completing their education.

6.4.4. Future Researcher

Future studies could explore long-term effects of integrated HIV education within schools, incorporating community health workers and religious leaders to reinforce HIV prevention messaging. Additional research studies could assess the impact of increased accessibility to healthcare facilities or school-based PrEP delivery on adolescents' attitudes and PrEP uptake.

6.4.5 Direct benefits to Respondents

This study directly benefits the respondents by shedding light on their knowledge gaps, misconceptions, and barriers surrounding PrEP, creating an opportunity for targeted

education and awareness campaigns that speak their language and realities. With this newfound insight, health programs can be tailored to empower these very adolescents—boosting their confidence, access, and ability to protect themselves with smart, stigma-free HIV prevention choices.

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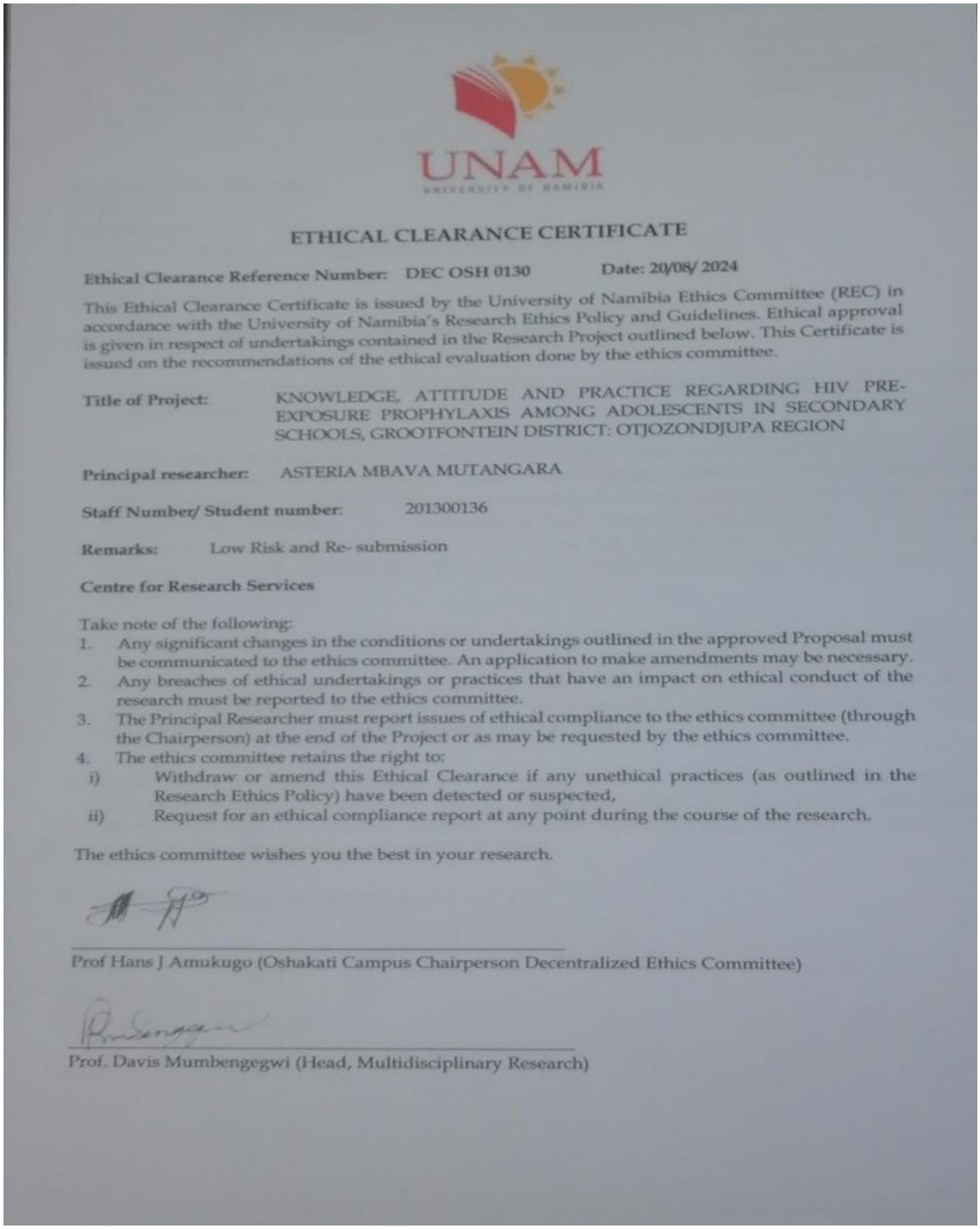
ANNEXURES

Annexure A: UNAM Ethical clearance letter



UNAM
UNIVERSITY OF NAMIBIA

ETHICAL CLEARANCE CERTIFICATE

Ethical Clearance Reference Number: DEC OSH 0130 **Date:** 20/08/ 2024

This Ethical Clearance Certificate is issued by the University of Namibia Ethics Committee (REC) in accordance with the University of Namibia's Research Ethics Policy and Guidelines. Ethical approval is given in respect of undertakings contained in the Research Project outlined below. This Certificate is issued on the recommendations of the ethical evaluation done by the ethics committee.

Title of Project: KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING HIV PRE-EXPOSURE PROPHYLAXIS AMONG ADOLESCENTS IN SECONDARY SCHOOLS, GROOTFONTEIN DISTRICT: OTJOZONDJUPA REGION

Principal researcher: ASTERIA MBAVA MUTANGARA

Staff Number/ Student number: 201300136

Remarks: Low Risk and Re- submission

Centre for Research Services

Take note of the following:

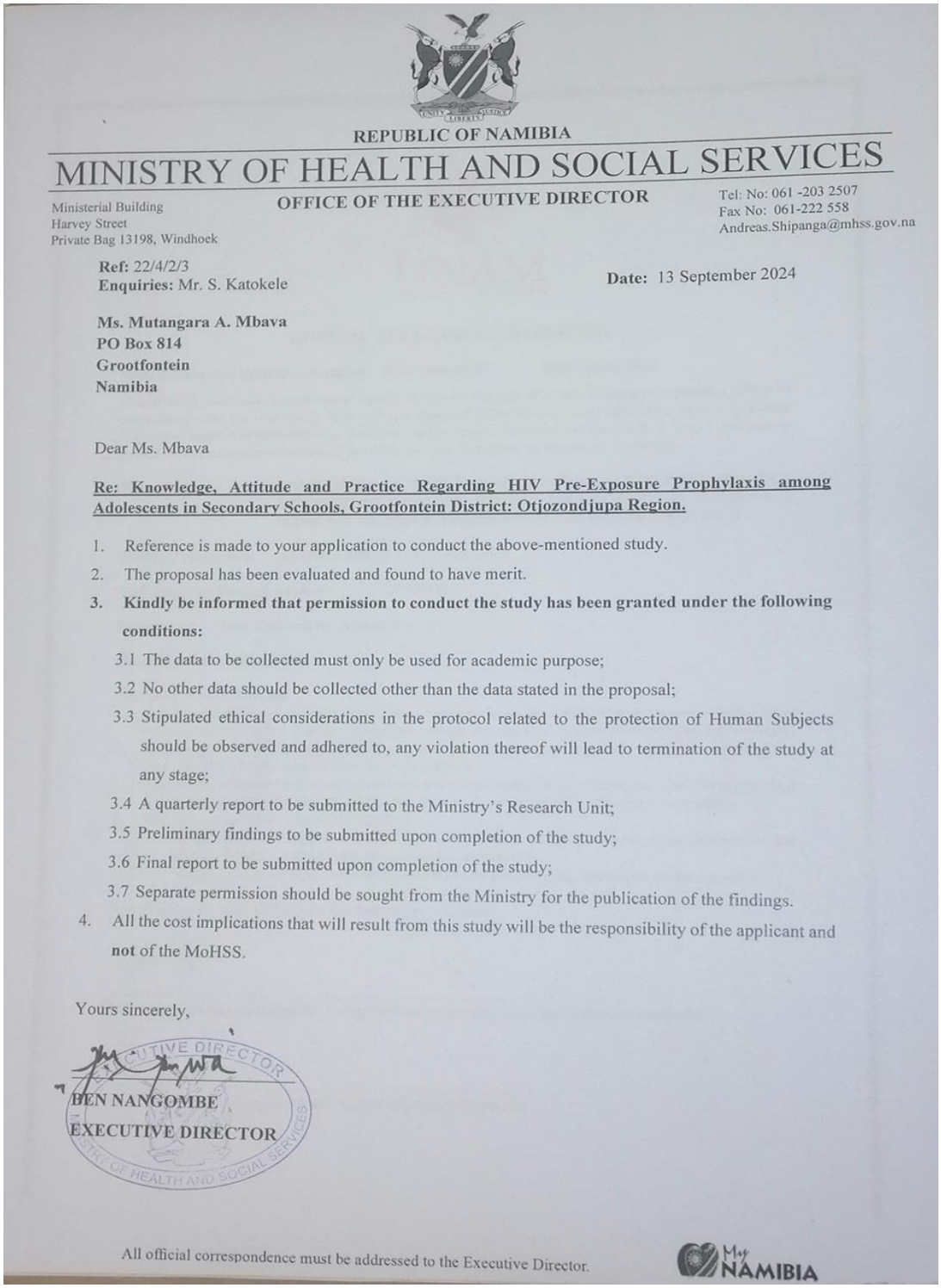
1. Any significant changes in the conditions or undertakings outlined in the approved Proposal must be communicated to the ethics committee. An application to make amendments may be necessary.
2. Any breaches of ethical undertakings or practices that have an impact on ethical conduct of the research must be reported to the ethics committee.
3. The Principal Researcher must report issues of ethical compliance to the ethics committee (through the Chairperson) at the end of the Project or as may be requested by the ethics committee.
4. The ethics committee retains the right to:
   i) Withdraw or amend this Ethical Clearance if any unethical practices (as outlined in the Research Ethics Policy) have been detected or suspected,
   ii) Request for an ethical compliance report at any point during the course of the research.

The ethics committee wishes you the best in your research.

Prof Hans J Amukugo (Oshakati Campus Chairperson Decentralized Ethics Committee)

Prof. Davis Mumbengegwi (Head, Multidisciplinary Research)

Annexure B: approval letter from the MOHSS executive director to conduct the study



REPUBLIC OF NAMIBIA

MINISTRY OF HEALTH AND SOCIAL SERVICES

OFFICE OF THE EXECUTIVE DIRECTOR

Ministerial Building
Harvey Street
Private Bag 13198, Windhoek

Tel: No: 061 -203 2507
Fax No: 061-222 558
Andreas.Shipanga@mhss.gov.na

Ref: 22/4/2/3
Enquiries: Mr. S. Katokele

Date: 13 September 2024

Ms. Mutangara A. Mbava
PO Box 814
Grootfontein
Namibia

Dear Ms. Mbava

Re: Knowledge, Attitude and Practice Regarding HIV Pre-Exposure Prophylaxis among Adolescents in Secondary Schools, Grootfontein District: Otjozondjupa Region.

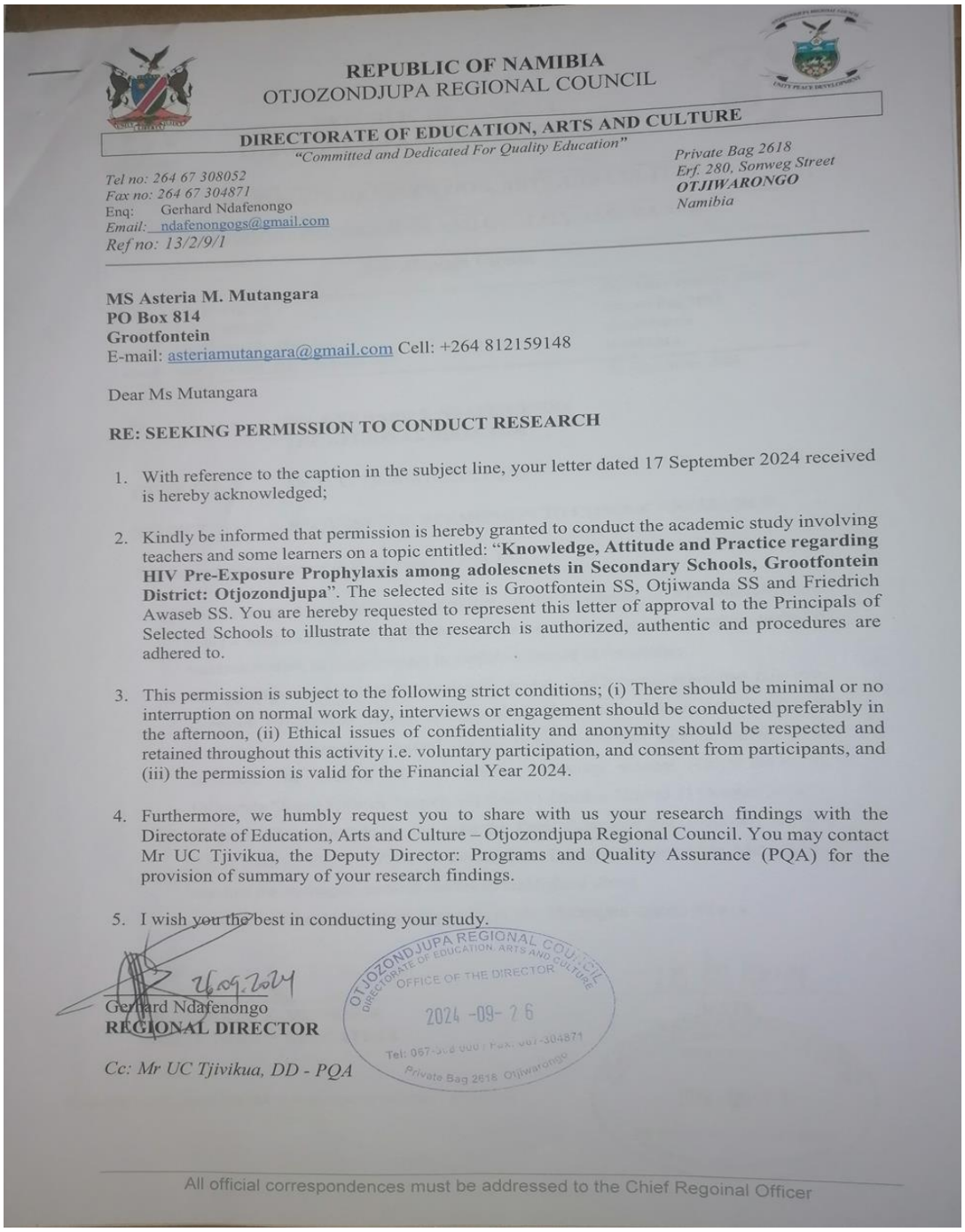
1. Reference is made to your application to conduct the above-mentioned study.
2. The proposal has been evaluated and found to have merit.
3. **Kindly be informed that permission to conduct the study has been granted under the following conditions:**
   - 3.1 The data to be collected must only be used for academic purpose;
   - 3.2 No other data should be collected other than the data stated in the proposal;
   - 3.3 Stipulated ethical considerations in the protocol related to the protection of Human Subjects should be observed and adhered to, any violation thereof will lead to termination of the study at any stage;
   - 3.4 A quarterly report to be submitted to the Ministry's Research Unit;
   - 3.5 Preliminary findings to be submitted upon completion of the study;
   - 3.6 Final report to be submitted upon completion of the study;
   - 3.7 Separate permission should be sought from the Ministry for the publication of the findings.
4. All the cost implications that will result from this study will be the responsibility of the applicant and **not** of the MoHSS.

Yours sincerely,

BEN NANGOMBE
EXECUTIVE DIRECTOR

All official correspondence must be addressed to the Executive Director.

Annexure C: Approval letter from Ministry of Education, arts and culture Executive Director.



REPUBLIC OF NAMIBIA
OTJOZONDJUPA REGIONAL COUNCIL

DIRECTORATE OF EDUCATION, ARTS AND CULTURE
"Committed and Dedicated For Quality Education"

Tel no: 264 67 308052
Fax no: 264 67 304871
Enq: Gerhard Ndafenongo
Email: ndafenongogs@gmail.com
Ref no: 13/2/9/1

Private Bag 2618
Erf. 280, Sonweg Street
OTJIWARONGO
Namibia

MS Asteria M. Mutangara
PO Box 814
Grootfontein
E-mail: asteriamutangara@gmail.com Cell: +264 812159148

Dear Ms Mutangara

RE: SEEKING PERMISSION TO CONDUCT RESEARCH

1. With reference to the caption in the subject line, your letter dated 17 September 2024 received is hereby acknowledged;

2. Kindly be informed that permission is hereby granted to conduct the academic study involving teachers and some learners on a topic entitled: "**Knowledge, Attitude and Practice regarding HIV Pre-Exposure Prophylaxis among adolescnets in Secondary Schools, Grootfontein District: Otjozondjupa**". The selected site is Grootfontein SS, Otjiwanda SS and Friedrich Awaseb SS. You are hereby requested to represent this letter of approval to the Principals of Selected Schools to illustrate that the research is authorized, authentic and procedures are adhered to.

3. This permission is subject to the following strict conditions; (i) There should be minimal or no interruption on normal work day, interviews or engagement should be conducted preferably in the afternoon, (ii) Ethical issues of confidentiality and anonymity should be respected and retained throughout this activity i.e. voluntary participation, and consent from participants, and (iii) the permission is valid for the Financial Year 2024.

4. Furthermore, we humbly request you to share with us your research findings with the Directorate of Education, Arts and Culture – Otjozondjupa Regional Council. You may contact Mr UC Tjivikua, the Deputy Director: Programs and Quality Assurance (PQA) for the provision of summary of your research findings.

5. I wish you the best in conducting your study.

26.09.2024

Gerhard Ndafenongo
REGIONAL DIRECTOR

Cc: Mr UC Tjivikua, DD - PQA

OTJOZONDJUPA REGIONAL COUNCIL
DIRECTORATE OF EDUCATION, ARTS AND CULTURE
OFFICE OF THE DIRECTOR
2024 -09- 26
Private Bag 2618 Otjiwarongo

All official correspondences must be addressed to the Chief Regoinal Officer

Annexure D: Informed parental consent for minors to participate in research

TITLE: KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING HIV PREP-EXPOSURE PROPHYLAXIS AMONG ADOLESCENTS IN SECONDARY SCHOOLS, GROOTFONTEIN DISTRICT: OTJOZONDJUPA REGION.

Dear Parents/ Guardians

I am Mutangara Asteria Mbava, Master in Public health student at the University of Namibia. I wish to conduct a research project with the title above. The purpose of these study is to assess and determine the level of knowledge, attitude, and practice regarding HIV PrEP among adolescents in Secondary Schools Grootfontein district, Otjozondjupa region. The study will take only approximately 30 minutes of your child's time, with the aim to address the following objectives:

- To assess the level of knowledge regarding HIV PrEP among adolescents in Secondary Schools, Grootfontein District: Otjozondjupa Region.
- To determine attitudes regarding HIV PrEP among adolescents in Secondary Schools, Grootfontein District: Otjozondjupa Region.
- To assess the extent of practice regarding HIV PrEP among adolescents in Secondary Schools, Grootfontein District: Otjozondjupa Region.
- To analyse the relationship between knowledge, attitudes, and practice regarding HIV PrEP among adolescents in Secondary Schools, Grootfontein District: Otjozondjupa Region.

Your child's participation in this study is voluntarily and you have the right to withdraw them from participation at any time should you feel so without prejudice. There will be zero level of risks and discomfort caused to your child and there will be no direct benefits,

however, the findings of the study will help increase the level of knowledge, attitudes and practice regarding PrEP usage which can reduce the spread of HIV in the district. Your identity and that of your child will not be revealed during the study or when the study is being reported or published with the permission granted by the Ministry of Health and Social Services. The researcher and the supervisors are the only persons that will have access to the data collected.

For any queries or concerns regarding the research study forward them to me @ +264812159148, email: asteriamutangara50@gmail.com. The main supervisor Dr Anna Shilunga @ ashilunga@unam.na, faculty of health science, School of Veterinary medicine and public health at University of Namibia Oshakati campus.

Parent/Guardians consent:

I……the parent/guardian of (child's name) …….... have read the above information and agree to let my child participate in this study on my own will.

signed at ……

Parent/guardian's signature

Date……..

Annexure E: Consent to participate in research

TITLE: KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING HIV PREP-EXPOSURE PROPHYLAXIS AMONG ADOLESCENTS IN SECONDARY SCHOOLS, GROOTFONTEIN DISTRICT: OTJOZONDJUPA REGION.

Dear Participant

I am Mutangara Asteria Mbava, Master in Public health student at the University of Namibia. I wish to conduct a research project with the title above. The aim of the study is to assess and determine the level of knowledge, attitude, and practice regarding HIV PrEP among adolescents in secondary schools Grootfontein district, Otjozondjupa region.

Your participation in this study is voluntarily and you have the right to withdraw at any time should you feel so. There will be no direct benefits, however, the findings of the study will help increase the level of knowledge, attitudes and practice regarding PrEP usage which can reduce the spread of HIV in the district. Your identity will not be revealed during the study or when the study is being reported or published with permission granted by ministry of health and social services. The researcher and the supervisors are the only persons that will have access to the data collected.

For any queries or concerns regarding the research study forward them to me @ +264812159148, email: asteriamutangara50@gmail.com. The main supervisor Dr Anna Shilunga @ ashilunga@unam.na, faculty of health science, School of Veterinary medicine and public health at University of Namibia Oshakati campus.

Respondents consent:

I…….. have read the above information and agree

to participate in this study on my own will.

signed at ……

Participant's signature

Date…….

Annexure F: Questionnaire

Questionnaire no:

TITLE: KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING HIV PREP-EXPOSURE PROPHYLAXIS AMONG ADOLESCENTS IN SECONDARY SCHOOLS, GROOTFONTEIN DISTRICT: OTJOZONDJUPA REGION.

Primary investigator: Mutangara Asteria Mbava

Student No: 201300136

Program: Master in Public Health

Institution: University of Namibia

Contact details: 0812159148

Instructions:

- The questionnaire consists of three (3) pages.
- Kindly, do not write your name on the questionnaire for anonymity.
- Your participation in this study is voluntarily. Your refusal to participate will not have any consequence.
- You have the right to choose not to answer any question that you do not want to answer.
- All responses will be regarded as confidential.
- This questionnaire consists of Sections A, B, C, D.

SECTION.A

Demographic data

Please mark with a cross **(X)** in the appropriate box below

1. Indicate your gender?

Male ☐ Female ☐

2. Indicate your age? ……

3. Your current Grade?

Grade 8 ☐ Grade 10 ☐ Grade 12 ☐

Grade 9 ☐ Grade 11 ☐

4. Religious background

Christian ☐ Atheist ☐

Muslim ☐ Others ☐

SECTION. B

This section aims to assess your level of Knowledge regarding HIV PrEP-Exposure Prophylaxis.

Circle the appropriate box with the word, that most agree with the statement regarding your knowledge on HIV PrEP. 1.

1. I have heard of HIV PrEP

A. Yes

B. No

2. I can get HIV PrEP only if I am HIV negative

A. Yes

B. No

C. Not sure

3. HIV PrEP is an antiretroviral treatment used to prevent HIV

A. Yes

B. No

C. Not sure

4. I can only use HIV PrEP if I am at risk of getting HIV. E.g multiple sexual partners, men to men sex, commercial sex workers, alcohol and drug abuse

A. Yes

B. No

C. Not sure

SECTION. C

This section aims to assess attitude regarding HIV PrEP-Exposure Prophylaxis.

Please mark with a cross **(X)** in the appropriate box below

Statement	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
1.I would feel comfortable asking my medical service provider about HIV PrEP?	①	②	③	④	⑤
2.If i were at risk of HIV infection, I would consider using HIV PrEP?	①	②	③	④	⑤
3.I would feel comfortable talking about HIV PrEP with my friends/relatives?	①	②	③	④	⑤
4.Based on what I currently know about HIV PrEP, I	①	②	③	④	⑤

would recommend HIV PrEP to a friend or partner?					
5.Do you feel it is important for adolescents to have access to HIV PrEP?	①	②	③	④	⑤

SECTION. D

This section aims at assessing your Practice regarding HIV PrEP-Exposure Prophylaxis. Please circle the appropriate answer.

1. Have you ever used HIV PrEP before?

A. Yes

B. No

2. If yes in your response to question 1, what was the reason for taking HIV PrEP?

A. I do not always use condoms

B. I did not know my partner's HIV status

C. My partner has HIV

D. other, please specify……..

Thank you for participating

Annexure: G Captured data

GENDER	AGE	GRADE	RELIGION	HEARD ABOUT HIV PrEP	ONLY WHEN HIV NEGATIVE	PrEP IS AN ANTIRETROVIRAL	ONLY USE PrEP WHEN AT RISK	ASKING MEDICAL SERVICE PROVIDER	IF NEED BE USE HIV PrEP	TALKING ABOUT
female	16	8	christian	no	not sure	not sure	not sure	agree	agree	agree
male		8	christian	no	not sure	not sure	not sure	agree	strongly agree	strongly agree
female	14	8	christian	no	not sure	yes	yes	agree	neutral	disagree
female	15	8	christian	yes	not sure	yes	no	agree	disagree	strongly agree
male		8	others	no	not sure	not sure	not sure	agree	neutral	strongly disagre
male	16	8	christian	no	not sure	not sure	yes	agree	strongly agree	strongly agree
female	16	9	christian	yes	yes	yes	yes	strongly agree	agree	agree
female	16	9	christian	no	not sure	not sure	no	strongly agree	agree	agree
male	15	8	christian	no	not sure	not sure	no	agree	neutral	strongly disagre
female	15	8	christian	yes	no	not sure	no	strongly agree	strongly agree	disagree
male	16	9	christian	yes	not sure	not sure	not sure	strongly agree	neutral	agree
female	15	9	christian	yes	no	not sure	not sure	agree	strongly agree	stronly agree
male	17	9	others	no	not sure	not sure	not sure	agree	agree	strongly disagre
female	15	9	christian	yes	not sure	yes	no	strongly agree	agree	strongly agree
female	16	9	others	yes	yes	yes	not sure	strongly disagree	neutral	agree
female	17	10	christian	yes	not sure	yes	no	agree	strongly agree	agree
female	16	9	christian	yes	not sure	yes	not sure	neutral	agree	neutral
male	16	9	others	no	not sure	yes	yes	agree	agree	stronly disagree
female	15	9	christian	yes	not sure	not sure	yes	strongly agree	agree	disagree
female	14	8	others	yes	no	yes	no	agree	strongly agree	agree
female	17	10	others	yes	no	yes	no	agree	strongly agree	neutral
female	17	9	christian	no	not sure	not sure	not sure	strongly agree	strongly agree	disagree
female	15	8	christian	yes	not sure	yes	no	strongly agree	strongly agree	strongly agree
female	16	8	others	no	no		not sure	agree	agree	agree
male	17	9	christian	yes	no	yes	yes	strongly agree	agree	strongly agree
female	16	8	christian	yes	not sure	not sure	not sure	agree	agree	agree
male	18	9	others	no	yes	not sure	yes	strongly agree	agree	strongly agree
male	15	9	others	yes	not sure	not sure	not sure	neutral	agree	strongly disagre
female	18	10	christian	no	not sure	yes	yes	agree	strongly agree	strongly agree

female	17	10	christian	no	not sure	yes	not sure	strongly agree	strongly agree	strongly agree
female	19	10	others	yes	no	yes	yes	strongly agree	agree	strongly agree
female	18	10		yes	no	yes	yes	strongly agree	agree	agree
male	18	10	christian	yes	not sure	yes	not sure	strongly agree	neutral	strongly agree
male	16	10	christian	no	not sure	not sure	not sure	agree	agree	neutral
female	19	10	christian	yes	no	yes	no	stronly agree	strongly agree	neutral
male	18	10	christian	yes	no	yes	yes	strongly agree	neutral	strongly disagre
female	19	10	christian	yes	not sure	yes	yes	agree	agree	agree
female	17	10		yes	not sure	yes	no	strongly agree	neutral	neutral
male	18	10		yes	not sure	yes	yes	agree	strongly agree	neutral
male	18	10		yes	not sure	yes	yes	agree	agree	agree
female	17	10	christian	yes	not sure	yes	not sure	neutral	strongly agree	disagree
female	14	8	christian	no	no	not sure	yes	agree	strongly agree	disagree
male	18	8	christian	no	no	yes	no	strongly disagree	agree	disagree
female	14	8	christian	no	not sure	not sure	no	agree	disagree	disagree
male	16	8	others		yes		not sure			agree
female	16	8	christian	yes	yes	not sure	yes	agree	strongly agree	strongly agree
male	16	8	christian	no	yes	not sure	no	agree	strongly disagree	strongly agree
male	15	8	christian	no	not sure	yes	yes	strongly agree	agree	agree
male	15	8	others	no	not sure	not sure	not sure	neutral		
male	15	8	others	no	not sure	not sure	not sure	disagree	disagree	disagree
male	14	8	others	no	not sure	not sure	not sure	agree	disagree	strongly agree
female	17	9	others	yes	no	yes	yes	strongly agree	strongly agree	strongly agree
female		8	others	no	no	not sure	not sure	agree	disagree	disagree
male	17	9	christian	no		yes	no	strongly agree	strongly agree	strongly agree
female	16	8	christian	no	not sure	not sure	not sure	agree	agree	agree
female	16	8	christian	no	not sure	not sure	not sure	agree	agree	strongly agree
female	16	8	others	yes	no	yes	not sure	disagree	neutral	disagree
female	17	9	christian	no	not sure	yes	yes	disagree	disagree	stongly agree
female	14	8	others	yes	no	yes	no	agree	strongly agree	strongly agree
male	16	9	christian	yes	no	yes	no	disagree	strongly disagree	strongly disagre
female	14	8	christian	yes	yes	yes	not sure	agree	agree	agree
male	18	10	christian	yes	yes	yes	no	strongly agree	strongly agree	strongly agree
female	17	9	christian	yes	no	not sure	not sure	strongly agree	agree	disagree
female	15	9	christian	yes	not sure	yes	not sure	agree	agree	strongly agree
male	19	10	christian	yes	yes	yes	yes	strongly agree	strongly agree	disagree

male	18	9	christian	no	not sure	not sure	yes	agree	agree	agree
male	16	10	christian	yes	no	yes	yes	strongly agree	stronglt agree	strongly agree
female	16	10	christian	no	not sure	not sure	no	strongly agree	neutral	strongly agree
male	17	9	christian	no	not sure	not sure	yes	strongly agree	agree	neutral
female		9	muslim	no	no		not sure	agree	strongly agree	neutral
female	16	10	christian	no	no	yes	no	agree	agree	strongly disagre
female	18	10	others	no	not sure	not sure	not sure	strongly agree	neutral	disagree
female	18	10	christian	no	not sure	not sure	not sure	strongly agree	agree	strongly agree
female	17	10	christian	no	not sure	not sure	not sure	strongly disagree	strongly agree	strongly agree
female	17	10	christian	no	not sure	yes	yes	strongly agree	strongly agree	disagree
female	17	10	christian	no	not sure	yes	yes	strongly agree	strongly agree	strongly disagre
male	18	9	muslim	yes	yes	not sure	yes	agree	agree	neutral
female	17	9	others	no	not sure	not sure	not sure	strongly agree	neutral	strongly agree
female	16	8	christian	no	no	yes	no	strongly agree	neutral	neutral
female	16	8	christian	no	no	yes	yes	strongly agree	strongly agree	strongly agree
female	19	11	christian	no	not sure	yes	no	agree	strongly agree	disagree
female	17	11	christian	yes	no	yes	not sure	neutral	agree	strongly agree
female	19	11	others	no	not sure	no	not sure	neutral	disagree	neutral
female	19	11	christian	yes	no	yes	yes	strongly disagree	strongly agree	strongly agree
female	18	11	christian	yes	no	yes	yes	agree	strongly agree	strongly agree
male	19	11	christian	yes	not sure	yes		agree	strongly agree	agree
female	19	11	christian	yes	no	yes	yes	strongly agree	neutral	disagree
female	19	11	christian	yes	no	yes	yes	strongly agree	strongly agree	disagree
female	18	11	christian	yes	no	yes	yes	agree	strongly agree	strongly agree
female	17	11	christian	no	not sure	not sure	not sure	strongly agree	neutral	disagree
male	19	11	christian	no	not sure	not sure	not sure	strongly disagree	neutral	disagree
female	19	11	christian	yes	yes	not sure	not sure	strongly agree	agree	agree
female	19	11	christian	yes	yes	not sure	not sure	strongly agree	agree	agree
female	19	11	christian	yes	no	yes	yes	strongly agree	strongly agree	neutral
male	19	11	christian	yes	yes	yes	yes	disagree	agree	disagree
female	18	11	christian	yes	not sure	yes	not sure	agree	agree	agree
female	19	11	christian	no	no	not sure	not sure	neutral	strongly agree	strongly disagre
male	17	8	others		yes	not sure	not sure	neutral	strongly agree	strongly agree
male	19	11	christian	no	not sure	not sure	not sure	neutral	neutral	neutral

female	14	8	christian	no	not sure	not sure	yes	agree	agree	disagree
male	17	8	christian		yes	not sure	not sure	neutral	strongly agree	agree
female	17	10	christian	no	no	no	no	disagree	agree	disagree
female	15	9	christian	no	no	no	yes	disagree	disagree	disagree
male	19	10	christian	yes	no	no	no	disagree	disagree	agree
female	15	8	christian	no	no	yes	no	agree		disagree
male	15	8	christian	yes	no	yes	no	agree	disagree	agree
female	15	8	christian	no	no	no	yes	disagree	disagree	disagree
female	14	8	christian	no	no	no	yes	disagree	agree	disagree
female	18	12	christian	no	yes	yes	yes	agree	agree	disagree
female	18	10	christian	no	no	yes	no	agree	disagree	agree
female	14	8	christian	no	no	yes	no	agree	agree	disagree
female	16	8	christian	yes	yes	no	yes	agree	disagree	agree
female	19	12	christian	no	yes	no	no	agree	agree	agree
female	18	12	christian	no	no	no	yes	agree	disagree	disagree
female	19	12	christian	no	no	no	no	agree	agree	disagree
female	19	12	christian	no	no	yes	yes	agree	disagree	agree
female	17	12	christian	yes	no	yes	yes	agree	agree	disagree
male	19	12	christian	no	no	yes	yes	agree	agree	agree
male	19	12	christian	yes	no	no	yes	agree	agree	agree
male	17	11	christian	no	no	no	no	agree	disagree	disagree
male	18	10	christian	yes	yes	yes	yes	agree	agree	agree
male	17	10	christian	no	no	no	no	agree	agree	disagree
female	16	10	christian	yes	yes	yes	yes	agree	agree	disagree
female	17	10	christian	yes	yes	yes	yes	agree	agree	agree
male	16	10	others	yes	yes	yes	yes	agree	disagree	disagree
female	18	10	christian	yes	yes	yes	no	agree	agree	agree
female	17	10	christian	yes	yes	yes	no	agree	disagree	agree
female	17	11	christian	no	no	no	no	agree	agree	disagree
female	15	9	christian	no	yes	no	yes	agree	disagree	disagree
female	16	9	others	no	no	no	yes	agree	agree	disagree
female	15	8	christian	no	no	yes	no	agree	agree	disagree
male	16	9	christian	no	no	yes	no	agree	agree	agree
female	15	9	christian	no	no	no	no	disagree	agree	disagree
female	16	9	christian	no	yes	yes	yes	disagree	disagree	disagree

female	17	9	christian	no	no	yes	yes	disagree	agree	disagree
male	16	9	christian	no	no	no	yes	agree	agree	agree
female	16	9	christian	no	no	no	yes	agree	agree	agree
male	16	9	christian	no	no	yes	yes	disagree	agree	disagree
female	16	9	christian	no	no	no	yes	disagree	agree	agree
female	17	9	christian	no	no	no	no	agree	agree	agree
female	15	9	christian	no	no	no	no	agree	agree	disagree
female	15	9	christian	no	no	no	no	agree	agree	disagree
male	15	9	christian	no				disagree	agree	disagree
male	14	9	christian	no	no	no	no	disagree	disagree	disagree
male	17	9	christian	no	no	yes	yes	disagree	disagree	disagree
male	15	9	christian	no	no	no	yes	agree	agree	agree
male	15	9	christian	yes	no	yes	no	disagree	agree	agree
female	15	9	christian	no	no	yes	yes	agree	agree	agree
male	14	8	christian	yes				agree	agree	disagree
male	15	9	christian	no	no	yes	no	agree	disagree	disagree
male	16	9	christian	no	no	no	yes	agree	agree	disagree
male	17	10	christian	no	no	yes	no	agree	agree	disagree
female	17	10	christian	yes	no	yes	no	agree	disagree	disagree
male	18	10	christian	no	yes	no	no	agree	agree	agree
female	17	10	others	no	no	yes	yes	agree	disagree	disagree
female	16	10	christian	yes	no	yes	no	agree	disagree	disagree
male	17	10	christian	no	yes	yes	no	agree	disagree	disagree
male	17	10	christian	no	no	no	no	agree	agree	agree
male	18	10	christian	yes	no	no	yes	agree	disagree	disagree
male	18	10	christian	yes	no	no	no	disagree	disagree	agree
female	16	10	christian	yes	no	yes	no	disagree	disagree	disagree
female	18	10	christian	no	no	no	no	agree	disagree	disagree
female	16	10	christian	no	no	yes	yes	agree	agree	agree
male	14	8	christian	no	no	yes	yes	agree	agree	disagree
male	16	8	atheist	no	no	no	no	disagree	agree	disagree
male	15	8	muslim	no	no	yes	yes	disagree	disagree	disagree
male	15	8	christian	yes	no	yes	no		agree	
male	14	8	christian	no	no	yes	yes	disagree	agree	disagree

male	19	12	christian	yes	no	yes	no	agree	agree	agree
male	19	11	christian	yes	no	yes	yes	agree	agree	agree
female	14	8	christian	yes	no	yes	no	agree	agree	agree
female	14	8	christian	no	no	yes	no	disagree	disagree	disagree
female	14	8	christian	yes	yes	yes	yes	disagree	disagree	agree
female	15	8	christian	no	yes	yes	yes	agree		agree
female	14	8	christian	no	yes	no	yes	agree	agree	agree
female	15	8	christian	yes	no	no	yes	agree	disagree	disagree
female	15	8	christian	no	no	no	no	agree	disagree	agree
female	16	8	christian	yes	no	yes	no	disagree	disagree	disagree
male	15	8	others	no	yes	yes	yes	agree	agree	agree
male	15	8	christian	yes	no	yes	no	disagree	disagree	disagree
male	14	8	christian	yes	no	yes	no	agree	disagree	disagree
female	16	8	christian	yes	no	no	no	agree	agree	disagree
male	15	8	christian	no	no	no	no	disagree	agree	agree
male	16	8	christian	no	no	no	no	disagree	agree	disagree
female	15	8	others	no	no	yes	no	disagree	agree	agree
female	16	8	others	no	no	yes	yes	agree	agree	disagree
female	15	8	christian	no	yes	no	yes	agree	disagree	agree
female	14	8	christian	no	no	no	yes	disagree	disagree	disagree
female	15	8	christian	yes	no	yes	no	agree	disagree	agree
male	14	8	christian	yes	no	no	no	disagree	disagree	disagree
female	16	8	christian	yes	no	no	no	disagree	disagree	disagree
female	16	8	christian	yes	no	yes	no	agree	agree	agree
female	14	8	christian	no	no	no	yes	disagree	disagree	disagree
female	14	8	christian	no	no	yes	no	disagree	agree	agree
female	16	8	christian	yes	yes	yes	no	agree	agree	disagree
female	15	8	christian	no	no	no	yes	agree	disagree	agree
female	14	8	christian	no	yes	no	yes	disagree	disagree	agree
female	16	8	christian	no	no	no	no	agree	disagree	agree
female	13	8	christian	no	yes	yes	no	agree	agree	disagree
female	14	8	christian	no	no	yes	yes	agree	agree	agree
female	13	8	christian	yes	no	no	yes	disagree	disagree	disagree
female	16	8	christian	no	yes	yes	yes	disagree	disagree	disagree

female	13	8	christian	no	no	no	yes	disagree	disagree	agree
male	15	8	others	no	no	yes	yes	disagree	disagree	disagree
male	14	8	christian	no	no	yes	no	disagree	agree	disagree
male	14	8	christian	no	no	yes	no	agree	agree	disagree
female	14	8	christian	no	no	yes	no	disagree	disagree	disagree
female	16	8	christian	no	no	no	yes	disagree	agree	agree
male	14	8	christian	no	no	no	yes	disagree	disagree	disagree
male	14	8	christian	no	yes	yes	yes	disagree	disagree	disagree
male	14	8	christian	yes	no	yes	no	agree	agree	agree
female	16	8	christian	no	no	yes	no	disagree	agree	disagree
female	15	8	christian	no	no	yes	yes	agree	agree	
male	17	8	muslim	no	no	yes	yes	disagree	disagree	disagree
female	16	8	others	yes	no	no	yes	agree	disagree	agree
male	14	8	christian	no	no	yes	yes	disagree	agree	disagree
female	18	10	christian	yes	no	yes	no	agree	agree	agree
male	17	10	christian	yes	no	yes	no	agree	agree	disagree
male	17	10	christian	no	no	no	yes	agree	disagree	agree
female	17	10	christian	no	no	yes	no	agree	agree	
male	16	10	christian	yes	no	no	no	agree	agree	disagree
female	19	12	christian	yes	yes	yes	yes	strongly agree	strongly agree	agree
male	18	12	christian	yes	no	yes	not sure	neutral	agree	disagree
female	18	12	christian	yes	not sure	yes	yes	neutral	agree	strongly agree
male	18	12	christian	yes	not sure	not sure	yes	strongly agree	agree	neutral
female	18	12	christian	yes	yes	yes	no	strongly agree	strongly agree	strongly agree
female	17	12	christian	yes	not sure	yes	yes	neutral	strongly agree	neutral
female	18	12	christian	yes	not sure	yes	not sure	agree	strongly agree	neutral
female	18	12	christian	no	not sure	not sure	not sure	agree	neutral	neutral
female	16	10	christian	no	not sure	yes	yes	neutral	agree	strongly agree
female	18	12	christian	no	not sure	not sure	not sure	neutral	agree	agree
male	16	10	christian	no	not sure		not sure	agree	neutral	disagree
female	16	10	christian	no	not sure	not sure	not sure	agree	neutral	agree
female	16	10	christian	no	not sure	not sure	not sure	strongly agree	neutral	neutral
female	16	10	christian	no	no	not sure	yes	neutral	neutral	agree
female	15	10	christian	yes	no	no	yes	agree	disagree	neutral

female	16	10	christian	yes	no	no	not sure	strongly agree	strongly agree	neutral
female	16	10	christian	no	not sure	not sure	not sure	neutral	agree	neutral
female	15	10	christian	no	not sure	no	no	strongly agree	strongly agree	agree
male	18	12		no	not sure	yes	not sure	agree	neutral	neutral
male	18	12	christian	yes	yes	not sure	no	agree	neutral	strongly agree
female	17	12	christian	yes	no	not sure	no	neutral	strongly agree	strongly agree
female	18	12	christian	yes	not sure	no	yes	neutral	agree	neutral
female	18	12	christian	yes	yes	yes	yes	agree	strongly agree	strongly agree
female	17	12	christian	yes	not sure	yes	yes	strongly agree	strongly agree	strongly agree
female	19	12	christian	yes	yes	yes	not sure	agree	strongly agree	neutral
female	16	10	christian	yes	not sure	not sure	yes	strongly agree	strongly agree	neutral
female	15	9	christian	no	not sure	not sure	yes	strongly agree	agree	neutral
female	17	12	christian	yes	not sure	yes	yes	strongly agree	strongly agree	agree
female	18	12	christian	yes	not sure	yes	not sure	strongly agree	agree	strongly agree
female	16	10	christian	yes	not sure	no	not sure	agree	neutral	strongly agree
male	14	8	others	no	not sure	not sure	not sure	strongly agree	neutral	strongly agree
female	14	8	christian	yes	no	no	yes	neutral	strongly agree	strongly agree
female	14	8	christian	no	not sure	yes	yes	strongly agree	disagree	agree
female	14	8	christian	yes	no	yes	yes	disagree	strongly agree	agree
male	14	8	christian	no	not sure	yes	not sure	neutral	neutral	strongly agree
female	14	8	others	yes	not sure	not sure	not sure	strongly agree	neutral	strongly agree
female	14	8	christian	yes	not sure	yes	not sure	strongly agree	agree	strongly agree
female	13	8	christian	yes	not sure	yes	not sure	strongly agree	strongly agree	neutral
female	14	8	christian	yes	not sure	not sure	not sure	strongly agree	neutral	neutral
female	14	8	christian	yes	not sure	yes	yes	strongly agree	agree	strongly agree
female	14	8	christian	yes	no	not sure	not sure	strongly agree	strongly agree	neutral
female	14	8	christian	yes	not sure	not sure	no	strongly agree	neutral	neutral
female	14	8	christian	no	no	yes	yes	neutral	agree	strongly agree
female	15	8	christian	yes	no	not sure	not sure	strongly agree	neutral	strongly agree
female	14	8	christian	yes	not sure	yes	not sure	strongly agree	agree	strongly agree
female	14	8	christian	yes	yes	yes	no	agree	strongly agree	strongly agree
female	16	10	christian	no	not sure	not sure	not sure	strongly agree	neutral	neutral
female	16	10	christian	yes	no	no	no	neutral	strongly agree	disagree

female	16	10	christian	no	not sure	not sure	not sure	agree	neutral	neutral
female	15	9	christian	yes	no	yes	yes	stongly agree	strongly agree	strongly agree
female	15	9	christian	yes	no	not sure	no	strongly agree	agree	neutral
female	15	9	christian	yes	not sure	yes	not sure	agree	strongly agree	stongly disagree
female	15	9	christian	no	not sure	not sure	not sure	agree	neutral	neutral
male	15	9	christian	no	not sure	not sure	not sure	agree	agree	neutral
male	17	9	christian	no	not sure	not sure	not sure	strongly agree	neutral	strongly agree
male	16	9		yes	not sure	not sure	not sure	agree	neutral	agree
male	15	9	christian	yes	no	yes	yes	agree	strongly agree	strongly disagre
female	15	9	christian	yes	not sure	yes	yes	strongly agree	agree	agree
male	15	9	christian	yes	no	yes	no	strongly agree	strongly agree	neutral
male	16	9	christian	yes	yes	yes	yes	stongly agree	strongly agree	strongly agree
male	15	9	christian	yes	not sure	yes	yes	strongly agree	agree	agree
male	15	9	christian	no	not sure	yes	yes	strongly agree	strongly agree	agree
male	15	9	christian	yes	not sure	yes	no	agree	strongly agree	agree
female	15	9	christian	yes	no	yes	not sure	strongly agree	neutral	neutral
male	16	9	christian	yes	no	yes	not sure	neutral	neutral	disagree
female	15	9	christian	yes	not sure	yes	not sure	agree	agree	strongly agree
male	15	9	christian	no	not sure	not sure	not sure	stongly agree	neutral	agree
female	15	9	christian	yes	no	yes	yes	agree	strongly agree	agree
female	15	9	christian	yes	not sure	yes	yes	strongly agree	agree	agree
female	15	9	christian	yes	yes	yes	yes	disagree	agree	agree
female	16	9	christian	yes	no	not sure	yes	disagree	strongly agree	agree
male	14	8	others	no	not sure	not sure	not sure	stongly agree	agree	strongly disagre
female	15	8	atheist	yes	yes	yes	no	agree	strongly agree	neutral
male	16	8	christian	yes	no	no	not sure	strongly agree	neutral	strongly agree
male	16	10	christian	yes	not sure	not sure	yes	agree	neutral	disagree
female	16	10	christian	no	not sure	yes	yes	agree	strongly agree	agree
male	15	10	christian	no	not sure	not sure	not sure	agree	neutral	neutral
male	16	10	christian	no	not sure	not sure	not sure	agree	agree	neutral
male	16	10	christian	no	not sure	not sure	yes	strongly agree	strongly agree	neutral
female	18	12	christian	yes	not sure	yes	yes	strongly agree	strongly agree	strongly agree
female	18	12	christian	yes	not sure	yes	yes	neutral	strongly agree	neutral
female	10		christian	yes	yes	no	yes	neutral	neutral	agree

female	18	12	christian	yes	not sure	not sure	not sure	neutral	agree	neutral
male	17	10	christian	no	not sure	not sure	not sure	strongly agree	neutral	
male	16	10	christian	yes	yes	no	no	strongly agree	strongly agree	agree
female	18	11	others	yes	no	yes	not sure			
female	18	11	christian	no	not sure	not sure	not sure	strongly agree	neutral	strongly agree
female	16	11	christian	yes	no	yes	yes	strongly agree	strongly agree	strongly agree
female	17	11	christian	yes	no	not sure	not sure	neutral	strongly agree	stongly agree
male	17	11	christian	no	not sure	not sure	not sure	neutral	agree	strongly agree
female	17	11	christian	no	not sure	not sure	no	neutral	neutral	neutral
male	19	11	christian	no	no	yes	yes	strongly agree	neutral	disagree
female	18	11	christian	no	not sure	not sure	not sure	agree	strongly agree	agree
male	19	11	christian	no	not sure	not sure	no	strongly agree	strongly agree	disagree
male	16	11	christian	no	not sure	not sure	not sure	disagree	neutral	neutral
male	19	11	christian	yes	not sure	not sure	not sure	agree	neutral	strongly disagre
male	16	10	christian	yes	not sure	not sure	yes	strongly agree	strongly agree	strongly disagre
male	18	12	christian	yes	yes	yes	not sure	agree	strongly agree	strongly agree
male	14	8	christian	no	not sure	not sure	not sure	strongly agree	agree	disagree
female	14	8	christian	no	not sure	not sure	not sure	agree	neutral	agree
female	14	8	christian	no	not sure	not sure	not sure	strongly agree	neutral	neutral
male	14	8	christian	yes	yes	yes	yes	strongly agree	strongly agree	strongly disagre
male	15	8	christian	no	not sure	not sure	not sure	agree	neutral	neutral
female	14	8	christian	no	not sure	not sure	not sure	agree	agree	agree
female	14	8	christian	no	not sure	not sure	not sure	strongly agree	agree	disagree
female	15	8	christian	no	not sure	not sure	not sure	neutral	neutral	agree
female	14	8	others	no	no	yes	not sure	agree	neutral	strongly agree
male	14	8	christian	no	not sure	not sure	yes	strongly agree	neutral	strongly agree
male	16	8	christian	no	yes	yes	yes	agree	strongly agree	strongly disagre
male	16	8	christian	yes	no	not sure	not sure	agree	neutral	agree
female	14	8	christian	no	not sure	not sure	yes	strongly agree	agree	disagree
male	14	8	christian	no	not sure	not sure	not sure	strongly agree	neutral	neutral
male	14	8	christian	no	not sure	not sure	not sure	agree	neutral	neutral
male	15	8	christian	no	not sure	not sure	not sure	agree	neutral	disagree
male	17	8	christian	no	not sure	not sure	not sure	disagree	agree	agree
female	14	8	christian	no	not sure	not sure	no	agree	strongly agree	neutral
male	14	8	christian	no	not sure	not sure	not sure	agree	neutral	neutral

female	14	8	christian	no	no	not sure	no	neutral	agree	neutral
female	14	8	christian	no	not sure	yes	not sure	disagree	agree	neutral
female	17	11	christian	yes	not sure	yes	yes	strongly agree	strongly agree	strongly agree