# ASSESSMENT OF DETERMINANTS AND LEVELS OF ADHERENCE TO ANTIRETROVIRAL THERAPY IN HIV-INFECTED PEOPLE IN OPUWO DISTRICT, KUNENE REGION, NAMIBIA

A THESIS SUBMITTED IN PARTIAL FULFILMENT

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**Abstract**

Since the beginning of the outbreak of Acquired Immunodeficiency Syndrome (AIDS) epidemic, more than 78 million people have been infected with Human Immunodeficiency Virus (HIV) and 39 million people have died globally (UNAIDS, 2014, p. 123). In Namibia, AIDS is the leading cause of death accounting for 23% of deaths (CDC in Namibia, fact sheet, 2013, & WHO Namibia, 2011). Adherence to medication refers to the extent to which a patient takes a medication in the way intended by a health care provider (Machtinger & Bangsberg, 2006). Very high levels of adherence, taking at least 95% of prescribed doses, are required to achieve sustained suppression of HIV replication over time. Namibia has a national ART coverage of 84%, but the coverage per health district differs (MoHSS, 2012).

A quantitative, descriptive, exploratory, cross-sectional, analytical research design was used to assess the levels and determinants of adherence to ART in HIV infected people in Opuwo district. Specific objectives were; to determine the levels of adherence to ART among HIV infected people in Opuwo district and to identify determinants of adherence to ART in Opuwo district. A structured questionnaire was used to collect data for self-reporting method, while the pill count was conducted by subtracting the number of pills left from those given. Pharmacy records were reviewed to determine the appoint keeping. Health workers were also interviewed.

The study finds that the levels of adherence to ART measured by pill count and by self-reporting were 73% and 70% respectively. The determinant which is associated with adherence was educational level. Females had higher adherence, being

employed, being married or cohabitating also favoured higher adherence. Distance to facilities, travelling, alcohol usage, dietary requirements, side effects were identified as barrier to adherence by not statistically significant.

The researcher recommended health education on ART, recruitments of more health worker, tracing of defaulters and late comers, a vehicle specific for ART services, and training at health worker at all facilities to enable them to give ART.

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**Dedication**

To my late grandmother, the hard works you have instilled in me have not gone to waste. To my siters Aili, Suama, Albertina  let this be a motivation for you to study further.

**Declaration**

I, Severen Shali Nghoshi, declare hereby that this study is a true reflection of my own research, and that this work, or part thereof has not been submitted for a degree in any other institution of higher education.



……. Date……..

[Severen Shali Nghoshi]

## Abbreviations and acronyms

| | |
|---|---|
| **AIDS** | Acquired Immunodeficiency Syndrome |
| **ANC** | Ante-Natal Care |
| **ART** | Anti-Retroviral Therapy |
| **ARV** | **A**ntiretroviral |
| **CD4** | Cluster of differentiation 4 |
| **CDC** | Centre for Disease Control and Prevention |
| **CI** | Confidence interval |
| **CMO** | Chief Medical Officer |
| **HAART** | Highly Active Antiretroviral Therapy |
| **HBM** | Health Belief Model |
| **HBV** | Hepatitis B virus |
| **HIV** | Human Immunodeficiency Virus |

| | |
|---|---|
| **MoHSS** | Ministry of Health and Social Services |
| **NSA** | Namibia Statistics Agency |
| **PMTCT** | Prevention of Mother to Child Transmission |
| **P – Value** | Probability value |
| **RNA** | Ribonucleic acid |
| **UN** | United Nation |
| **UNAIDS** | United nation AIDS |
| **URECU** | University of Namibia Research Ethic Committee |
| **VAS** | Visual Analogue Scale |
| **WHO** | World Health Organisation |

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# CHAPTER 1: ORIENTATION OF THE STUDY

## 1.1 Introduction and background information

Since the beginning of the outbreak of Acquired Immunodeficiency Syndrome (AIDS) epidemic, more than 78 million people have been infected with Human Immunodeficiency Virus (HIV) and 39 million people have died globally (UNAIDS, 2014, p. 123). The report further stated that in 2013, about 71% of the people living with HIV and AIDS are from Sab-Saharan Africa. After the introduction of ART, fewer people are dying of AIDS related illness. Between 2005 and 2013, AIDS related deaths have decreased by 39% in Sab-Saharan Africa (UNAIDS, 2014, p. 27). As more people are becoming more aware of HIV and AIDS, a large number of people now know their HIV status.

The World Health Organisation (WHO) estimates that about 50% of people who are infected with HIV know their status, and about 86% of those who are infected and know their status in sub-Saharan Africa are receiving Anti Retroviral Therapy (ART), and nearly 76% of them have achieved viral suppression. The WHO Gap Report (2014, p.16) further stated close to 12.9 million people were receiving ART world wide by the end of 2013 and that the percentage of people living with HIV who are not receiving ART has decreased from 90% in 2006 to 63% in 2013. This is a move in the light direction because as the number of ART coverage increases, the rate of spreading of the HIV virus will decrease if the people are adhering to the treatment.

In 2011, the United Nation (UN) General Assembly adopted the resolution 65/277, Political Declaration on HIV and AIDS: Intensifying Our Efforts to Eliminate HIV and AIDS. In the resolution, ten targets and commitment were set to be achieved by 2015. The fourth target was to reach 15 million people living with HIV with lifesaving antiretroviral treatment by 2015. As the 2015 due date came to pass, a new strategy was developed. According to the UNAIDS (2014, p.1) a new ambitious but achievable treatment target has been developed to help end the AIDS epidemic. It is called a 90% 90% 90% ambitious treatment strategy. In the new strategy the deadline was set for 2020. The new dictates states that by 2020, 90% of all the living with HIV will know their HIV status, by 2020 90% of all the people with diagnosed HIV infection will receive sustained antiretroviral therapy, and that by 2020, 90% of all the people receiving antiretroviral therapy will have viral suppression. From these few examples of the UN effort to stop the AIDS epidemic, it is clear that ART is the way to end AIDS.

In Namibia, AIDS is the leading cause of death accounting for 23% of deaths (CDC in Namibia, fact sheet, 2013, & WHO Namibia, 2011). By 2012, the country had 192 654 people living with HIV of which a total of 107 154 are on ART (MoHSS, Annual implementation progress report for the national strategic framework for HIV and AIDS 2011/12, 2012) . This shows that Namibia had a national ART coverage of 84%, but the coverage per health district differs. As the country is committed at preventing the spread of HIV, all pregnant women are advised to take a voluntary HIV counselling and testing. The overall national HIV prevalence among pregnant

women receiving antenatal care (ANC) was 16.9% (Ministry of Health and Social Services (MoHSS), (2014). According to the Namibia National ART Guidelines (2014), the Government of Namibia has changed the CD4 threshold for ART eligibility for adults from 350 to 500 cells/µL. The report further states that, all pregnant women, all children under 15 years old, all HBV/HIV co-infected patients, and HIV-positive persons whose partners are HIV-negative are eligible for ART irrespective of their CD4 count. The estimated number of new infections coupled with high uptake of ART, has resulted in an estimated 250,942 adults and children living with HIV in Namibia in 2014 (MoHSS, 2014).

In the Kunene Region of Namibia, HIV / AIDS was the number one top cause of death accounting for 29 deaths per year in the 18 to 49 years age group, and 11 deaths in the 50 years and above age group (MoHSS, Kunene Regional Health Directorate annual report, 2013/2014).

The Kunene region is one of the fourteen regions in Namibia, situated in North Western part of the country and shares borders with Omusati, Oshana, and Oshikoto Regions on the East, Atlantic Ocean on the West, Angola to the North, Otjozondjupa Region in the South East and Erongo Region to the South. The region is divided into three health districts namely, Opuwo, Outjo, and Khorixas. Based on the population and housing census main report by the Namibia Statistics Agency (NSA) (2011), the region has a population annual growth of 2.3 %, which give a total population of 95 128 people in 2015. About 53 272 (56%) of the Kunene population lives in Opuwo Health District. The landscape is mountainous with large rivers, poor road

infrastructures, making some area hard to reach. Opuwo district share a border with Angola and some Angolan come to seek medical service at facilities in the district. It is home to the Himba, Herero, Dhemba, Damara, Nama and Wambo ethnic groups the majority of them living a nomadic life style. Most Opuwo residents have a strong root in their old culture, do not attend school, which makes it hard for most of them to get employment.

Antiretroviral therapy (ART) refers to the use of multiple antiretroviral drugs (ARV) in management of HIV and AIDS (Machtinger & Bangsberg, 2006). Antiretroviral treatment for HIV infection consists of drugs which work against HIV infection by slowing down the replication of HIV in the body. Different antiretroviral agents target different stage of the HIV life cycle. For antiretroviral treatment to be effective for a long time, it has been established that the patient need to take more than one antiretroviral drug at a time. The term Highly Active Antiretroviral Therapy (HAART) refers to the use of a combination of three or more anti-HIV drugs (Grubb, Perrens, & Schwartlander, 2014).

Adherence to medication may be defined as the extent to which a patient takes a medication in the way intended by a health care provider (Machtinger & Bangsberg, 2006). Very high levels of adherence, taking at least 95% of prescribed doses, are required to achieve sustained suppression of HIV replication over time (MoHSS, National guideline for antiretroviral therapy., 2014). For many chronic diseases such

as diabetes or hypertension, drug regimens remain effective even after some periods of poor adherence. However, in the case of HIV there is loss of virologic control as a consequence of poor adherence to ART and this may lead to development of drug resistance and loss of future treatment options (Grubb, Perrens, & Schwartlander, 2014). The study states that several studies have demonstrated that medication adherence is important in accurately predicting progression to AIDS and death. It further noted that ART adherence is not the only determinant of ART failure or success. Other factors such as genetic differences in drug metabolism, severe baseline immune suppression, prior drug resistance, and concurrent opportunistic infections also influence ART success (Grubb, Perrens, & Schwartlander, 2014). However ART adherence is one of few potentially alterable factors determining outcomes for patients with HIV.

According to Adefolalu & Nkosi (2013), it has been established that any adherence below 95% in ART has been linked to treatment failure. They further noted that a study by Paterson et al has been used widely in establishing the >95% level of adherence required for optimal adherence necessary to maintain viral suppression. In the study, the authors reported virologic failure (HIV RNA>400 copies/mL) in 22% of patients with adherence level of 95% and above, 61% in patients with adherence level of 80–94.9% and 80% virologic failure in patients whose adherence level fell below 80%. This is a clear indication that a near prefect adherence levels is needed in order to achieve total virologic suppression.

There are several factors that have been established as barriers to adherence such as alcohol and drug abuse, depression and other mental conditions, stigma and discrimination, work and family responsibility and past history of poor adherence or defaulting. Availability and accessibility to ART, quality of health care and services, dietary requirements and frequency of doze also affect ART adherence. These factors and many others need to be study in order to remedy the situation so that the UNAIDS's 90-90-90 ambitious goal can be realised and the world will move towards an AIDS free generation.

Not much publication was available to the researcher on adherence to ART in Namibia. The findings of studies done else were can not really be a representative of the Opuwo's nomadic population which are living in an underdeveloped district. The drought experienced in the last few years also has an effect on the livelihood of the people which in turn may affect adherence to ART. This study aimed to assess the levels and determinants of adherence to ART in Opuwo district, Kunene of Namibia.

## 1.2 Statement of the problem

Determinants for ART adherence can be summarised into three groups; patients, drug regiments, and health system (Machtinger & Bangsberg, 2006). These determinants differ in different populations depending on the settings, believes and resources availability. The Namibia antiretroviral therapy adherence baseline survey report shows that the level of adherence in Kunene region was 65% (Tjituka, F.,

Gweshe, J., Mabirizi, D., Sumbi, V., Lukwago, J., & Sagwa, E., 2013). The report also shows that some of patients in Kunene region experience delays in getting their repeat medication. It further recommends that a further study should be done because the sample size used was too small. In a secondary data analysis of factors influencing the adherence to ART in Kunene region, (Edvard, 2010) recommended a study to identify the determinants of adherence to ART in Kunene region. It is important to determine which determinants are associated with adherence to ensure that patients remain on a cheaper first line treatment and prevent the development and transmission of drug resistant strain.

## 1.3 Objectives of the study

**Main objectives**

- To assess the adherence levels and determinants of adherence to ART in Opuwo district, Kunene region, Namibia.

**Specific objectives were to:**

- Determine the levels of adherence to ART among HIV infected people in Opuwo district
- Identify determinants of adherence to ART in Opuwo district
- Compare the level of adherence measured by pill count, self-reporting; and pharmacy refill

## 1.4 Significance of the study

Adherence to ART is one of the important predictor of progression to AIDS and death in HIV infected people. Good adherence to ART can prevent the development and transmission of drug-resistant virus. Furthermore, good adherence to ART ensures the patients stay on the first line treatment which is cheap thereby ensuring a low cost for treatment. This study aims to contribute to the knowledge on the determinants and levels of adherence to ART in Opuwo district. The nomadic life style of the majority of the inhabitants of Opuwo district makes it difficult to generalize the finding from studies done in modern (non-nomadic) communities to Opuwo people.

## 1.5 Operational definitions

**Adherence:** refers to taking the medication the way it is prescribed by the physician, at the right time, the right way and right quantity.

**High adherence:** Those patients who have neither missed a dose, nor ran out of medicine (self-reporting method), never missed or late for refill appointment (pharmacy refill method). In other words, those who answered "no" to the question of whether they missed a dose, and whether they ran out of medicine and those who always came on or before the date of the refill, and those who scored 95% and above on pill count.

**Low adherence:** Those who took less 95% of the prescribed dosage

**Pill count:** Method of measuring a medicine adherence that involves counting the remaining doses of medication at the end of a given period and assuming that pills remaining in excess of what is expected represent missed doses.

**Self-report**: Method of measuring adherence in which the patient reports the number of doses missed over a given period.

**Marriage:** In this study marriage refers to both statutory marriage and traditional marriage or marriage by communal law, as well as couples who are cohabitating as the researcher believe that when it comes to treatment adherence, what matter is having a partner that one is staying with irrespective of how they were married. This was also necessitated by the fact that the majority of the people in Opuwo are married by traditional law not by state law.

**Educational level:** For this study educational level is dived into two categories; those with no education are grouped together with those who have up to grade 7 as the low educational level, while from grade 8 up to tertiary are grouped together as the high educational level.

## 1.6 Thesis outline

**Chapter 1,** gives an introduction and background information about the fight against HIV/AIDS, starting at global level narrowing down to Namibia, and finally Opuwo district. The problem statement and the study objectives are also given here.

**Chapter 2**, present the literature review.

**Chapter 3,** covers the study research design and the methodology.

**Chapter 4,** presents the finding of the study and discusses the findings

**Chapter 5**, give the conclusion and recommendations of the study

## 1.7 Summary

This chapter gave an introduction of the study, starting with background information about global effort in combating of the HIV and AIDS epidemic. It further introduced the concept of adherence and level of adherence needed to achieve virologic suppression. The objectives of the study and its significance are also outline in this chapter.

# CHAPTER 2: LITERATURE REVIEW

## 2.1 Introduction

According to Burns & Grove (2005), a literature review is an organized written presentation of what has been published on a topic by scholars. The literature review gives the leader more information of what was already published before that specific study on the topic of interest. It also help the researcher when it comes to discussing the findings. By conducting a literature review the researcher identifies the research problem and refines the research question (Brink, 2006).

## 2.2 Background

Since the introduction of the first agent zidovudine in 1987, substantial advances have been made in antiretroviral therapy (Katzung, Masters, & Trevor, 2009, p.853). Many studies have been conducted which contributed to the knowledge about HIV and its life-cycle. This information has been used in developing ARV which target different stage of HIV life-cycle which leads to the use of a combination of drugs. Currently the administration of a highly active antiretroviral therapy (HAART), comprising a combination of three to four ARV agents, has become the standards of care (Katzung et al, 2009). Adherence to ART is critical for suppression of viral replication, reduced destruction of CD4 cells, prevention of viral resistance, promotion of immune reconstitution and slowed disease progression (Berhe, Tegabu, & Alemayehu, 2013).

## 2.3 Definition of the term adherence

Although there is no universally accepted definition, medication adherence may be defined as the extent to which a patient takes a medication in the way intended by a health care provider (Machtinger & Bangsberg, 2006). Haoses-Gorases (2008), defined medication adherence as taking the right medicines, at the right time, in the right way. She defined the right medication as taking the exact dose as has been formulated based on international study and deemed essential to prevent viral replication and resistance from occurring. Her definition of right time refers to the need of taking ART at set time, because there is a window period before medication efficacy is diminished, and the right way refers taking ARV with the appropriate diet, and at the right temperature. From these definitions one can see that there is a difference between medication adherence and compliance, which refers to taking medication as per instruction of the health provider without questioning.

## 2.4 Treatment related factors

Treatment related factors such as treatment side-effects and treatment fatigue have contributed to defaulting (Baureth, 2013). Treatments with fewer or no side effect are perceived to enhance good adherence more especially if there are taken for a short time only. Characteristics of the commercially available drug formulations such as taste, palatability, size of pills, availability of liquid formulations, and adverse effects (e.g., metabolic complications) can significantly affect adherence. Furthermore, the complicated regimen to be followed, such as the need for daily administration, dietary restriction, drug interactions, frequency of dosing, dosage, and therefore pill

burden or amount of liquid, had an influence child's adherence to therapy (Reda & Sibhatu, 2012).

## 2.5 Health service related factors

The health service related factors such as poor patient-health provider relationship, negative attitudes of health providers and long distance to health facility were reported to be associated with poor adherence (Baureth, 2013). Another study established that limited availability and accessibility of antiretroviral medications and healthcare facilities for diagnosis and treatment of HIV/AIDs, out-of-pocket payments, high cost of ART and other health services, presence of healthcare providers experienced in ART provision, patient-nurse and other provider relationship, health care providers' beliefs, waiting time and opening hours, and availability of counselling services, contributed to poor adherence (Reda & Sibhatu, 2012). In agreement with these findings are Adefolalu AO & Nkosi ZZ, (2013), who concluded that other socioeconomic factors implicated as part of barriers to adherence to ART in a number of studies in Africa are the cost of ART, availability and accessibility to medications. It is expected that the levels of adherence will be high in area where there is good road and the distances to health facilities are shorter. Consistent with these findings was a study by (Nyamathi AM, Sinha S, Ganguly KK, William RR, Heravian A, Ramakrishnan P, 2011) one of the most prevalent barrier was financial issues with childcare, and distance, or transportation to the site. This can be a problem especially in Opuwo district where there is poor road infrastructure. The financial implication in access to ART has been identified in a 635 patients survey at care centre by Batavia AS, Balaji K, Houle E, Parisaboina S, Ganesh AK,

Mayer KH, (2010), where they concluded that a a good health care provider patients relationship encourage good adherence. The study further states that overall patients' satisfaction with the level of care has been found to correlate with increased adherence. (Gauchet, A.; Tarquinio, C.; Fischer, G, 2007). The time spent at the hospital in queue also act as a barrier to adherence (Hardon, A.P.; Akurut, D.; Comoro, C.; Ekezie, C.; Irunde, H.F.; Gerrits, T.; Kglatwane, J.; Kinsman, J.; Kwasa, R.; Maridadi, J. 2007). These results are similar to the finding in study by Hawkins, C.; Murphy, R, (2007) where it was noted that long waiting times, poor staff attitudes, intermittent drug availability and other procedural barriers decrease patients' adherence to ART and also results in poor clinic attendance. However this is a challenge especially in resource limited country where there are no enough infrastructure and man power to give ART service.

## 2.6 Patients related factors

Patient related factors such as poor understanding of treatment regimen, forgetfulness, alcohol use, lack of commitment, travelling and illiteracy affected the level of adherence to ART adherence (Baureth, 2013). This means that people who have a good understand of the medication and how it function in supressing the virus can adhere to it better than those who have poor understanding. This was in agreement with another study of HIV positive women who had inadequate knowledge about ART and Prevention of Mother to Child Transmission (PMTCT) and these women were more likely to default ART (Daniel Boateng, Kwapong, & Agyei-Baffour, 2013). This evidence suggests that the level of literacy and

educational level may affect adherence. According to a study in Kenya, Namibia, and Tanzania by Nuwagaba-Biribonwoha et al; patient characteristics associated with non-adherence include alcohol use, depressive symptoms, and younger age.

## 2.7 Rate of adherence

In most countries, the average rate of adherence to ART is approximately 70%, despite the fact that long-term viral suppression requires near-perfect adherence (Machtinger & Bangsberg, 2006). This finding applies to both developed and developing countries. The study also noted that the average rate of adherence varies by the method used to assess it and the group studied. Furthermore it stated that for most patients, near-perfect (>95%) adherence is necessary to achieve full and durable viral suppression. There are several determinants for adherence to ART.

Some of the determinants of adherence are grouped under socio-economic factors. Social factors that are associated with poor adherence include spiritual beliefs, cultural beliefs, stigma and discrimination, non-disclosure of HIV status and unwillingness to take medication in the presence of others (Baureth, 2013). This is supported by another study which shows that social or family stigmatization and fear of the consequences of revealing HIV infection status to sexual partners are closely related to poor adherence (Reda & Sibhatu, 2012). This means that adherence can be enhanced by having a supporting family and or sexual partner who share the responsibility of reminding the patients to take medication.

## 2.8 Conceptual frameworks

The literature review is based on the Health Belief Model (HBM). The HBM can be defined as an intrapersonal (within the individual, knowledge and beliefs) theory which is used in health promotion to design intervention and programs (Glanz, Lewis, & Rimer, 2002). The HBM is concerned with the health behaviour of people through examination of perceptions and attitudes people have towards disease and negative outcomes of certain actions. The model assumes that behaviour change occurs with the existence of three ideas at the same time:

- Perceived susceptibility and severity: assumes that an individual recognizes that there is enough reason to make a health concern relevant
- Perceived threat: assumes that person understands he or she may be vulnerable to a disease or negative health outcome
- Perceived benefits and barriers: which assumes that the individual must realize that behaviour change can be beneficial and the benefits of that change will outweigh any costs of doing so (Glanz, et al, 2002).

## 2.9 Summary

This chapter gives a discussion on what other researchers have published about the factors affecting adherence to ART both globally and locally. It discusses the patients' related factors, the medicinal factors and the health systems factors. It also outlined the HBM.

# CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

## 3.1 Introduction

This chapter discusses the research design and the method which was used to find answers to the research questions. It defines the study population, sampling, data collection tool and how the data collection tool was validated. The ethical consideration and subjects rights are also explained in this chapter.

## 3.2 Research design

A research design is the plan according to which we obtain research participant and collect information from them (Welman, Kruger, Mitchell, 2005, p.52). In this study, a quantitative, descriptive, exploratory, cross-sectional, analytical research design was used to assess the levels and determinants of adherence to ART in HIV infected people in Opuwo district, Kunene region, Namibia. According to Brink, (2006, p.102 - 103), a descriptive design is used in studies where more information is required in a particular field through the provision of a picture of the phenomenon as it occurs naturally. They further stated that the emphasis in the collection of data in descriptive study is on structured observation, questionnaires and interviews or survey study. The main aim of this researcher was to describe the levels of adherence and determinants of adherence to ART in Opuwo District.

## 3.3 Research method

Since there is no single method which can be used to assess medication adherence levels and determinants, three methods were used in this study. A structured questionnaire was used to collect data for self-reporting method. According to Brink,

(2006, p.151) structured interviews are formalised so that all respondents hear the same questions in the same manner and same order. A questionnaire with closed-ended or fixed alternative questions, including indicator on how the questions should be answered was used. This questionnaire is called an interview schedule (Brink, 2006 p.151). Pill count was conducted to determine if there are access tablets, or shortage. The third method used was the review of pharmacy records to see whether the participants are coming to collect the medication on time.

### 3.4 Study population

Various authors have defined the study population as the entire group of persons or objects that is of interest to the researcher, or those that meets the criteria which the researcher is interested in studying (Brink, 2006 p.123). Welman et al (2005, p.52), defined a population as the study object and which consist of individuals, groups, organisations, human products and events, or the conditions to which they are exposed.

In this study, the population was made up of all people living with HIV and AIDS who are receiving ART in Opuwo Health District in Kunene Region who met the inclusion criteria. There were 1241 people living with HIV and AIDS who were on ART in Opuwo Health District in Kunene Region.

### 3.4.1. Inclusion criteria

The people living with HIV and AIDS and were receiving ART in Opuwo Health District who were included in this study were:

- All people on ART who were aged 21 years and above
- All people on ART for more than 3 months
- All people on ART who can give an oral informed consent on their own

## 3.5 Sample and sampling procedures

Brinks (2006, p.124) defined a sample as a fraction of the whole population which was selected to participate in the study. The information gathered from the sample must be able to be interpreted to the entire population from which the sample was chosen. Sampling procedures refers to the way the sample was chosen from the study population. Sampling is the most feasible way of studying large populations, given resource, time and financial limitations.

### 3.5.1 Sampling procedures

There are two types of sampling; the probability or random sampling and the non-probability sampling. In the probability sampling, the sample is more likely to be a true representative of the population because all members of the population have an equal chance of being included in the sample. Probability sampling allows the researcher to estimate the sampling error, reduces bias, and use inferential statistics correctly (Brink, 2006, p.126). The researcher has chosen probability sampling so that all the people living with HIV and AIDS who are receiving ART in Opuwo Health District have any equal chance of being part of the sample. The examples of

probability sampling includes, simple random sampling, stratified random sampling, systematic sampling, and cluster sampling.

Systematic or interval probability sampling was utilised to recruit people in the sample until the sample size was reached. This method was easy and convenient because the list of people receiving ART each day at every health centre and clinic was available to the researcher.

### 3.5.2 The sample size

In order for study findings to be interpreted as applicable to the population from which the sample was taken, a minimum sample size need to be chosen. Brink (2006, p. 135) stated that the larger the sample, the better it is, as it is closer to the population itself. But a larger size will require more resources and after a certain maximum sample size is reached, increasing the sample size does not have a significant improvement on the findings, except in cases of rare conditions. Brink (2006, p. 135) states that selecting the appropriate sample size and obtaining it are challenges that face every researcher.

However, with advancement in technology there are computer software which can calculate the sample size. In this study the sample size was calculated using Epi-info 7.'s statcalc. At an expected frequency of 65 % (Tjituka, et al, 2013), 5% confidence limit, 95 % confidence interval, and from the population of 1241 people on ART the sample size was found to be 273 participants in Opuwo Health District. The number of participants from each health centre and clinic was calculated according to the

percentage of people on ART from that specific facility that makes up 100% of people on ART in Opuwo Health District. The percentage of people receiving ART from each facility was calculated using the following formula.

$$percentage\ for\ facility\ A\ = \frac{number\ of\ people\ on\ ART\ at\ facility\ A}{People\ on\ ART\ in\ Opuwo\ Health\ District} * 100$$

Of the 1241 people on ART in Opuwo Health District, a total of 938 were receiving their ART at Opuwo Clinic.

$$percentage\ for\ Opuwo\ Clinic\ = \frac{938}{1241} * 100 = 76\%$$

The sample size for Opuwo Clinic was than determined, by calculating 75% of the sample size.

$$sample\ for\ facility\ A\ = \frac{percentage\ of\ facility\ A}{100} * sample\ size\ for\ District$$

$$sample\ forOpuwo\ Clinic\ = \frac{76}{100} * 271 = 207$$

The percentage and sample size for each facility are given in the table below.

**Table 3.1 Percentage and sample size for each facility of people on ART in Opuwo Health District, 2015.**

| **Facility name** | **Number of people on ART** | **Percent (%)** | **Sample size** |
|---|---|---|---|
| Opuwo Clinic | 938 | 75.6 | 206 |
| Etanga Clinic | 3 | 0.2 | 1 |
| Etoto Clinic | 18 | 1.5 | 4 |
| Otjondeka Clinic | 35 | 2.8 | 8 |
| Epupa Clinic | 11 | 0.9 | 2 |
| Orumana Clinic | 30 | 2.4 | 7 |
| Okanguati Health Centre | 26 | 2.1 | 6 |
| Otjimuhaka Clinic | 43 | 3.5 | 10 |
| Otjokavare Clinic | 29 | 2.3 | 6 |
| Otuani Clinic | 20 | 1.6 | 4 |
| Sesfontein Health Centre | 58 | 4.7 | 13 |
| Otjiu Clinic | 6 | 0.5 | 1 |
| Oruvandjai Clinic | 24 | 1.9 | 5 |
| **Total** | **1241** | **100** | **273** |

The sampling interval for each health centre / clinic was calculated using the formula below.

$$sampling\ interval\ (K) = \frac{size\ of\ population\ (N)}{size\ of\ the\ sample\ (n)}$$

For Opuwo Clinic which had 938 people on ART, the sampling interval

s$ampling\ interval\ (Opuwo\ Clinic) = \frac{938}{225} = 4$

The sampling interval used for recruitment of participant at Opuwo Clinic was 4. The researcher used a table of random numbers to choose a random starting point. The procedure from calculation of the sampling interval and choosing a random starting point was repeated for all facilities which have more than 10 people on ART.

### 3.5.3 Data collection instrument and method

The researcher collected data by administering a structured questionnaire, by reviewing pharmacy records, and by using the pill count method. The researcher was the primary data collector assisted by a translator when the participant does not understand English, Herero language, and Wambo language, more specifically at Sesfontein Health Centre were the majority of the people only speaks Damara Nama language and Afrikans.

The first part of data collection was done by administering a structured questionnaire and recording the response in the form separate for each participant. The same participants' left over pills were than counted. The numbers of tablets they are supposed to be left with were calculated with the help of the pharmacist who has the records of how many pills each person received. The findings for pill count were recorded on the same form for the structured questionnaire. The appointment keeping for that specific participant for the last 3 months were reviewed and recorded on that specific person's questionnaire.

The time period the researcher stayed in the field collecting data was from the beginning of September to the middle of December 2015.

**3.6 Pilot**

Brinks (2006, p.148) defined a pilot study as a process of administering the research instrument to a limited number of subjects from the population of interest to detect possible flaws in the measurement procedure and to identify unclear or ambiguously formulated items. It gives the researcher an opportunity to make adjustment were need be before starting the actual data collection. In order to pre-test the feasibility of the study and the data collection tool, the researcher conducted a pilot study at Opuwo CDC Clinic. The pilot study was done on 23 participants who met the inclusion criteria. At the end of the pilot study following changes were made to the questionnaire:

- A written informed consent was replaced with an oral informed consent because majority of people cannot write and asking them to sign was met with a lot of resistance
- The options of monogamy and polygamy were asked the people who are cohabitating and not only to married ones
- A question “at what time do you take your pills?” was added preceding the question asking if one delays taking they pills
- The systematic sampling was changed to be done as participants comes into the consultation room and not based on appointments for the day or health passport handed in as was planned.

The identity of people who took part in the pilot study was recorded by coding to ensure they did not participate in the actual study.

### 3.7 Data analysis

The findings were coded in order to enable the computer program to read the findings. After coding the data were line-listed in Microsoft excel and exported to epi info 7 which was used to analyse the data. The findings from all facilities were combined on the same li ne list. The data were summarised into proportions and percentages and presented in forms of graphs, charts, and tables.

### 3.8 Ethical considerations

Brinks (2006, p.30) stated that, in order to conduct the research ethically, the researcher must carry out the research competently, manage resource honestly, acknowledge fairly, communicate the results accurately, and consider the consequences of the research for the field of study in particular and for society in general. Some ethical principle which guided the researcher in the study were; permission, informed consent, right to privacy, voluntary participation, anonymity, and confidentiality.

#### 3.8.1 Permission

The researcher was given an ethical clearance certificate to conduct the study by the University of Namibia Research Ethic Committee (UREC). The permission to conduct the study was granted by the Ministry of Health. The consent to conduct the

study in Opuwo Health District was granted by the Regional Director, the acting Chief Medical Officer (CMO) and the District Primary Health Care Supervisor.

### 3.8.2 Informed consent

At the point of recruitment, the researcher explained the purpose of the study and the benefits to the respondents before an oral informed consent was obtained in the presence of the nurse responsible for ART service. The informed consent and the interview were conducted in oshiwambo and herero languages by the researcher, while the damara nama language interviews were conducted through the interpreter who works as a community councillor in that community.

### 3.8.3 Right to privacy and voluntary participation

In this study the research participants were all informed of their right to withdraw from the study at any time, the right to refuse to provide information and the right to ask for clarification regarding the study. All participants were recruited on voluntary basis.

### 3.8.4 Anonymity

The identities of all participants were protected to ensure anonymity and no names were recorded. The researcher did not reveal any identity of participant to anybody.

### 3.8.5 Confidentiality

In order to ensure confidentiality, the researcher made sure that no information provided by the participants during the course of the study was either divulged or made available to any person throughout the study.

### 3.9 Validity and reliability of the data

Brink (2006, p.165) noted that reliability and validity are related in the sense that they are both equally important. He further stated that there is no point in using an instrument which is not valid, however reliable it might be. At the same time a valid instrument that is not reliable is equally useless. A reliable instrument can yield comparable results under comparable settings. Having spent over a year in facilities in Opuwo Health District, the researcher was familiar with the environment in which the study was conducted, hence reliability was high. Validity is concerned with whether the instrument actually measures what it is intended to measure. The instrument was evaluated by the Ministry of Health, the supervisors and my nurses at the Opuwo cdc clinic, after which adjustment were made. The pilot study which was conducted also helped in increasing both validity and reliability.

### 3.10 Dissemination of research findings

Findings from the study will be disseminated to The University of Namibia, The Ministry of Health at national level, and Kunene Regional Health Directorate and the Opuwo Health District at regional and district level respectively.

### 3.11 Summary

In this chapter the researcher gave an in-depth description of the research methodology. The study employed a quantitative, descriptive, exploratory, cross-sectional study which was considered more appropriate in addressing the study

objectives. The population size, sample size, and sampling method were discussed in more details. The researcher also explained the methods used in recruiting study participants, and addressed ethical issues. The validity and reliability of the study were discussed and the pilot study which ensured them was also outlined. The next chapter presents the findings of the study.

# CHAPTER 4: RESEARCH FINDINGS AND DISCUSSIONS

## 4.1 Introduction

This chapter presents the findings of the research and discusses the data analysis. The information was collected using structured interviews which were conducted with 281 people who were on ART at selected Health facilities in Opuwo Health District. The health facilities at which the interviews were conducted were: Epupa Clinic, Etanga Clinic, Etoto Clinic, Okanguati Health Centre, Opuwo Clinic, Orumana Clinic, Oruvandjai Clinic, Otjimuhaka Clinic, Otjokavare Clinic, Otuani Clinic, and Sesfontein Health Centre. The results from the pills count and pharmacy refill were also presented. Only 0.5% (n=5) people from Opuwo CDC Clinic did not give an informed consent and were hence not interviewed.

It describes the demographic data and socio-economic characteristics of the study's participants, and the factors which influence them when it comes to adhering to the ART. Proportions, chi-squares and P-values were calculated for each variable in order to assess the existence of any possible statistical significance between variables. The questionnaire used to conduct the structured interviews was made up of five (5) sections. Section A collected the demographic data and socio-economic status of the respondents. Section B probed the information about medicinal factors. Section C gathered information about the health system factors. Section D collected information about patient related factors. Section E investigated the levels of adherence using self-reporting, pharmacy refills, and pill count. The results are presented according to the five sections of the questionnaire.

## 4.2 Section A: Demographic and Socio-economic information

Demographic and socio-economic variables are variables which the researcher has no control over. The demographic and socio-economic variables which were analysed in this study were gender, age, marital status, ethnicity, area of residence, name of health centre / clinic, employment status, and educational level, and religion.

### 4.2.1 Gender

Gender is one of the important variables which can influence a person's behaviour and decisions when it comes to taking their medication. The distribution of gender for respondents in this study is show in the figure below.

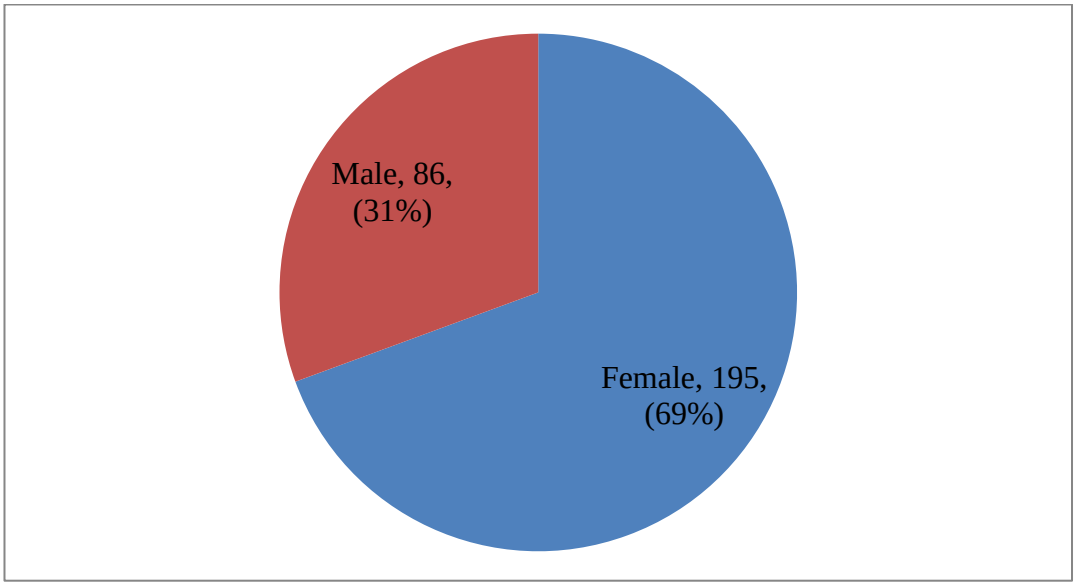


**Figure 4.1.1 Gender of respondents, Opuwo Health District, September – December, 2015.**

In this study a total of 195 (69%) of the respondents were females while only 86 (31 %) were male. According to the Namibia 2011 Population and Housing Census main Report, the sex ratio in Kunene Region was 101 males to 100 females. The large

difference in number of males and females who were recruited in this study can be due to the facts that most people only get initiated on ART once they go for antenatal care. Males on other hand don not have a medical condition that requires HIV testing. However, literature shows a similar representation of gender when it comes to HIV / AIDS testing. In fact the 5 years trend shows a continuous decline in the percentage of males who comes for the HIV / AIDS as shown in the two tables below **( Extracted** from The Ministry of Health and Social Services Annual report for the Kunene Region, for the 2011/2012 and 2013/2014 annual years p. 27 and p. 28 respectively).

**Table a) Regional HIV Counselling and Testing statistics by sex 2008/09 – 2011/12**

| **Area** | **2008/2009** | **2009/2010** | **2010/2011** | **2011/2012** |
|---|---|---|---|---|
| Female tested | 4390 (59.4%) | 4937 (63.3%) | 6621 (64.8%) | 8498 (69%) |
| Male tested | 3001 (40.6%) | 2868 (36.7%) | 3593 (35.2%) | 3839 (31%) |
| Total tested | 7391 | 7805 | 10214 | 12337 |
| Tested Positive | 855 (11.6%) | 716 (9.2%) | 741 (7.3%) | 743 (6%) |

**Table b) Regional HIV Counselling and Testing statistics by sex 2009/10 – 2013/14**

| Area | 2009/2010 | 2010/2011 | 2011/2012 | 2012/2013 | 2013/2014 |
|---|---|---|---|---|---|
| **Female** | 4937 (63.3%) | 6621 (64.8%) | 8498 (69%) | 8663 (70%) | 9934(72%) |
| **Male** | 2868 (36.7%) | 3593 (35.2%) | 3839 (31%) | 3763 (30%) | 3811(28%) |
| **Total** | **7805** | **10214** | **12337** | **12426** | **13745** |
| **Tested Positive** | 716 (9.2%) | 741 (7.3%) | 743 (6%) | 673 (6%) | 568 (4.1%) |

The gender representation as observed in HIV / AIDS testing from 2012 to 2014. These trends and the study findings are in disagreement with findings by Machtinger & Bangsberg , (2006), who concluded that gender, educational level, insurance status, and HIV risk factors generally are not associated with adherence behaviour. However they noted that when an association is found, the direction is always consistent.

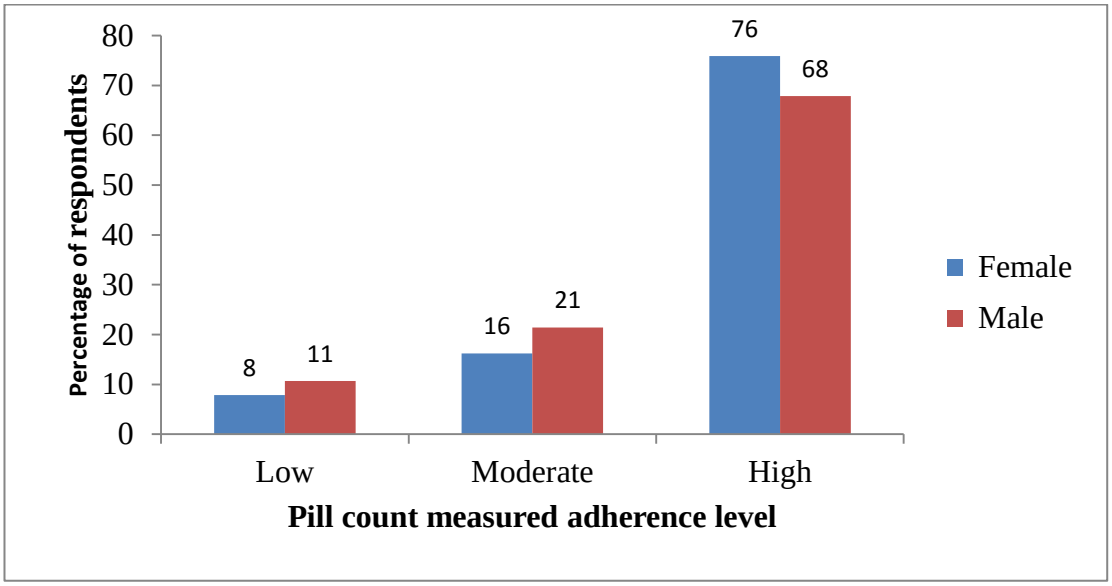


**Figure 4.1.2 Percentage of respondents and their level of adherence measured by pill count**

From the bar graph, it is clear that a larger percentage of male had low and moderate levels of adherence. Female had a higher percentage 75% of higher adherences compared to male with 68%. The percentage of males who reported missing a dose was 30% while female were 27%. These results indicate that overall females had higher level adherence compared to male. However the P-value = 0.16, so the difference is not statistically significant.

**Table 4.1 Gender distribution of respondents by rate of adherence measured using pharmacy refill**

| | **Rate of adherence measured by pharmacy refill (%)** | | |
|---|---|---|---|
| **Sex** | on or before (high) | < 3 days late (moderate) | > 3 days late (low) |
| **Female** | 84 | 8 | 9 |
| **Male** | 77 | 14 | 9 |
| | | | |

A large percentage of female had a high rate 84% of adherence compared to male 77%. Male had a high rate 14% of moderate adherence compared to females whose moderate adherence was only 8%. All gender had an equal 9% rate of low adherence.

These findings are in agreement with findings by Sasaki Y, Kakimoto K, Dube C, Sikazwe I, Moyo C, Syakantu G, Komada K, Miyano S, Ishikawa N, Kita K, Kai I, (2012), in rural Zambia where results showed that women had a high percentage 68% for full adherence compared to male. But again the difference in Opuwo district is not statistically significant.

### 4.2.2 Age of respondents

The distribution of respondent by age group is presented in the table below.

**Table 4.2 Age groups of respondents, Opuwo Health District, September – December, 2015.**

| **Age group** | **Frequency** | **Percent (%)** |
|---|---|---|
| 20 – 29 | 35 | 12.5 |
| 30 – 39 | 94 | 33.5 |
| 40 – 49 | 65 | 23.1 |
| 50 – 59 | 64 | 22.8 |
| 60 + | 23 | 8.2 |
| **Total** | **281** | **100.0** |

From table 4.2.1 above it is clear that the majority of respondents 94 (33.5%) were from the 30 – 39 years age group, followed by the 40 – 49 age group with 65 (23.1%). The age group with the least number of respondent was the 60 years and above with 23 (8.2%).

The minimum age of respondents in this study was 21 years, the maximum age was 77 years, the mean age was 43 years, and the median age was 42 years while the modal age was 49 years. Since the mean, the median and the mode age are in the same age group, the plot of the respondent distribution by age group shows a symmetrical shape which means it is a normal distribution.

### 4.2.3 Marital status

The distribution of the respondent by marital status are presented in the bar graph below.

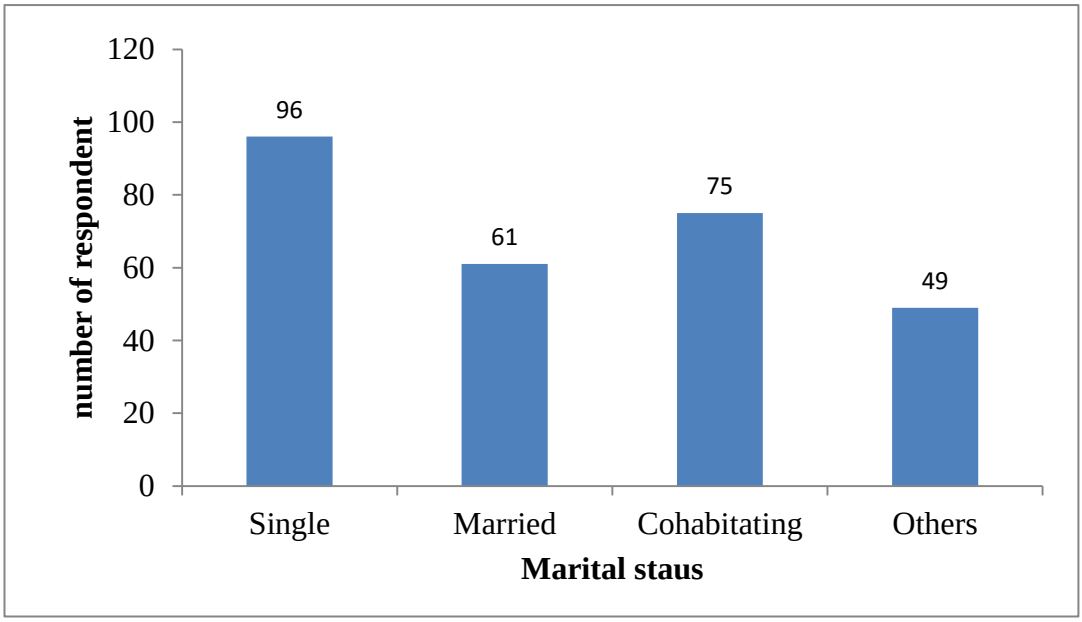


**Figure 4.2 The distribution of respondents by marital status.**

From figure 4.2 it can be seen that the majority of respondents 96 (34%) in this study were single, followed by the cohabitating category with 75 (27%). Having a large number of unmarried people may weaken adherence because it is much easier when one has a treatment supporter in the form of a spouse who help encourage and reminding them to take their medication. These findings are in agreement with the Namibia 2011 Population and Housing Census main report which said that 56% of people in Kunene region who are 15 years and above were never married. The report also showed that only 18% have marriage certificate, which is closer to the 61 (22%) of respondents who were married in this study. Out of the 136 people who are

married or cohabitating, 116 (85%) are married and monogamy while the remaining 20 (15%) were in polygamous marriage.

**Table 4.3 Table 4.1 Marital status distribution of respondents by rate of adherence measured using pharmacy refill**

| | **Rate of adherence measured by pharmacy refill (%)** | | |
|---|---|---|---|
| **Marital status** | **on or before (high)** | **< 3 days late (moderate)** | **> 3 days late (low)** |
| **Cohabitating** | 84 | 8 | 8 |
| **Married** | 89 | 2 | 10 |
| **Single** | 82 | 11 | 6 |
| **other** | 67 | 18 | 14 |

Married people recorded are high rate 89% of adherence followed by cohabitating 84% and single 82%, other group only had a 67% of high adherence. When it comes to low adherence rate, other groups had a 14% followed by married 10%, while the cohabitating and the single were at 8% and 6% respectively. In their study in rural Zambia, Sasaki et al, (2012), found that married participants had a high percentage of full adherence compared to male. For the chi-square test, the married and cohabitating were grouped together while the singles, separated, windows and divorced were grouped together. They P-value = 0,06 showing no statistically significance.

### 4.2.4 Ethnicity

The ethnic groups of respondent in this study are presented on a bar graph below.

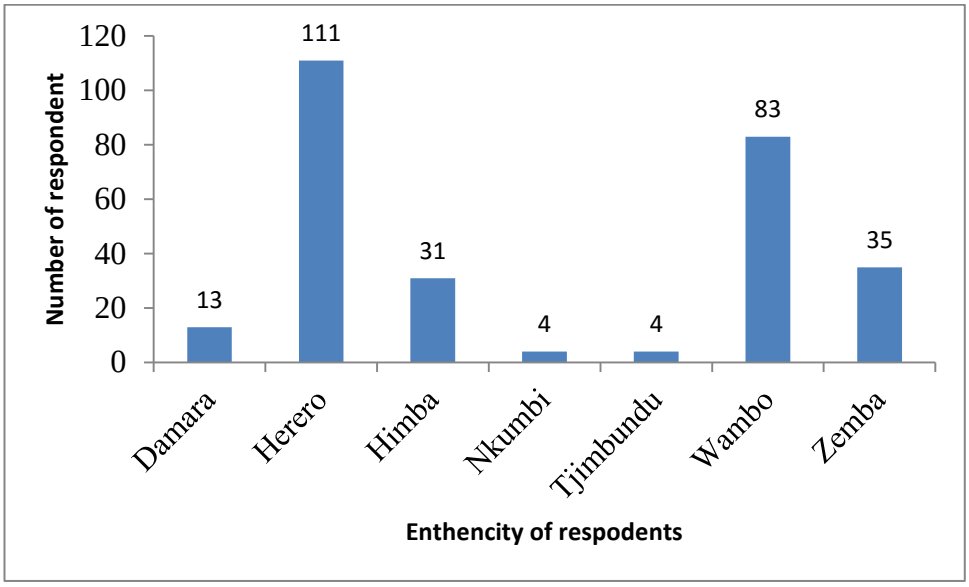


**Figure 4.3 Distribution of respondent by ethnic group.**

A large number of people who participated in this study where the Herero 111 (40%) followed by Wambo 83 (30%). The Dhembas and Himbas were 35 (13%) and 31 (11%) respectively. There were 13 (5%) Damaras while the Nkumbis and Tjimbundu only constituted 4 (1.4%) each. According to a study by Machtinger and Bangsberg (2006), ethnicity is one of sociodemographic factors which are predictor of adherence. The percentage of respondent who reported missing a dose distributed according to their ethnic groups are shown in the table below.

**Table 4.4 The percentage of respondent who reported missing a dose per ethnic group**

| | **Have you ever missed a dose** | | | |
|---|---|---|---|---|
| **Ethenicit** | **Yes** | **No** | **TOTAL** | **Percent missed dose** |
| Damara | 4 | 9 | 13 | **30.8** |
| Herero | 32 | 79 | 111 | **28.8** |
| Himba | 15 | 16 | 31 | **48.4** |
| Nkumbi | 1 | 3 | 4 | **25.0** |
| Tjimbundu | 1 | 3 | 4 | **25.0** |
| Owambo | 14 | 69 | 83 | **16.9** |
| Dhemba | 11 | 24 | 35 | **31.4** |

A total of 15 (48%) of the Himbas reported missing a dose, followed by Dhembas 11 (31%) and Damaras 4 (31%). About 32 (29%) of Hereros reported missing a dose, the Nkumbis and the Tjimbundus only 1 (25%) each, while among the Owambos only 14 (17%) reported missing a dose. Table 4.4 shows that Himbas have a high percentage but as one looks at other socio-economic factors such as educational level and employment status, one might get a different idea why the majority of them reported missing doses. Studies have report conflicting evidence about the association between sociodemographic factors and adherence behaviour, however younger age, non-white race/ethnicity, lower income, lower literacy, and unstable housing are associated with nonadherence in resource-rich settings (Machtinger & Bangsberg. (2006).

### 4.2.5 Name of health facilities

The numbers of people recruited at each health facility are shown in the table below**.**

**Table 4.5 The number of people recruited at each health facility**

| **Name of Health Centre / Clinic** | **Frequency** | **Percent** |
|---|---|---|
| Epupa Clinic | 7 | 2.5% |
| Etanga Clinic | 3 | 1.1% |
| Etoto Clinic | 5 | 1.8% |
| Okanguati Health Centre | 6 | 2.1% |
| Opuwo CDC Clinic | 215 | 76.5% |
| Orumana Clinic | 5 | 1.8% |
| Oruvandjai Clinic | 5 | 1.8% |
| Otjimuhaka Clinic | 10 | 3.6% |
| Otjokavare Clinic | 5 | 1.8% |
| Otuani Clinic | 6 | 2.1% |
| Sesfontein Health Centre | 14 | 5.0% |
| **TOTAL** | **281** | **100.0%** |

A large number of respondents 215 (77%) in this study were interviewed at Opuwo CDC Clinic while the rest of the facilities had only between 1 to 5% of respondents.

**Table 4.6 Rate of adherence measured by pharmacy refill per health facility**

| | **Rate of adherence by pharmacy refill** | | |
|---|---|---|---|
| **Health Centre** | **1 - 3 days late (Moderate)** | **> 3 days late (Low)** | **On or before (High)** |
| **Epupa Clinic** | 0 | 29 | 71 |
| **Etanga** | 0 | 33 | 67 |
| **Etoto** | 0 | 0 | 100 |
| **Okanguati** | 0 | 0 | 100 |
| **Opuwo cdc clinic** | 13 | 8 | 80 |
| **Orumana Clinic** | 0 | 0 | 100 |
| **Oruvandjai** | 0 | 0 | 100 |
| **Otjimuhaka Clinic** | 0 | 10 | 90 |
| **Otjokavare Clinic** | 0 | 20 | 80 |
| **Otuani** | 0 | 0 | 100 |
| **Sesfontein** | 0 | 21 | 79 |

Table 4.6 show that all the respondents who were interviewed at Etoto Clinic, Otuani Clinic, Orumana Clinic, Okanguati Health Centre, and Orundjai Clinic were all up-to-date with their pharmarcy appointment having a 100% adherence. Etanga Cling recorded the lowest percentage 67% of respondent who are up-to-date with their appointments in the last 3 months. It was followed by Epupa Clinic with 71%, Sesfontein Clinic with 79 %, Opuwo CDC Clinic and Otjokavare Clinic with 80%,

and Otjimuhaka Clinic recorded 90% of respondents who were on time for the refill appointments in the last 3 months.

The moderate rate of adherence was only recorded at Opuwo CDC Clinic with 13% of respondents being 1 to 3 days rate on their pharmacy appointments.

When it comes to respondents who were more than three days late for the refill in the last 3 months, Etanga Clinic had the highest of 33%, followed by Epupa Clinic with 29%, Sesfontein Clinic had 21%, Otjokavare Clinic recorded 20%, Otjimuhaka Clinic recorded 10% while Opuwo CDC Clinic recorded the lowest of 8%. The lowest percentage of respondents who were more than 3 days late at Opuwo CDC Clinic can be attributed to the fact that Opuwo CDC Clinics gives ART services every day, while other health facilities only gives ART services once a month with the majority giving ART services once every three month. All other clinics that reported some percentage of being more than three days are very far from Opuwo where the people have to go get their medication if they miss their appointment date at the outreach facilities. Given that the majority of the respondents are unemployed, the issue of transport or cost of transport might be the reason why they were late with more than 3 days.

If a person did not come on the specific day the facility is giving ART service, one has only the option of traveling to Opuwo or stay without medication until after a month or three when the next ART outreach service will visit the facility.

**Table 4.7 Rate of adherence measured by pharmacy refill per health facility**

| | **Rate of adherence by pill count** | | |
|---|---|---|---|
| **Health Centre** | **<80% (low)** | **> 95% (high)** | **80 - 95 % (moderate)** |
| **Epupa Clinic** | 14 | 71 | 14 |
| **Etanga** | 33 | 67 | 0 |
| **Etoto** | 0 | 100 | 0 |
| **Okanguati** | 0 | 67 | 33 |
| **Opuwo cdc clinic** | 10 | 72 | 18 |
| **Orumana Clinic** | 40 | 40 | 20 |
| **Oruvandjai** | 0 | 60 | 40 |
| **Otjimuhaka Clinic** | 10 | 80 | 10 |
| **Otjokavare Clinic** | 0 | 80 | 20 |
| **Otuani** | 0 | 100 | 0 |
| **Sesfontein** | 0 | 73 | 27 |

Table 4.7 shows that respondents who were recruited at Etoto and Otuani Clinics recorded a 100% high adherence rate measured by pill count. The lowest percentage of respondents with high pill count adherence were Oruman Clinic 40%, followed by Oruvandjai Clinic with 60%, Okanguati Health Centre, and Etanga Clinic 67%, Epupa Clinic 71%, Opuwo CDC Clinic 72%, Sesfontein Clinic 73%, while Otjokavare and Otjimuhaka Clinic were at 80%.

### 4.2.6 Employment status

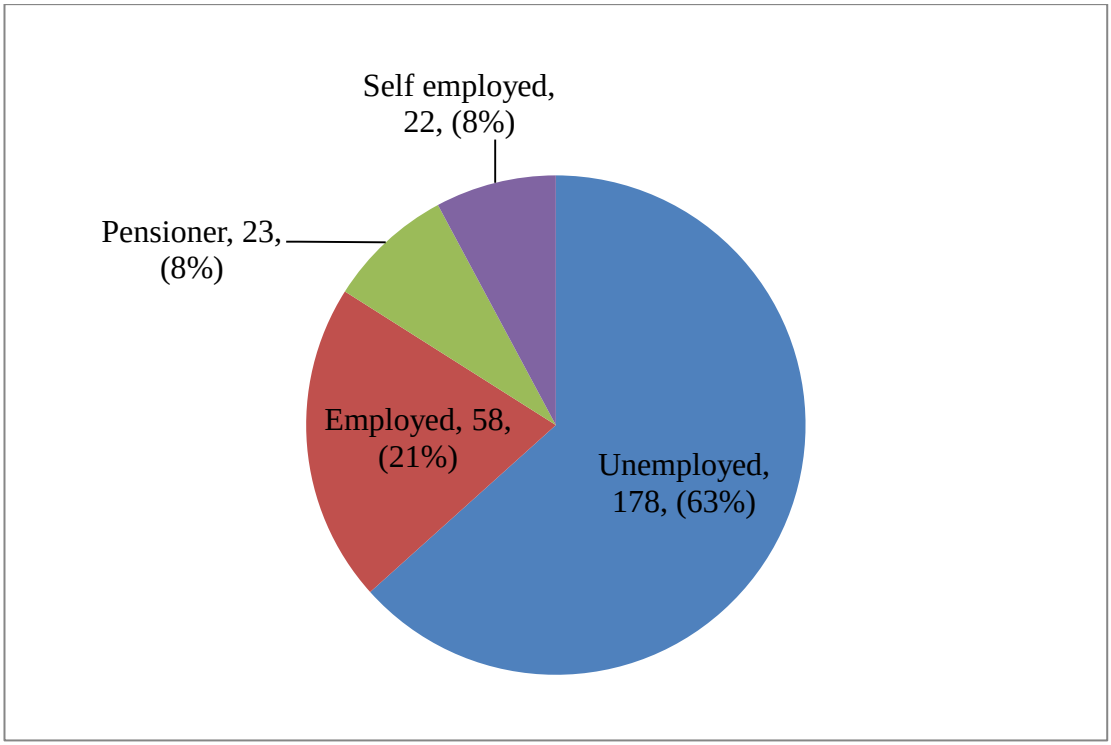


**Figure 4.4 The employment status of respondents**

The majority of respondents 178 (63%) in this study were unemployed, 80 (29%) were employed and 23 (8%) were pensioners.

**Table 4.8 The percentage of respondent from different employment status compared to their rate of pill count measured adherence**

| | **Rate of adherence measured by pill count** | | | |
|---|---|---|---|---|
| **Employment** | **Low (%)** | **Moderate (%)** | **High (%)** | **Not done (%)** |
| Employed | 6.1 | 17.1 | 75.6 | 1.2 |
| Pensioner | 23.5 | 5.9 | 70.6 | 0.0 |
| Unemployed | 8.2 | 18.7 | 70.3 | 2.7 |

The large proportion 76% of respondents with a higher rate adherence measured by pill count was observed among the working group, followed by pensioners with 71% while the unemployed group with higher rate of adherence was 70%. About 23% of pensioners has a low rate of pill count measured adherence, followed by the unemployed at 8%, and lastly the employed at 6%. These results show that the employed respondents have a higher rate of adherence compared to the pensioners and the unemployed combined. These results are consistent with a study in Kwazulu-Natal by (Michel J, Matlakala C, English R, Lessells R, Newell M, 2013) who found that a proportion that had lack of food and lack of transport money reported skipping medications. In this study majority of respondents are unemployed, which means they do not have enough money to buy food and pay for transport.

### 4.2.7 Educational level

The educational level of the respondents are presented in figure 4.5 below.

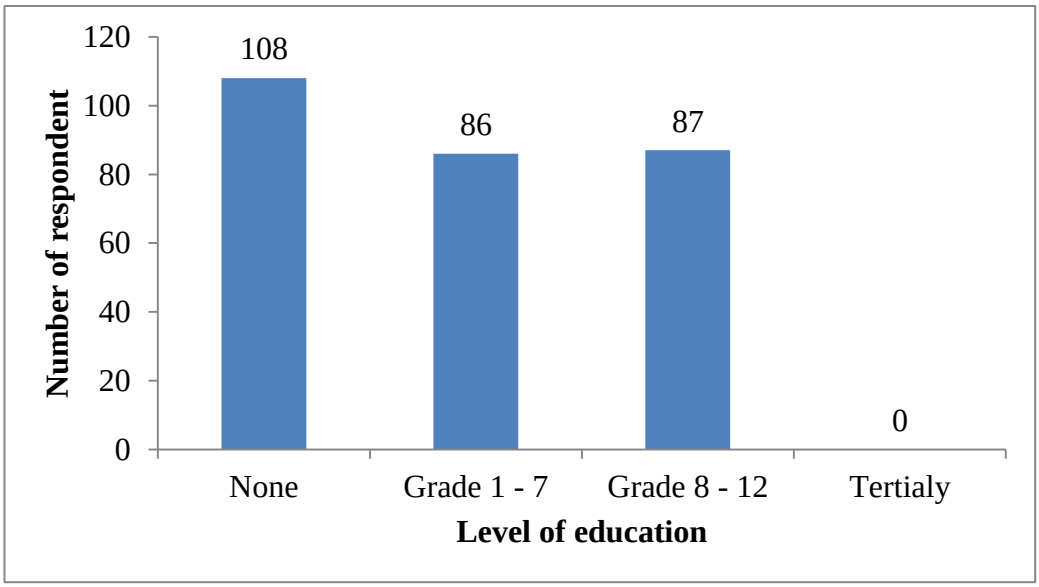


**Figure 4.5.1 Educational level distributions of respondents**

A total of 108 (38%) of respondent have not attended formal school, 86 (31%) of respondents had primary education, 87 (31%) had secondary education. None of the 281 respondents is in possession of a tertiary qualification.

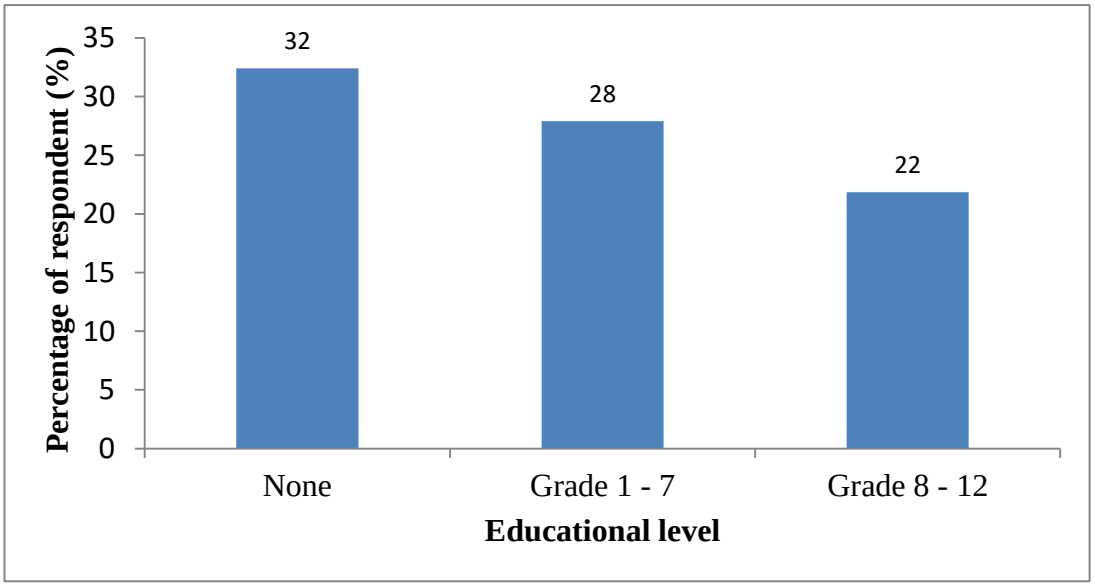


**Figure 4.5.2 Percentage of respondents who reported missing a dose from different educational levels**

From figure 4.4.1 it is clear that the percentage of respondents who reported missing dose increases as the educational level decrease. Only 22 % of those who have attended secondary school reported missing a dose, while the percentage of those who have only attended primary school and those who have not attended any formal school were 28% and 32% respectively. This might be due to the fact people who have attended secondary education have a better understanding than those who have not attended school.

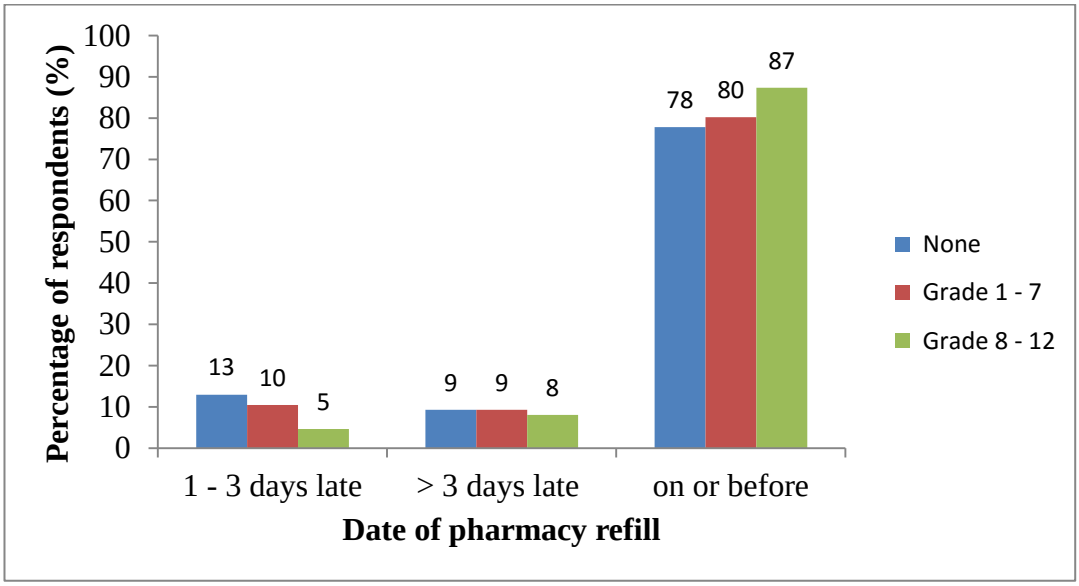


**Figure 4.5.3 Percentage of respondents and the date they come for pharmacy refill**

From figure 4.5.3, one can see that have a high level of education (grade 8 – 12) recorded a high percentage 87% of those who came on time for the pharmacy in the last 3 months before the study, followed by the grade 1to 7 group with 80% while those who have not attended school were only 78%. For the respondents who were 1 to 3 days late, the uneducated topped the list with 13% of respondents who were less than 4 days late, followed by the grade 1 to 7 group, while the group that has attended grade 8 – 12 had only 5% in this category. This is a clear indication that the level of education has something to do with respondents' appointment keeping. The more educated the respondents the more likely they are to be on time, the less educated the respondent the likely they were to be on time for refill appointments.

According to a study by Hansana V, Sanchaisuriya P, Durham J, Sychareun V, Chaleunvong K, Boonyaleepun S, Schelp FP, (2013), educational level at secondary

school had an (p=0.012) which is protective against poor adherence. Their findings were in agreement with this study were educational level of grade 8 to 12 had a higher proportion of good adherence. For the Opuwo district the educational level had (risk ratio = 0.8, 95% CI 0.73 – 0.96, p-value = 0.02) measured by pill count. The p-value = 0.02 which is less than 0.05 shows that educational level had a statistically significant difference at 95% confidence. The risk ratio of 0.8

(less than 1) indicate that the association between educational level and pill count is protective. The risk ratio's 95% CI of 0.73 – 0.96 shows that the difference is significant because the interval does not include but it includes the risk ratio.

## 4.3 SECTION B: Medicinal factors

### 4.3.1 Which of the following factors makes it difficult for you to take medicine?

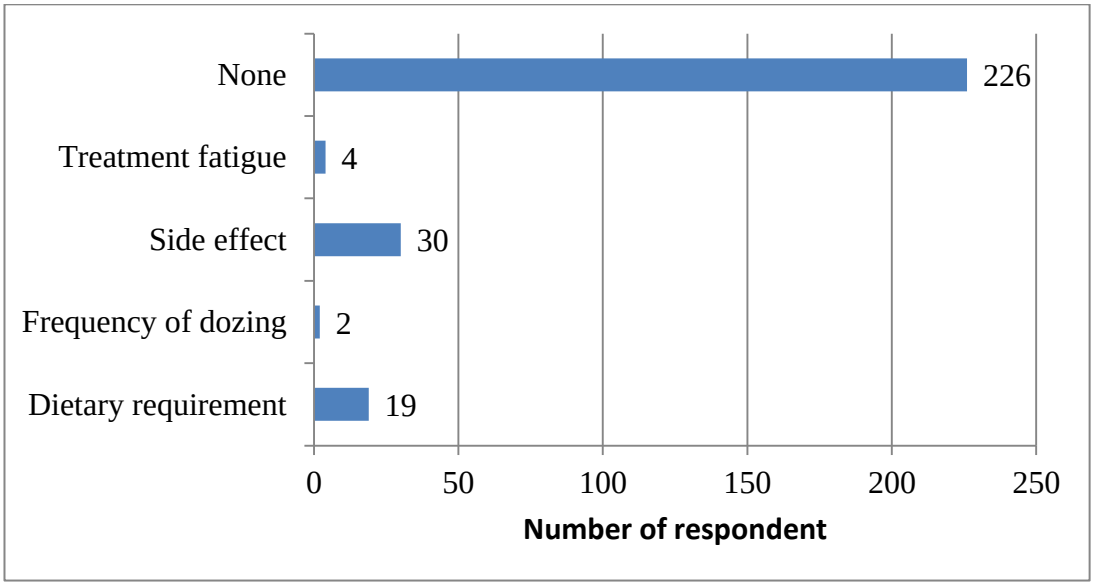


**Figure 4.6. Distribution of respondents by medicinal factors**

A total of 30 (11%) respondent reported suffering from medication side effect, 19 (7%) complained of dietary requirements, 4 (1%) suffer from treatment fatigue and 2 (1%) reported the frequency of dozing as the medicinal factors which makes it difficult to adhere to their medication. A large number 226 (80%) of respondents said they do not suffer from any medicinal factors. This is in agreement with the changes that were introduced in the ART services such as reducing the number of pills, the frequency of dozing and most drugs now have very little side effect and dietary requirements. Malnutrition which is linked to dietary requirement was linked to non-adherent in a study in Northern Ethiopia by Berhe N, Tegabu D, Alemayehu M, (2013). A large proportion of the malnourished people were in the poor adherent group. A study in Viet Nam by Do HM, Dunne MP, Kato M, Pham CV, Nguyen KV, (2013), medicinal side effects were associated with poor adherence.

### 4.3.2 Are you taking any other medication, including traditional medicine apart from ARV?

A total of 250 (89%) of the respondents were not taking other medication, while the remaining 31 (11%) reported taking other medication as well. The table below show the medical condition for which the 11% are also being treated.

**Table 4.9 Medical conditions / medication which respondents are being treated for**

| If yes please specify | Frequency | Percent |
|---|---|---|
| TB | 5 | 16.1 |
| BP | 9 | 29.0 |
| Heart disease | 3 | 9.7 |
| Asthma disease | 1 | 3.2 |
| Muscular skeletal disease | 1 | 3.2 |
| Epilepsy | 1 | 3.2 |
| For ever living product | 2 | 6.5 |
| Traditional medicine feet pain | 1 | 3.2 |
| Traditional medicine for heart pain | 1 | 3.2 |
| Zinc pill | 7 | 22.6 |
| **Total** | **31** | **100.0** |

About 9 (30%) were receiving treatments for blood pressure, 9 (30%) were taking supplementary medicine, 5 (16%) were on treatment for TB, 3 (10%) were being treated for heart disease, 2 (6%) were taking traditional medicine. The ART being given currently are known to have no problem when it comes to taking them with other drugs except if the number of pills are too many, than the patient might have poor adherence due to pill burden.

Only one of respondent who was taking traditional medicine reported that he experienced a problem taking it with ARV, which forced him to stop taking ARV.

He was only restarted later when he saw that he was not getting better with traditional medicine.

## 4.4 Section C: Health system factors

### 4.4.1 How long does it take you to reach the clinic?

The time duration it takes respondents to reach the health facility using different mode of transport is presented in the bar graph below.

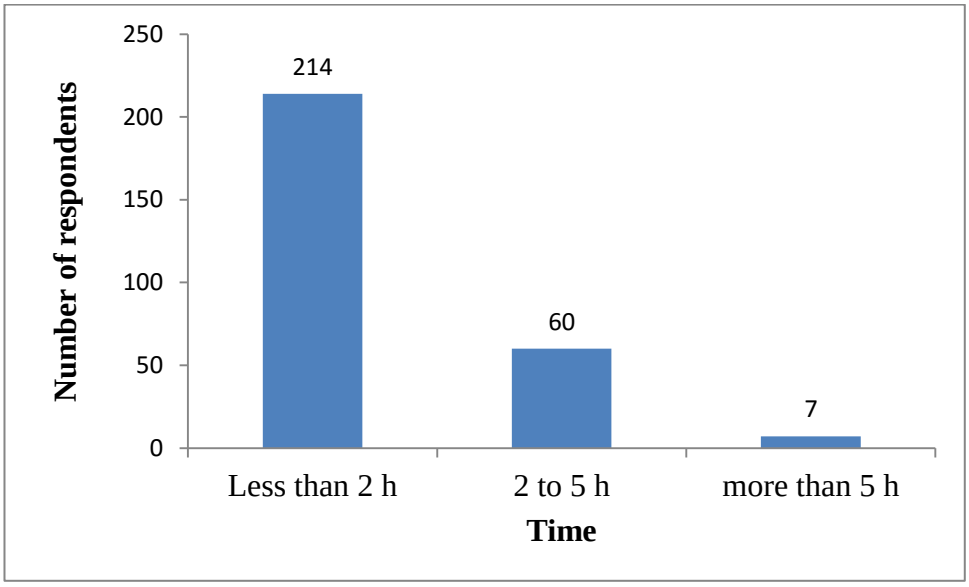


**Figure 4.7 Distribution of respondents by the time it takes them to reach the health facility**

The majority of respondents 214 (76%) takes less than 2 hours to reach the health facility, 60 (21%) takes between 2 and 5 hours, and the remaining 7 (3%) takes more than 5 hours. A longer distance to the facility can read to people not coming on time for their appointment especially in a place where transport is scarce. Some

respondents who stay far from the facility reported they come to the facility a few days in advance to make sure they do not miss their appointments.

### 4.4.2 What mode of transport do you use to get to the clinic?

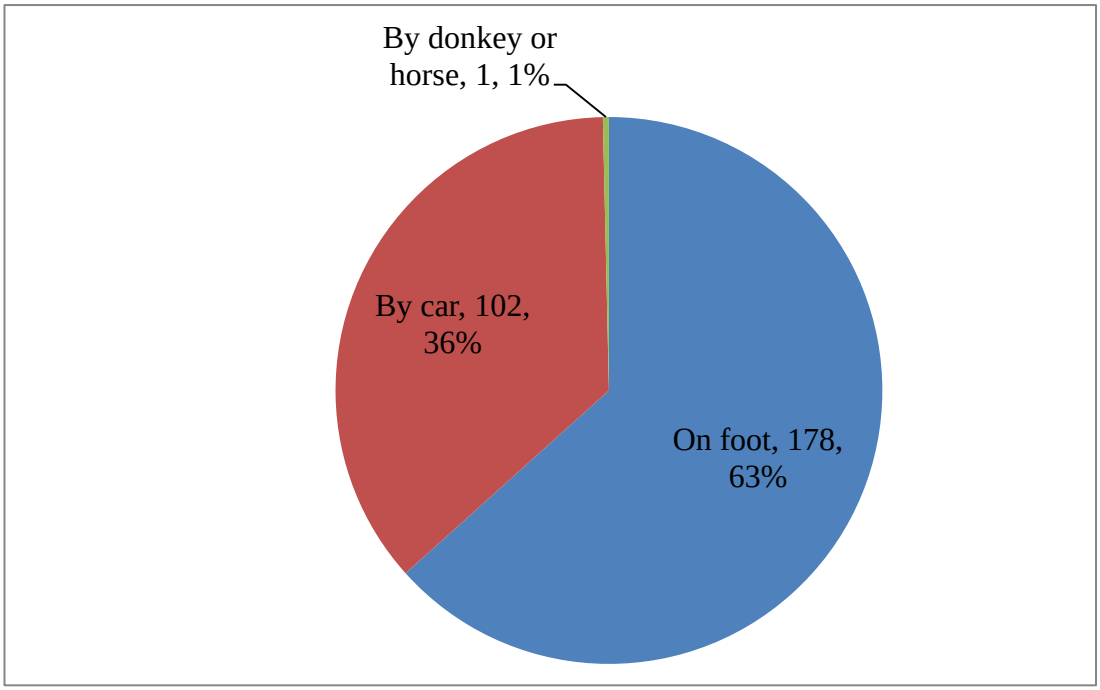


**Figure 4.8 Distribution of respondents by their mode of transport**

Majority of respondents 178 (63%) reach the health facility on foot while 102 (36%) reach to the facility by cars while the remaining 1 (1%) reach the facility by using a donkey. Table 4.5 shows that majority of the respondents were recruited at Opuwo CDC Clinic and majority of them stays in town and the villages near town so they can foot to the health facility.

### 4.4.3 How easy is it for you to come to the health facility for all your appointments?

**Table 4.10 How easy or difficult it takes the respondent to reach the health facility**

| How easy is it for you to come to the health facility for all your appointments | Frequency | Percent |
|---|---|---|
| Very easy | 142 | 50.5 |
| Easy | 4 | 1.4 |
| Not easy, not difficult | 69 | 24.6 |
| Difficult | 49 | 17.4 |
| Very difficult | 17 | 6.0 |
| **Total** | **281** | **100** |

Table 4.10 shows that about 52% of respondents revealed that it is easy for them to reach the health facility where they get their ART. The group that answered that its neither easy nor difficult in assessing the health facility had 69 (25%) respondents. The remaining 17 % finds it difficult with the last 17 (6%) of respondents answered that it is very difficult for them to get to the health facility. The percentage that finds it difficult and very difficult to get to the health facility may also find it difficult to adhere due to accessibility to health care, as Adefolalu et al, (2013), stated in their study that the barrier to adherence were transportation, homelessness, lack of access to food and water and poor accessibility to health facilities .

### 4.4.4 How do you rate the service of the health worker at the ART clinic?

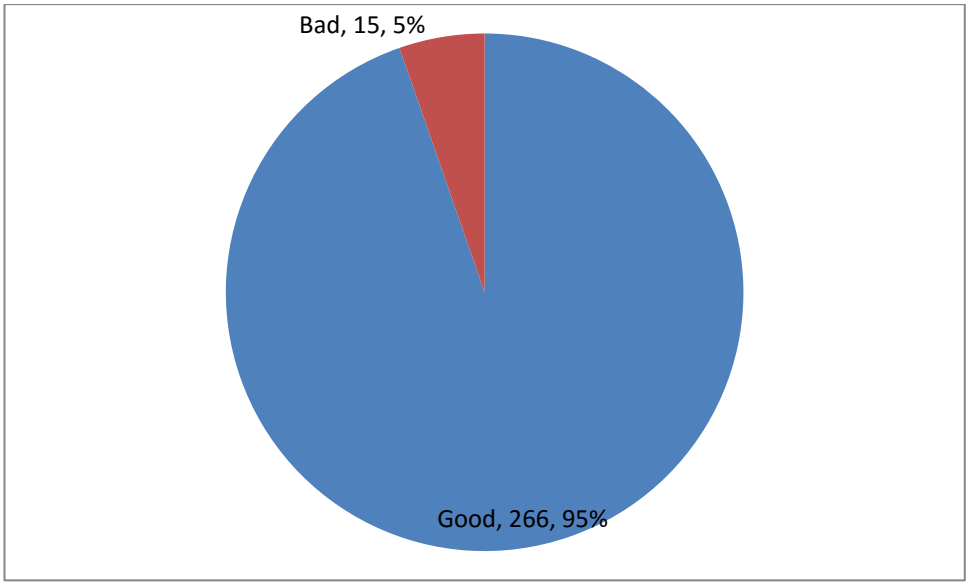


**Figure 4.9 Response of respondents on whether the health workers are always present on date of pharmacy refill**

A large number 266 (95%) of reported that the service they receive at the ART clinics is good compared the remaining 15 (5%) who reported that the service was not good. The 95% satisfied respondents is a good thing because good health worker patients relationship facilities good adherence.

**Table 4.11 Reasons given by 5% of respondents who said the health service they get was not good**

| If bad please specify | Frequency | Percent |
|---|---|---|
| Did not check BP in more than 1 year | 3 | 20.0 |
| Do not listen to my complain | 1 | 6.7 |
| Not giving cd4 results | 1 | 6.7 |
| Slow pace | 9 | 60.0 |
| They do not leave medicine when they are going back | 1 | 6.7 |
| **Total** | **15** | **100** |

The majority of respondents 9 (60%) cited the slow pace or long waiting period as the reason they were not satisfied with the quality of health service, while 3 (20%) blamed the health worker for not checking their blood pressure. Do et al, (2013) concluded that low perceived quality of information from care provider was associated adherence with poor adherence measured using visual analogue scale (VAS). Patient satisfaction with level of care, long waiting time, and poor staff attitude and other procedural barriers decrease patients' adherence to ART and also results in poor clinic attendance (Machtinger & Bangsberg, 2006).

### 4.4.5 Do you have privacy during consultations and counselling?

**Table 4.12 Answers to the question of privacy during consultation and counselling**

| **Do you have privacy during consultations and counselling?** | **Frequency** | **Percent** |
|---|---|---|
| No | 19 | 6.76% |
| Yes | 262 | 93.24% |
| **TOTAL** | **281** | **100.00%** |

A total of 262 (93%) responded that they have privacy, while 19 (7%) responded that there was no privacy during consultation and counselling. Some of the reasons given by some of the 19 respondents who said there is no privacy were the location of the ARV Clinic where everybody can see them as they come for service, others claim that community members come to the facility to see who is getting ARVs.

### 4.4.6 Are health workers always present when you come for your appointments?

**Table 4.13 The presence of health the time respondents comes for refill**

| **Are health workers always present when you come for your a** | **Frequency** | **Percent** |
|---|---|---|
| No | 6 | 2.14% |
| Yes | 275 | 97.86% |
| **TOTAL** | **281** | **100.00%** |

A large number of 98% confirmed that health workers are always present when one comes for pharmacy refill.

**Table 4.14 Action taken by respondent when they did not find health workers at the facility**

| **What do you do if they are not present when you came for a** | **Frequency** | **Percent** |
|---|---|---|
| Came back after 3 days | 1 | 16.7 |
| Came back next day | 4 | 66.7 |
| Went to Opuwo | 1 | 16.7 |
| **Total** | **6** | **100,0** |

About 83% (5) said they came back the next day. This means they are getting their ART in Opuwo where the service is available during the week. The other 1 (17%) said they went to Opuwo the next day.

### 4.4.7 Have you ever come to collect pills and there were no pills at the clinic?

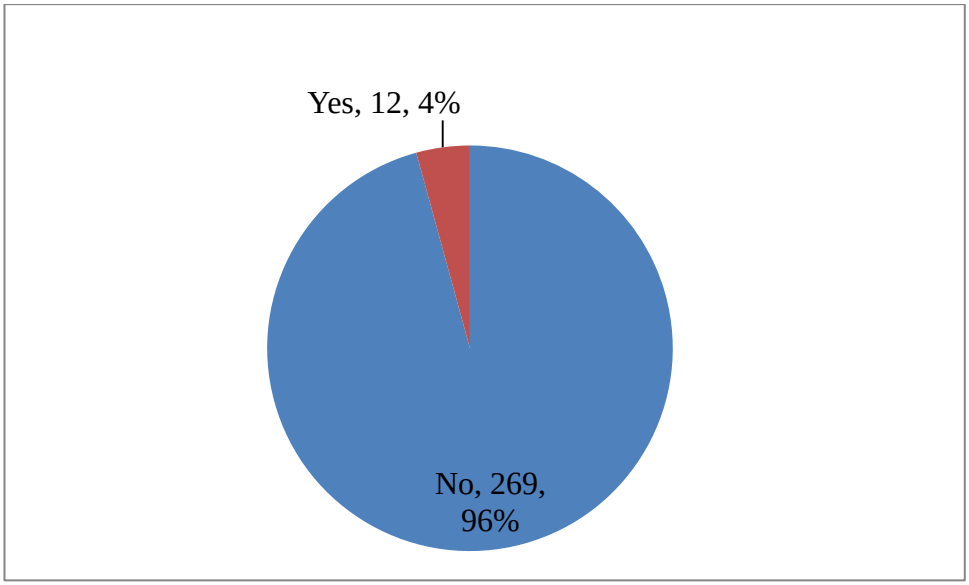


**Figure 4.10 Response of respondents on whether there is always pills when they come for refill**

A total of 269 (95%) reported that they always find medication when they come for refill, while 12 (4%) claims there do not always find pills at the facility.

### 4.4.8 Have you ever run out of tablets?

**Table 4.15 Response on whether the respondents ever run out of tablets**

| Have you ever run out of tablets? | Frequency | Percent |
|---|---|---|
| No | 242 | 86.12% |
| yes | 39 | 13.88% |
| **TOTAL** | **281** | **100.00%** |

About 242 (86%) responded that they never run out of tables while the remaining (14%) responded that they experience running out of tablets.

**If yes what was the cause?**

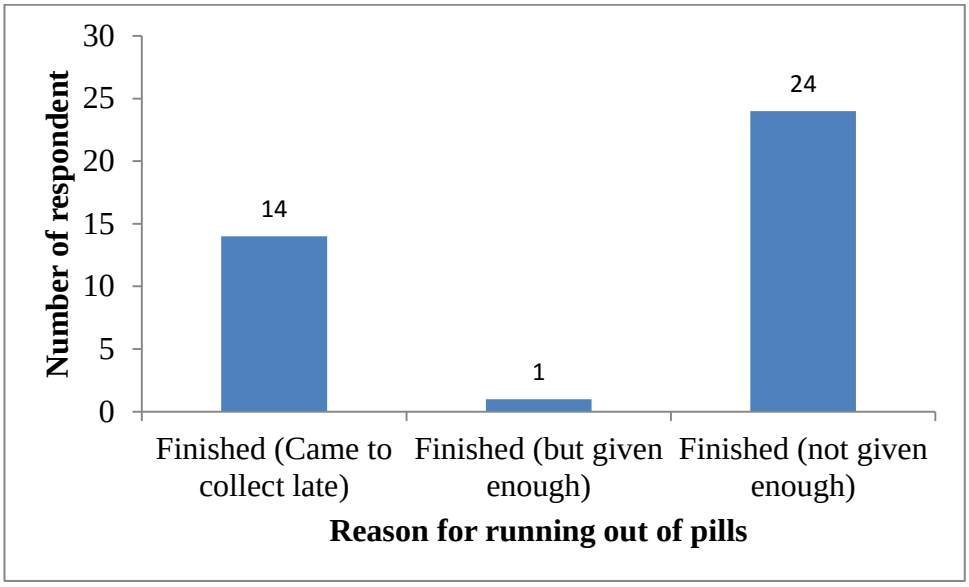


**Figure 4.11 Reason given by respondents for running out of tablets**

A total of 24 (62%) said they were not given enough pills, while 14 (36%) said they came late for follow up after the tablets are finished. A further investigation is needed to look into the respondents not given enough pills.

## 4.5 Section D. Patients related factors

### 4.5.1 Which of the following reasons has caused you to skip your medicines?

**Table 4.16 Factors that caused respondents to skip taking medications**

| Which of the following reasons has caused you to skip your medication | Frequency | Percent |
|---|---|---|
| **Alcohol usage** | 26 | 9.3 |
| **Do not understand medications effectiveness** | 9 | 3.2 |
| **Simply forgot** | 57 | 20.3 |
| **Travelled** | 32 | 11.4 |
| **Funeral** | 1 | 0.4 |
| **No transport** | 2 | 0.7 |
| **Very far** | 1 | 0.4 |
| **None** | 152 | 54.1 |
| **Work** | 1 | 0.4 |
| **Total** | **281** | **100.0** |

The majority of respondents 57 (20%) who reported skipping medication said they simply forgot, 32 (11%) said they travelled away from home, while 26 (9%) said its due to alcohol usage.

### 4.5.2 What is it that helps you to take your HIV medicine regularly as prescribed?

**Table 4.17 Factors that help the respondents to take their medications**

| **What is it that helps you to take your HIV medicine regularly as prescribed?** | **Frequency** | **Percent** |
|---|---|---|
| Counselling | 127 | 45.2 |
| Reminder | 33 | 11.7 |
| Treatment supporter | 121 | 43.1 |
| **Total** | **281** | **100.0** |

Table 4.17 shows that 127 (45%) cited counselling as the factors which help them to adhere to their medication, 121 (43%) said they have treatment supporter, while the remaining 33 (12%) relay on reminder by mobile phone alarms and the radio in reminding them to take their medication.

## 4.6 Levels of adherence

### 4.6.1 Self-reporting adherence was measured based on the question if one missed a dose, and if they run out of tablets.

**Table 4.18 self-reported adherence rate**

| **Self- reporting (rate)** | **Frequency** | **Percent** |
|---|---|---|
| No to all (High) | 197 | 70.1 |
| Yes to 1 (moderate) | 51 | 18.1 |
| Yes to all (low) | 33 | 11.7 |
| **Total** | **281** | **100.0** |

A large percentage 70% of respondent responded that they have never missed a dose nor run out of tablets, 18% reported either missing a dose or running out of tablets, while the remaining 12% reported that they have experienced both missing a dose and running out of tablets. The question of delaying taking medication by more than 3 hours, was excluded from the self-reported rate of adherence because a large number of respondents do not have the means of measuring time instead they only look at the sun. This give an implication that one cannot ascertain whether the person delayed taking the medication or not.

**Table 4. 19 Pill count measured adherence**

| **Pill count** | **Frequency** | **Percent** | **Level** |
|---|---|---|---|
| > 95 % | 202 | 71.9 | High |
| 80 - 95 % | 49 | 17.4 | Moderate |
| < 80% | 24 | 8.5 | Low |
| Not done | 6 | 2.1 | |
| **TOTAL** | **281** | **100.0** | |

Table 4.19 shows that the majority of respondents 202 (72%) had a high level (more than 95%) of pill count, 49 (17%) had a moderate pill count while the remaining 24 (9% ) scored a low rate (less than 80%) of pill count.

**Table 4.20 Pharmacy refill measured adherence**

| **Pharmacy refill** | **Frequency** | **Percent** | **Level** |
|---|---|---|---|
| on or before | 231 | 82.2 | High |
| 1 to 3 days late | 35 | 12.5 | Moderate |
| more than 3 days late | 15 | 5.3 | Low |
| **Total** | **281** | **100.0** | |

According to table 4.20, 231 (82%) of respondents were on time for their appointment, 35 (13%) came less than 4 days late, while the remaining 15 (5%) came to the facility over 3 days late.

**Table 4.21 Rate of adherence measured by self-reporting, pill count, and pharmacy refill**

| | **Rate** | | | |
|---|---|---|---|---|
| **Method** | **High** | **Moderate** | **Low** | **Total** |
| **Self -reporting** | 197 (70%) | 51(18%) | 33 (12%) | **281 (100%)** |
| **Pill count** | 202 (73%) | 49 (18%) | 24 (9%) | **281 (100%)** |
| **Pharmacy refill** | 231 (82%) | 35 (13%) | 15 (5%) | **281 (100%)** |

The rates of adherence measured by self-reporting and pill counts are very close, 70% and 73% for high rate, while that measured by pharmacy refill is 82%. This is

due to the facts that pharmacy refill only look at whether one came to collect the pill or not, but does not look at whether they were taken. Self-reporting and pill count how ever take into consideration whether they were taken. The moderate rate for self-reporting and pill count were equal at 18%, pharmacy refill was 13% while the low rate ranged from 5% to 12% for all three methods. Literatures show that in order to achieve viral suppression, people need to have a 95% or more level of adherence.

Over all, the level of ART adherence in Opuwo district is below the literature recommended 95% at which viral suppression is achieved and drug resistance development is reduced. Educational level was the only determinant which was statistically associated with adherence, but given the 70% of people in this study having only up to grade 7 level of education the district is way too far from achieve the UN's 90-90-90 ambitious strategy by 2020 which is just four years from this year. A lot need to be done to educate the people of Opuwo districts so that their level of education can be improved. In the Namibia 2011 population and housing census main report NSA (2011), in the age group of 15 and above 50% of the people have dropped out of school, 37 % have never attended school and only 9 % were still in school in Kunene region. These figures shows that the people of Kunene Region need to be encouraged to attend school through which they can achieve better good levels of adherence.

### 4.7 Health workers question

The researcher interviewed the health worker for Opuwo CDC Clinic, Sesfontein IMAI site, and Okanguati health center. Opuwo CDC Clinic and Sesfontein said they use the pill count method to monitor adherence, while Okanguati health centre was using pharmacy refill. The adherence at Sesfontein was estimated to be at 95%, While Opuwo CDC Clinic and ranges from 80% - 95%. However they usually only do it to the patients who are adhering already.

The Health related factor which makes it difficult for most patients at all three facilities is the distance to the facilities, with the health worker at Sesfontein suggesting that people from Okahirongo village needs to be changed to a three months dosage as they more often find it difficult to get both money and transport to come to Sesfontein every month. All three facilities said there is shortage of health workers. The pharmacy does not send the required amount of medicine to Sesfontein. Another health related factors which is affecting privacy in the whole of Opuwo district is the location of ART clinic together with the normal pharmacy. Some people do not come for follow due to the fact that everybody will see that they came for ART, which forces some people to get medicine at facilities which are far away from their homes.

The patient related factor mentioned at all three facilities is travelling, which is worsened by the current drought. People move further away from the health facilities in search of grazing area and water for their livestock. Okanguati Health Centre said most of its defaulters and late comers are from Angola who comes only twice per

year. Another factor which contributes to patients coming late for appointment was illiterate. Majority of people in Opuwo district cannot read which means they cannot read the date of follow up as well. Patients who comes late at Okanguati finds it difficult to go to Opuwo as the medication usually goes back with the outreach team.

## 4.8 Summary

This chapter presented the data in the form of tables, bar graphs, and pie charts. These figures and tables were interpreted and discussed in more details. The conclusion drawn from these finding are presented in the next chapter, which also focus on the limitations or challenges, and recommendations from the study.

# Chapter 5. Conclusions, recommendations, and limitations

## 5.1 Introduction

In this chapter the researcher presents the conclusions drawn from the findings of the study. The limitations or challenges which the researcher met during the study are also discussed in this chapter. The recommendations which are based on the evidence from the study are also outlined. The main objective of the study was to assess the adherence levels and determinants of adherence to ART in Opuwo district, Kunene region, Namibia in 2015. The specific objectives were to:

- Determine the levels of adherence to ART among HIV infected people in Opuwo district
- Identify determinants of adherence to ART in Opuwo district
- Compare the level of adherence measured by pill count, self-reporting; and pharmacy refill

## 5.2 Conclusion

Conclusions from the findings are presented with reference to the objectives of the study.

### 5.2.1 To determine the levels of adherence

The levels of adherence to ART in Opuwo district 2015 measured by pill count and by self-reporting were 73% and 70% respectively. These two methods are better at estimating adherence than pharmacy refill.

### 5.2.2 To identify determinants of adherence to ART in Opuwo district

The level of educational having attended grade 8 to 12 was the only determinant which was associated with good adherence having a p-value less than 0.05.

Female gender had higher adherence compared to male in terms of percentage.

Married and cohabitating couples showed a better adherence compared to singles, separated, and windows. Being employed was found to favour high rate of adherence compared to unemployed. Dietary requirements and side effects were some of the reason given for missing doses. Poor patient, health worker relation was linked to respondents' dissatisfaction. Having a treatment supporter and counselling were identified as facilitator of good adherence. Forgetfulness, alcohol usage, and being away from home, were the patients factors that were barrier to adherence. The distance from the facility was also mentioned by both patients and health workers with long distance being the barrier to adherence.

### 5.2.3 Compare the level of adherence measured by pill count, self-reporting; and pharmacy refill

The rates of adherence measured by pill count, self-reporting, and pharmacy refill were close ranging from 70 % to 82 %, for high, 13% to 18% for moderate, and 5% to 12% for low rate of adherence.

From these findings it is clear that Opuwo district have to do more to improve the low adherence rate to 95% which is needed for viral suppression, but the high rate of school dropout increases the already large uneducated number, while being educated is associated with higher adherence.

## 5.3 Recommendation

### 5.3.1 Give health education on adherence to ART and intensify counselling

Some people do not seem to understand that delaying taking medication on time has an effect on adherence and hence treatment outcome. Some do not use a watch, they only take their ARV whatever time they wake up in the morning or go to sleep at night, some they take once they eat and they do not have a specific time at which they eat. Some people do not consider missing one or two dose as a poor adherence. They do not understand the 95% needed for viral suppression.

### 5.3.2 Tracing patients who comes late for refill and defaulter

Some of the patients who were selected by systematic sampling did not turn up some came late with some days even the one that are staying near the health facility. Tracing them will help to improve adherence. Starting someone on ART is not an emergency but once they start, staying on ART is an emergency as it may lead to development of drug resistant strains.

### 5.3.3 Recruit health worker to fill the vacant posts

The Opuwo CDC Clinic which over the service of ART and TB treatment had 4 nurses, but one was transferred to Intermediate Hospital Oshakati, one resigned for personal reasons, one was on a leave for two month leaving only one nurse to run give both ART and TB services assisted by a TB field promoter. Apart from the single nurse having to run the two service, she is also responsible for the outreach services to more than 10 health facilities most of which are far from Opuwo town

and connected by bad road, leaving the Opuwo CDC Clinic with no one to assist the patients.

It is also impossible to trace late comers and defaulter with the few human resources.

The health worker retention in Opuwo district is very low as most people do not want to stay there. The government should introduce measure to motivate and encourage people to work in Opuwo by introducing bush allowance for example. The state needs to treat the Opuwo district different from other districts in the country because of its harsh environment, remoteness, nomadic population, and hard to convince inhabitants.

### 5.3.4 Dedicate one car and driver to the ART / TB program

The ART outreach team need to have a car specific for the outreach program with a driver attached to the outreach. During data collection, some days the team left late in the afternoon because they have to struggle to get a car and a driver, which demotivate the patients as they have to wait longer before the medicine arrives. It also puts the life of the outreach team at risk as they usually drive back at night. This transport can also be used in late comers and defaulters tracing. This will also enable the outreach services to be done once every month which can improve adherence unlike the current once in three months.

### 5.3.5 Train health workers at each clinic and health centre to start a patients and give out ARV to patients

This will reduce the poor adherent caused when patients find the outreach team gone, and those do who do not have transport money can find the service at the nearest facility. This will also reduce the need for more health worker at the Opuwo CDC Clinic, and it will reduce the days of outreach as the car can go drop of ARV for even four month to more than two clinics in one day, thereby saving fuel and repairs of tyres.

## 5.4 Limitations

From the beginning of the study the researcher met some limitations.

Obtaining ethical clearance from University of Namibia Research Ethic Committee (URECU) took too long. The study proposal was approved in November 2014 but the ethical clearance certificate was only issued in middle of June 2015.

Obtaining the permission from the Ministry of Health took two month to be granted as it was issued towards the end of August.

The systematic sampling method caused the process to be slow as the number of people interviewed per day was limited to the number of appointments for that specific day, and once the researcher used the interval of 4 as per calculations, this caused the researcher to interview only 12 respondents on a day when there is 50 appointments for example and they all came.

The study did not include ART patients younger than 21 years of age.

The study did not include the people who are defaulting and lost to follow up. This means that the levels of adherence found in this study are higher than the actual levels as people who come for appointments are the ones who are adhering.

## 5.5 Summary

This chapter presented the conclusions, limitations and recommendations that came out of the study. It outlined the conclusion in connection with objectives, the limitations for the process of getting ethical clearance and permission were outlined, as well as limitations of the research findings. The recommendations were also outlined in this chapter.

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**Annexure A. Research tool**

**Part A**

**Consent form and research instrument.**

**Consent form**

Dear participant

Good day! My name is Severen Shali Nghoshi, a final year Masters of Science in Applied Field Epidemiology and Laboratory Management student at the University of Namibia, faculty of Health Sciences, under the supervisors of Dr J. Sheehama and Dr L. Nelumbu. I am conducting a research on: Assessment of determinants and levels of adherence to antiretroviral therapy (ART) in HIV-infected people in Opuwo district, Kunene Region, Namibia. The aim of the study is to assess the adherence levels and determinants of adherence to ART in Opuwo district, Kunene region, Namibia. I am authorised by the Ministry of Health and Social Services to conduct this study.

You are hereby requested to participate in this study to provide information about the adherence to ART. Your participation in this research is voluntary; you may withdraw from the research at any time without any consequences. The researcher, with your permission will use self-reporting interview, pill count and review your pharmacy refill records to get valuable information. However, this may be withdrawn if you are not comfortable with it.

The results of the study may be published but your name will not be revealed and no individual identification information will be provided. Although there may be no direct or immediate benefit derived from the study, the result of the study may generate factors associated with adherence to ART in Opuwo district, Namibia.

Do you agree to participate in the study? ……

Consent

I have read the above informed consent, the nature, demands and benefits of the study.

I understand that I may withdraw my consent and discontinue participation during the study without any penalty or loss of benefit to myself.

Signature of the Participant: …… Date…….

Date: …….

I certify that I have explained to the above participant the nature, purpose, and potential benefits and risks associated with participation in this study.

Signature of the researcher ……... Date…….

**Part B. Questionnaire**

1. Patient I.D: _____

2. Date: _____

3. Name of Health Facility:_____

4. Age: _____

5. Sex :

a) Male _____

b) Female _____

6. What is the highest grade have you passed at school?

a) No schooling _____

b) Grade 1- 7 _____

c) Grade 8 – 12 _____

d) Tertiary _____

7. What is your current marital status?

a) Single: _____

b) Married _____

c) Divorced/widower _____

d) Cohabitating _____

8. If married,

a) Monogamy _____

b) Polygamy _____

9. Type of employment

a) Unemployed

b) Self employed

c) Employed

10. What is the name of your village/location

_____

11. What is your religion?

a) ) Catholic _____

b) Protestant _____

c) Muslim _____

d) Other, (please specify) _____

**Part C**

**SELF-REPORT**

Introductory statement. Taking pills every day can be hard. Most people have problems taking their pills at some point during treatment. I am going to ask you about problems that you have had taking your pills. Please feel comfortable telling me about pills you may have missed or taken late; I am asking because I want to make it easier for you to take them.

1. Do you sometimes delay taking your medicines?

a) Yes _____

b) No _____

2. Have you ever missed taking your pills?

a) Yes _____

b) No _____

3. If yes, when? _____

4. If 1 or 2 is yes, specify what makes you to delay or miss your pills?

_____

**Part D Factors affecting adherence**

**Part D1**

1. Which of the following factors makes it difficult for you to medicine?

a) side-effects _____

b) treatment fatigue _____

c) dietary requirement _____

d) frequency of dosing _____

2. Are you taking any other medication, including traditional medicine apart from ARV?

a) Yes _____

b) No _____

3. If yes, please specify

_____

4. If Q 2 is yes, are you having problem taking all the medication together with ARV?

a) Yes_____

b) No_____

5. If yes, what have you done about it?

a) continued taking them all _____

b) have gone to report at the ART clinic _____

c) stopped taking the other medicines _____

d) stopped taking the ARV medicines _____

Part D 2

1. How long does it take you to reach the clinic?

a) Less than 2 hours _____

b) 2 to 5 hours _____

c) More than 5 hours _____

2. What mode of transport do you use to get to the clinic?

a) On foot _____

b) By car _____

c) By donkey or horse _____

3. Other, specify.

_____

How easy is it for you to come to the health facility for all your appointments?

a) Very easy _____

b) Not easy but not too difficult _____

c) Difficult _____

d) Very difficult _____

4. How do you rate the service of the health worker at the ART clinic?

a) Good

b) Bad

5. If bad, please specify. _____

6. Do you have privacy during consultations and counselling?

a) Yes_____

b) No_____

7. Are health workers always present when you come for your appointments?

a) Yes _____

b) No _____

8. What do you do if they are not present when you came for appointment?

a) Come back the next day _____

b) Go to Opuwo hospital _____

c) Wait for next week/month_____

9. Have you ever come to collect pills and there were no pills at the clinic?

a) Yes _____

b) No _____

10. Have you ever run out of tablets?

a) Yes _____

b) No _____

11. If yes, what was the cause?

a) Was not given enough pills _____

b) Lost the pills _____

c) Shared with someone _____

d) Other, specify _____

Part D 3

1. Many people find it hard to take all their HIV medicine exactly as prescribed.

Which of the following reasons has caused you to skip your medicines?

a) Forgot _____

b) Alcohol usage _____

c) Do not understand medications effectiveness _____

d) Travelling

2. Which of the following reasons prevent you from adhering to your medication?

a) Cultural believe _____

b) Spiritual believe _____

c) Stigma and discrimination _____

d) Non-disclosure of HIV status _____

e) _____

3. What is it that helps you to take your HIV medicine regularly as prescribed?

a) Treatment supporter _____

b) Counselling _____

c) reminders (radio, cellphone, etc) _____

d) Other, please specify _____

**Collaboration with the patient to facilitate adherence**

**Pill count**

Count the number of pills the participant have at that particular time and indicate shortage or excess

……..

**Pharmacy refill**

Review the record to see if the participant had missed / delayed refill in the last two weeks ……

**Part E**

**Health workers question**

1. How many patients on ART were lost to follow-up at your facility last month?

_____

2. Which of the following measuring tools do you use to measure ART adherence?

a) Patient self-report _____

b) Pill count _____

c) Pharmacy refill _____

3. Other; please specify

_____

What is the average rate of adherence for patients at this facility?

a) More than 95% _____

b) 90% to 95 % _____

c) Below 90% _____

4. What percentage of patients is finding it difficult to achieve high level of adherence because of the factors bellow? (Please indicate the estimated % of patients next to each factor)

a) Patient-related factors _____

b) Medicinal-related factors _____

c) Health facility related factors _____

5. What are the challenges do you face when delivering ART service to patients?

_____

**Thank you, your participation is highly appreciated**

## Annexure B: ethical clearance letter

**Annexure C: Permission to conduct the study from the Ministry of Health and Social Services**