DETERMINANTS OF ADHERENCE TO ANTI-RETROVIRAL THERAPY AMONG ADULTS WITH HIV/AIDS IN DALHATU ARAF SPECIALIST HOSPITAL LAFIA, NASSARAWA STATE

BY

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DECLARATION

I declare that the work in this Project entitled “Determinants of Adherence to Anti-retroviral Therapy Among Adults With HIV/AIDS in Dalhatu Araf Specialist Hospital Lafia” has been carried out by me in the Department of Community Medicine, ABU Zaria. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this project was previously presented for another degree or diploma in this or any other institution.

_____ _____

Dogo Bala Shekwagu Date

CERTIFICATION

This project entitled "Determinants of Adherence to Anti-retroviral Therapy Among Adults With HIV/AIDS in Dalhatu Araf Specialist Hospital Lafia" by BALA SHEKWAGU DOGO meets the regulation governing the award of the degree of Master of Public Health (Field Epidemiology) of the Ahmadu Bello University and is approved for its contribution to knowledge and literary presentation.

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LIST OF ACRONYMS

AIDS	-	Acquired Immune Deficiency Syndrome
ART	-	Anti-Retroviral Therapy
ARVs	-	Antiretroviral drugs
DASH	-	Dalhatu Araf Specialist Hospital, Lafia
DNA	-	Deoxyribonucleic acid
HAART	-	Highly Active Anti-Retroviral Therapy
HIV	-	Human Immunodeficiency Virus
LGAs	-	Local Government Areas
MEMS	-	Medical Events Monitoring System
mDOT	-	Modified Directly Observed Therapy
NPopC	-	National Population Commission
RNA	-	Ribonucleic acid
STC	-	Special Treatment Clinic

SUMMARY

HIV/AIDS is a disease of public health importance with about 35 million people worldwide living with the disease and Sub-Saharan Africa accounting for about 27.7 million cases. Nigeria has 3.2 million cases and has recorded 210,000 deaths. Control of the disease has been predicated on prevention and effective ART. For ART to be successful however, adherence rate of 95% or more is required to be complemented by adult ART coverage of 80%. Nigeria however, has 40%. Thus, this study aims to identify the determinants of adherence to antiretroviral therapy among adults with HIV/AIDS in Dalhatu Araf Specialist Hospital, Lafia, Nasarawa State.

The study was conducted using a descriptive cross sectional design among 426 randomly selected HIV/AIDS patients (18 years and above) attending ART clinic in DASH, Lafia. Quantitative data collection technique was used with the administration of a semi-structured questionnaire by research assistants. Data was analyzed using Statistical Package for Social Sciences (SPSS) version 20.0 for univariate and bivariate analyses.

Mean age was 35.8 years (SD± 9.6). Of the respondents, 2.6% had less than 95% adherence rate and forgetfulness (40%) was the commonest reason for non-adherence. The study showed that 70.2% were females, 59.6% were married and 55.2% had educational level lower than secondary school education. Also, average knowledge HIV, ART, adherence and level of adherence were determined to be 40.4%, 80.1%, 55.4% and 97.4% respectively. In addition, age, gender, marital status and level of education were not significantly associated with adherence. It was recommended that the adherence level be sustained and enlightenment be intensified to curb the spread of HIV/AIDS.

Key words: HIV/AIDS, Adherence, Antiretroviral therapy, Nigeria

CHAPTER ONE

INTRODUCTION

1.1 Background

The Human Immunodeficiency Virus (HIV) which causes Acquired Immune Deficiency Syndrome (AIDS) has continued to be a major global challenge since its discovery in the 1980s and is said to be the leading cause of mortality in the last decade. Deaths arising from HIV/AIDS have been estimated to be about 39 million.[1]

About 35 million people worldwide live with HIV/AIDS. Majority live in low and moderate income countries in Sub-Saharan Africa accounting for about 24.7 million of people living with HIV/AIDS.[1] Sub-Saharan Africa with a prevalence of 4.7% has South Africa as the worst affected region. Swaziland has the highest HIV prevalence of any country worldwide (27.4%) while South Africa has the highest epidemic of any country (5.9 million) .[2,3]

In Nigeria, about 3.2 million people are living with HIV accounting for about 9% of global figure. 210,000 deaths have been recorded from AIDS-related illnesses.[3] National prevalence of HIV stands at 3.4% with the highest prevalence being among 35-39 years age group (4.4%) and the lowest in 15-19 years age group (2.9%).[4] Rivers State however has the highest prevalence among other states with a prevalence of 15.2%.[4] The availability of effective anti-retroviral therapy (ART) to control the virus so that people with HIV can enjoy healthy lives and reduce the risk of transmission to others has resulted in concerted efforts being made by the global health community and leading government and civil society organizations in the treatment and prevention of HIV.[3] However adherence to ART by people living with HIV who are eligible is key.

Adherence is described as a patient's ability to follow a treatment plan, take medications at prescribed times and frequencies and follow restrictions regarding food and other medications. It is a collaborative process between the patient and the provider where the patient plays a more active role in his treatment and makes a commitment to follow the prescribed regimen as best as possible.[5,6-7]

Adherence to ART is critical to obtain the full benefits of Highly Active Anti-Retroviral Therapy (HAART) which include maximal and durable suppression of viral replication, reduced destruction of CD4 cells, prevention of viral resistance, promotion of immune reconstitution and slowed disease progression.[5,6-7] While an adherence rate of 95% or more is needed to achieve virologic success, multiple approaches are used to measure adherence as there is no single method to measure it accurately. Some of the measures used include self report, electronic devices, pill counts, pharmacy refill tracking, biological markers, provider estimation and therapeutic drug monitoring.[5,6-7]

1.2 Problem Statement

About 35 million people worldwide live with HIV/AIDS[1,2] of which Sub-Saharan Africa accounts for about 24.7 million. In Nigeria however, about 3.2 million people are living with HIV with some 210,000 deaths attributed to AIDS-related illnesses.[3] With a national HIV prevalence of 3.4%, the age group of 35-39 years has the highest prevalence of 4.4% while the age group of 15-19 has the lowest prevalence of 2.9%. Regional distribution of prevalence shows the South South leading with 5.5% while the South East has the lowest with 1.8%. Females have higher prevalence in the South East, North East, North Central and South West regions (2.5%, 3.8%, 3.9% and 2.9% respectively) over the males who have 1.0%, 3.5%, 3.0% and 2.7% respectively. However, in the North West and South South regions, males have higher

prevalence of 3.6% and 5.5% respectively compared to 2.8% and 5.4% respectively for females. In terms of distribution by state, Rivers State emerged with the highest prevalence of 15.2% while Ekiti State has the least with 0.2%.[4] Meanwhile, Nasarawa State ranks 4th with a prevalence of 8.1% amongst other states in the country.[4]

Of the 35 million people worldwide living with HIV/AIDS,[1,2] 25.9 million need anti-retroviral therapy[8] but as at 2013, only 12.9 million people with HIV are receiving anti-retroviral therapy.[9] While majority (86%) of people living with HIV in Sub-Saharan Africa are receiving anti-retroviral therapy, Nigeria with 9% of the total population of people living with HIV worldwide and also the 2nd highest proportion of new infections with 10% as at 2013 has an adult ART coverage less than 40%.[9]

Adherence to ART however has been influenced by certain patient factors such as age, sex, education level, marital status and income as seen in some studies. Being female, single and less than 35 years have been significantly associated with non-adherence.[6] The same goes for possession of higher educational status.[8] Forgetfulness accounts for about 60.4% of other determinants of non-adherence while busy daily tasks claimed 18.3%.[6] Some medical factors such as doses and frequency of drug intake and side effects also influence adherence. The influence of clinical setting factors are those which require people to visit health services frequently for drug refill, travelling long distances to reach health services and bearing direct and indirect costs of care.[5,7,10] Previous studies conducted in Kano and South-South Nigeria had adherence rates of 49.2% and 58% respectively which are far less than the target ART adherence rate of 95%.[11-12]

Furthermore, previous efforts aimed at improving adherence such as counseling, use of pill boxes, telephone reminders, use of medication diaries, pill charts, incentives and directly

observed treatment have been met with some challenges. For instance, in the use of pill boxes which are clearly visible, confidentiality is breached thereby exposing patients to stigma. Telephone reminders will require more staff in this setting where staff strength is already low and telephones being expensive. Furthermore, the use of medication diaries is only feasible when patients are literate and the sustainability of directly observed treatment is challenged by the fact ART is lifelong.[5,13]

1.3 Justification

It is imperative to ensure a reduction in the morbidity and mortality of HIV via its effective preventive strategies and ART for people living with the virus. ART has transformed the perception of HIV/AIDS from a fatal incurable disease to a manageable chronic illness. The success of ART is predicated on good adherence rate which leads to viral load suppression, elimination of drug resistance and improved health. Poor adherence rate would lead to increased viral replication, drug resistance and poor health.[5]

For the achievement of effective viral suppression, reduction in the number of HIV/AIDS related deaths and decline in new HIV infections, an expected adult anti-retroviral therapy coverage of 80% should be met[8] to be complemented with an adherence rate greater than 95%. As several efforts are being intensified for effective response to the burden of HIV/AIDS and particularly the improvement of adherence to ART such as the 90-90-90 treatment target for 2020 which requires 90% of all people living with HIV to have known their status, 90% of all people with diagnosed HIV infection to be receiving sustained ART and 90% of all people receiving ART to have had viral suppression,[14] identification of the determinants of ART adherence and their improvement would help avert poor adherence.

A similar study on patients' adherence to ART was conducted in Federal Medical Centre (one of two tertiary health centres rendering comprehensive service in the state) situated in Keffi Local Government Area[15] but none has been conducted in the second tertiary health centre (DASH) located in the state capital.

Nasarawa State has been prioritized by Centers for Disease Control as one of the states in Nigeria for scale-up of HIV viral load monitoring in patients receiving ART. This perhaps could be due to increasing HIV prevalence rate in Nasarawa State from 7.5% in 2014 to 8.1% in 2015[16] which may be due to increasing new infection rates occasioned by poor adult ART coverage and ART adherence. Therefore, findings of this study would be used to improve adherence rate locally among patients accessing ART and also to improve operations, planning and policies in Dalhatu Araf Specialist Hospital (DASH) Lafia.

1.4 Research Questions

1. What are the socio-demographic characteristics of people living with HIV/AIDS attending Special Treatment Clinic in DASH, Lafia?
2. What is the level of knowledge of HIV/AIDS and ART in HIV/AIDS patients receiving treatment in DASH, Lafia?
3. What is the level of knowledge of adherence to ART in HIV/AIDS patients receiving treatment in DASH, Lafia?
4. What is the level of adherence to ART in HIV/AIDS patients receiving treatment in DASH, Lafia?
5. What are the factors that determine adherence to ART in HIV/AIDS patients receiving treatment in DASH, Lafia?

1.5 General and Specific Objectives

1.5.1 General objective

To identify the determinants of adherence to ART amongst adults with HIV/AIDS attending Special Treatment Clinic (STC) in Dalhatu Araf Specialist Hospital Lafia.

1.5.2 Specific objectives

1. To determine the level of knowledge of HIV/AIDS and ART in HIV/AIDS patients receiving treatment in DASH Lafia.
2. To determine the level of knowledge of adherence to ART in HIV/AIDS patients receiving treatment in DASH Lafia.
3. To determine the level of adherence to ART in HIV/AIDS patients receiving treatment in DASH Lafia.
4. To identify the factors that determine adherence to ART in HIV/AIDS patients receiving treatment in DASH Lafia.

CHAPTER TWO

LITERATURE REVIEW

2.1 Background

HIV which causes AIDS was first isolated in 1983 as a retro-virus in the United States of America when some unusual infections were noted in homosexual populations dating back to 1981. It belongs to one of the groups of viruses known as retroviruses and has been isolated in blood, seminal fluid, vaginal secretions, saliva, tears and breast milk of infected individuals.[13] Once inside the human body, it enters many different cells and incorporates its gene into the human DNA attacking cells of the immune system called CD4 or T-helper cells (T cells) and destroying them and the body's ability to fight infections and certain cancers. There are two subtypes: HIV-1 and HIV-2.[17] Deaths arising from HIV/AIDS have been estimated to be about 39 million. About 35 million people live with the disease worldwide majority in Sub-Saharan Africa which accounts for 24.7 million and has a prevalence of 4.7%. In Nigeria, about 3.2 million people live with HIV accounting for 9% of global figure. 210,000 deaths have been recorded from HIV/AIDS-related illnesses.[3] Nasarawa State ranks 4th with HIV prevalence of 8.1% amongst other states in the country.[4]

The infection's primary mode of spread is through sexual exposure. There's also the non-sexual transmission. Sexual transmission occurs when the virus enters the body by infected immune cells in blood, vaginal fluids or semen following sexual intercourse with an infected partner without using a condom of other barrier protection. The virus can enter the body through the lining of the vagina, vulva, penis, rectum or mouth during sex. Sexual transmission may be through males and females or males to males. People who already have sexually transmitted infections such as syphilis, genital herpes, gonorrhea or human papilloma virus are more likely to

acquire HIV infection during sexual intercourse with an infected partner. Non-sexual transmission on the other hand through injection-drug use with shared needles or syringes that are contaminated with blood from an infected person.[13,17] Furthermore, there's mother-to-baby transmission during pregnancy or birth when infected maternal cells enter the baby's circulation or through breastfeeding. In addition, accidental needle pricks with contaminated fluids especially in health workers also enable transmission of the virus and so also is the transfusion of contaminated blood or blood products in conditions such as haemorrhage following delivery or road crashes and some medical conditions such as anaemia in pregnancy and sickle cell anaemia. Generally speaking, the higher the level of HIV in the blood (viral load), the more likely the person is to transmit the virus.

Clinical features of the disease are in stages ranging from acute HIV infection and clinical latency stage to acquired immune deficiency. In the acute HIV infection stage, most people do not develop signs or symptoms when infected with HIV but others may have signs and symptoms in the first two to three weeks after HIV infection. Most common symptoms in this stage include fever, headache, mouth ulcers, fatigue, rash, weight loss, sore throat and swollen lymph nodes in the neck and groin. However these symptoms usually disappear within a few weeks. The clinical latency stage is follows the acute infection stage and here, the virus appears to be dormant and the person feels normal while the virus continues to multiply actively. This stage can last an average of eight to ten years but can vary among individuals and strains of HIV. Even though the person has no symptoms at this stage, he or she is contagious. At the end of this stage, as the virus overwhelms the CD4 cells, the viral load starts to rise and the CD4 cell count begins to drop. As this happens, the person may begin to have symptoms as the virus level increases in the body leading to the Acquired Immunodeficiency Syndrome (AIDS) which

constitutes stage three. This is the later stage of HIV infection where the CD4 cells fall lower than 500 cells/mL characterized by the presence of unusual infections and cancers that signal how weak the immune system is including pneumonia, toxoplasmosis, diarrhea, weight loss, candidiasis, meningitis, lymphoma and karposi's sarcoma.[17-18]

HIV infection is usually diagnosed by blood tests involving two steps i.e screening and confirmation. There are three common screening tests viz: HIV antibody test, combination antibody/antigen that detects both antibodies and a piece of the virus called p24 antigen and then the RNA tests. The confirmatory test however is the Western blot.[17]

The introduction of ARVs in the 1990s brought new hope to people living with HIV. The increased availability of treatment has dramatically improved survival rates and lowered the incidence of opportunistic infections in people with AIDS. Those who have access to ARVs and the care needed to maintain therapy can live for many years with what is now considered to be a complicated but manageable chronic disease. The ARVs are very effective in controlling the virus and can reduce the level of the virus to a point where it is no longer possible to detect any HIV in the blood. These medicines prevent HIV from multiplying rapidly and at the same time boost the body's immune system. In this way, they can increase the length and quality of life and enable people to lead full and productive lives.[7]

Many drugs have become available to fight both the HIV infection and other associated infections and cancers. The treatment for HIV infection is with a cocktail of 3 or more anti-retroviral medications from at least 2 different classes referred to as Highly Active Anti-Retroviral Therapy (HAART) or Anti-Retroviral Therapy (ART) and how these drugs are combined depends on the most current treatment guidelines. The goal is maximum and durable viral suppression (undetectable levels) thereby reducing HIV-related deaths and complications.

The classes of ART include Nuleoside or Nucleotide Reverse Transcriptase Inhibitors (NRTIs), Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs), Protease Inhibitors (PIs), Fusion and Entry Inhibitors (FEIs) and Integrase Strand Transfer Inhibitors (ISTIs). The NNRTIs (e.g. efavirenz and nevirapine) in combination with NRTIs (e.g. stavudine, lamivudine and zidovudine) help keep the virus from multiplying. PIs (e.g. ritonavir and darunavir) interrupt virus replication at a later step in the HIV life cycle thereby preventing cells from producing new viruses. ISTIs (e.g. raltegravir) stop HIV genes from becoming incorporated into the human cell's DNA. FEIs (e.g. enfuvertide keep HIV from entering human cells. Some of these drug combinations have been formulated into pills to be taken once daily. ART however may have a variety of side effects depending on the type of drug. But baring severe side effects, ART extends the average life expectancy and many people with HIV can live for decades with proper treatment. An increasing number of people with HIV infection have normal life expectancy if they adhere to medication regimen. If ART is not taken regularly and doses are missed, the virus may become resistant and the manifestations of AIDS may develop. ART however does not eliminate the infection.[17-18]

In some situations, several ARVs are combined in a single tablet, a fixed-dose combination, which ensures that patients always take multiple doses together. There are both first line and second line medications.

2.2 Adherence to ART

Appropriate use of ART has improved the health of many HIV positive individuals who otherwise may have died. The efficacy of any treatment depends on sustained high levels of adherence to ART. In other words, adherence to ART by people living with HIV who are eligible for it is key. Adults on whom this research would be based are HIV/AIDS patients who have

been on ARV medications at least two months before the distribution of the questionnaires for this research and are either 18 years or above. In the context of ART, adherence is defined as a patient's ability to follow a treatment plan, take medications at prescribed times and frequencies and follow restrictions regarding food and other medications. It is a collaborative process between the patient and the provider where the patient plays a more active role in his treatment and makes a commitment to follow the prescribed regimen as best as possible.[5,7] It has also been described as an act or quality of sticking to something connoting the acceptance of an active role in one's own health. In addition, it is seen as the extent to which a person's behavior in relation to taking medications, following a diet and/or executing lifestyle changes correspond with agreed recommendations from a healthcare provider. Adherence is computed as the number of doses taken by the patient divided by the number of doses prescribed over the period under review (i.e 8 weeks) and expressed as percentage as self-reported by the patient. Patient is said to be adherent if at least 95% of the prescribed doses of anti-retroviral medications (ARV) are taken in the preceding 60 days before the interview. If less than 95% are taken, patient is termed non-adherent.[5,7,19-20]

2.3 Non-adherence

Significant proportions of HIV infected patients do not reach high levels of adherence and this can lead to devastating public health problems. Getting patients to take drugs everyday without failure for the rest of their lives is one of the biggest challenges. Poor knowledge of HIV/AIDS and stigmatization are also prevalent among patients affecting adherence to medication. It is increasingly becoming necessary to scale up access to ART especially in Africa where 95% of all new infections occur. Poor adherence to treatment and defaulting from treatment are the two major challenges facing successful ART.[6] Non-adherence comes in different forms. It could

range from missing one dose of a medication to missing a single dose of all 3 or 4 medications to missing multiple doses or all doses in a day or week. It also involves not observing restrictions regarding dietary or fluid intake or not taking medications at prescribed time intervals.[5,7] Non-adherence can lead to inadequate suppression of viral replication, continued destruction of CD4 cells, progressive decline in immune functions, disease progression, emergence of viral resistance to one or more ARV medications.[5,7,10]

2.4 Assessment of Adherence

There are multiple approaches to the assessment of adherence. No single method can assess it accurately and as such there is no gold standard. Some currently used measures are client self-report, electronic monitoring devices, pill counts, provider estimation and measurement of medications in the blood stream.[5,7,10] Self report entails patients reporting their own adherence. Different periods of recall ranging from four-day, one-week, one-month or most recent recall of missing a dose may be used. This could be obtained at the time of clinic visit with non-judgemental questions. Although patients tend to overestimate their adherence, several studies have found that the self-report correlates fairly with actual medication intake especially when a trusting patient-provider relationship has been established. In maximizing accuracy of self-report, patient should be approached as a matter of fact by asking the most recent days and doses missed and using prompts to help recall.[5,7,10] The use of electronic devices on the other hand, i.e Medication Events Monitoring System (MEMS) employs the use of a chip in the lid of the medication bottle which records the date and time of each opening of the cap which is assumed to coincide with intake. A computer programme downloads the information from the lid and gives a written report. However, it is associated with some disadvantages viz;(i) MEMS can underestimate intake as patients sometimes remove multiple doses at one time (ii) both patients

and providers require training in its use (iii) it fails to work if patients leave the cap off or lose the cap (iv) it is very expensive.[5,7,10] The pill counts method entails healthcare workers conducting pill counts during scheduled clinic visits and the disadvantage is that patients can manipulate pills via pill dumping prior to scheduled visits leading to overestimation of adherence. Also it requires patients to bring their medications at the time of visit. However unannounced pill counts may be accurate. Visiting patients' homes is resource-intensive and may present issues of confidentiality and stigma in the community. This method also negates the development of a trust between the patient and the provider.[5,7] Other means of assessment include pharmacy refill tracking which entails pharmacists helping in educating patients about medication and also conducting pill counts. They provide information to providers from pharmacy refill data on the lapses in refills or problems the patient may be experiencing with taking medications. Patients collecting medications on due dates regularly are assumed to be adhering to treatment. However, advantages of this method are that (i) it is not a measure of intake of medication (ii) it requires patients to use the same pharmacy for all refills.[4,15] Furthermore, monitoring viral load (biological markers) can be used as an indicator of effectiveness of treatment and thereby of medication intake since the goal of HAART therapy is to lower the plasma viral load. In some patients however, viral load may remain high even though they take all the medications regularly and this could be due to the problems of non-response due to viral resistance, treatment failure or poor absorption of the drug. This method is expensive and may not be available in resource-constrained settings.[5,7] Therapeutic drug monitoring involving measuring drug levels in blood can also be a measure of adherence. It is not being used because of short circulating times for most anti-retroviral medications as well as

the expense related to conducting therapeutic drug measurements. It is only limited to research settings at the moment.[5,7]

While adherence can be expressed quantitatively as a percentage of expected treatments actually taken, its accurate measurement is very difficult. When reporting adherence to ART, two measures are frequently used . The first is the overall adherence recorded as the number of tablets taken correctly as a proportion of those which were prescribed. This measure is an important marker for the clinical evaluation of individual patients as well as for counseling purposes. The second measure which is more sensitive to the particular requirements of ART, reports the percentage of patients taking at least 95% of their tablets correctly and is essential for programmatic or public health evaluation.[7]

2.5 Strategies to Enhance Adherence

Strategies are in place to enhance adherence either employed singly or in combination. Counseling: This aims to improve patient's knowledge about the disease, medications and side effects and helps the patient to set goals, develop positive beliefs and perceptions and to increase self-efficacy. It is the mainstay of any treatment programnme.[5,7,21]

Pill boxes: These are containers for storing medications with dividers for each day and each dose within the day making it easy for patients to take doses correctly. Some come with electronic reminders. A disadvantage especially in developing countries may be its visibility in situations where patients need to hide medications from others for confidentiality reason and the very sick or illiterate patients may need help to fill the pill boxes.[5]

Electronic devices: These are common in developed countries. Devices ranging from beepers to alarms to watches that remind patients to take medications on time are use. Internet-linked

electronic pages are also used to send messages to patients. However, the disadvantages are that they may have to be discreet to avoid stigma and confidentiality related issues and may not be practiced in developing country settings.[5,7,21]

Telephone reminders: Telephone reminders have some limitations in that they are labour intensive for staff. Patient must have a telephone at all times and the related cost issues of telephone.[5]

Medication diaries: Patients record the date and time of medication intake including missed doses and reasons for missed doses. The advantages are that it helps in identifying patterns of use and reasons for missing doses and serves as useful records of side effects or other problems the patient may experience.[5,7]

Buddy system: This entails relying on a friend or family member to help the patient take medications regularly via reminders and encouragement and helping to keep hospital appointments.[5]

Pill charts: These are visual displays of pills in terms of colour, shape, names and dosage of each medication used by health providers during counseling which is very useful for patients with literacy problems.[5]

Modified directly observed therapy (mDOT): This is a program that ensures that patients take their medications under the supervision of adherence staff. Only some doses are observed for a fixed period of time (a few months) because it is not possible to observe all doses as most HAART regimens have multiple doses and treatment is life-long. Observation could be done at the health centre or the patient's home.[5,7,21]

Incentives: In developed countries, incentives such as telephone cards, transport, food and movie tickets are issued to patients to increase effectiveness of ART intake.[5]

2.6 Factors Influencing Adherence

A number of factors have been associated with adherence to ART and have been grouped into 5 categories viz; patient factors, medication factors, patient-provider relationship, disease characteristics and clinical setting.[5,10]

Patient factors include socio-demographic factors such as sex, age, education and literacy, employment, income, active drug or alcohol use, degree of social support, social stability, depression and other psychiatric illnesses and have been studied with regard to adherence.[5,10] Socio-demographic and psychological issues have great potential to impact on adherence. For instance, family support and religious beliefs about illness and medications may influence motivation and adherence. The issue of disclosure has also been found to have serious implication for adherence. For example, the use of medication may inadvertently reveal a person's HIV status, poverty may prevent individuals from following treatment-related dietary advice, drug and alcohol abuse may impair judgement and the ability to adopt and maintain routine medication use and family responsibilities may require adults to place the health care needs of others before their own. Mental health problems such as depression have been associated with low adherence in HIV positive adults as have other psychological variables such as perception of one's ability to follow a medication regimen or self efficacy.[5,10]

Adherence to ART and sex: In a study conducted in Southeast Nigeria , it was found that being a male was significantly associated with adherence (p value of 0.00).[22] Similar studies in Kenya also found significant association between males and adherence (p value of 0.00).[23]

Adherence to ART and age: A significant association between adherence and decreasing age (<30years) was recorded in a study in North Central Nigeria (p value <0.05) [24] similar to another (< 35years) in Southeast Nigeria (p value of 0.026).[22]

Adherence and level of education: In a study conducted in Southern Brazil, a significant association was found between an increasing level of education and adherence (p value of 0.02).[25] Studies also done in Southeast Nigeria (p value of 0.007)[22] and Kano (p value of 0.01)[26] all showed significant association between having formal education and adherence.

Adherence to ART and income: A significant association was found between income and adherence in a study in Delta, Nigeria (p value of <0.05).[27] However in studies carried out in Recife, Brazil (p value of 0.08)[28] and Southeast Nigeria (p value of 0.69),[22] there was no significant association between income and adherence.

Adherence to ART and marital status: Studies have shown significant association between marital status and adherence as seen in studies in Southeast Nigeria (p value of 0.04),[22] Kenya (p value of 0.00)[23] and Delta Nigeria(p value of <0.05).[11]

In terms of medication factors, doses of drugs and frequencies of intake with their side effects and also the knowledge of the relationship between adherence and drug resistance and the stage of commencement of medication are considered. The frequency of taking drugs is associated with adherence. Twice daily frequency of drug intake was associated with good adherence than taking thrice daily frequency. It was also found that increasing number of pills i.e. more than 3 tablets per day was associated with non-adherence to ART.[30] Some studies however found no association between ART regimens and adherence.[31]

Side effects of antiretroviral drugs could be mild or severe. These side effects impact on quality of life and may lead to non-adherence. Once doses are missed, the risk of drug resistance increases. The harm of side effects could be reduced by treating the side effects or by switching to alternative antiretroviral drugs.[32] The NRTIs are associated with hypersensitivity reactions, peripheral neuropathy, renal changes and the risk of hepatitis B flaring. NNRTIs on the other hand are associated with dizziness, hypertension and severe hepatotoxicity. PIs have skin rashes, perioral parethesia and pancreatitis as potential side effects. Cough, fever, upper respiratory symptoms, injection site reactions and eosinophilic hypersensitivity reactions are known to be associated with FEIs while the ISTIs are associated with diarrhea, nausea and headache.[32] Although side effects have been cited by some studies in developed countries as predictor of adherence, experience of symptoms and views about medications may be complex and may vary according to the type of regimen. Symptoms may stimulate the use of medications by acting as a reminder or reinforcing beliefs about the necessity for treatment. However, patients' expectations of symptoms relief are also likely to have an important effect. This could be problematic if expectations are unrealistic or where treatment is given for asymptomatic disease, as occurs with HIV infection. In addition, patients' concerns about the potential harm of ART may be entirely rational. It is proposed that for some individuals, missed doses may be a logical attempt to moderate this risk by taking fewer medications. Patients who understand the rationale for ART and treatment failure report higher adherence levels than those without this information.[32]

Furthermore, the patient-provider relationship is another strategy to consider for the enhancement of adherence. This includes the patient's overall satisfaction and trust in the provider and clinic staff, the patient's opinion of the provider's competency, the provider's willingness to include the patient in the decision-making process, the effective tone of the

relationship (e.g warmth, openness, cooperation), the compatibility of race/ethnicity between patient and provider and the adequacy of referral. A positive relationship built on trust and mutual respect between the patient and the provider (Physician) can ensure patient's satisfaction and good adherence while the opposite might be the case in a negative relationship.[33-34] The same goes for adherence counselors, pharmacists and other service providers directly or indirectly involved in patients' management.

With respect to disease characteristics, the presence of opportunistic infections before the commencement of ART encourages adherence because patients may perceive their illness to be severe and as such adhere. Also, the regression or disappearance of opportunistic infections following the commencement of ART increases adherence as regression of symptoms may be attributed to the positive effects of the ART.[5,10] By and large, the stage and duration of HIV infection, associated opportunistic infections and HIV-related symptoms are considered and the severity of the illness could impact negatively or positively on adherence to ART.

Aspects of the clinical setting may be associated with improved adherence or non-adherence. In clinical setting, focus is on the availability of medications, adequate staffing, convenient appointment schedules, healthcare facilities for diagnosis and treatment.[5,10] In addition, there's also the availability of transport, general environment, perceived confidentiality and satisfaction with past experience with the health care system. If the aforementioned are in place, then adherence on the part of patients may be good. On the other hand, their non-availability might lead to non-adherence.

CHAPTER THREE

METHODOLOGY

3.1 Study Area

Nasarawa State is located in the North Central geographical zone of Nigeria on latitude 8° 32ˈ N and longitude 8° 18ˈ E on a land mass of 27,117km (10,470sqm). It has a population of 2.2 million. It is bound in the South East by Taraba State, in the West by Kogi State, in the North East by Kaduna and Plateau States, in the North West by Federal Capital Territory and in the South by Benue State. It has 13 Local Government Areas and 146 Wards, a total of 750 health facilities with 730 primary health facilities, 18 secondary health facilities and 2 tertiary health facilities. There are 473 registered private health facilities of which 71 are comprehensive health centres while there are 23 government- owned comprehensive health centres in the state.

Dalhatu Araf Specialist Hospital Lafia, one of two tertiary health facilities in the state is also among the 23 government-owned Anti-retroviral Treatment Centers. It is a 204 bed capacity health facility. It has a Special Treatment Clinic (STC) for people living with HIV/AIDS that has 7271 adults currently on anti-retroviral treatment. The STC is run by Medical Officers, Resident Doctors and Consultants in Internal Medicine and Paediatric departments. Other departments in the hospital include Surgery, Radiology, Family medicine and Obstetrics and Gynaecology. An average of 250 patients attend each clinic session. Patients come in from different LGAs of the state and also from surrounding states including Taraba, Benue and Plateau States. Clinic days are Mondays and Thursdays every week.

3.2 Study Design

A descriptive cross-sectional study design was employed in this study.

3.3 Study Population

This involved HIV/AIDS patients on ART attending STC in DASH.

3.3.1 Inclusion criterion: all HIV/AIDS patients on ART for at least 60 days.

3.3.2 Exclusion criterion: HIV/AIDS patients critically ill and unable to respond to questionnaire administration.

3.4 Sample Size Determination

The study sample size was determined using the formula[35]

$n = Z\alpha^2 pq/d^2$

Where n = minimum sample size

$Z\alpha$= standard normal deviate set at 1.96

d= desired precision of 0.05

p= prevalence of adherence to ART from a previous study (49.2% i.e 0.492)[11]

q= complimentary probability

= 1- p =1-0.492

= 0.508

$n = 1.96^2 \times 0.492 \times 0.508 / (0.05)^2$

= 384.06 ~ 384

For 10% (non-response rate)

=n/1-NR (384/1-0.1)

= 426

3.5 Sampling Technique

Systematic random sampling technique was used for the study. The sampling frame: clinic attendees per clinic day. Eight (8) clinic sessions in a month and two(2) clinic sessions in a week. For a sample size of 426, 54 patients were interviewed every clinic day (i.e 426/8). First patient was determined by ballot and then subsequently every 5^{th} patient (250/54) was picked until the required number for interview on that clinic day was attained.

3.6 Data Collection Tool and Technique

Quantitative data collection technique was employed. An adapted interviewer-administered semi-structured questionnaire[36] comprising the following sections: 1) socio-demographic characteristics with variables on sex, age, marital status, tribe, religion, occupation, educational level and income 2) knowledge of HIV/AIDS 3) knowledge of anti-retroviral drugs 4) knowledge of adherence and level of adherence 5) factors that determine adherence. The questionnaire was pre-tested at Model Comprehensive Health Center Shabu near Lafia, a care and support site. Findings were reflected in the finalized questionnaire and then subsequently used to collect data at DASH by the researcher and three assistants (all nurses) who were trained on the objectives, methodology and tools of the study over a two-day period using role plays. Supervision was done during and post data collection to ensure correctness, completeness appropriateness of filling.

3.7 Data Management

3.7.1 Measurement of variable

The exposure variables (independent variables) are socio-demographic characteristics of the respondents, their level of knowledge of HIV/AIDS, antiretroviral drugs and adherence, level of

adherence and factors that determine adherence. The outcome variable (dependent variable) is adherence status of respondents which could be adherent or non-adherent.

3.7.2 Statistical analysis

Data were entered into Microsoft Excel version 2007 and cleaned. Statistical Package for Social Sciences (SPSS) version 20.0 was used in processing data and statistical analyses performed and summarized using appropriate measures of central tendencies and deviations. Tests of significance were conducted using chi-square with the p value less than 0.05 accepted as being statistically significant with confidence level set at 95%. Results were displayed in tables. For each correct response to a question asked, one point was scored and zero for wrong response. Grading of knowledge score adapted from a previous study was categorized into poor, average and good in line with percentiles as a function of the total number of questions asked. Scores of ≥ 75%, 50%-74% and ≤ 49% were termed good, average and poor respectively. Adherence was computed as the number of doses of medication taken by the patient divided by the number of doses prescribed over the period under review (i.e 8 weeks) and expressed as percentage. The prevalence was computed as number of adherent respondents divided by number of sampled patients and expressed as percentage.

3.8 Ethical Clearance

Ethical approval was sought and gotten from the Research and Ethics Committee of DASH, Lafia (attached). Informed and written consent were sought from all participants. Participation was voluntary and opting out of the study or failure to give consent did not negatively affect patient's management. Confidentiality was maintained in questionnaire administration and data collected was used for the sole purpose of the research.

3.9 Study Limitation

- The use of the self-report as an assessment method may result in recall bias even though the period under study was restricted to two months preceding the interview.
- The use of self report might also introduce bias in the information given by respondents because they often say what the interviewer would like to hear and as such the essence of the research was re-emphasized and respondents urged to be as honest as possible in responding to questions in the questionnaire.
- Viral load monitoring was not done because in addition to the lack of equipment for such in DASH, it is also very expensive to conduct.

CHAPTER FOUR

RESULTS

A total of 426 patients living with HIV/AIDS and on ART in Dalhatu Araf Specialist Hospital Lafia participated in this research. The results are presented below in tables and charts in line with the specific objectives of the study in terms of the socio-demographic characteristics of the respondents, knowledge of HIV/AIDS, knowledge of anti-retroviral drugs, knowledge of adherence to ART, level of adherence and factors that determine adherence.

Table 1: Socio-demographic characteristics of HIV/AIDS patients on ART in DASH Lafia

Variable	Frequency	Percent (%)
Sex	127	
Male	299	29.8
Female		70.2
Age group (in years)		
15-19	2	5
20-24	37	8.7
25-29	64	15.0
30-34	89	20.9
35-39	88	20.7
40-44	66	15.5
45-49	36	8.5
50-54	21	4.9
55-59	8	1.9
60-64	12	2.8
65-69	2	0.5
70-74	1	0.2
Marital status		
Single	54	12.7
Married	254	59.6
Divorced/ separated	40	9.4
Widow/widower	78	18.3

Females participated more than males recording 70.2% while the age group of 26-35 years had more respondents with 41.8%. The mean age however was 35.8 years (SD ± 9.6) and of the respondents, 59.6% were married.

Table 1b: Socio-demographic characteristics of HIV/AIDS patients on ART in DASH, Lafia

Variable	Frequency	Percent (%)
Tribe		
Hausa/Fulani	76	17.8
Yoruba	6	1.4
Igbo	14	3.3
Eggon	150	35.2
Tiv	50	11.8
Others	130	30.5
Religion		
Islam	183	43.0
Christianity	243	57.0
Occupation		
Unemployed	91	21.4
Farmer	91	21.4
Civil servant	85	20.0
Businessman/woman	64	15.0
Petty trader	52	12.2
Artisans	19	4.5
Student	12	2.8
Commercial driver	7	1.6
Retirees	3	0.7
Others	2	0.4
Education level		
No formal education	157	36.9
Primary	78	18.3
Secondary	99	23.2
Tertiary	92	21.6

Of the respondents, Eggon tribe constituted 35.2% while 91 (21.4%) were unemployed and 91 (21.4%) were farmers. However, 36.9% of the respondents had no formal education.

Table 2: Distribution of correct knowledge of HIV/AIDS in HIV/AIDS patients receiving treatment in DASH, Lafia

Correct knowledge	Frequency	Percent (%)
HIV transmission		
Unprotected sexual intercourse	379	89.2
Blood transfusion/injection	275	64.6
Contaminated blood letting instruments	267	62.7
From mother to her unborn child	167	39.2
From mother to child during breastfeeding	151	35.4
Cure for HIV/AIDS	302	70.9
ABC of HIV transmission	321	75.4

Fewer respondents agreed that HIV could be transmitted from mother to her unborn child and also during breastfeeding (39.2% and 35.4% respectively). However 89.2% agreed that HIV could be transmitted through unprotected sexual intercourse.

Table 3: Distribution of knowledge score for HIV/AIDS

Knowledge score	**Frequency (%)**
Poor	135 (31.7)
Average	172 (40.4)
Good	119 (27.9)
Total	426 (100.0)

Majority of the respondents had average knowledge of HIV/AIDS constituting 40.4% while 27.9% had good knowledge.

Table 4: Distribution of correct knowledge of ART in HIV/AIDS patients receiving treatment in DASH, Lafia

Correct knowledge	**Frequency**	**Percent (%)**
Use of ARV drugs	399	93.7
ARVs and cure	337	79.1
Missing ARVs and disease progression	408	95.8
ARVs prevent transmission from mother to child	357	83.8
HIV positive patients on ARV give birth to child without HIV infection	362	85.0
ART duration	405	95.1
ARVs and effect on health	399	93.7

Missing doses of antiretroviral drugs was agreed by 95.8% of the respondents to lead to disease progression while 79.1% agreed that antiretroviral drugs cannot cure HIV infection.

Table 5: Distribution of knowledge score for ART

Knowledge score	**Frequency (%)**
Poor	9 (2.1)
Average	341 (80.1)
Good	76 (17.8)
Total	426 (100.0)

Most of the respondents had average knowledge of antiretroviral therapy accounting for 80.1% while 2.1% had poor knowledge.

Table 6: Distribution of correct knowledge of adherence to ART in HIV/AIDS patients receiving treatment in DASH, Lafia

Correct knowledge	**Frequency**	**Percent (%)**
Adherence is ability to follow treatment plan	420	98.6
It means taking medications at prescribed times	421	98.8
Observing restrictions regarding food and other medications	187	43.9
Not missing doses of medications	406	95.3

Taking medications at prescribed times was agreed by 98.8% of respondents to mean adherence while 43.9% agreed observing restrictions regarding food and other medications also means adherence.

Table 7: Distribution of knowledge score for adherence

Knowledge score	**Frequency (%)**
Poor	14 (3.3)
Average	236 (55.4)
Good	176 (41.3)
Total	426 (100.0)

Most of the respondents had average knowledge of adherence constituting 55.4% while 3.3% had poor knowledge.

Table 8: Level of adherence to ART in DASH, Lafia

Variable	Frequency	Percent (%)
Level of adherence		
< 95% (poor/non-adherent)	11	2.6
≥ 95% (good/adherent)	415	97.4
Total	426	100.0

Respondents who were non-adherent (< 95% adherence to ART) were found to be 11 constituting 2.6% while those who were adherent (≥ 95% adherence to ART) were 415 accounting for 97.4%.

Table 9: Distribution of prescribed doses of medications

Variable	Frequency	Percent (%)
Ever missed (sometimes)	119	27.9
Never missed	307	72.1
Total	426	100.0

Those who have ever missed medications amounted to 119 (27.9%) while those who have never missed were 307 (72.1%).

Table 10: Association between socio-demographic factors and adherence to ART in DASH, Lafia

Variable	Non-adherent	Adherent	Total	OR(95% CI)	p value
Age					
<45 years	8 (72.8)	359 (86.5)	367 (86.2)	0.42 (0.11-1.62)	0.185*
≥45 years	3 (27.2)	56 (13.5)	159 (13.8)		
Total	11 (100.0)	415 (100.0)	426 (100.0)		
Marital status					
Single	3 (27.3)	51 (12.3)	54 (12.7)	2.68 (0.69-10.42)	0.152*
Others	8 (72.7)	364 (87.7)	372 (87.3)		
Total	11 (100.0)	415 (100.0)	426 (100.0)		
Religion					
Islam	3 (27.3)	180 (43.4)	183 (43.0)	0.49 (0.13-1.87)	0.365*
Christianity	8 (72.7	235 (56.6)	243 (57.0)		
Total	11 (100.0)	415 (100.0)	426 (100.0)		
Educational level					
Lower than secondary	4 (36.3)	231 (55.7)	235 (55.2)	0.45 (0.13-1.58)	0.232*
Secondary and above	7 (63.7)	184 (44.3)	191 (44.8)		
Total	11 (100.0)	415 (100.0)	426 (100.0)		
Sex					
Male	3 (27.3)	124 (29.9)	127 (29.8)	0.88 (0.23-3.37)	1.000*
Female	8 (72.7)	291 (70.1)	299 (70.2)		
Total	11 (100.0)	415 (100.0)	426 (100.0)		

No statistically significant association was found between the socio-demographic factors and adherence to ART.

*Fisher's Exact Test was used to determine the respective p values.

Table 11: Distribution of reasons for missing doses in the non-adherents

Reasons	**Frequency (%)**
Forgetfulness	4 (36.3)
Too ill	2 (18.2)
Stock was finished	2 (18.2)
Away from home	1 (9.1)
Lack of transport fare to the hospital	1 (9.1)
Lack of food	1 (9.1)
Total	11 (100.0)

Forgetfulness was the commonest reason for non-adherence in 36.3% of the respondents. The least reasons were being away from home, lack of transport fare to the hospital and lack of food all at 9.1%.

CHAPTER FIVE

DISCUSSION

This study whose objective is to identify the determinants of adherence to ART among adults with HIV/AIDS attending Special Treatment Clinic in DASH showed that females constituted three-quarters of the whole respondents similar to what obtained in studies from Eldoret, Kenya[23] and Ilorin[37] but more than the finding in the study done in Southwest Nigeria.[18] Although not determined by this study, this may be because in this study area, polygamous marriages are common and usually men are expected to have many sexual relationships and as such, considering the ratio of men to women in sexual relationships, females are more likely to constitute a higher percentage of infected individuals.

The mean age of 35.8 years found in this study is similar to that found in studies done in Southern Brazil[25] and Benin City[12] but lower than the finding in another study in Southwest Nigeria.[19] However, the age group of 26-35 years which accounts for about half of the respondents is quite close to the age group of 35-39 years which has the highest prevalence at the national level and is similar to findings in a study in Keffi.[15]

Whereas this study showed that married respondents constituted over half of the respondents similar to previous studies in Ethiopia[38] and Southeast Nigeria,[22] studies in Ilorin[37] and Eldoret, Kenya[23] found higher values for married respondents . This might not be unconnected with the fact that early marriage is very prevalent in the study area.

Percentage of respondents with educational level lower than secondary school education was found to be higher than findings from a study Benin City[12] but fell short of that done in Southwest Nigeria.[19]

The high adherence prevalence of 97.4% for this study was found to be similar to those of studies done in Southeast Ethiopia[39] and Britain[40] but significantly higher than that of the study in Benin City.[12] The level of adherence to ART has been reported to affect the outcome of treatment in patients on ARV drugs. The high prevalence recorded may be as a result of adequate counseling of patients by health workers prior to the commencement of ART with emphasis on doses, side effects, health benefits of medications and the need to be adherent to ART. In addition, pill burden was low with the highest number of pills per dose being two. There was also uninterrupted service delivery and drug supply in DASH even during industrial strike actions by health workers whereby health workers at the STC are still mobilized to provide services to the patients. Furthermore, antiretroviral medications are supplied free to patients accessing care in the clinic and rapid improvement in signs and symptoms of infected patients may have encouraged adherence to ART. However, the variations in prevalence in different studies may be because of the lack of a gold standard for adherence measurement and differences in health services provided to patients in different health centers.

High level of knowledge of adherence arising from scoring high percentage in correct response to questions on adherence viz; the ability of a patient to follow a treatment plan, taking medications and not missing dose of medications might have led to high level of adherence. This might also be as a result of adequacy of counseling by the clinic staff and consistent availability of medications at the facility. Whereas majority of the respondents in the study had average knowledge of HIV/AIDS, the percentage of respondents with good knowledge was much lower than the findings in the study done in Southwest Nigeria[19] and Zamfara[36] where respondents with good knowledge tended to be more adherent.

In this study, in terms of level of knowledge of ART, majority of the respondents had average knowledge in contrast to a study conducted in Southwest Nigerian study[19] where most had good knowledge. Even though the proportions of respondents with good knowledge of HIV/AIDS and ART are low and also given the fact that majority of them had educational level less than secondary education, a high adherence rate of 97.4% was recorded in the study. This might be due to a good patient-healthcare provider relationship and also the adequacy of counseling offered by health workers in the facility as a high percentage of the respondents agreed that HIV/AIDS has no cure and believed ART can reduce the progression of HIV. However, forgetfulness was the commonest reason of non-adherence by about one third of the respondents with a percentage similar to findings of studies in Keffi[15] and Ethiopia.[38] Other reasons for non-adherence include being too ill, finished stock of medications, being away from home, lack of food and lack of transportation fare to the hospital.

For now, none of the factors assessed in this study were statistically significant. The finding that sex was not a statistically significant association is similar to findings reported from a study done in Keffi.[15] However, it contrasts the findings of a study in Kenya[23] which found the male gender was more likely to be adherent while another study in the Southeast Nigeria reported the female gender was more likely to be non-adherent.

In addition, the finding that age was not statistically significant in this study, contrasts the findings reported from studies in North Central Nigeria[24] and Southeast Nigeria[22] which found statistically significant association between age and adherence while the same study in Southeast Nigeria[22] showed significant association between being less than 35 years and non-adherence.

Furthermore, a statistically significant association was found between increasing level of education and adherence in studies in Southern Brazil,[25] Southeast Nigeria[22] and in Kano[26]

contrasting the study in Southeast Nigeria[22] whose finding reported a significant association between increasing level of education and non-adherence. All these contrast the finding in this study for now that educational level was not statistically significant.

The finding that marital status was not statistically significant in this study contrasts the findings reported in studies in Southeast Nigeria,[22] Eldoret, Kenya[23] and Keffi[15] of significant statistical association between marital status and adherence.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Majority of the respondents were females, married with educational level lower than secondary school education and in the age range of 25-35 years. Respondents with average knowledge of HIV/AIDS and ART were also in the majority. However most had good knowledge of adherence.

The level of adherence to ART was found to be high with the commonest reason for non-adherence being forgetfulness. However, age, gender, level of education and marital status were not found to be statistically significant with adherence.

6.2 Recommendations

1. The momentum of adherence counseling in DASH by service providers should be sustained to ensure that the level of adherence is improved upon or at most maintained. Adherence counseling for patients should be continued prior to commencement of ART and also re-emphasized during clinic visits.
2. Enlightenment activities aimed at the prevention of transmission of HIV should be carried out by the Nasarawa State Ministry of Health periodically with emphasis on the female and youth populations given the fact that they have the highest percentage of respondents in order to curb the spread of HIV/AIDS.

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APPENDICES

APPENDIX 1: CONSENT FORM

Department of Community Medicine, Ahmadu Bello University, Zaria.

Consent form for Respondents.

Dear sir/ madam,

I am Dr. Dogo Bala Shekwagu, a Cohort 6 Resident of Nigeria Field Epidemiology and Laboratory Training Programme/ Department of Community Medicine, Ahmadu Bello University, Zaria undertaking a study on the Determinants of Adherence to Anti-retroviral Therapy Among Adults with HIV/AIDS in Dalhatu Araf Specialist Hospital, Lafia. I wish to recruit you in this research.

HIV/AIDS is the leading cause of death worldwide with about 35 million people living with the virus. Deaths associated with HIV/AIDS can be reduced through prevention of transmission of the virus and also adherence to anti-retroviral therapy (ART). The main aim of this research is to identify the determinants of poor adherence to ART with a view to addressing them in order to improve ART adherence.

If you agree to participate in this study, you will be required to sign an informed consent form. A questionnaire for recording some of disease history will be filled by you or with the help of the researcher after the details of the study procedure would have been interpreted to you in the language you can understand.

The information you give and your identity would be confidential. You will not be charged for participating. Your participation is voluntary and if you decline, it will not in any way affect your access to healthcare in this facility.

If you agree, I will ask you some questions which will last for about 20 minutes.

Consent obtained? Yes ☐ **No** ☐

If yes,

Signature/Thumb print of participant……..Date……

Initials of participant…….Serial No. ……

I have explained the nature and purpose of the research to the participant identified above.

Signature of Researcher……..Date……..……

Name of Researcher……

APPENDIX 2: QUESTIONNAIRE

AHMADU BELLO UNIVERSITY, ZARIA

DEPARTMENT OF COMMUNITY MEDICINE

Research on Determinants of Adherence to Anti-retroviral Therapy Amongst Adults with HIV/AIDS in Dalhatu Araf S pecialist Hospital, Lafia, Nasarawa State.

Questionnaire number……

Interviewer's name……Date……

A. Socio-Demographic Characteristics.

1. Sex: 1) Male ( ) 2) Female ( )

2. Age (in completed years)…….

3. Marital status: 1) Single ( ) 2) Married ( ) 3) Divorced/ Seperated ( ) 4) Widow/Widower

4. Tribe: 1) Hausa/ Fulani ( ) 2) Yoruba ( ) 3) Igbo ( ) 4) Others (please specify)…….

5. Religion: 1) Islam ( ) 2) Christianity ( ) 3) Traditional ( )

6. Occupation: 1) Unemployed ( ) 2) Farmer ( ) 3) Petty trader ( ) 4) Businessman/woman ( ) 5) Civil servant ( ) 6) Artisan 7) Others (please specify)……..

7. Education level: 1) No formal education ( ) 2) Quaranic/Islamiyya ( ) 3) Primary ( ) 4) Secondary ( ) 5 Tertiary ( )

8. How much is your monthly income/salary? ……

B. Knowledge of HIV/AIDS.

9. What was your first source of information on HIV/AIDS ? 1) Radio ( ) 2) Hospitals ( ) 3) Billboard ( ) 4) Others (specify)……..

10. Which of the following ways can HIV/AIDS be transmitted ? (tick correct responses) 1) Unprotected sexual intercourse ( ) 2) Blood transfusion/injection ( ) 3) Contaminated blood letting instruments ( ) 4) From mother to her unborn baby ( ) 5) From mother to child during breastfeeding ( )

11. Is there any cure for HIV/AIDS ? 1) Yes ( ) 2) No ( ) 3) Don't know

12. Do you know ABC of HIV/AIDS prevention ? 1) Yes ( ) 2) No ( )

C. Knowledge of anti-retroviral drugs.

13. In your own view what are Anti-retroviral drugs used for? 1) Curing ( ) 2) Reducing pain ( ) 3) Reducing the progression of HIV ( ) 4) Don't know ( )

14. Can anti-retroviral drugs cure HIV? 1) Yes ( ) 2) No ( ) 3) Don't know

15. Can missing anti-retroviral drugs lead to disease progression ? 1) Yes ( ) 2) No ( ) 3) Don't know

16. Anti-retroviral drugs can prevent the transmission of HIV from mother to child 1)Yes ( ) 2) No ( ) 3) Don't know ( )

17. Can HIV positive patients on anti-retroviral therapy give birth to a child without HIV infection? 1) Yes ( ) 2) No ( ) 3) Don't know

18. Anti-retroviral treatment is lifelong 1) Yes ( ) 2) No ( ) 3) Don't know

19. Do you think anti-retroviral treatment will have a positive effect on your health ? 1) Yes ( ) 2)No ( ) 3) Don't know

D. Knowledge of adherence.

20. Adherence is the ability of a patient to follow a treatment plan 1) Yes 2) No 3) Don't know

21. Adherence means taking medications : 1) Anytime 2) at prescribed times/frequencies

3) only at night 4) at patient's convenience

22. Sometimes adherence involves observing restrictions regarding food and other medications when taking anti-retroviral drugs. 1) Yes 2) No 3) Don't know.

23. Adherence also means not missing doses of medications 1) Yes 2) No 3) Don't know

E. Level of adherence.

Instructions to the study participant: Now I would ask questions on how you have been taking your medications in the past two months. Please be aware that everyone misses doses sometimes. Be assured that this information will neither change the way you receive anti-retroviral medications from the HIV clinic nor your opportunity to participate in this study.

24. How long have you been on anti-retroviral therapy ? ……

25. How many times per day do you take your drugs ?.....

26. In the last 60 days, how many doses have you missed ? …….

F. Factors that determine adherence.

I appreciate how difficult it can be to take medications on a daily basis.

27. If sometimes you miss a dose, please can you tell me the reason that made you miss

1) Side effects ( ) 2) Forgot to take anti-retroviral drugs ( ) 3) Felt better ( ) 4) Too ill ( ) 5) Fear of stigma/disclosure ( ) 6) Stock was finished ( ) 7) Drunk with alcohol ( ) 8) Too many pills/pill burden ( ) 9) away from home ( ) 10) fasting ( ) 11) too busy ( ) 12) lack of food ( ) 13) drugs not available at the hospital ( ) 14) lack of transport fare to the hospital ( ) 15)Others (specify)…….

28. What other drugs (besides anti-retroviral) are you currently on? Tick as appropriate. 1) Pain killers ( ) 2) Appetite stimulants ( ) 3) Haematinics ( ) 4) Sleeping pills ( ) 5) Anti TB drugs ( ) 6) Antibiotics (other than for TB) ( ) 7) Fungal infection treatment ( ) 8) Others (specify)……

29. In the last two months did you have a family or community member who supported, reminded or encouraged you to take your anti-retroviral medications? Yes ( ) No ( )

30. If yes, who was the main person that supported you? (check one response only) 1) Spouse ( ) 2) Immediate member of family (specify)…… 3) Nurse ( ) 4) Doctor ( ) 5) Social worker/Community Health worker ( ) 6) Friend ( ) 7) Others (specify)……

31. Were you told the importance of adhering to anti-retroviral therapy ? Yes ( ) No ( )

32. Were you told about the side effects and interactions of these drugs given? Yes ( ) No ( )

33. Have you received any counseling during your treatment ? Yes ( ) No ( )

34. Do you think counseling is useful for HIV patients on treatment? Yes ( ) No ( )

Thank you for your time and co-operation

APPENDIX 3: ETHICAL APPROVAL

DALHATU ARAF SPECIALIST HOSPITAL
LAFIA, NASARAWA STATE, NIGERIA

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Ref: DASH/L/ADM/0340

Date: 29th March, 2016.

Dr. Dogo Bala Shekwagu,

Community Medicine Department,

Faculty of Medicine,

Ahmadu Bello University,

Zaria.

ETHICAL CLEARANCE/APPROVAL

I am directed to refer to your application dated 15th March, 2016 on the research proposal titled: ***"Determinants of Poor Adherence to Anti-retroviral Therapy amongst Adults with HIV/AIDS in Dalhatu Araf Specialist Hospital, Lafia"***, and your appearance before the Ethical Committee on the 29th March 2016. Following recommendation from the DASH Health Research Ethical Committee, I write to inform you that the committee has given approval for you to proceed on your research topic as indicated.

You are advised to ensure patient's confidentiality in your research as stated in your proposal, and also, your study should not in any way interfere with the primary duties of the staff of the department.

The principal investigator is required to send a progress report to the Ethical Committee of the hospital at the expiration of three months after ethical clearance to enable the committee carry out its oversight function.

Submission of final research work should be made to the DASH Health Research Ethical Committee through the secretary of the committee at the information unit.

On behalf of the management of the hospital, I wish you a successful research outing.

DANGARA LADI DEBORAH,
Chairman
29/03/2016
FOR: CHAIRMAN, DHREC.