Thesis
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DETERMINANTS OF TREATMENT ADHERENCE AMONG TUBERCULOSIS-INFECTED HIV PATIENTS IN CROSS RIVER STATE, NIGERIA

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A THESIS SUBMITTED TO THE DEPARTMENT OF SOCIOLOGY, FACULTY OF THE SOCIAL SCIENCES, UNIVERSITY OF IBADAN, NIGERIA, IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF DOCTOR OF PHILOSOPHY IN SOCIOLOGY

ABSTRACT

Concurrent tuberculosis and HIV treatment is a standard practice in co-infected patients. However, adherence to combined treatment is challenging because of multiplicity of drugs involved. Although studies exist on adherence to either HIV or tuberculosis treatment, negligible attention has been paid to adherence among patients on combined HIV and tuberculosis treatments. This study therefore examined the factors influencing treatment adherence among tuberculosis-infected HIV patients in Cross River State (CRS), where prevalence is higher than the national average.

Parsonian Social Action theory, Social Cognitive theory and Health Belief Model were employed as theoretical framework. The study adopted a cross-sectional design using 333 patients. A three-stage purposive sampling technique was used to select respondents. This involved identification of treatment facilities across CRS, selection of facilities that had up to 10 co-infected patients and selection of patients who had received concurrent treatment for three months or more prior to the study. A semi-structured questionnaire was used to generate data. Adherence was assessed with a 14-item scale categorised as low (>7), moderate (2-7) and high (0-1). Knowledge was measured using a 17-item instrument categorised as low (≤8) and high (>8). Four Focus Group Discussion sessions comprising seven discussants each were conducted and four case studies were undertaken with patients. Quantitative data were analysed using descriptive statistics, Chi-square and ordinal regression test at 0.05 level of significance while qualitative data were content analysed.

The mean age of respondents was 34.5±9.6 and 61.9% were female. Fifty-seven percent of respondents had high knowledge of treatment and 48.7% did not link poor adherence to poor treatment outcomes. Level of adherence was high (38.1%), moderate (29.4%) and low (32.4%). Adherence to tuberculosis treatment was significantly higher than to HIV treatment. Respondents' reasons for missing drugs included not being at home (64.7%), not having eaten (45.5%), being busy (44.9%) and avoiding status disclosure (25.1%). Having good knowledge of treatment was significantly related to low level of adherence. The likelihood of adherence was significantly high among males (OR: 1.8; 95% CI: 0.4-2.4), those with a minimum of secondary education (OR: 2.7; 95% CI: 1.2-3.4) and those not living in the same community as the location of their treatment facility (OR: 1.7; 95% CI: 1.0-3.5). Patients who received adequate social support showed the likelihood of better adherence relative to those who received little or no support (OR: 3.0; 95% CI: 1.3-4.7). Patients reported that when in the

midst of other people, they did not want to be seen using drugs to forestall stigmatisation. Respondents demonstrated enthusiasm at the start of the treatment but adherence reduced when difficulties were encountered. Respondents whose spouses or regular sexual partners were not infected encountered more difficulties with adherence because they were believed to be under spiritual attacks not HIV. Patients benefitted much from counselling and good care-provider/patient relationship.

Treatment adherence among tuberculosis-infected HIV patients was influenced by personal characteristics and health facility location. Training on how to overcome the stigma, initiation of patient-selected treatment facility options and policies that emphasise sustained patient counselling could improve adherence.

Key words: Treatment adherence, Co-infected patients, HIV, Tuberculosis, Patient counselling

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CERTIFICATION

This is to certify that this research is an original work carried out in the Department of Sociology, Faculty of the Social Sciences by Boniface Ayanbekongshie USHIE under my supervision.

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DEDICATION

This work is dedicated to the Almighty God who provided me with the ability, courage and inspiration to carry on in spite of difficulties.

TABLE OF CONTENTS

CHAPTER FOUR

DATA PRESENTATION AND DISCUSSION OF FINDINGS

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS USED IN THE TEXT

Abbreviation	Full meaning
AACTG	Adult AIDS Clinical Trial Group
AGIL	Adaptation, Goal attainment, Integration, and Latency
APHA	American Public Health Association
ART	Anti-Retroviral Therapy
ARVs	Anti-Retroviral Drugs
CRS	Cross River State
DOT	Directly Observed Therapy
FGD	Focus Group Discussion
HAART	Highly Active Anti-Retroviral Therapy
HBM	Health Belief Model
HIV/AIDS	Human Immune-Deficiency Virus/Acquired Immune Deficiency Syndrome
IDI	In-Depth Interview
IMR	Infant Mortality Rate
MMR	Maternal Mortality Rate
NACA	National Agency for the Control of AIDS
NNRTIs	Non-nucleoside Reverse Transcriptase Inhibitors
PEPFAR	President's Emergency Plan for AIDS Relief
PI	Protease Inhibitors
TB	Tuberculosis
UCH	University College Hospital
UCTH	University of Calabar teaching Hospital
UNGASS	United Nations General Assemble
USAID	United States Agency for International Development
WHO	World Health Organisation

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Human Immunodeficiency Virus (HIV) and Tuberculosis (Tb) co-morbidity constitutes a public health crisis. The co-morbidity between HIV and Tb was first noted in the early 1980s (Bryt and Rogers, 1994), and reports have since shown a much greater than expected incidence of Tb in HIV patients (Dong, Thabethe, Hurtado, Sibaya, Dlwati, Walker and Wilson, 2007; Wood, 2007). Infection with HIV suppresses the immune system, thus, making it easy for other opportunistic infections like Tb to further weaken the HIV-infected person's immune system. Tuberculosis is the most frequent co-infection among HIV-infected patients worldwide (Ojikutu, 2007), with much of the incidence of co-morbidity occurring in low- and middle-income countries where limited resources constrain access to medication (Gray and Cohn, 2013). In fact, epidemiologic evidence indicates that HIV epidemic contributes substantially to increase in Tb infections (Shargie and Lindtjorn, 2007; Datiko, Yassin, Chekol, Kabeto, and Lindtjorn, 2008).

The prevalence and incidence of Tb in the general population vary substantially across countries and regions. The escalating HIV and Tb epidemics have had a significant impact on public health services in resource-limited settings. The greatest Tb/HIV co-infection burdens are on the African continent where Tb treatment success has been historically low. Only about 50.6 percent of all co-infected persons are currently on medication in Nigeria [United Nations General Assembly, (UNGASS), 2007], and with the fragility and complex global and local politics of funding, the shortage may become acute in a few more years (Omenka and Zarowsky, 2013). In Nigeria, the rate of Tb-HIV co-infection is said to be 9.5 percent. Nigeria is reported to have the third highest HIV-infected persons worldwide (UNGASS, 2007) and the fifth highest Tb rates (WHO, 2008). In the African continent, Nigeria's number is second only to that of South Africa with respect to HIV infection.

Access to anti-HIV and anti-Tb treatment services is a critical need, especially in resource-poor and difficult-to-reach settings. However, the fight against the co-infections can no longer be limited to the provision of medication for treatment and preventive services only; there is also the to focus attention on the improvement of adherence to treatment regimen.

While access and utilisation of treatment remain important, adherence to treatment has become a paramount concern for those on treatment. The efficacy of drugs depends on accurate and consistent use of prescribed regimen (Watt, Maman, Earp, Eng, Setel, Golin and Jacobson, 2009; Ammassari, Trotta, Shalev, Marconi and Antino, 2012). Non-availability and non-use of HIV and Tb drugs threaten the wellbeing of the individual and the society. Defaulting from treatment is dangerous, with the risk of drug resistance, relapse and early death (Afolabi, Ijadunola, Fatusi and Olasode, 2009). Besides, non-adherence has public health implications, including strain on the already lean health resources and continuous spread of the diseases through contact (Omenka and Zarowsky, 2013).

Adherence is critical in the cure of Tb and management of HIV because anti-HIV and anti-Tb medications, if adhered to, can significantly reduce mortality (Vreeman, Wiehe, Ayaya, Musick and Nyandiko, 2008; Ammassari, et al., 2012). Therefore, very high levels of adherence to antiretroviral drugs and anti-tuberculosis medicines are a prerequisite for a successful and durable virological and immunological response to HIV and Tb. Low adherence increases the risk of treatment failure, disease progression and development of drug resistance (Sarna, Pujari, Sengar, Garg, Gupta, and van Dam, 2008). It is known that in antiretroviral therapy above 95 percent adherence is required for adequate virological and immunological response. Adherence plays a critical role in the success of HIV/AIDS/Tb treatment plans, and it is the most important factor that can jeopardise expected treatment outcomes (El-Khatib, Ekstrom, Coovadia, Abrams, Petzold, Katzenstein, Morris and Kuhn, 2011).

The problem with 'perfect' adherence is that it poses numerous treatment challenges to the patient, including life-long pill-taking, pill burden, frequent dosing intervals and food restrictions, among others. As a result, and because of various factors, a high number of patients do not adhere to their treatment regimen. Of course, non-adherence does not only put the infected person at risk of constant morbidity and early death but also endangers the public, as well as makes waste of limited public resources that are used in the provision of antiretroviral (ARV) drugs.

There are a number of factors that may influence adherence to treatment. These factors include perception of the threat pose by the disease (Wrubel, Moskowitz, Stephens and Johnson, 2011), benefits of medication (Bosworth, 2010), perceived side-effects, and perceived consequences of not adhering to medication (Wrubel *et al*. 2011). In addition, stress, attitude, motivation, social support, stigma, interaction with the medical system,

culture and economic costs can all influence treatment adherence. Even though these factors have been identified, there is still considerable uncertainty about the nature of their influence on adherence to treatment.

Patients co-infected with HIV and Tb must seek separate treatment for both conditions. The treatments are either provided by two separate centres (one for HIV and the other for Tb) or in two separate departments within the same facility. As a result, patients' consultation days are different for HIV and Tb; some have to attend different clinic days for HIV and Tb. This is because, until recently, most nations' HIV and Tb programmes were mainly separate and distinct, with varying levels of interactions and communications (Tsiouris, Gandhi, El-Sadr, and Friedland, 2007). Efforts at integrating HIV and Tb treatment only began in some parts of Nigeria around 2009 with the collaboration of the United States Agency for International Development [(USAID) USAID, 2009].

The standard World Health Organisation (WHO) recommended ways of treating Tb is the Directly Observed Therapy (DOT). Adopting the DOT strategy for HIV treatment could raise the level of treatment adherence. However, separate programmes for HIV and Tb makes it difficult to attempt the DOT strategy with HIV treatment. Moreover, this strategy has the potential for improving monitoring of treatment adherence levels (US office of Global AIDS Coordinator, 2004).

With various difficulties patients face, adherence to treatment remains a key issue in HIV and Tb management. This study, therefore, examined the determinants of adherence to treatment among patients with HIV and TB in Cross River State.

1.2 Statement of the Problem

Most patients suffering from chronic diseases find it difficult to take their medications as prescribed. Poor medication adherence leads to poor treatment outcomes and unnecessary expenditure. Inability to adhere to treatment raises the question of patients' awareness and knowledge of the implications (to themselves and the general public) of non-adherence. However, limited data exists on the relationship between knowledge of the implications of treatment adherence and patients' levels of adherence. Knowledge of the consequences of non-adherence should be a motivating factor for patients to want to act, in spite of barriers, to achieve favourable outcomes. Lack of knowledge of the implications of adherence has the

potential to engender poor attitudes to treatment. In addition, patients may have poor knowledge of the lifelong nature of treatment required for HIV management (at least for the time being), and as such, get discouraged after being on treatment for sometime without being cured. Adequate research has not focused on this aspect of patient management.

The combined effect of HIV and Tb is devastatingly high; availability and access to prevention and treatment services are necessary in the fight to contain these disease conditions. The huge financial burden brought on by these diseases makes it difficult to provide adequate drugs for all infected persons. Besides, available treatment services do not get to all those that need them, and on a constant basis, as required for ARV and DOTs. This and other factors make it difficult for even those on treatment to adhere strictly to the treatment regimen. Yet, adherence to treatment is a necessary requirement in the management of HIV and the treatment of Tb to avoid relapse and early death.

Moreover, few studies have examined adherence to treatment of both HIV and Tb co-infections. Available studies have mostly concentrated on the individual-level predictors of patients' adherence, such as psychological factors, personality traits, behavioural correlates, and treatment characteristics. That notwithstanding, the rate of non-adherence is likely to increase when patients are co-infected with HIV and Tb. Nigeria is currently facing a huge crisis with the continued spread of HIV and Tb epidemics. Presently, there are about 616 incidence of Tb per 100, 000 in Nigeria (UNGASS, 2007), while HIV prevalence was 1.8% in 1990, peaking at 5.8% in 2001, and fell to 4.6% in 2008 and 4.1 in 2010 [National Agency for the Control of AIDS (NACA), 2011].

The high rate of HIV and Tb infections suggests that a lot of people infected with any one of the diseases are at risk of the other. Co-infection ultimately makes adherence to treatment more problematic. HIV and Tb co-morbidity complicates treatment and makes it difficult for patients to adhere to treatment. Co-infected persons may need different clinics for the treatment of the different diseases, and this may be a very difficult process with the potential of leading to poor adherence.

Available research has not sufficiently focused attention on the interaction between the individual- and social-level factors that may hold proximal or distal relationships with treatment adherence and outcomes. Existing studies have approached adherence to treatment from the biomedical and clinical perspectives. From this perspective, experts are more concerned with

the clinical manifestations of treatment failure than with social and behavioural explanation of non-adherence. As a consequence, there are gaps in knowledge of the motives and situations determining patients' adherence to treatment. This study was therefore designed to examine the social determinants of adherence treatment among patient with HIV and Tb co-infections in Cross River State, Nigeria.

1.3 Research Questions

The study addressed two questions:

1. What is the level of patients' awareness and knowledge of the implications of treatment adherence?
2. To what extent do patients co-infected with HIV and Tb adhere to their treatment and what are the factors that contribute to their level of adherence?

1.4 Objectives of the Study

The broad objective of the study was to examine the determinants adherence to treatment by HIV and Tb co-infected patients. The specific objectives were to:

1. Assess the level of patients' awareness and knowledge of the implications of treatment adherence.
2. Measure the level of adherence to the treatment of HIV and Tb co-infections.
3. Identify the factors determining adherence to the treatment of HIV and Tb co-infections.

1.5 Significance of the Study

Outcomes of the study contributed to a greater understanding of adherence to HIV and Tb treatment. This study characterised level of adherence on a three-level rating. These levels are: low, moderate and high adherence. Before now, most studies have depended mainly on two levels: adherent or non-adherent. This earlier categorisation was based on the belief that if a patient did not complete up to 95% of drugs, then they were not adherent. The significance of the three levels of categorisation is not only in clearly showing patients' treatment-taking behaviour, but also has policy implications.

The policy implication of a three-level of adherence categorisation is that it is not the same level of attention and efforts are needed to scale-up adherence for patients in the various adherence levels. Besides, this study is significant because it examined HIV and Tb co-morbid patients' treatment adherence. Studies have concentrated on treatment behaviour for the conditions separately. By examining co-morbid patients, this study revealed the various problems that inhibit adherence on the basis of having to take medication for two chronic and stigma-inducing diseases.

This study is also useful because it stimulates, and encourages more research on adherence to the treatment of HIV and Tb by showing that it is necessary to compare adherence levels of person with only HIV or TB, and those co-infected with both. In sum, findings from this study are useful in guiding policy and strategies towards improving adherence and add to the body of knowledge available on determinants of adherence to treatment.

The study has also contributed in furthering the understanding of the usefulness of the Health Belief Model (HBM) in explaining adherence behaviour. The HBM was found to be useful for short term treatment but not for long-term treatment. Moreover, when faced with the harsh realities of stigmatisation, access problems and financial burdens, among others, perception of danger as a basic tenet of HBM can be limited in engendering appropriate health seeking behaviour.

1.6 Definitions of Concepts

Treatment Adherence: The concept "adherence" is sometimes used interchangeably with "compliance". Compliance carries a sense of compulsion with it as if patients may be forced by a higher authority into obedience. This notion does not suit the purpose of this study, thus, adherence was retained. For the purpose of this study, adherence to treatment was defined as the willingness to accept and start a prescribed treatment, and how closely the regimen is followed by taking drugs correctly (i.e., in the right dose, with the right frequency, and at the right time).

Self-efficacy: Self-efficacy was defined as the patient's belief that they were capable of organising and executing the course of action required to perform a particular activity, in this case, adhering to treatment.

Stigmatisation: A situation whereby an individual or a group of people are disqualified from full social acceptance by virtue of their being infected by certain ailments, which worsen social suffering and complicates efforts to treat and control the ailment, thus, contributing to more suffering, delay in seeking help, and encourage non-adherence to treatment of those conditions.

Attitude: Attitude was defined as a disposition or tendency to respond positively or negatively towards a certain thing, idea, object, person or situation). Attitudes encompass, or are closely related to, opinions and beliefs, and are influenced by past experiences.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Literature Review

The papers that were reviewed in this study were obtained through an extensive search of the Internet using search engines such as Pub Med and Medline and library hardcopies. The search strategy involved the combination of key terms like "tuberculosis", "HIV/AIDS", "treatment", "adherence", "compliance", "access", "utilisation", and "integrated HIV/Tb care". The articles that were included in the review were those with full-text or abstracts written in English language. The literature review was undertaken to highlight the extent of scholarship and research on the issue of treatment adherence with particular attention to Tb and HIV co-infections, and to map out areas for the present research. The presentation of the review of the literature is in thematic format, based on variables emerging from the objectives of the study.

2.1 Prevalence of HIV and Tb Co-infections

The association between HIV/AIDS and Tb has been identified for a long time. HIV/AIDS and Tb co-infection has made it quite easy to assume that all persons positive for Tb must also be positive for HIV and vice verse (Bryt and Rogers, 1994). Though HIV and Tb have different risks and exposure factors, their association with each other has made the conditions more volatile. Reports from around the globe have shown that there is a high prevalence of co-infections between HIV and Tb. Research has reported that the prevalence of HIV infection among patients with Tb is 20 to 60% (Clements-Nolle, Rani, Michael, Eileen, Milton, and Mitchell, 2008). In some cases the reported prevalence suggests that one in every four Tb deaths is HIV-related; this is twice as many as previously recognised (Sharma, Mohan, and Kadhiravan, 2005).

In Nigeria, varying prevalence rates have been reported. For example, Nnorom, Esu-Williams and Tilley-Gyado (1996) in a study of the incidence of HIV, Tb and syphilis in Nigeria found that Tb prevalence increases as HIV prevalence increases. HIV epidemic therefore has grave implications for the control of tuberculosis. Nnorom *et al* (1996) insisted that cases of Tb within the age bracket of 16-30 should be strongly considered for HIV screening and vice

versa because their data show a high prevalence of Tb and HIV among this population sub-set. Iliyasu and Babashani (2009) reported 10% while Nwachukwu and Peter (2010) found 6.4% and Pennap, Makpa, and Ogbu (2011) reported 41% prevalence of HIV in Tb patients; According to the World Health Organisation, Tb and HIV co-infection remains a major challenge and more efforts are needed to spot and treat the two conditions in tandem. In spite of the fact that Tb kills more people with HIV than any other disease, in 2008 only 1% of people with HIV had a Tb screen (de Carvalho, Monteiro, Neto, Grangeiro and Frota, 2008).

2.1.2 Knowledge, Attitudes and Beliefs relating to Treatment

There are many studies centred on the influence of patients' understanding of treatment, (including its duration and the consequences of defaulting) on adherence to treatment (Johansson, Long, Diwan and Winkvist, 1999; Khan, Walley, Newell and Imdad, 2000; Harper, Ahmadu, Ogden, McAdam, and Lienhardt, 2003; Jaiswal, Singh, Ogden, Porter, Sharma, Sarin, Arora and Jain, 2003; Watkins and Plant, 2004; Agu, Okojie, Oqua, King, Omonaiye, Onuoha, Isah and Iyaji, 2011). Although many of these studies were not in Nigeria, some of the findings can be useful in the examination of knowledge-related issues of treatment adherence in the present study. One important issue emerging from such studies is patients' poor understanding that life-long duration of treatment is required (Watkins and Plant, 2004; Estcott and Walley, 2005) while adherence is facilitated when patients understand the importance of completing treatment.

The importance of information on treatment was emphasised in a study that found non-adherent patients had little information on Tb as a disease, but were very aware of the potential adverse effects caused by its treatment (San Sebastian and Bothamley, 2000; Olowookere, et al., 2009). Similarly, knowledge about the treatment regimen has also been explored in research on adherence. For example, a number of scholars has identified pill burden and regimen complexity as important contributors to poor adherence (Maggiolo, Ripamonti and Suter, 2003; Simoni, Frick, Pantalone and Turner, 2003; Deschamps, Graeve, Van Wijngaerden, De Saar, Vandamme, Van Vaerenbergh, Ceunen, Bobbaers, Peetermans, de Vleeschouwer and de Geest, 2004; Erah and Arute, 2008).

In a study on patients' preferences of treatment regimen, optimum treatment regimen that patients selected included two or less pills per day, without dietary restrictions, small pills, all drugs combined into one pill and once-a-day dosing (Maggiolo, *et al*., 2003). Bartlett,

DeMasi, Quinn, Moxham and Rousseau (2001) showed that increased pill burden was negatively associated with the maintenance of viral suppression at 48 weeks and seemed to be the most significant predictor of response to therapy. A pill burden of up to six tablets was suitable for administration once daily, whereas twice daily therapy was preferred for a higher pill burden (Maggiolo, *et al*., 2003). Good adherence is associated with dosing twice a day or less (Chesney, Ickovics, Chambers, Gifford, Neidig, Zwickl and Wu, 2000; Chesney, 2003; Orrel, Bangsberg, Badri and Wood, 2003; Ramirez and Cote, 2003).

Scheduling demands, i.e. work, difficulty fitting medication into daily routine, mealtime and food restrictions and difficult dosing schedules, are consistently associated with decreased adherence (Fogarty, Roter, Larson, Burke, Gillespie and Levy, 2002; Chesney, Chambers, Taylor and Johnson, 2003; Simoni, *et al*., 2003;). This is why it is absolutely necessary that patients understand the treatment and its requirements. The use of interventions, such as pill boxes labelled with the dosing regimen and instructions, using a timer, and medication fitted into the daily schedule, can overcome some of the scheduling demands, and is associated with increased adherence (Carpenter, Cooper, Fischl, Gatell, Gazzard, Hammer, Hirsch, Jacobsen, Katzenstein, Montaner, Richman, Saag, Schechter, Schooley, Thompson, Vella, Yeni, and Volberding, 2000; Fogarty, *et al*., 2002).

Patients who experience difficulty with concentration or are forgetful, who have inadequate information about the regimen or who have difficulty with medication schedules, and do not understanding the relationship between adherence, viral load and disease progression, adhere significantly poorer (Wagner, 2000; Fogarty, *et al*., 2002; Chesney, *et al*., 2003). On the other hand, patients who have an accurate understanding of the purpose of the regimen are more likely to adhere to their treatment (Jones, Ishii, LaPerriere, Stanley, Antoni, Ironson, Schneiderman, Van Splunteren, Cassells, Alexander, Gousse, Vaughn, Brondolo, Tobin and Weiss, 2003). Clear, written instructions, pill boxes, asking questions about how the treatment can fit into daily activities and medication event monitoring feedbacks have been associated with improved adherence (Carpenter, *et al*., 2000; Fogarty, *et al*., 2002).

Patients' knowledge, attitudes, and beliefs about the disease (HIV/Tb), its treatment, and patients' interpretations of illness and wellness, can act as a "filter" for the information and treatment offered by the health services (Uzochukwu, Onwujekwe, Onoka, Okoli, Uguru and Chukwuogo, 2008). The influence of patients' interpretation of various illnesses on their adherence behaviour is important, and patients may interpret the themes of illness, wellness,

and disease differently from health professionals. This is unlikely to be the only influence on treatment-taking, because patients' interpretations interact with structural and health care service factors, as well as with social context.

Knowledge is an essential component of the health behaviours of patients, especially with regard to seeking medical care for symptomatic relief. A study by Chimbanrai, Fungladda, Kaewkungwal and Silachamroon (2008) found out that knowledge was significantly associated with treatment-seeking behaviours. Patients with better knowledge of Tb were more likely to come to a hospital for a Tb clinic first than those with poorer knowledge. Chimbanrai *et al*. (2008) further report that knowledge of Tb enables people to recognise the symptoms of Tb and seek early and appropriate medical care. In the same vein, Demissie, Lindtjorn and Berhane (2002) found knowledge to be an independent variable resulting in significant treatment-seeking delays. Therefore, educating people about HIV and Tb (and thus, other health conditions) will help people to seek medical care earlier.

Recent industry-supported surveys of knowledge, attitude and behaviour regarding treatment adherence have given greater insight into patient and provider perceptions of many variables influencing the practice of medicine-taking (Gallant and Block, 1998; Farthing, 2001). Such population data regarding health beliefs, self-efficacy, and barrier identification are useful for better understanding of the epidemiology treatment-taking and adherence. They are also useful in providing a context for further discussion about individual patient and provider interaction. The importance of assessing HIV educational needs has been recognised since the early 90s and researchers involved in clinical care of HIV infected patients have developed tools accordingly (Nokes, Kendrew, Rappaport, Jordan and Rivera, 1997).

Patients' beliefs about the efficacy of treatment, both positive (Marra, Marra, Cox, Palepu and Fitzgerald, 2004), and negative (Khan, *et al*., 2000; Demissie *et al*., 2003; Fong, 2004; Greene, 2004; Khan, Walley, Witten, Shah and Javeed, 2005), may impact adherence. Patients may question the efficacy of the pills or think that only injections are "medicine" (Khan *et al*., 2005), or even question the validity of diagnostic tests that are not considered sophisticated enough for such a dangerous disease. Belief in treatment efficacy appeared to be related to patient confidence in the medical system (Munro, Lewin, Swart and Volmink, 2007a); in some cases community-based treatment programmes increased confidence among community members that Tb could be cured (Liefooghe *et al*., 1995). Another study noted that patients preferred to consult traditional healers (Edginton, 2002).

Gauchet, Tarquinio and Fischer (2007) found adherence significantly associated with patients' beliefs about treatment, satisfaction with treatment, confidence in the physician, some values ("other people," "god and children"), and duration of treatment and illness. They concluded that patients' beliefs about treatment are formed to a certain degree in the patients' relationship with the physician, and that adherence seems to be related to personal values.

Depression and stress are some of the strongest predictors of non-adherence (Fogarty, *et al*., 2002; Chesney, *et al*., 2003). A feeling of hopelessness and negative feelings reduce the motivation for self-care. Other psychological factors that have been associated with poor adherence include coping by denial and behavioural disengagement (Jones, *et al*., 2003). The presence of social support systems, such as supportive family members and friends (Simoni, *et al*., 2003) or treatment groups, peer counselling (Chesney, *et al*., 2003), participation in cognitive-behavioural support therapy (Jones, *et al*., 2003), a positive attitude to the future, long-term plans and goals, and stable mental health are consistently associated with better adherence (Fogarty, *et al*., 2002). It is only when people that are infected with HIV and Tb have hope, and think of a future in which they have a part to play that they will be highly motivated to follow their prescribed regimen.

Hope is a motivator and can be encouraged by the belief that outcomes are controllable (Fraser, Hadjimichael and Vollmer, 2001). In a study on the predictors of adherence to copaxone therapy, Fraser *et al*. (2001) saw hope as a significant predictor of adherence. Stotland (1969) defines hope as the expectation greater than zero of achieving a goal. Hope is a primary motivator and necessary for action. Motivation is demonstrated by the individual acting toward goal attainment. Determinants of motivation include the importance of the goal and the expectation of achieving it. This can lead to the following indicators of motivation: overt action toward the goal, covert symbolic action toward the goal, and selective attention to aspects of the environment relevant to attaining the goal. Stotland (1969) suggests that the greater the expectation of attaining a goal, the more likely the individual will act to attain it. Therefore, it can be argued that hope for improved health and better quality of life in the future can motivate the patients to take their medication diligently, and that the hope that HIV will eventually get a cure can motivate patients to keep trying while waiting for such a time.

Investigating the individual-level factors that influence adherence to treatment has revealed a number of reasons for non-adherence. Talam, Gatongi, Rotich and Kimaiyo (2008), for example, reported keeping to clinic appointments, being away from home, forgetting, being

too busy, stigma attached to ARVs, side effects, too many medicines to take, feeling sick and change in routine as contributory factors to poor adherence. Studies have shown that fear and actual experience of side effects have consistently been associated with decreased adherence, and patients who experience more than two adverse reactions are less likely to continue with the treatment (Stone, 2001). Patients may self-adjust their regimen because of side effects, toxicity or personal beliefs (Miller, 1997).

When patients self-adjust the regimen, they will be taking less than the required doses and this has serious implications for the treatment outcomes. Forgetfulness and being too busy have been cited as the most common reasons for poor adherence to medications (Ostrop, Hallert and Gill, 2000). Talam *et al* (2008) also posit that a change in daily routine activities of the patients contributes to poor adherence to clinic schedules. If routine activities and lifestyles of patients are associated with medication schedules, adherence to medication can easily be accommodated (Catz, 2000). Regularity of appointment is important because it is during such appointments that medicines are given, and in Nigeria, the practice is to provide medicines that can last for two weeks. It is therefore necessary for patients to keep their appointments to forestall missing their medication because they were out of stock.

Efforts have been made to determine characteristics of patients (van Dulmen *et al*., 2007) who are particularly likely to be non-adherent (Simoni, Frick and Huang, 2006). Factors that have been found to be associated with adherence levels include mental health problems (Mills, Nachega, Buchan, Orbinski, Attaran, Singh, Rachlis, Wu, Cooper, Thabane, Wilson, Guyatt and Bangsberg, 2006), preparation, disclosure, coping, attitude to treatment (Horne, Buick, Fisher, Leake, Cooper and Weinman, 2004), understanding (Poppa, Davidson, Deutsch, Godfrey, Fisher, Head, Horne and Sherr, 2004), and the quality of the relationship between doctor and patient (Aronson, 2007).

2.1.3 Levels of Adherence for HIV Medication

There are differing levels of adherence needed to maintain virologic suppression, depending on the ARV class used. Kobin and Sheth (2011) have found out from their systematic review of literatures that the adherence level needed for un-boosted protease inhibitors (PIs) has been established as greater than 95%, but recent studies have shown that greater than 80% adherence to boosted PIs may be sufficient. Non-nucleoside Reverse Transcriptase Inhibitors (NNRTIs) could require lower adherence rates than boosted PIs. However, study results are

varied, and NNRTIs carry a potential for developing resistance with non-adherence. Studies assessing the adherence needed for raltegravir are yet to be performed.

Similarly, El-Khatib, *et al*. (2011) reported that unboosted protease inhibitor-based ART regimen required more than 95% adherence to ensure virologic suppression (Paterson et al., 2000). With today's NNRTI- and boosted protease inhibitor-based regimen a moderate adherence level (70-90%) may be adequate to achieve virologic suppression

The only concern is the availability of NNRTIs on a large scale in many developing countries. Although with funds coming from PEFFAR, these may be available with another downside to the NNRTIs that non-adherence leads quite easily to the development of resistance

2.1.4 Adherence to HIV and Tb Treatments

Several studies have been carried out in Nigeria to examine adherence levels to HIV/AIDS treatment and many other conditions requiring long-term medication taking. For example, Olowookere, Fatiregun, Akinyemi, Bamgboye and Osagbemi (2008) found out that up to 37% of respondents in a study of HIV patients did not meet 95% adherence levels, while also reporting forgetfulness and fear of toxicity of drugs as the main reason why patients reported poor adherence. Among patients co-infected with HIV and Tb, studies have reported higher default rate in Nigeria (Daniel and Oladapo, 2006; Wasiu, Asekun-Olarinmoye, Abdul-Wasiu, Olugbenga, Olarewaju and Akeem, 2011).

Uzochukwu *et al* (2009) have provided a deep insight into factors determining adherence to ARVs in south eastern Nigeria. Some of the most common reasons for non-adherence they reported were running out of medicines, and the inability to purchase more due to non-availability and inaccessibility to medications and financial constraints. Their findings were consistent with those found in Kano, Nigeria (Iliyasu, Kabir, Abubakar, Babashani and Zubair, 2005; Mukhtar-Yola, Adeleke, Gwarzo and Ladan, 2006). Uzochuwku *et al* (2009) have argued that access to medication at the treatment centres is of great concern and one of the predictors of non-adherence.

The frequent ARV drug stock-outs at several facilities in Nigeria have raised serious concerns about the sustainability of the national ARV programme and issues of non-

adherence. Whenever they are out of stock for drugs, it means that some people will not receive treatment for the period the stock-out last. This would no doubt have demoralised patients and most likely shake their faith in the government and the treatment programme. This is apart from the fact that these drugs are taken under a strict time-based regimen where 95% adherence or more is needed to effectively control viral load.

Although there is no standardised adherence measure especially in out-patients (one would have to depend on self-reported compliance), some studies have managed to do so. Current research has demonstrated that adherence to HIV remains a serious cause for worry in the course of the management of HIV and Tb morbidity and mortality. For example, Aboubacrine, Niamba, Boileau, Zunzunegui, Machouf, Nguyen and Rashed (2007) have reported that adherence to treatment remains a major public health challenge even though biological and clinical efficacy of treatment depend on strict adherence to at least three antiretroviral drugs in order to suppress replication of HIV (also see Paterson, Swindells, Mohr, Brester, Vergis, Squier, Wagener and Singh, 2000; De Ollala, Knobel, Carmona, Geula, Lopez-Colomes, Cayla, 2001; Duong, Piroth, Peytavin, Forte, Kohli, Grappin, Buisson, Chavanet and Portier 2001; McNabb, Ross, Abriola, Turley, Nightingale and Nicolau, 2001).

It is argued that missing more than 10% of doses is linked to incomplete suppression of viral replication, declining CD4 cell counts, clinical progression to AIDS or death (Paterson, *et al*., 2000; Press, Tyndall, Wood, Hogg and Montaner, 2002; Kuritzkes, 2004) and may even lead to the spread of drug-resistant HIV or Tb (Kuritzkes, 2004; Harrigan, Hogg, Dong, Yip, Wynhoven, Woodward, Brumme, Brumme, Mo, Alexander and Montaner, 2005). It must be noted that more recent reports stipulate 80% adherence to PI-boosted (Protease Inhibitors) and NNRTIs-based (Non-Nucleoside Reverse Transcriptase Inhibitors) regimen. However, PI-boosted and NNRTI-based regimen is not widely available in many parts of Africa. Studies have shown differing levels of adherence needed among ARV classes of medications as a result of differing methods of adherence measurement.

According American Public Health Association (APHA) (2004), adherence is a concept with social and emotional components. It argues that if adherence is to be attained in the setting of HIV treatment, close attention must be given to the daunting regimen to which the patient is subjected to. For the patient, the "how to" of adherence is the means to achieving relevant personal goals. Unless the health care provider works with the patient to identify these goals,

and to understand adherence as the means to achieving them, adherence to the therapeutic regimen may be inadequate. The term "therapeutic alliance" is used to describe a health care provider-patient relationship in which the therapeutic goals and the means to reach these goals are mutually affirmed and thus, most likely to be achieved (APHA, 2004).

Adherence to medication for various diseases has been the focus of many researchers and scientists long before the emergence of HIV (Cramer, Mattson, Prevey, Scheyer and Ouellette, 1989; Altice, 1998). Earlier studies on adherence to HIV medication, especially from the early HAART era, suggested that for there to viral suppression and virologic response, patients must make up to 80% or 90% adherence (Chesney, *et al*., 1999). However, some evidence later indicated that an 80% level with HAART adherence may be inadequate to prevent the development of antiretroviral drug resistance (Chesney, *et al*., 1999; Paterson, *et al*., 2000). This is significant in light of preliminary studies that suggest most individuals on HAART therapy are not 100% compliant. In fact, studies suggest that in a two- to three-day period, as many as 30% of patients report missing at least one dose (Chesney, 1997; Hecht, *et al*., 1998). Studies among hypertensive patients report that these patients may be compliant with their medications at the 50% level and that adherence or non-adherence to medications for other diseases, as well as HIV, generally ranges from 20-80% (Ickovics, 1997; Williams and Friedland, 1997).

However, more recent studies have found different levels of adherence required for HIV management, depending on the class of ARV used. The level of adherence needed for unboosted Protease Inhibitors (PIs) has been established as greater than 95%; greater than 80% are required for booted PIs. Nonnucleside Reverse Transcriptase Inhibitors (NNRTIs) may require lower than 80% adherence rates, but has the potential to develop drug resistant if patients do not meet the required adherence (El-Khatib, et al., 2011; Kobin and Sheth, 2011)

Studies examining the rate of adherence to HIV medications clearly document less than 100% adherence. For example, Muma, *et al*. (1995) reported adherence rates of 42%, with Chow, *et al*. (1993) documenting rates of 50%. Samet, Libman, Steger, Dhawan, Chen, Shevitz, Dewees-Dunk, Levenson, Kufe and Craven (1992) reported that 67% of patients were compliant at the 80% level and Eldred, Wu, Chaisson and Moore (1995) found that 46% of their sample missed one or more doses of their medication. It is important to also note that patients may take the total number of prescribed doses, but may not take these at the appropriate times. Melbourne, Geletko, Brown, Willey-Lessne, Chase and Fisher (1999)

noted that within a subgroup of patients who took more than 90% of doses, there was significant dosing fluctuation in 50% of patients during the first two months of treatment. The dosing fluctuation ranged from taking the medication within two hours of the prescribed dose time to greater than two hours of that defined time.

Even with the present day interventions to improve adherence, significant proportion of patients still do not reach the threshold necessary for viral suppression as evidenced from studies across various regions of the world. Hardly do patients attain 100% adherence and many do not reach the minimal level for reduction of viral load.

The consequences of missed doses or non-adherence to HAART appear to be severe, with evidence of an increasing viral load after missing only two days and the development of mutant viral strains (Vanhove, Schapiro, Winters, Merigan and Blaschke, 1996; Blaschke, 1997). As drug levels fall below a critical point, the regimen's inhibitory effect on viral replication may lessen, allowing for increases in viral load. This is why clinicians currently recommend that adherence be as close to 100% as possible while recognising that this recommendation poses a significant challenge to patients.

All over Africa, research is reporting poor levels of adherence to treatment of HIV (Akam, 2004; Benjaber, Rey and Himmich, 2005; Byakika-Tusiime, Oyugi, Tumwikirize, Katabira, Mugyenyi and Bangsberg, 2005). However, Biadgilign, Deribew, Amberbir and Deribe (2008) in a study in Ethiopia found that 339 children (86.9%), as reported by caregivers, were adherent to antiretroviral drugs for the past 7 days before the interview. Numerous variables were found to be significantly associated with adherence: children whose parents did not pay a fee for treatment and children who had ever received any nutritional support from the clinic were less likely to adhere. Whereas children who took co-trimoxazole medication/syrup in addition to ARVs, children who did not know their HIV status, and children who were not aware of their caregiver's health problem, were more likely to adhere than their counterparts. The implication of Biadgilgn *et al.*'s (2008) findings, especially the fact that children whose parents did not pay for the treatment are less likely to be adherent, is that whereas financial hardship is a strong factor in non-adherence, completely free provision of medication can also become a negative factor. People usually suppose that free medication is not important and thus, waste of. A good case in point is the non-acceptance of the oral polio vaccine in some parts of Nigeria.

It must be reemphasised that although adherence levels are one predictor of clinical outcome, they do not always explain all the observed variations in response. Liu, Miller, Golin, Hays, Wu, Wenger and Kaplan (2006a) noted that errors in dose timing may be crucial in understanding virological response and that the percentage of doses taken is insufficient to exclusively explain outcome effects they monitored in their samples in the US (Liu, Miller, Hays, Golin, Wu, Wenger and Kaplan, 2006b). This suggests that studies examining adherence which simply utilise a recall of dose are insufficient, and a more complex measure of adherence, involving dose timing as well as adherence to circumstances of drug administration, are important for a complete and accurate measure of adherence.

Bells, Kapitao, Sikwese, van Oosterhout and Lalloo (2007) examined the rate of adherence to antiretroviral treatment among patients receiving free treatment in Malawi using MEMS cap as a 'better" method of measuring adherence instead of patients self-report of adherence and pill count. Pill count dwells on the difference between number of tablets that have been taken and the number that should have been taken since that the last clinic visit. One important conclusion from the study is that there are serious complexities in the measurement of adherence and probable overestimation of adherence by pill count and self-report. Of course, these are the main methods used in the developing countries; this consequently raises concerns about the development of drug resistance

It is almost a consensus that in order to achieve an undetectable viral load and prevent the development of drug resistance, a person on HAART needs to take at least 95% of the prescribed doses on time (Paterson *et al.*, 2000; Castro, 2005). For many people, this means taking a regimen of three antiretroviral drugs twice per day – on both occasions, they are usually taking several pills (Partners in Health, PIH, 2004). With co-infection, this number would be higher, thus doubling the pill burden.

The relationship between adherence and resistance is drug specific (Bangsberg, Moss and Deeks, 2004), There is increasing evidence that drug resistance is high among patients taking 70 – 80% of regimen containing a non-boosted protease inhibitor (i.e. regimen with no combined ritonavir). It is also high among those with intermittent or single-dose regimen of non-nucleoside reverse transcriptase inhibitors (including when nevirapine is used once to prevent mother-to-child transmission of HIV) (Castro, 2005). Ritonavir-boosted PIs (a full dose of a PI combined with ritonavir to increase the blood levels of the former) confer limited resistance, regardless of one's level of adherence (Bangsberg *et al*., 1999).

Similarly, the key to successful tuberculosis control is patient adherence to treatment recommendations (Juvekar, Morankar, Dalai, Rangan, Khanvilkar, Vadair, Uplekar and Deshpande, 1995; White, Tulsky, Lee, Chen, Goldenson, Spetz and Kawamura, 2012). Juvekar *et al*. (1995) examined connected aspects like knowledge and perceptions, attitude and beliefs, help and treatment seeking pattern of tuberculosis patients as well as the operational aspects of help seeking. They found that social stigma plays an important role in the acceptance of a disease and adherence to its treatment. A large number of patients in their study accepted that they were suffering from tuberculosis, though there were a few instances of stigmatisation by the community and denials that they had tuberculosis. Juvekar *et al*.'s (1995) study also shows that patients have enough knowledge about the disease so as to recognise the symptoms and take action when they get the symptoms, but their inability to adhere to and complete the entire course of treatment is due to social, economic and health services related problems.

The administration of DOTS as opposed to self-administered Tb treatment requires the patient to appear at the DOTS centre and take the drugs in the presence and guidance of the health officers. Difficult as this may be, the DOTS therefore presents a better adherence determination than self-administered treatment. Treatment facilities in Nigeria give two weeks doses of medicines to patients so that they appear in the facility in a two weekly routine. Even so adherence to treatment in the DOTS programme is not very encouraging (Hovell, Blumberga, Gil-Trejob, Veraa, Kelleya, Sipana, Richard, Marshalld, Berge, Friedman, Catanzarog and Moser, 2003). The definition of non-adherence is varied (Albuquerque, Ximenes, Lucena-Silva, Souza, Dantas, Dantas and Rodrigues, 2007). The definitions vary for an "unsuccessful" outcome of Tb treatment and the population in which it has been studied. Some definitions consider only noncompliance, while others combine all negative outcomes: treatment failure, noncompliance, and death (Paz and Siqueira, 2004; Albuquerque, *et al*., 2007).

The introduction of a comprehensive multi-targeted intervention aimed at improving patient's adherence to treatment through improved counselling and communication between health staff and patients, decentralisation of treatment involving community health workers, flexibility in the choice of DOT supporter, and reinforced supervision activities of remote health posts can reduce the proportion of patients interrupting treatment before completion (Thiam, LeFevre, Hane, Ndiaye, Fatoumata, Fielding, Moustapha and Lienhardt, 2007).

According to Thiam *et al*. (2007) this resulted in a higher proportion of successful treatment outcomes compared with the usual treatment procedures. They also found that the choice of a DOT supporter among the patients' family members yielded better treatment outcomes than other DOT supporters.

Determinants have included male gender (Comolet, *et al*., 1998; Uplekar, 2001), older age, migration, homelessness, history of incarceration, alcoholism, HIV infection, intravenous drug use, and decreased access to healthcare. This implies therefore that patients concurrently on treatment for HIV and Tb (and any other co-infection for that matter) face increased risk of non-adherence. McCoy (2008) has written extensively on the work that goes into striving for adherence. She argues that what comes into view is a form of time work that brings about a temporary alignment between the inner experience of time, standard clock time, and the requirements of the medication schedule. For her, time work is largely cognitive; the pills, however, must actually be swallowed to complete the dose, occasioning, for some people, additional work to suppress or refashion emotional responses of anger and resistance. Both the time work and the emotional work of taking medicines for a prolong period of time draw people into forms of self work, including self-examination and self-adjustment, as they develop strategies for 'doing adherence'.

In a research on the factors which hinder HIV positive people from taking up antiretroviral therapy in Poland, Rogowska-Szadkowska, Chlabicz, Oltarzewska and Sawicka-Powierza (2009) have demonstrated a significant degree of prejudice regarding antiretroviral therapy among asymptomatic patients, which contributes to the decision of HAART refusal. The implication is that most HIV positive people would not want to adhere to treatment because of the fear they have of the antiretroviral. When HIV in complicated by other infections, such as Tb, the fear of the combined drug may become morbid, and act as a determining factor in patients' observance of their treatment.

Rocha, Pereira, Ferreira and Barros (2003) assessed the determinants of an unfavourable tuberculosis outcome (defined as no cure or death), and determinants for non-adherence to anti-tuberculosis treatment, in which seventy HIV positive patients with tuberculosis Rocha *et al*. (2003) found that an unfavourable outcome occurred in 22.9% of patients and 32.9% were non-adherent with therapy. Non-adherence was the only independent determinant for an unfavourable outcome. Adherence was independently associated with current intravenous drug use, treatment complications and use of methadone. Rocha *et al*.'s (2003) study

concludes that HIV-infected patients, treated as outpatients, have high rates of non-adherence. The problem here is that the possibility of keeping all HIV/Tb co-infected persons as in-patients is really difficult especially in resource-limited settings like Nigeria.

Shin, Muñoz, Espiritu, Zeladita, Sanchez, Callacna, Rojas, Arevalo, Wu, Caldas and Sebastian's (2009) study prospectively examines case series to identify risk factors for HAART non-adherence among patients with HIV and Tb in Lima, Peru. They depended on patients self-report as the basis for determining adherence. Results found low social support, substance use, and depression to be associated with non-adherence. Adherence interventions may be unsuccessful unless they target the underlying psychosocial challenges faced by patients living with Tb and AIDS.

Contrary to majority of studies which report a high level of non-adherence, Ware, Idoko, Kaaya, Biraro, Wyatt, Agbaji, Chalamilla and Bangsberg (2009) reported that individuals living with HIV/AIDS in sub-Saharan Africa generally take more than 90% of prescribed doses of antiretroviral therapy. This number exceeds the levels of adherence observed in North America and should have dispels early scale-up concerns that adherence would be inadequate in settings of extreme poverty. Yet, findings from other studies continue to report high levels of adherence issues; the difference may be in the methodology employed for the study. It is also necessary to mention that a single adherence level statistic for the whole of sub-Saharan Africa may hide considerable variations between countries and even within countries.

Ware *et al.*'s (2009) findings indicated that individuals taking ART routinely overcome economic obstacles to ART adherence through a number of deliberate strategies aimed at prioritising adherence: borrowing and "begging" transport funds, making "impossible choices" to allocate resources in favour of treatment, and "doing without." Prioritisation of adherence is accomplished through resources and help made available by treatment partners, other family members and friends, and health care providers. Helpers expect adherence and make their expectations known, creating a responsibility on the part of patients to adhere.

Patients adhere to promote good will on the part of helpers (Izugbara and Wekesa, 2011), thereby ensuring that help will be available when future needs arise. In this light, Ware *et al* (2009), therefore, explained adherence success in sub-Saharan Africa as a function of the attempt to fulfil social responsibilities to people who help and thus preserving social capital

in essential relationships. The issue with this conclusion is the assumption that patients will take their medication strictly as a "payback" to their helpers. This leaves out a number of barriers which may be internal to the individual or external (as in the health care system).

2.1.5 Integration of HIV and Tb Care

In a study on the need for the integration of HIV and Tb treatment services in South Africa, Wood (2007) maintained that integrated services is critical to effectively addressing both epidemics. He argues that integrating the services is important because it will help to streamline health systems, reduce referral delays, and improve individual case management. However, the integration of these services alone is unlikely to be sufficient to control Tb and HIV at a population level. Integration needs to be followed up with changes in programme to emphasise earlier identification of HIV-infected individuals before they develop the symptoms associated with advanced immune suppression, along with subsequent access to monitoring of HIV progression together with ongoing active Tb case finding.

A critically important issue to both Tb and HIV programmes is the availability of adequately trained healthcare workers who will be able to provide the breadth of care necessary for Tb/HIV co-infected patients (Awofeso, Schelokova and Dalhatu, 2008; Tsiouris *et al*., 2007). Tsiouris *et al.* (2007) posit that given the limited number of clinical providers currently available in resource-poor settings, it is necessary to evaluate the feasibility of using non-professional healthcare workers to serve in auxiliary roles, such as treatment supporters or directly observed therapy workers, which provide support to patients' adherence efforts and monitoring for adverse reactions for Tb/HIV co-infected patients.

These healthcare workers can be drawn from the community or family members, who are a rich source of support available in many resource-limited settings (farmer, Léandre, Mukherjee, Claude, Nevil, Smith-Fawzi, Koegnig, Castro, Becerra, Sachs, Attaran and Kim, 2001). The use of these facilitators and a community care model has been shown to be effective for delivering Tb therapy in other resource-limited settings (Miti, Mfungwe, Reijer and Maher, 2003). Non-professional facilitators and community care model may be associated with favourable clinical and virologic outcomes in patients with both Tb and HIV disease in need of treatment (Tsiouris, *et al*., 2007; Koenig, Ivers, Pace, Destine, Leandre, Grandpierre, Mukherjee, Farmer and Pape, 2010). Efforts are necessary to determine how to

effectively and safely adapt these models to serve for the simultaneous treatment of both Tb and HIV in a high prevalence country like Nigeria.

The importance of integrating HIV and Tb treatments has been well recognised (Ghandi, Moll, Lalloo, Pawinski, Zeller, Moodley, Meyer and Friedland, 2009) as one of the challenges to providing effective treatment for Tb/HIV-co-infected patients. Until recently, ARV therapy was not available in most of sub-Saharan Africa, not only due to high costs, but also due to a lack of health care infrastructure to safely and effectively utilise such therapy. Although Tb treatment programmes have long existed throughout Africa, treatment completion rates remain near 60%, well below the WHO's 85% standard, primarily due to a three- to four-fold increase in Tb case load in the past decade. Integration of Tb into HIV care is a promising strategy for addressing the need for infrastructure to provide HIV care, and the need for additional resources for Tb programmes (Reid, Scano, Getahun, Wiliams, Dye, Nunn, Cock, Hankins, Miller, Castro and Raviglion, 2006; Friedland, Harries and Coetzee, 2007).

Ghandhi *et al*. (2009) insisted that Tb and HIV therapy may be safely and effectively integrated to improve Tb and HIV outcomes and mortality in Tb and HIV co-infected patients in resource-limited settings. The integration strategy then needs to identify whether it will utilise a once-daily ARV regimen, given concomitantly with standard Tb therapy by home-based modified DOT or any other strategy. This will result in improved clinical outcomes, high levels of adherence, and a low incidence of severe adverse reactions. This strategy can serve as a model for integration of Tb and HIV care in other resource-limited settings where Tb DOTS programmes already exist (Ghandi, *et al*., 2009).

2.1.6 Social Support and Adherence to Treatment

Adherence to daily medicine regimen is embedded within a complex context that includes individual patients and their therapy, caregivers, households and society (Rapoff, 1999; Cupsa, Gheonea, Bulucea and Dinescu, 2000; Vreeman *et al*., 2008). In the absence of any of these involved categories of people, the treatment of patients may result in non-compliance, which in the long run will lead to high mortality from the condition. The influence of social context on treatment adherence was reviewed by Munro, Lewin, Smith, Engel, Fretheim and Volmink (2007) and found to be apparent in all studies included in their review.

The community, household, and health care service help in countering the shame and guilt that patients with Tb and/or HIV experienced, and also offered support in maintaining treatment taking (Munro *et al*., 2007). Social support can help patients overcome structural and personal barriers, and may influence their knowledge, attitudes, and beliefs. Conversely, community and family members' attitudes may influence a patient's decision to stop taking treatment. In such circumstances, community-based treatment programmes and stronger involvement of local social networks to support patients may be justified (WHO, 2003). Yet, in some cases the attitude of the community and even the family may be counter-productive, especially if it is socially excluding.

Mavandadi, Zanjani, Ten Have and Oslin (2009) found that social relationship play a significant role in the well-being of HIV positive people. As is the case with other chronic health conditions, individuals co-infected with HIV and Tb often experience challenges that place a lot of demands on coping resources and impact their quality of life, including changes in neuropsychiatric functioning (Baldewicz, Leserman, Silva, Petitto, Golden, Perkins, Barroso and Evans, 2004); a reduced ability to participate in daily activities (O'Dell, 1996); adherence to complicated treatment regimen (Tsasis, 2000) and changes in social network composition (Shippy and Karpiak, 2005). This last factor is very significant, because in cases where people suffer from diseases which are stigma-related, they tend to lose that network of social relationships, a resource which otherwise should be useful to them in coping with the condition.

The lost of family and friends due to HIV and/or any other stigma-inducing illness can be very depressing. In fact, approximately one-third to one-half of individuals with HIV often experience depressive symptoms (Swartz, Markowitz and Sewell, 1998; Lyketsos, Hoover, Guccione, Senterfitt, Dew, Wesch, VanRaden, Treisman, Morgenstern, Saah, Palenicek, Armenian, Farzadegan, Graham, Margolick, McArthur, Phair, Chmiel, Cohen, O'Gorman, Variakojis, Wesch, Wolinsky, Detels, Visscher, Chen, Dudley, Fahey, Giorgi, Lee, Martinez-Mara, Miller, Nishanian, Taylor, Zack, Rinaldor Jr, Kingsley, Becker, Gupta, Ho, Muñoz, Jacobson, Beaty, Galai, Epstein, Guccione, Hoover, Meinert, Nelson, Piantadosi, Su, Schrager, Vermund, Kaslow, VanRaden and Seminara, 2003; Eller, Corless, Bunch, Kemppainen, Holzemer, Nokes, Portillo and Nicholas, 2005). Vreeman *et al* (2008) examined the loss of social capital on adherence to HIV treatment focusing on orphans in Western Kenya, and stressed it's important to the patients' treatment behaviour.

Consistent with reports indicating high levels of adherence (Orel, Bangsberg, Badri and Wood, 2003; Laurent, Kouanfack, Koulla-Shiro, Nkoue, Bourgeois, Calmy, Lactuock, Nzeusseu, Mougnutou, Peytavin, Liegeois, Nerrienet, Tardy, Peeters, Andrieux-Meyer, Zekeng, Kazatchkine, Mpoudi-Ngole and Delaporte, 2004; Oyugi, Byakika-Tusiime, Charlebois, Kityo, Mugerwa, Mugyenyi and Bangsberg, 2004), participants in a qualitative study in Uganda rarely reported missing a dose of antiretroviral medication during interviews (Crane, Kawuma, Oyugi, Byakika, Moss, Bourgois and Bangsberg, 2006). One thing that must be borne in mind is that self-reported adherence is deluding and may not present the true situation because participants want to appear socially desirable. However, Crane *et al*. (2006) described this excellent adherence as the product of a constant battle to overcome the barrier of drug cost. The participants routinely named the price of medication (rather than side effects, stigma, or inconvenience) as the principal challenge to sustaining treatment, a finding consistent with those reported by Byakika-Tusiime, Oyugi, Tumwikirize, Katabira, Mugyenyi and Bangsberg (2005) and Gopi, Vasantha, Muniyandi, Chandrasekaran, Balasubramanian and Narayanan (2007).

Both Byakika-Tusiime *et al*. (2005) and Gopi *et al*. (2007) found out that financial sacrifice is the most important barrier to sustained adherence to treatment. Participants described purchasing and adhering to their antiretroviral regimen as a major life priority. Crane *et al*. (2006) reported that a single, working mother of two described buying her medication as "the most important thing in my life right now." This is particularly the case in resource-poor and difficult-to-access settings, where infected persons have to rely on out-of-pocket payment for their ARV and DOT treatment. In such a case, rationing becomes the standard practice. Crane *et al*. (2006) reported participants who had to alternate between one dose a day and two doses daily in order to stretch a prescription because she did not want to go a whole day without taking any drugs. Such practices have serious implications for medication outcomes.

Financial sacrifices required to purchase antiretroviral drugs encourage participants to postpone therapy until they experienced a rapid decline in their health or received a doctor's warning that they would soon die without treatment (Crane *et al*., 2006). In Crane *et al*'s (2006) study, patients' dramatic improvement, however, was often accompanied by new worries about the long-term sustainability of purchasing more drugs. Three participants, described as being unable to cover the full cost of the medication on their own, relied on assistance from family members and extended kin networks to purchase ARV medications.

Adherence to medication is seriously hinged on the support (financial, emotional, etc) patients received from family members and friends in continuing care. Financial cost of having to pay out-of-pocket for medication exerts a serious toll on family welfare and basic needs.

Antshel (2002) found culture to be an important variable in adherence among the Latino population in the USA. He argued that the consideration of common elements of the Latino culture is a viable mechanism to improving treatment adherence. Important shared elements including language, "familismo" (family), "respeto" (respect), "personalismo" (individualism), espiritism, "simpatia" (sympathy), fatalism and a crisis orientation as factors in the Latino population which can influence adherence to treatment. In addition, Antshel (2002) notes that acculturation pertains to treatment adherence and treats each cultural variable as a means of improving treatment adherence while the importance of culturally competent care is emphasised.

2.1.7 Availability and Characteristics of Treatment Service

Access to health care is the cornerstone of infectious disease control programmes that must ensure that patients receive a full course of treatment. In areas in which patients live far from health centres, the positive effect of free treatment is often offset by indirect transportation costs, and patients might prefer to give up treatment due to these costs (Hill, Stevens, Hill, Bah, Donkor, Jallow and Lienhardt, 2005). Results from a study by Hane *et al*. (2008) suggest that access to drugs would be improved through decentralisation of treatment. This finding is consistent with those reported in Africa (Adatu, Odeke, Mugenyi, Gargioni, McCray, Schneider and Maher, 2003; Kangangi, Kibuga, Muli, maher, Billo, Nogangoa, Ngugi and Kinmani, 2003; Nyirenda, Harries, Gausi, van Gorkom, Maher, Floyd and Salaniponi, 2003) in which decentralisation was shown to be effective overall, although the magnitude of the effect on treatment outcome varied according to the country, the type of treatment, and the site identified for treatment delivery.

Crane *et al*. (2006) suggested that poor adherence in impoverished settings may be understood best as an issue of access. For them, the distinction between access and adherence is more than semantics, because a problem with adherence suggests the need for intervention, whereas a problem of access suggests that efforts would be best targeted toward providing a reliable supply of free treatment. Some have suggested that the roll-out of antiretroviral

treatment in sub-Saharan Africa should be modelled on the DOT programmes that have been widely used to ensure adherence to tuberculosis medication (Harries, Nyangulu, Hargreaves, Kaluwa and Salaniponi, 2001). One component of these programmes is witnessed dosing (Farmer, *et al*., 2001). Crane *et al*. (2006) argued that this type of intervention is helpful in securing stable supply and distribution of medications, but the daily witnessed dosing component may be unnecessary in populations that are already highly motivated to adhere (Liechty and Bangsberg, 2003). More appropriately, resources should be allocated toward reliable medicine supply, distribution of free therapy, training of medical providers to prescribe optimal therapy, and clinical and laboratory infrastructure needed to support the increasing numbers of participants on ARVs and DOTs.

Factors related to the provision of health care services emerged strongly in the review by Heyer and Ogunbanjo (2006). Flexibility and choice in treatment, and options that maintain patient autonomy in treatment taking, appeared to run contrary to the traditional organisation of many Tb services (WHO, 2003; Dixon-Woods, Shaw, Sagarwal and Smith, 2004). These problems are often exacerbated by programme failures, such as inadequate supplies of drugs (khan, *et al*., 2000; Watkin and Plant, 2004) and difficulties in consulting providers (Khan, *et al*., 2000; Sanou, Dembele, Theobald and Macq, 2004; Khan *et al*., 2005).

Indeed, treatment at a health care facility often means that a patient has to give up part of their working day to attend (Khan, et al., 2000; Khan, et al., 2005). However, responsibilities in the home, including providing for their family, may be given priority over treatment adherence by patients. Other health care service factors, such as long waiting times and inconvenient opening times in clinics, add to economic discomfort and social disruption for patients (Estcott and Walley, 2005), can negatively influence adherence. The reviewed studies suggest that patients often face a choice between employment and taking medication for Tb and HIV; and there is evidence that patients consciously estimate the opportunity costs of taking treatment.

Moreover, it has been found that most of the factors associated with treatment non-completion, apart from the patient's age and level of education, are those related to physical access to health-care services. These include distance from home to treatment centre, rural residence, and a need to use public transport for ambulatory care (Shargi and Lindtjorn, 2007). In other settings, risk factors such as knowledge about treatment duration, change of treatment unit, running out of drugs, poor patient-health provider communication, and

medication side effects were reported to have been associated with treatment non-completion (Chang, Leung and Tam, 2004; Shargie and Lindtjørn, 2007; Inotu, 2012).

In India, Sarna *et al*. (2008) found out that education less than university level, unemployment, free treatment, severe depression, hospitalisation of more than 2 times, having moderate to severe side-effects, and taking four or more medicines were associated with lower adherence. However, on adjustment, only obtaining free treatment and severe depression were associated with lower adherence at the multivariate level. Sarna *et al*.'s (2008) main conclusion is that the provision of free treatment without adequate patient preparation and adherence support may compromise the success of ART programmes.

Adverse drug events influence willingness to take medication, and are consistently associated with poorer adherence (Fogarty, *et al*., 2002; Chesney, *et al*., 2003; Simoni, *et al*., 2003; Safren, Kumarasamy, James, Raminani, Solomon and Mayer, 2005). In one study, patients who reported adverse events (e.g. dermatological and gastrointestinal symptoms), were 12.8 times less likely to be 95-100% adherent (Ickovics, *et al*., 2002). Medication is often discontinued when side effects occur, whether the side effects are actual or perceived. The patients' subjective side-effect experiences in the first four months predict long-term adherence more strongly than do other variables (Chesney, *et al*., 2003). According to Heyer and Ogunbanjo (2008), collaboration between the patient and the provider can result in the selection of a lifestyle-tailored regimen characterised by convenient dosing, a low pill burden and tolerable side effects. Side effects should be dealt with actively to prevent discontinuation of treatment.

The patient-provider relationship has been identified as an important factor influencing adherence to treatment (Roberts, 2002; Beach, Keruly, Moore, 2006). Aspects of the patient-provider relationship including trust, consistency, and continued interaction have been identified as being particularly important (Singh, Squier, Sivek, Wagener, Nguyen and Yu, 1996; Ickovics and Meisler, 1997; Bakken, Holzemer, Brown, Powell-Cope, Turner, Jnouye, Nokes and Corless, 2000, Uzochukwu et al., 2009). Further, patient adherence to medications is enhanced when providers give clear explanations and provide full disclosure of potential adverse events, and when they offer encouragement, reassurance and support (Etienne, Hossain, Redfield, Stafford and Amoroso, 2010).

Another class of variable that appeared relevant to the problem of adherence is values. Many authors have demonstrated the link between values and behaviours (Schwartz, 1992; Fischer and Tarquinio, 2002). Indeed, values are often considered as representing the underpinnings of behaviour. In this view, people create a system of personal values from their experiences with their physical and social environment, their culture, and so on, and they then proceed to act from this system of values. To put it differently, people decide what is important for them and act accordingly. For instance, how does values like "spirituality" influence medication adherence? Although the effect of spirituality on medication adherence per se is undocumented, persons diagnosed with life-threatening illness such as cancer and HIV/AIDS have reported high levels of spirituality (Jenkins, 1995), which have been highly correlated with psychological adaptation and good health outcomes (Kaczorowski, 1989; Simoni, *et al*., 2002).

A good patient-healthcare provider relationship is an important motivating factor for taking and adhering to complex combination drug therapies. Perceptions of the competence of the healthcare provider, as well as their communication quality and clarity, compassion and willingness to include patients in treatment decisions and the convenience of visiting the doctor are associated with better adherence (Chesney, 2003; Godin, Cote, Naccache, Lambert and Trottier, 2005). Healthcare providers should be encouraged to work with patients as "partners" in care and to involve representatives from the entire HIV community (Chesney, 2003; Heyer and Ogunbanjo. 2008). Primary care providers who exhibit judgmental behaviour, stereotyping and homophobia, and who fail to address cultural issues when administering care, are likely to cause some people with HIV and Tb co-infection to avoid the healthcare system (Chesney, 2003). A lack of financial and institutional resources, disruptions in the supply of medication and difficulty in gaining access to health services have been associated with poorer adherence (Fogarty, *et al*., 2002; Safren, *et al*., 2005).

A report from Cameroun of an intervention programme aimed at making ARV available to people who cannot access drug in which the cost of drugs and medical follow-up were entirely supported by patients, families or employers (Meilo, Guiard-Schmid, Tzeuton, Mapoure, Meno, Ntone Ntone and Rozenbaum, 2002). The report showed a great disparity on treatment adherence: less than 50% of patients regularly bought their drugs, 90% of adherent patients had funding from their employers; patients asking for a switch to a cheaper treatment were nine fold larger among those supported by their families or themselves than those

funded by their companies Patients supported by their families feel uncomfortable to be dependant, and those supported by their companies are anxious about sustainability of their treatment (in case of losing their job) (Meilo, *et al*., 2002). The implication is that the cost of treatment is a major factor in the understanding of treatment adherence. It must be noted that elsewhere free supply of medicines to patients was documented as an inhibitor of adherence to treatment (Sarna *et al*., 2008).

2.1.8 Socio-Economic Status and Access to HIV/Tb Treatment

An interesting finding by DeSilva, Merry, Fischer, Rohrer, Isichei and Cha (2009) has it that youthfulness, unemployment and male gender are predictors of mortality from HIV among patients already started on treatment. This finding has implications for the understanding of factors influencing adherence to treatment, since the factors that make a patient who is already on treatment to die may be related to those regarding their ability to be compliant with the medication regimen. Also, the DeSilva *et al*.'s (2009) study is significant because it raises serious questions regarding the interpretation of demographic disparities as health disparities between the different socio-economic strata. DeSilva *et al.* (2009) found that individual and household income has a strong correlation with predictors like ''youth'' and ''unemployment''. They controlled for economic differences between patients by using employment status as a proxy for socioeconomic status, but this in itself can be a mistake as where extended families live together, household income, rather than individual employment status, is a stronger predictor of socioeconomic status.

Furthermore, DeSilva *et al.* (2009) found out that differences in health outcomes between demographic groups are by definition health disparities, and that active Tb and socio-demographic risk factors makes younger adults, the unemployed or those with unknown employment, and men started on HAART to have a poorer clinical outcome than women, the employed and older adults. A review of factors by Heyer and Ogunbanjo (2006) reported that personal and social factors, including poverty and social marginalisation, may be used by some providers to identify patients at risk of non-adherence to their medication regimen. However, it cannot be assumed that all individuals sharing a particular characteristic face the same barriers to adherence. Non-adherence can be a product of programme failures, such as an inadequate supply of drugs, rather than patient-related problems or failures (Jaiswal,

Singh, Ogden, Porter, Sharma, Sarin, Arora and Jain, 2003). This is why a study that examined both individual level and social level factors predicting adherence was necessary.

Educational level, literacy, income and housing status are not consistently predictive of adherence (Fogarty *et al*., 2002). In 22 studies evaluated by Fogarty *et al*. (2002), five demonstrated an association between socio-economic factors and adherence. Tuldra, Fumaz, Ferrer, Bayes, Arno, Balague, Bonjoch, Jou, Negredo, Paredes, Ruiz, Romeu, Sirera, Tural, Burger and Clotel (2000) demonstrated that a higher income was associated with better adherence; Wagner (2002) reported a positive association between college education and adherence, while employment status showed no association with adherence. In Brazil, a very low educational level, which is considered the best indicator of social status, was a predictor of non-adherence (Nemes, Carvalho and Souza, 2004). Studies in India (Safren, *et al*., 2005) and South Africa (Orrel, *et al*., 2003) have found no association between adherence and socio-economic status. Evidence regarding the relationship between adherence and gender is weak, with most studies not finding any association (Fogarty, *et al*., 2002; Orrel, *et al*., 2003, Safren, *et al*., 2005). In a one-year longitudinal study in Canada, being male was associated with better adherence (Godin, *et al*., 2005). Barriers to adherence, such as care-giving burdens, a multiplicity of roles and fear of disclosure, might disproportionately affect women and have an influence on their ability to adhere to medication (Zorilla, 2000).

Several studies have reported better adherence among older patients (Tuldra, *et al*., 2000; Fogarty, *et al*., 2002; Mannheimer, *et al*., 2002; Wagner, 2002; Goujard, Bernard, Sohier, Peyramond, Lançon, Chwalow, Arnould and Delfraissy, 2003; Orrel, *et al*., 2003; Nemes, *et al*., 2004). Special issues relating to adherence exist for HIV-infected children and adolescents (Chesney, 2003). Children are dependent on their caregivers for the administration of medication and adherence is thus only as good as the caregivers are able to achieve. Unpalatable liquid formulations may affect the willingness of a child to take medication. Adolescents often rebel against treatment, as they do not want to be different from their peers. A fear of disclosure of the child's HIV status may prevent caregivers from collecting a script at local pharmacies or from sending the child to school without their medication.

Active substance abuse is generally associated with lower adherence (Fogarty, *et al*., 2002; Mannheimer, *et al*., 2002; Chesney, 2003; Chesney, *et al*., 2003; Jones, *et al*., 2003) However, in 26 studies evaluated by Fogarty *et al*. (2002) no association was established

between lower adherence and substance abuse. One study showed better adherence in patients who did not smoke (Goujard, *et al*., 2003).

2.1.9 Gender, HIV Vulnerability and Treatment Adherence

More than 60% of HIV-infected adults in sub-Saharan Africa are women, who are disproportionately affected by the HIV-1 epidemic for both biological and socio-cultural reasons (El-Khatib, Ekstrom, Coovadia, Abrams, Petzold, Katzenstein, Morris and Kuhn, 2011). Women bear 10% of the global burden of HIV with youths and in particular young women vulnerable to the infection (NACA, 2010a). The HIV/AIDS pandemic reflects gross socio-economic and gender inequalities in developing countries. The female-to-male ratio of new HIV infections is significantly higher in sub-Saharan Africa and the Caribbean than in the Western countries. The vulnerability of women and girls to HIV remain particularly high in sub-Saharan Africa, about 76% of all HIV positive women in the world live in this region (UNAIDS, 2009).

Women's lack of property rights, differential access to literacy and education, lower wages and lack of assets also shape their HIV/AIDs risks. Research has confirmed that sexual double standards, harmful cultural practices (e.g. widow cleansing, a practice that involves a widow having sexual relations with relatives of her late husband) and sexual violence heightens women's HIV/AIDs risks (Dworkin and Ehrhardt, 2006). The Joint United Nations Programme on HIV/AIDS report detailed that in several countries 50% of new infections were occurring between spouses and that those women were most often at risks from their male partner.

The concept "feminisation of HIV/AIDS" was conceptualised with evidence-based studies reinforcing the necessity of placing comprehensive, long term efforts that focus on gender relations in the forefront of the fight against HIV/AIDS (Dworkin and Ehrhardt, 2007). HIV/AIDS is no longer confined to high-risk populations, it is becoming increasingly feminised and it is clearly linked to cumulative patterns of gender inequality, economic disruption and population movements. Stigma and discrimination, entrenched gender inequalities, gender-based violence, human rights violations, mobility and economic power are some of the major structural drivers that hamper HIV prevention efforts and impede progress towards universal access.

Conflict-affected populations are vulnerable to gender based violence and risk of HIV infection. A study conducted in Ethiopia among refugees elucidated there been subject to gang rape, sexual violence, coercion and kidnapping coupled with their inability to access health services. Various barriers were stated by the refugees from seeking health care in their host country. Such barriers included lack of awareness of HIV/ health risks and available services, low confidence in availability and quality of services, language barriers between providers and survivors, stigma related to gender based violence (Wirtz, Vu, Pham, Rubenstein, Singh and Glass, 2012).

In Nigeria, internally displaced persons are faced with several problems such as sexual violence which has increased the prevalence of HIV/AIDS. The situation is worrisome with the neglect of these persons from services including HIV/AIDS prevention and treatment. In a study conducted by Enwereji (2009), on internally displaced persons in Abia State, Nigeria, it was documented that none of the organisations including governmental institutions provided social services or assistance in prevention of HIV/AIDS to internally displaced persons. The main services provided were provision of food, clothing, money, spiritual counselling and resolution communal conflicts which were provided on an ad hoc basis. The fact that government does not have services for internally displaced prisons indicates lack of support for internally displaced persons.

Women who test positive to HIV are highly vulnerable populations that need specialised, long-term services focusing on their being integrated back into their communities and homes. Survivors of war violence are perceived as being HIV positive after rape, contributing to their isolation. Often times these women are stigmatised and often repudiated by their husbands and families. Integrating religious and community leaders into programs that respond to negative attitudes towards survivors will be vital in addressing the stigma towards these women.

Numerous studies in heterosexual relationships found an association between intimate partner violence and high rates of risky behaviours (such as multiple sex partners, non-use or inconsistent use of condoms and sexual coercion) and Sexually Transmitted Infections (STIs) such as HIV. There are several explanations for this relationship which are the socialisation of women and men in relation to their gender which are socially defined and constructed. Also, the patriarchal societies is constructed to idolise men's strengths and toughness, phenomenal sexual success and clustering of violent, anti-social and risky sexual practices as

well as women's submissiveness. In such societies, women's sexuality might pose a threat to the socially accepted norms and behaviour, as it challenges men's control over women, and provokes jealousy in the women's spouses (Jewkes and Morrell, 2010; Dunkle, Jewkes, Nduna, Levin, Jama, Khuzwayo, Koss Duvvury, 2006].

Women who follow such socially prescribed norms are at high risk of acquiring HIV infection subsequent to their partners' high-risk behaviour (Osinde, Kaye and Kakaire, 2011). Social and cultural systems in many African societies dictate that women have no control over their sex lives, or the sex lives of their husbands outside marriage. This culturally prescribed lack of control on their sexual relationships has made women, particularly married women, highly vulnerable to HIV infection. Wives are not allowed to refuse sex from their husband, or to use a condom, even if the husband is infected with HIV (Buve, Bishikwabo-Nsarhaza and Mutangadura, 2009). Similar findings were observed in normative gender relations studies in Zimbabwe, Cameroon and Nigeria where men make decisions and husbands have power over their lives sexuality/fertility (Koster, Bruinderink and Kuijper, 2012).

Tun, Keesbury, Simmonds, Sheehy, Moyo, Rathner and Kalibala (2012) in their study on gender issues and its implications for HIV prevention programmes in Zambia observed that inequitable gender norms are pervasive affecting women's vulnerability to HIV and gender based violence. Consequently marital rape which is a form of sexual violence that happens covertly increases women's vulnerability to HIV infection. Marital rape in a study conducted among respondents in rural and urban Tanzania connotes 'normal" and a 'common' practice. The sexual norms forbid married women from denying sex to their husbands in whatever circumstances. Findings from the study revealed that women had to comply with marital rape due to the social construct of marriage and their duty to serve their husbands (Kachuchuru, Matungwu, Chenha, Visser, Vanreeuwijk, Maro, Massawe, Kalongola, Francis, Changalucha and Mshana, 2012).

According to the NDHS 2008, 28% of all women reported experiencing physical violence since the age of 15, and 15% of women experienced physical violence in 12 months preceding the survey. Forty five percent of the respondents reported their perpetrator was their current husband or partner while 7% stated that the perpetrator was a former husband or partner. Half the women in the study indicated that the perpetrator of their sexual violence was a stranger (28%), friend or acquaintance (12%), relative (11%) and family friend (7%).

Further findings from the study revealed that 34% of Nigerian women who ever experienced physical or sexual violence sought help to stop the violence, 8% did not sought help but told someone while 45% of the women did not seek help or tell anyone about the violence. Alarming findings are the susceptibility of HIV positive women to domestic violence such as physical violence, verbal violence, emotional violence, sexual deprivation and sexual violence in Nigeria. Most of the violence stems from the woman's age, marital status, disclosure, multiparity and partner's education (Iliyasu et al., 2011; Ezeanochie, Olagbuji, Ande, Kubeyinje and Okonofua, 2011; Ezechi, Gab-Okafor, Onwujekwe, Adu, Amadi and Herbertson, 2009). Thus there is the need to address the power imbalances between men and women that contribute to HIV risk and focusing on male norms and behaviours that contribute to gender based violence.

In addition women empowerment programmes should be considered as an effective way for HIV prevention with government strengthening and implementing policies fostering women sexual and reproductive rights. Similarly, Nyirenda et al (2006) showed that fewer women from the 15-29 age group accessed counselling and testing services, but more were positive (4% of men, against 18% of women). More women also tested positive in the over-24 age group (40%) compared to men (26%).

Studies on adherence to ARVs have hardly set out to consider gender issues underpinning adherence; some have analysed gender differences as a by-product of the socio-demographic analysis. As such much attention has not paid to gender issues in treatment-taking behaviour. At the same time, evidence suggests that women often encounter gender-related barriers to accessing health services of which ARVs are a part. In Africa, many women have to obtain permission from their husbands or male relative to seek any health care and this can become more difficult if women request for money. In addition, where costs for treatment are involved, families may prioritise paying for men's treatment (Herstad, 2010). Herstad (2010) argues that HIV-positive women's access to information, treatment and support is also affected by stigma and discrimination because of social values surrounding the importance of female purity and virginity.

Recently, studies have started to explore women's and men's experiences related to adherence by including discussions of gender issues. Muula and Kataika's (2008) assessment of the uptake of ARVs in Malawi found that men were unlikely to access treatment out of fear of marital consequences. That is, men testing positive were perceived to have contracted

HIV as a result of infidelity; most women think that HIV transmitted from one spouse to another is indicative of husbands' infidelity (Muula and Kataika, 2008). Given that the desire for marital harmony affects men's willingness to access testing services, men clearly face a barrier in obtaining and maintaining treatment.

2.1.10 Stigmatisation and Adherence

Stigma and discrimination have always been serious problems for people living with HIV and Tb. This is true in developing as well as developed nations, and in concentrated as well as generalised epidemics. Stigma and discrimination affect women, men, orphans, youths, care providers, and the most at-risk populations. A failure to understand and address this problem represents a failure of imagination across the spectrum of prevention, treatment, and care, and, ultimately, in the ability to shape an effective response. Understanding the roles of stigma and discrimination depends on the ability to think through the difficult and complex social and emotional dimensions of the epidemic. It is necessary to look through the eyes of those most affected and try to understand how stigma operates as a structural barrier to programme and policy implementation aimed at ameliorating the effects of these epidemics.

Waite, Paasche-Orlow, Rintamaki, Davis and Wolf (2008) examined social stigma as a possible mediator between literacy and self-reported HIV medication adherence. In that study it was found that approximately one-third of the patients studied (30.4%) were less than 100% adherent to their regimen and 31.4% had marginal (7th–8th grade) or low (≤ 6th grade) literacy. Moreover, patients with low literacy were 3.3 times more likely to be non-adherent to antiretroviral regimen; perceived social stigma was found to mediate the relationship between literacy and medication adherence. While low literacy was a significant risk factor for improper adherence to HIV medication regimen in that study, perceived social stigma mediated the relationship.

According to Rintamaki, Davis, Skripkauskas, Bennett and Wolf (2006), the threat of social stigma may prevent people living with HIV (and other chronic illnesses) from revealing their status to others and serve as a barrier to treatment adherence. Rintamaki *et al.* (2006) evaluated the effect of such concerns on self-reported treatment adherence using a short, three-item measure among 204 people living with HIV. They found that people with high HIV stigma concerns were 2.5 times less likely to define and interpret the meaning of CD4 count correctly and 3.3 times more likely to be non-adherent to their medication regimen than

those with low concerns. Concern over revealing HIV status was a significant predictor of adherence. Rintamaki *et al*. (2006) therefore suggested that clinical care directed to individuals living with HIV should include considerations for patient sensitivity to social stigma, such as modifications to medication schedules and referrals for counselling prior to enrolment in antiretroviral therapies.

Although the availability of antiretroviral medications has transformed living with HIV infection into a manageable chronic illness, stigma has been identified as one reason mitigating effective management because of missed medication doses (Dlamini, Wantland, Makoae, Chirwa, Kohi, Greeff, Naidoo, Mullan, Uys and Holzemer, 2009). A study explored the relationship between perceived HIV stigma and self-reported missed doses of antiretroviral medications in Lesotho, Malawi, South Africa, Swaziland, and Tanzania. Dlamini *et al*. (2009) found that there was a significant relationship between perceived HIV stigma and self-report of missed medications over time: individuals who reported missing more ARV medications also reported higher levels of perceived HIV stigma. Individuals reporting fewer medication worries reported decreased stigma over the one year period that the study lasted; those who reported increased symptom intensity also reported increased stigma that remained high over time. The implication of this is that there is a significant and stable correlation documenting the relationship between perceived HIV stigma and self-reported reasons for missed medications over time. Poor adherence is therefore clearly linked to social stigma.

In Nigeria, Sekoni, Obidke and Balogun (2012) found out that stigma was experienced by 35% of the respondents although it did not affect the level of adherence. Sekoni et al (2012) also found out that stigma was low, and that the most common domain of stigma experienced was public attitude stigma. A study among adolescents in Ibadan (Sangowawa and Owoaje, 2012) found out that significant proportions of young people, especially women experienced a lot of social stigma and discrimination because their HIV status was disclosed. The implication is that HIV continues to be treated with stigma and infected persons hide their status; and this may affect their treatment-taking behaviour.

Another dimension of the social stigma issues and treatment adherence is introduced by Zukoski and Thorburn (2009). In their investigation of treatment adherence in low prevalence and rural communities, they insisted that those were unique settings in which HIV-related stigma and discrimination may be intensified due to lower tolerance of differences among

people and greater fear of HIV. It is likely that in such communities, almost everybody will know the other, and even those who are infected, thereby, increasing the likelihood of stigmatisation. Zukoski and Thorburn examined the experiences of 16 individuals living with HIV who reside in a predominantly rural area with low HIV prevalence to explore participants' experience with stigma and discrimination in social and health care settings, and their behavioural and emotional responses.

Zukoski and Thorburn found out that participants experience feelings of social rejection, being forced to follow different rules of social contact, and being treated differently in their day to day living in the community. In health care settings, participants described specific instances when they felt providers were afraid of them and when they were refused or discouraged treatment or treated differently based on their HIV status. Participants experienced stigma and acts of discrimination in different settings (e.g., physician and dentist offices and hospitals) and from a range of types of providers (e.g., physicians, nurses, and dentists). Behavioural and emotional responses to perceived acts of stigma and discrimination included anger, shame, social isolation, and self-advocacy. All these emotional and behavioural outcomes have a direct bearing on treatment adherence.

Sirey, Bruce, Alexopoulos, Perlick, Friedman and Meyers (2001) examined psychological barriers to treatment (but they focused on depression), such as perceived stigma and minimisation of the need for care to find out whether they are important obstacles to adherence to treatment. They examined the impact of barriers that were present at the initiation of antidepressant drug therapy on medication adherence in a mixed-age sample of outpatients with major depression. Sirey *et al*. (2001) found medication adherence to be associated with lower perceived stigma, higher self-rated severity of illness, age over 60 years, and absence of personality pathology. They made a pertinent conclusion that perceived stigma associated with mental illness and individuals' views about the illness play an important role in adherence to treatment for depression.

Nachega, Stein, Hlatshwayo, Mothopeng, Chaisson and Karstaedt (2003) investigated potential cultural barriers to antiretroviral adherence in resource-limited settings in South Africa, and found out that 84% of their participants reported greater than 95% adherence in the previous month. Six respondents (11%) reported adherence of 90-95% and two (5%) adherence of 80-85%. The main reasons for missing doses were being away from home; difficulty of dosing schedules and running out of pills. Results also showed that the odds of

adherence decreased considerably with fear of stigmatisation by sexual partner. They maintained that access to affordable, simplified regimen as well as continuing vigilance and fight against disease stigmatisation are some of the strategies to maximise ART adherence.

2.1.11 Interventions to Improve Patient Adherence

Several intervention programmes have been designed to help scale-up adherence to HIV medication. To examine some of the interventions studies, it was appropriate to review systematic literature reviews of intervention studies. Thus, Bärnighausen, Chaiyachati, Chimbindi, Peoples, Haberer and Newell's (2011) review of interventions to improve antiretroviral adherence in sub-Saharan Africa and Haynes, Ackloo, Sahota, McDonald and Yao's (2008) review of interventions for enhancing medication adherence were examined.

Haynes *et al* (2008) identified a number of interventions that have been used or proposed including giving patients more and clear instructions, counselling patients on the importance of treatment and adherence to treatment and informing them of the possible side-effects, thus, empowering to make informed decisions. Other intervention options include using reminders, namely, automated telephone, computer-assisted patient monitoring and counselling, manual telephone follow-up and family intervention.

The review by Bärnighausen *et al*. (2011) may be more relevant because they concentrated on interventions within the sub-Saharan African region. Although several of the interventions identified were similar to those in the review by Haynes *et al*. (2008), Bärnighausen *et al*. (2011) classified theirs into interventions combining behavioural, cognitive, and affective components which included treatment supporters that provided both emotional and instrumental adherence support.

They identified other interventions incorporated behavioural, cognitive, affective, and biological interventions through combinations of treatment supporters, nutritional support, financial support, psychosocial support, and education sessions. Purely behavioural interventions used directly observed therapy, diary cards, and mobile-phone short message services (text messages) to remind patients to take their ART drugs. Several interventions used directly observed therapy in addition to other adherence support. Purely biological interventions used various food supplements. Structural interventions included several

models of delivery which differed in the type of health worker providing routine adherence support or the type of health-care setting.

It is important to note that these intervention studies reported varying degrees of successes, and have differential challenges with their implementation.

2.1.11 Summary of Review

It was obvious from the review of the literature that studies have focused mainly on either one set of variables (individual- or social-level factors) without seriously examining the interactions among the variables. This has produced knowledge that identifies issues that were found out from the interested set of factors, and leaving the other set out. This creates lacunae in the body of knowledge. A lot of factors at both individual level and social or structural level have been identified as determinants of treatment adherence or non-adherence. Moreover, most of the studies were approached from the biomedical perspective; the nature of HIV and Tb as social, as well as biomedical conditions makes it necessary to attempt a social dimension of the problem of adherence. In fact, a review of studies by Heyer and Ogunbanjo (2006) insisted that the fight against HIV and Tb must be approached from a multi-dimensional perspective. It was based on this that this study was designed not only to offer a social science angle to the burning issue of adherence, but to examine adherence to both HIV and Tb in one study since they are a high prevalent co-infection.

2.2 Theoretical Framework

Three theoretical perspectives were utilised for the explanation of adherence to HIV treatment. These were the social action theory, health belief model and the social cognitive theory. Whereas the health belief model approached the study from the individual level explanation, social cognitive theory explained the social dimensions that had implications for adherence or non-adherence. Social action theory finds the middle ground between the individual and structural level analyses.

2.2.1 Social Action Theory

Talcott Parsons popularised this theory and its emphasis is on how customs, values, norms of a particular socio-cultural milieu constrain or give impetus to individual action. In the structure of society, Parsons described a model of society whereby the voluntary actions of

individual actors are better understood as contributing to the workings of a cohesive whole. In other words, individual's intentional and voluntary actions are not performed in isolation or only toward their own ends. Rather, deterministic social pressures – such as situations, norms dictating standard behaviour, laws and the overall needs of the system – cause individuals to act in such a way that collective ends arise through the sum of their intentional and individual actions.

This theory owes its foundations to the Weberian social action theory, which questions the predominance and overwhelming influence of the whole above, and over the parts making up that whole. It therefore posits that the whole constrains the individual to use its pathways for or means of attaining a goal rather than the individuals' idiosyncratic perceptions (Nwokocha, 2004). The Action theory of Parsons is built around the premise that all human actions are directed at a goal including that of maintaining a functional health state.

Parsons' (1951) theory is built on four functional imperatives, also known as the AGIL system. According to him, the four functional imperatives, which ensure the survival or continuity of a system, are *Adaptation, Goal Attainment, Integration, and Latency* (also known as pattern maintenance). Adaptation refers to the fact that a system must adjust or cope with its external environment. Goal attainment has to do with the capability to set goals for the organisation and make decisions accordingly. The Integration prerequisite addresses the need for a system to regulate the interrelationship of its component parts. It has to do with the solid harmonisation of the system's values and norms. Lastly, the Latency imperative connotes the maintenance of the cultural patterns and sustaining the motivation to do them (Ritzer and Goodman, 2003, Keel, 2011). The AGIL scheme can be divided into external and internal aspects. The external aspects include the adaptation and goal attainment imperative while the latency and integration imperatives are the internal aspects.

The Parsonian social action theory is relevant to the understanding of patient treatment adherence behaviour. Erinosho (1978) and Oke (1982; 1996) have variously posited that the social and cultural contexts in which one finds themselves dictate norms that in turn define their actions (in Nwokocha, 2004). Patients' adherence behaviour is therefore determined by the facilities or services that are found in the social and physical environments, the cultural norms and values regarding health or sick role behaviour, and the individuals desire to conform to the expected social norms. These societal imperatives find expression in the wealth, health services, distance to these services and information available on these services.

These act on the individual's psyche and determine the actions that are taken in the face of these facilities (health) and services found in the social and cultural environment.

2.2.2 Health Belief Model

This study utilises the health belief model (HBM) to explain adherence to treatment of HIV and Tb co-infections. The HBM was developed by three notable scholars with social psychology backgrounds - Godfrey Hochbaum, Stephen Kegels, and Irwin Rosenstock (1974). They were seriously influenced by the work of Kurt Lewin. The HBM was originally developed as a systematic method to explain and predict preventive health behaviour. It focused on the relationship of health behaviours, practices and utilisation of health services. However, in later years, the HBM has been revised to include general health motivation for the purpose of distinguishing illness and sick-role behaviour from health behaviour. It is generally regarded as the beginning of systematic, theory-based research in health behaviour.

The HBM has the following key variables:

Perceived susceptibility **-** Each individual has their own perception of the likelihood of experiencing a condition that would adversely affect one's health. Individuals vary widely in their perception of susceptibility to a disease or condition. Those at low end of the extreme deny the possibility of contracting an adverse condition. Individuals in a moderate category admit to a statistical possibility of disease susceptibility. Those individuals at the high extreme of susceptibility feel there is real danger that they will experience an adverse condition or contract a given disease.

Perceived seriousness **-** refers to the beliefs a person holds concerning the effects a given disease or condition would have on one's state of affairs. These effects can be considered from the point of view of the difficulties that a disease would create and they determine the action someone may take in the face of illness (Jegede, 1998). For instance, pain and discomfort, loss of work time, financial burdens, difficulties with family, relationships, and susceptibility to future conditions. It is important to include these emotional and financial burdens when considering the seriousness of a disease or condition.

Perceived benefits of taking action **-** taking action toward the prevention of disease or toward dealing with an illness is the next step to expect after an individual has accepted that they are

susceptible to a disease and recognised its seriousness. The direction of action that a person chooses will be influenced by the beliefs regarding the action.

Barriers to taking action **-** However, action may not take place, even though an individual may believe that the benefits to taking action outweighs not taking action. This may be due to barriers. Barriers relate to the characteristics of a treatment or preventive measure which may be inconvenient, expensive, unpleasant, painful or upsetting. These characteristics may lead a person away from taking the desired action.

Cues to action **-** an individual's perception of the levels of susceptibility and seriousness provide the force to act. Benefits (minus barriers) provide the path of action. However, it may require a 'cue to action' for the desired behaviour to occur. These cues may be internal or external.

The HBM has been criticised on the ground that different questions are used in different studies to determine the same beliefs, and as such, it is difficult both to design appropriate tests of the HBM and to compare results across studies. Another reason why research does not always support the HBM is that factors other than health beliefs also heavily influence health behaviour practices. The HBM is also criticised on the grounds that it concentrates on rationalisation processes and is individualistic in its approach; for it supposes that health behaviour is driven by a personal assessment of the cost and benefits of taking medications (Chesney, *et al*., 2000). These factors may include: special influences, cultural factors, socioeconomic status, and previous experiences.

In spite of the criticisms, the health belief model fits into the explanatory model for the determinants of adherence to the treatment of HIV and Tb co-infections. First, the health consequences of HIV and Tb are very severe; they include constant morbidity, financial cost, social stigma, death, etc. There are some individuals who deny that they can be infected; in fact, even when diagnosed with the illness, they are often still in denial. However, the belief in the susceptibility to HIV and Tb is according to the HBM a key determinant of whether a person will take action. So an infected person faced with the reality of HIV and Tb should want to engage medication to get a favourable state of health, unless there are barriers such as stress, hunger and poverty, anxiety, side-effects of drugs, non-availability of the treatment, distance to the location of the health infrastructure, poor attitudes of, or poor relationship with, caregivers, social stigma, etc.

The barrier component of HBM is of paramount importance in this study as the barriers to treatment utilisation and sustenance mediate the effectiveness of treatment programmes and outcomes. Poor knowledge and culturally determined misconceptions are also among serious barriers to continued use of treatment regimen. Certain external cues can ginger the individual into health action; external influences promoting the desired behaviour may include information provided or sought, reminders by significant others, persuasive communications, and personal experiences. The prediction strength of the HBM is the likelihood of the individual concerned to undertake recommended health action (such as preventive and curative health actions) in order to attain a favourable state of health.

2.2.3 Social Cognitive/Learning Theory

Social cognitive theory was developed by Albert Bandura. It is a theory that focuses attention on the demand side of the health services in the belief that people live together and as such, minor dysfunctions develop into chronic diseases. Social cognitive theory focuses attention on psychosocial factors on the demand side of the health system that influences health behaviour. The theory specifies a number of core determinants, the mechanism through which they work, and the optimal ways of translating this knowledge into effective health practices (Bandura, 2004).

The core components of the theory include: 1) Knowledge of the health risk and benefits of one's health practices 2) Perceived self-efficacy that one can exercise control over one's health habits 3) Outcome expectations about the expected cost and benefits for different health habits 4) The health goals that people set for themselves and the concrete plan for realising those goals and 5) Perceived facilitators and barriers to the changes that people sort.

The first variable, knowledge, is the one that creates the precondition for change. People who lack the knowledge that their health habits can cause them health problems have little or no reason to put themselves through the necessary processes of changing the detrimental habits. One needs knowledge about what can be done to change a health condition to be willing to adopt the habits favourable to the needed change. Yet, knowledge alone can achieve nothing if it is not backed by self-efficacy. Self-efficacy is the foundation of human motivation and action (Bandura, 2004). For people to act to change a particular health condition, they have to believe in their ability to bring about the desired change. If they do not have self-efficacy, there will not be any incentive to act or persevere in the way required to bring about the

necessary change. It is in self-efficacy that the agentic power of the human being lies: the belief that one has the power to produce required changes and results.

The expected outcomes which people expect their action to produce also affect health behaviour. The expected outcomes, according to Bandura, can be in many forms including physical, social and self-evaluative. The physical outcomes include the pleasurable and aversive effects of the behaviour and the accompanying material losses and benefits. The physical outcomes can also be the superb state of fitness that the health behaviour brings about. Social outcomes relates to the approval or disapproval which the health behaviour produces in the interpersonal relationships. This can also come in the form of social inclusion and exclusion or stigmatisation. Self-evaluative outcomes concern the negative or positive self reactions to one's health behaviour or health status. This outcome can also be referred to as psychological and involves issues such as self-worth and self-satisfaction.

The goals set by people serve as a motivation and further incentives to act in order to change a particular health status. Goal can be long term and short term. Although long term goals are necessary, it is short term, realisable goals that help people to succeed by enlisting efforts and guiding action in the here and now. The set health goals will naturally be achieved if there are no impediments or barriers. Impediments to health behaviour change can be personal (psychological) or social and structural.

The social cognitive theory is very relevant to the understanding of adherence to the treatment of HIV and Tb co-infections. HIV and Tb are health conditions that are unfavourable to people living with the diseases and for this condition to be changed, knowledge is a necessary pre-condition. For example, people will need to know the action they need to avoid or to take in the process of ameliorating the condition; this can be knowledge of the availability of treatment, of what the treatment can do and how to access that treatment. Also, people will have to be willing to do something to bring about the change in their health conditions (reduce HIV/AIDS viral load and cure Tb) and this willingness is produced by the belief in their ability or power (self-efficacy) to cause that change to come about. If the outcomes that will result from taking positive action are desirable, then the goals, which the sick person set for himself, will be achieved. Since HIV and Tb unlike other chronic health conditions bring social isolation and stigma, an expectation that taking medication or persevering in taking drug will change the way other people relate with the sick person will be a strong motivation in persevering in treatment.

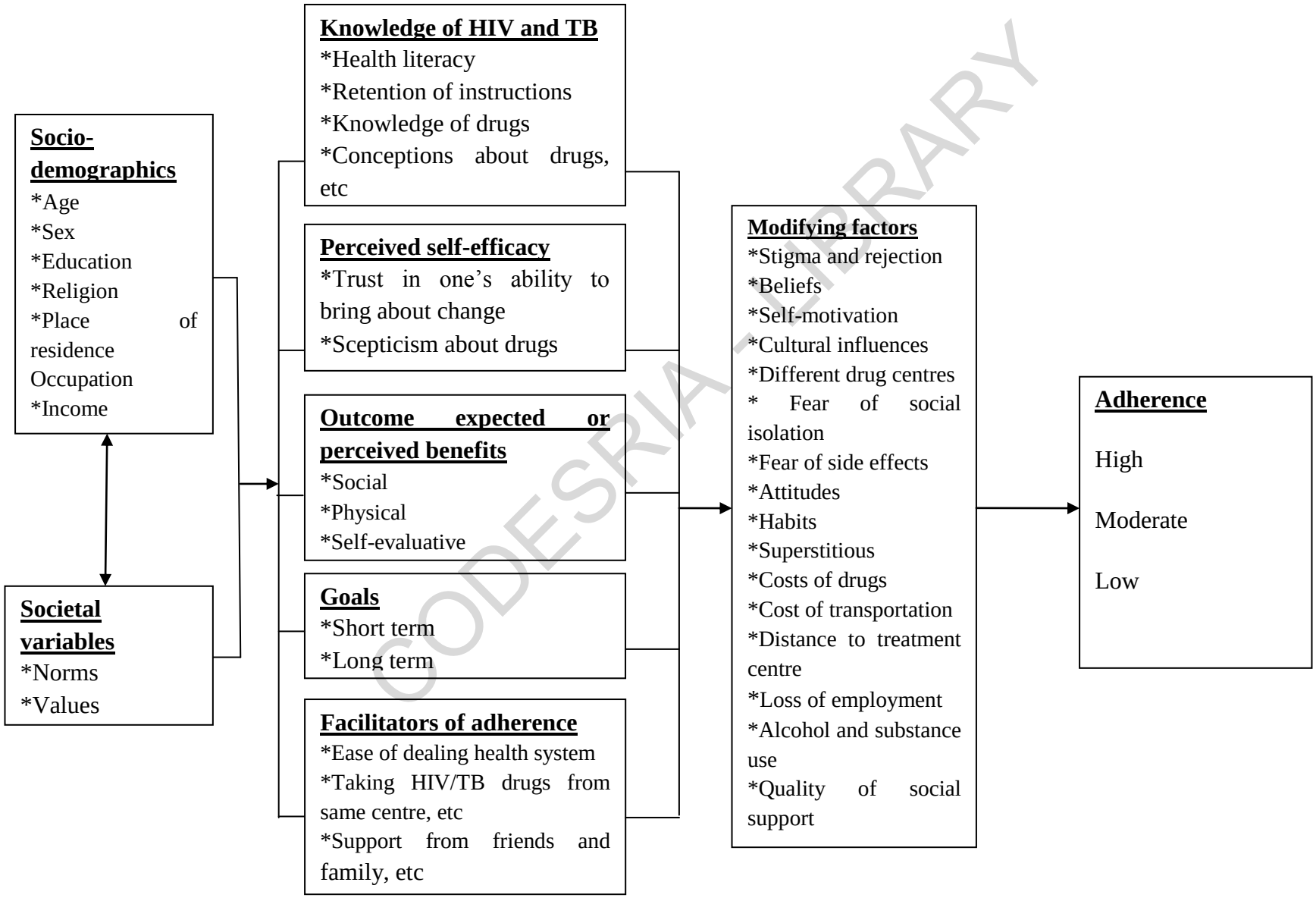
However, the process of health behaviour change does not usually so straight forward. One will naturally expect that since there is medication and people have been placed on them, then the people should get better. This process is usually affected by some barriers. Some of these barriers are psychosocial and include attitudes to treatment, knowledge about treatment, perception of treatment and its characteristics, stress, cost of treatment, social support, and social stigma. Others are culture and beliefs about the illness and its treatment. These factors influence one's ability to persevere in the treatment of HIV and Tb and as such mediate health outcomes.

Nevertheless, available and visibility of treatment infrastructure for HIV and Tb, and the provision of these services in the same centre may act as facilitator. Most importantly, persistent medication is necessary for the attainment of the expected outcomes.

2.2.3 Conceptual Framework

The conceptual framework (Figure 2.1) is derived from the social cognitive and health belief models of health behaviour. This framework is predicated on the assumption that individuals faced with the problems of HIV and Tb are forced by these dangers to take action.

Figure 2.1: Conceptual framework linking Parsons' social action theory, HBM and social cognitive theory to explain treatment adherence



Some basic assumptions need to be made in the explanation of the conceptual schema. 1) Infected persons need medication for the cure and management of Tb and HIV, respectively; 2) near perfect adherence levels are required in the treatment of these epidemics for better outcomes; and 3) there are some factors that mediate this near perfect adherence. At the starting point of the framework, knowledge of co-infections by persons living with the disease is very important. For them to start and continue treatment, they have to know how to get the treatment, where to find it, and how to take it as well as the implication of not adhering to the treatment. The retention of health information including prescription instruction is paramount; since these people do not only perceive, but are actually faced with life threatening illnesses. An adequate understanding of the risks involved in particular actions or inaction can prepare or ginger them into action and perseverance in that action to achieve required outcomes. Patients are motivated to seek this knowledge and treatment by the danger or threat to their health posed by not taking medication; since illness diminishes the ability to participate fully in all human endeavours and sometimes causes economic hardship, infected persons should want to take medication to get better. Treatment would consequently result in better health, epitomised by cure of the Tb, prolong life, better quality of life, etc.

The desire to take treatment is grounded on the patient's self-efficacy belief, that is, the belief that they have the capacity to take reasonable and positive action which will bring about some required change in their health status (in this case, reduction of viral load for HIV and cure of Tb). The stronger a person's self-efficacy belief, the higher the chances that people will take positive action to change an unfavourable health condition. Moreover, if the expected outcomes are considered of immense benefits and outweigh the cost, the motivation to take action and persevere during treatment will be enhanced. The necessary behaviour required to attain the set goals and the expected outcome may be hindered by a number of obstacles, including but not limited to psychological and social factors.

Psychosocial factors may be both independently and jointly associated with treatment adherence or non-adherence. These factors include: attitudes to treatment, knowledge about treatment, perception of treatment and its characteristics, stress, depression and demographics, availability and visibility of treatment infrastructure, cost of treatment, social support, social stigma, cultural beliefs about the illness and its treatment, being away from home, etc. The consideration of the social and personal factors can dictate which path an individual takes to treat an illness. The interaction between the individual-level and social

factors provides a robust and more accurate prediction of non-adherence. However, there are some mediating factors between these psychosocial factors and treatment adherence. These can include nutrition/hunger and poverty, alcohol and drug use, integrated or no-integrated HIV and Tb care, side effects of drugs, proximity to treatment infrastructure, confidence in, and relationship with, caregivers.

2.3 Hypotheses

Based on the objectives of the study, a careful review of the literature and the theoretical framework, the following hypotheses were formulated:

Patients who have good knowledge of the implications of adherence to treatment do not adhere significantly better than those who exhibit poor knowledge.

There is no significant influences of social factors (e.g., social capital, social stigma and quality of patient interaction with the care providers) on adherence to treatment of HIV and Tb co-infections

HIV and Tb co-infected patients who dwell in the urban areas are not likely to adhere better to treatment than those in the rural areas.

CHAPTER THREE

METHODOLOGY

3.1 Study Design

This was adopted a cross-sectional study designed to examine the determinants of treatment adherence among TB-infected HIV patients. To achieve this, both quantitative and qualitative methods were deployed for data collection. The quantitative aspect of the study involved the administration of a semi-structured questionnaire to patients co-infected with HIV and Tb. The qualitative component comprised the conduct of In-Depth Interviews (IDIs), Focus Group Discussions (FGDs) and collection of secondary information from patients' hospital records.

3.2 Study Area

The study setting, Cross River State, is one of the thirty six (36) states of the Federal Republic of Nigeria, situated in the oil-rich South-South geo-political zone. It has eighteen local government areas and lies between latitude 5o32' and 4o27' North of the Equator and longitude 7o50' and 9o28' East of the Greenwich meridian. The state has Calabar as its capital, and is a leading tourist haven in Nigeria, with attractions like the Tinapa, Calabar Export Processing Zone (EPZ), the International Obudu Cattle Ranch Resort, the Old Residency Museum as well as Agbokim and Kwa Waterfalls.

The state was created in 1967 and was known as the South-eastern state until 1976 when the name changed to Cross River State. It was so named because of the river which passes through the state. By 1976, the state still composed of the areas that make up the present Akwa Ibom State and Cross River State. However, with the excision of Akwa Ibom State from the old Cross River State on September 23, 1987, what remains of the old Calabar and Ogoja provinces make up the present political entity called Cross River State. It has an estimated population of 1,471,967 males and 1,421,021 females. It shares boundary with Akwa Ibom State (which was created out of Cross River) to the Southwest, Ebonyi and Abia to the West, Benue State to the North, The Republic of Cameroon in the east and the Atlantic Ocean in the South. The vegetation consists of the mangrove and tropical rainforest in the south and central zones, and is characterised by savannah woodlands in the far north. Obudu Plateau has a temperate climate. The two main climates are the rainy and dry seasons.

Cross River State is among the states with the highest prevalence of HIV in the country. The prevalence of HIV in the state is said to be between 6.1 and 8.0%, second only to Benue state which has a rate of 8.0% (UNGASS, 2008). In 2010, Cross River state reported Tb case notification of more than 2000 (United State Embassy in Nigeria, 2012). Thus, the high incidence of Tb may be attributed to the high prevalence of HIV. The State provides free HIV and Tb treatment, care and support through selected clinics using an integrated approach to health care. It is a standard practice to anonymously screen for HIV, especially at antenatal clinics across the state to determine prevalence.

Other health indicators like Infant Mortality Rate (IMR) and Maternal Mortality Rate (MMR) are still topical issues in Cross River State. National figures reveal that the rate of infant mortality in Cross River was 130/1000 while MMR was 900/100,000 as at 2006 (EU-Prime Project, 2006).

3.3 Study Population

The study population comprised 1) patients co-infected with HIV and Tb who were receiving treatment in HIV and Tb treatment centres across Cross River State as at the commencement of field work; 2) health care workers, namely, nurses, doctors, pharmacists and social workers or counsellors; 3) patients' friends or family members; 4) religious leaders; and 5) treatment support groups.

3.4 Sample Size Determination

The total sample for the study was initially planned to involve 457 patients. This number was estimated from a pilot study of treatment facilities in the study area and represented patients co-infected with HIV and Tb who were receiving treatment at President's Emergency Plan for AIDS Relief (PEPFAR)/Heart-to-Heart and DOTS treatment centres in Cross River State, Nigeria (see the breakdown of the figures shown in Table 3.1). The decision to use all available co-infected patients was informed by the reasoning that the study population was a special group of people who may be hard to find. Including all patients was the safest way to insure enough respondents were found and recruited with a view to enhancing the generalisability of results.

Table 3.1: Estimated number of Tb-infected HIV patients by health care facility and type of treatment services

Health care facility	Treatment offered	Number of patients
Eja Memorial Hospital, Ntigidi	TB	11
TB/Leprosy Hospital, Obudu	TB	17
TB/Leprosy Hospital, Ogoja	TB	21
General Hospital, Ogoja	HIV	24
TB/Leprosy Hospital Obubra	TB	31
General Hospital, Ugep	HIV and TB	33
General Hospital, Calabar	HIV	36
RCM maternity Hospital, Ogoja	HIV	42
Holy Family Hospital, Ikom	HIV and TB	57
Dr Lawrence Henshaw Research Hospital, Calabar	HIV and TB	89
PEPFAR clinic, University of Calabar Teaching Hospital, Calabar	HIV	96
Total		**457**

3.5 Sampling Procedure

All available patients who met the inclusion criteria were included in the study. Of the estimated number of patients, 385 met the selection criteria and were included in the study. The quantitative component of the study used 333 patients, while 52 were selected for the qualitative component.

The sampling technique was convenient because it involved the entire population available and who were eligible on the bases on the inclusion criteria. The non-patient group made up of 42 participants including health care workers, family and friends, treatment support groups, religious leaders and HIV NGOs. Health workers were selected based on availability and willingness to participate while, patients gave approval for family and friends that interviewed.

Inclusion Criteria: The inclusion criteria for patients in the study were:

1. Patients must have been enrolled and qualified to receive drugs.
2. Patients must have been on treatment for up to 3 months.
3. To be selected, a treatment facility must have up to 10 co-infected patients.

Exclusion Criteria:

1. Those whose treatment was temporary suspended on medical advice or by their own failure to continue.
2. All persons less than 15 years

3.6 Methods and Instruments of Data Collection

Both quantitative and qualitative instruments were used for data collection, namely, questionnaires, IDIs, FGDs, case studies and patients' medical history records.

3.6.1 Semi- structured Questionnaire

The questionnaire was designed by the researcher with some items and scales adapted from the Adult AIDS Clinical Trial Group (AACTG) Adherence Base-line Questionnaire (Chesney, *et al*., 2000). It was validated in a pre-test with a similar group of patients to the ones who were actually studied. The questionnaire contained 11 sections labelled A to K. Section A generated information on socio-demographic characteristics such as age, sex; marital status and level of

education (see Appendix I for details). Other variables that the questionnaire also covered were as follows:

Knowledge of HIV and Tb treatment and the implication of adherence (section B): Knowledge of treatment was measured using 17 items which had highest obtainable scores of 17 points. A composite score of these items was computed and categorised poor (≤ 8) and good (> 8) knowledge.

Adherence to treatment (section C): This section generated data on patients' levels of adherence to treatment and contained 14 items which were computed to obtain scores for each respondent. Composite scores obtained from the computation were used to categorised adherence as high (0-1), Moderate (2-7) and Low (>7). Whereas the WHO lumps all those who do not meet 95% of their medicine as non-adherence, this study contends that for proper intervention to scale up adherence, there is the need to adopt different approaches for the different level of non-adherence.

Perception of self and medical efficacy (section D): Self efficacy had five items in the scale with options coded from 0-2 point each. Self-efficacy was categorised from the computation of these items as low (≤5) and high (>5). On the other hand, medical efficacy was measured with two items with maximum obtainable scores of four points; with score ≤2 considered as low.

Interaction with treatment centres (section E): Patients interaction and relationship with the health care professional was measured with 25 questions with some having a 'yes' or 'no'. Questions under this question included whether patients had confidence in the ability of the health professional and if they are informed properly about their treatment.

Costs (section F): Information on distance to health facility and cost of transportation and feeding while in the facility and missing work, among others, were collected in this section.

Reasons for missing drugs (section G): Apart from the researcher-provider reasons for why respondents may miss their medications, this section also collected information reasons provided by the respondents without prompting from the interviewer.

Anxiety (section H): Anxiety was measured with the AACTG Base-line Adult Questionnaire. Five items on a 0-3 scale were used to measure level of anxiety with the highest obtainable score of 15. Respondents who scored zero (0) were coded as 'not anxious at all'; those who

scored from the 1-7 were regarded as 'somewhat anxious' while those who scored above the mean were categorised as 'very anxious'.

Alcohol Use (section I): Alcohol use and abuse may influence adherence to medication, thus, information on patients consumption of alcohol was collected in this section with questions such as the frequency of alcohol consumption within the last 30 days and the quantity taken.

Social support (section J): eight questions were asked to generate data on social support that respondents have received during the course of their treatment, including a question on the type of support they had received and two on the satisfaction with the support received. Social support was classified into two categories: little or none and adequate support.

Self-stigma (section Ka): The concept of self-stigmatisation was measured using a 9-item instrument. Each item had a score of 1-5 highest obtainable score of 45 point. All respondents who obtained a score of ≥ the mean score were categorised as low level of self stigma while those who score above the mean were coded as high.

Social stigma (section Kb): Social stigma was tested using a 9-item instrument with 'yes' or 'no' responses coded as 1 and 0 respectively. Thus, the maximum obtainable score was 9. All respondents whose total score on social stigma after computation was 0 were categorised as 'no stigma at all' while those with a score of ≥ 1 points were regarded as having had 'some level of stigma' directed at them.

3.6.2 In-depth interviews

A total of 24 interviews were conducted. This comprised interviews with nine health care workers (two doctors, three nurses, three counsellors and a pharmacist), four Christian religious leaders, four treatment support groups and four family members or friends. Two interviews each were conducted with family and friends of adherent and non-adherent patients. The interviews with family and friends were sanctioned by patients before hand to avoid status disclosure where this had not been done. The in-depth interview guide covered key areas such as knowledge of HIV and Tb co-infections and their treatment, community attitude to HIV and Tb, social stigma, social support and cultural values and beliefs about HIV and TB. Two interview guides, one for health care workers (details in Appendix II, page 190) and the other for family and friends (Appendix III) were used to collect data.

3.6.3 Focus Group Discussions

Six FGDs were conducted. Discussants were HIV and Tb co-infected patients. Each FGD was made up of eight discussants. The inclusion of the FGDs was borne out of the fact that the social element of the group situation produces more information than interviewing a single individual. There were three FGDs each for males and females. The FGDs focused prominently on the cultural and community beliefs, attitude and behaviour towards people who are infected, and are on drugs (details in Appendix IV).

3.6.4 Case Histories

Four case histories were conducted with two each for patients found to be adherent and non-adherent to treatment, and with both male and female patients. The case histories retrospectively constructed the patient's treatment experiences and behaviour from the time of diagnosis to the time of the interview. The aim was to uncover significant influences during the case management that may be responsible for explaining the observed patterns in patient's treatment behaviour (Appendix V has details).

3.6.5 Health Records

Secondary data from the treatment centres on patients' records of follow-up appointments were also collected, as a means of determining how consistent they kept appointments after being on drugs for a period of time (see Appendix VI for details). This method of measuring adherence has been used in a study of 26 perinatally HIV-infected children, where having no missed appointments in a six-month interval was associated with positive virologic response (Farley, *et al*., 2003). Records of appointments were compared with participants' self-reported levels of adherence, and thus provided a clearer picture of patients' adherence to their treatments.

3.7 Validity of the Instruments

Both face and content validity were used in ensuring that the instruments were capable of measuring what they were designed to measure. Questions were generated for every objective and after the pilot study; a mock analysis was conducted to determine whether the questions were capable of generating information to answer the research questions. The pilot study also helped in rephrasing the questions where they were found to be ambiguous and unclear to potential

respondents. Validity was ensured by consulting a researcher in the field of HIV treatment, a clinical psychologist, an English language expert and TB researcher, who reviewed the instruments for face and content validity.

In addition, the research instruments were translated into Pidgin English (see Appendix VII, page 167) and two major languages spoken in Cross River State: Efik in the Southern senatorial district (Appendix VIII, page 177) and Lokkur in Central senatorial district (Appendix IX). The instruments were back translated into English language by a different translator to ensure that accuracy of meaning was retained in the process of translation. Translation of the instrument was done to ensure that participants were in no doubts whatsoever about what they were asked during the interview. In translating the instruments, it was ensured that meaning was retained both in English and the local languages. This enabled respondents to fully understand and decide which questions they did not want to answer, in order not to be misrepresented, which could cause tension.

3.9 Reliability

A pre-test of the instrument was carried out using 50 copies of the questionnaire. Data collected during the pre-test were analysed using the Cronbach's alpha. The reliability co-efficient for the overall instrument was 0.761, signifying that the questionnaire had a high proportion of internal consistency. However, there were variations in the reliability co-efficient alphas of the different sub-sections. For example, the scale on reasons for missing drugs in the past one month yielded a co-efficient of 0.904 and 0.681 for the section of stigmatisation while social support yielded 0.699. Also, the sub-scale on anxiety had an internal reliability co-efficient of 0.918.

3.10 Procedure for Data Collection

The FGDs were conducted in the first phase of the study. Preliminary analysis of the FGD data informed any adjustments in the other qualitative guides and the questionnaire. The FGDs sessions were held during the treatment support group meetings of the patients to avoid the problem of bringing patients together to discuss issues they would rather keep secret. These meetings usually hold on the premises of the treatment facilities, which was where the FGDs were conducted. To conduct tthe FGDs, a moderator (one of the trained field assistants) guded the discussion according to the themes provided and a note-taker took notes in addition to the tape-recording where it was possible to record

The IDIs were conducted in the second phase of the study, and the administration of the questionnaire was carried out in the third phase. For the health workers, interviews took place in their offices, while the family members and friends were interviewed either on the premises of the health facilities or at their homes. Questionnaires were interviewer-administered. The final phase of the study involved the conduct of case histories. Case studies were conducted at the convenience of the participants with some being the premises of the clinics privacy of the participant's home.

The researcher made use of four field assistants and one supervisor in the process of data collection. The research assistants were two males and females each, two nursing students and two graduate students of the University of Calabar. The field supervisor was master's degree holder of the University of Ibadan. A two-day training was conducted for the research assistants in Calabar during which the researcher carefully went over the entire instruments with the assistants, who also role-played to ensure they were adequately prepared to carry out data collection. They were also guided on the ethics of conducting research with human subjects and how conduct the data collection in an ethically acceptable standard.

3.11 Data Management

Quantitative Data: Completed copies of the questionnaire were checked daily while still on the field. On-the-field checking provided an on-the-spot verification such that questionnaire were completed without errors or omissions. Any errors and omissions were resolved on site. The completed and checked questionnaire were tracked using tracking sheets to ensure that all returned questionnaire were accounted for, as well as entered without omissions or duplications. Data were double-entered in EPIDATA to compare the duplicate files and checked with the original copies of the questionnaire to validate entry accuracy. In this way errors in one entry were noticed by comparing them with the other entry. Validated data were exported from EPIDATA to SPSS version 15 where further cleaning was carried out before analysis.

Qualitative Data: Interviews were recorded using digital audio-recorders. Each audio recording was appropriately labelled with reference to the category of respondents (e.g. male, female, etc); date of interview; type of interview (e.g. FGD or IDI); and location (e.g. Calabar, Ikom or Ugep). The recorded interviews were sorted by type and arranged by category of participants. Each recorded interview was transcribed and translated where

interviews were conducted in the local languages. Observed non-verbal cues during interviews were also written down. Transcribers were trained to transcribe, verbatim, everything recorded. The transcripts were read and errors in transcription corrected before analysis.

3.12 Analyses of Data

Qualitative data were analysed in a thematic format with the aid of NVIVO software. Quantitative data were analysed at three levels: univariate, bivariate and multivariate. Univariate analysis was performed to summarise distribution of all variables while bivariate analysis – using Chi-square test – was performed to examine associations between independent (e.g. sex, age, marital status and level of education) and the dependent variable (adherence to treatment). In addition, multivariate analysis of the data was conducted using ordinal regression. Ordinal regression was used because the dependent variable was ordinal in nature, ranging from low, moderate to high levels of adherence.

3.13 Limitations

There were a number of issues that could be limiting the reliability of the findings and conclusions from this study. First, the sample size used in this study was small, due mainly to the peculiarity of the target population – HIV and TB co-morbid patients – and because of the inclusion criteria definition, which stipulated that patients must have been on treatment for a period no less than three months prior to the study. In addition, the study was conducted among patients in Cross River State only, thereby placing a limitation on its generalisability.

Second, adherence to treatment was mainly patient self-reported and could be biased by the likelihood that patients may embellish the truth in order to appear socially desirable. This, coupled with the problem of recall bias (because patients were asked to remember events that occurred in the past) may also be a limiting factor on the findings of this study. Indeed, adherence is difficult to measure, such that a "highly adherent" patient based on self-report, may just be as non-adherent, when medical history cards are used.

Other difficulties encountered were during field data collection and resolved around getting patients to permit the recording on tape of interviews and FGDs. In many some cases, interviews could not be tape-recorded, but had to be written by a note-taker, which made it very difficult.

This problem arose because of fear of disclosure and no matter the attempts to guarantee confidentiality, some respondents were adamant in refusing to be tape-recorded.

3.14 Delimitations

Some efforts were made to ameliorate the effects of the limitations outlined in section 3.13. To address the problems associated with the reliability of patient self-report for measuring adherence, the medical history cards of the patients were also used. The patients' records provided information on numbers of days that patients may have been without drugs because they were out of stock. The estimated days from the records were compared with information from patients' self-reports, to establish whether they were similar. In addition, health workers, family and friends were also included in the study to provide further insights on patients' treatment-taking behaviour.

3.15 Ethical Considerations

Ethical approval was sought from the University of Ibadan and University College Hospital Institutional Review Board (see Appendix XII), the University of Calabar Teaching Hospital Ethical Committee and the Cross River State Medical Advisory Board. The administrative heads of the treatment centres (clinics) also gave their permission before the study was conducted. Importantly, the participants gave their informed consent (see Appendix IX for details). Generally, the following ethical issues were addressed in the protocol:

Confidentiality of Data: All efforts were made to keep the instruments anonymous. Study participant were not required to write their names, signatures, addresses nor telephone numbers on the survey instrument. Participants were assigned identification numbers formed from the questionnaire numbers, and a number assigned to a treatment centre. For example, instead of a name, a participant was identified by a number such as UDPh/CR/06/001. This process was put in place to make it impossible for anybody to identify the person who gave the interview once the data had been collected. The same applied to the informed consent forms: these did not include the participant's name, but thumbprints. The preference for thumbprint was because it is difficult, under the current technological development in Nigeria, to identify a person through their thumbprints since sophisticated equipment is needed to do so. However, in some case where participants refused to sign or thumbprint, verbal consent was accepted. Immediately the respondents thumb-printed, the consent form was placed in a large envelope, sealed and put

under lock and key in a file cabinet to be destroyed at three years after data collection. Publication from the research will present de-personalised data.

Beneficence to participants: Respondents were informed that their participation could generate information that may improve understanding of the factors that influence treatment adherence with no direct and immediate benefits to them for participation in this study. However, respondents were shown a token of appreciation for their time and efforts at the end of the interview. The tokens were in the form of either toilet (bathing), bar soap for washing or soya bean milk.

Non-malfeasance to participants: There were no physical risks associated with participation in this study. However, the researcher made adequate plans in case respondents became emotionally uncomfortable with any of the questions, they could have been advised not to answer such questions. If during the interview, they had felt emotionally upset answering some of the questions, the interview could have been discontinued and respondents withdrawn from the study. In the event of any emotional discomfort, participants were to be referred to a counsellor in the treatment centre for counselling and advice. However, there were no cases of malfeasance to respondents.

Voluntariness: Participation in the study was completely voluntary. Nothing was done by the researcher or anybody representing the researcher to force people to participate in the study. Participation was absolutely voluntary with the right to discontinue guaranteed and the assurance of no punishment for refusal or withdrawal. The importance of the potential respondent to the study was made clear to the identified patients, including the purpose of the research, methods, and benefits of participating. The ultimate decision to participate was left entirely to the potential participant to make without pressure of any kind.

CHAPTER FOUR

DATA PRESENTATION AND DISCUSSION OF FINDINGS

4.1 Data Presentation

The results presented are from the data gathered from this sample of 385 patients and 42 non-patient respondents. The outline of the presentation of result is based on the objectives of the study.

4.1.2 Socio-Demographic Characteristics

In this section, results of respondents' demographic and socio-economic characteristics are presented. The information presented in this section is intended to facilitate the interpretation of key variables relating to adherence which will be presented in latter parts of the report of findings.

Table 4.1 Distribution of respondents by demographic characteristics

Characteristics	Number (n)	% Male	% Female	Total %
Sex:				
Male	127			38.1
Female	206			61.9
Age in Years:				
≤ 20	17	1.6	7.3	5.1
21 – 30	117	22.0	43.2	35.1
31 – 40	125	46.5	32.0	37.5
41 – 50	52	19.7	13.6	16.0
≥ 51	21	10.3	3.9	6.3
Marital Status:				
Single	132	33.1	48.5	42.6
Married	124	55.9	20.9	34.0
Separated/Divorced	29	7.9	9.2	9.8
Widowed	48	3.1	21.4	14.4
Total	**100.0**	**100.0**	**100.0**	**100.0**
Number	**333**	**127**	**206**	**333**

A majority of the respondents (61.9%) were females. The age of the respondents was 34.5 ± 9.6 years, with the minimum and maximum being 17 and 68 years, respectively. The mean age and standard deviation indicated that about 75% of all respondents were between the ages of 24 and 45 years. About 5% of the respondents were 20 years old or less; the highest proportion were those between 31 and 40 years of age with 37.5% followed by those 21 to 30 years old (35.1%). When the ages of the respondents were examined on the basis of the male-female dichotomy, it was noted that interesting differences existed. For example, 7.3% of female respondents were aged 20 and below with only 1.6% of male respondents in the same age category. There were still significantly more female than male respondents in the age category 21-30 years with 43.2% and 22%, respectively.

There were more singles (42.6) than married (34.0%) respondents. More than half of male respondents (55.9 %) were married compared to 20.9% of females. On the other hand, there were more single female (48.5 %) in the sample than single male respondents (33.1 %). More data on respondents' characteristics are presented in Table 4.2.

Table 4.2: Distribution of Respondents by Socio-economic Characteristics by Sex

Characteristics	Number (n)	Total %	% Female	% Male
Educational Attainment:				
No formal education	30	9.0	9.2	8.7
Primary	56	17.0	15.5	18.9
Secondary	150	45.0	47.6	40.9
Post Secondary	97	29.0	27.7	31.5
Place of Residence:				
Rural	61	18.3	19.4	16.5
Urban	272	81.7	80.6	83.5
Occupation:				
Unemployed	54	16.0	15.5	17.3
Farmer	42	12.6	12.6	12.6
Businessman/Trader	67	20.0	25.7	11.0
Civil/Public Servant	77	23.1	18.0	31.5
Self-employed Professional	52	16.0	12.1	21.3
Student	31	9.3	11.2	6.3
No Response	10	3.0	4.9	-
Monthly Income:				
≤ N5,000.00	100	30.1	33.0	25.2
N5001 – N10,000	24	7.2	6.8	7.9
N10,001 – N15,000	21	6.3	4.9	8.7
≥ N15,001	51	15.3	9.7	24.4
No Response	137	41.1	45.6	33.9
Ethnic Group:				
Efik	77	23.0	18.9	29.9
Ibibio/Oron/Annang	120	36.0	40.3	29.1
Other Cross River groups	101	30.3	28.6	33.1
Others*	5	2.0	2.9	-
No Response	30	8.7	9.2	7.9
Total	**100.0**	**100.0**	**100.0**	**100.0**
Number	**333**	**333**	**206**	**127**

* Of the 5 people in "others" there were Igbo (2), Tiv (2) and Hausa (1)

Table 4.2 shows that 9.0% of the total sample had no formal education, 17.0% were primary school leavers while 45.0% had secondary education. Slightly more female (9.2 %) than male respondents (8.7 %) had no formal education; similarly, more females (47.6 %) than males (40.9 %) had secondary school education. On the other hand, more males (31.5 %) than females (27.7 %) had higher education. On the whole, the educational qualifications of both sexes were similar.

The majority (81.7%) of the respondents were urban dwellers. Sixteen percent of the sample was unemployed; students made up 9.3% and civil or public servants made up 23.1%, which was the highest proportion. Respondents in the category of "trader/business" made up 20.0%. On the male-female dichotomy, 25.7% of female respondents were traders with 11% of male in the same occupational category. The highest proportion of respondents (41.1%) did not indicate the amount of money they earn monthly. This is understandable, as a lot of people do not like to reveal their earnings, for various reasons. Some (30.1%) respondents earned about five thousand naira or less with a lesser proportion of male (25.2%) compared to female (33.0%) respondents in this low income category.

4.1.3 Knowledge of Implication of Treatment Adherence

All respondents indicated their awareness of how to take their medication. Table 4.3 shows the results for knowledge of the consequences of non-adherence.

Table 4.3: Distribution of Respondents according to Knowledge of the Consequence of Non-adherence by selected characteristics

Characteristics	Number	% No consequence	% Grave consequences
Sex:			
Male	123	52.0	48.0
Female	196	46.9	53.1
Educational Attainment:			
No formal education	29	55.2	44.8
Primary	53	64.2	35.8
Secondary	146	54.1	45.9
Post Secondary	91	29.7	70.3
Age in Years:			
≤ 20	17	23.5	76.5
21 – 30	113	56.6	43.4
31 – 40	120	48.3	51.7
41 – 50	51	41.2	58.8
≥ 51	18	50.0	50.0
Time on HIV Drugs:			
Less than 1 year	131	58.0	42.0
1 – 2 years	131	46.6	53.4
More than 2 years	51	31.4	68.6
Time on Tb Drugs:			
3 – 4 months	228	55.7	44.3
5 – 6 months	18	77.8	22.2
7 – 8 months	36	8.3	91.7
More than 8 months	32	28.1	71.9
Total	**100.0**	**48.7**	**51.3**
Number	**319***	**156**	**163**

*No responses were excluded

Overall, slightly over half (51.3%) of the respondents perceived no danger if they did not take their medication as prescribed. A further examination revealed that certain differences between certain categories of the respondents existed. For example, the majority of respondents who had a post-secondary education (70.3%) were aware of the dangers to any patient who does not adhere to their medication as prescribed compared to those who had primary education (35.8%); no formal education (44.8%) and secondary education (45.9%). More respondents who had been on HIV drugs for more than two years (68.6%) knew that something unpleasant would happen compared to those who had spent between one to two years (53.4%) and those less than one year on HIV drugs (42.0%). This pattern was almost similar with regards to those on TB drugs. The only difference was that those who have spent between 7-8 months on drugs had a slightly higher percentage (91.7 %) than those who had spent more than 8 months (71.9%).

For respondents who knew that there are consequences of poor adherence to medication, 28.4% mentioned death as a likely consequence. Information on the consequences of not adhering to drugs can be seen in Table 4.4. Some respondents felt that poor adherence will cause the health conditions to deteriorate (50.4%) and cause drug resistance (17.7%).

Table 4.4: Distribution of Respondents According to the Consequences of Non-Adherence Identified

Response	Number	Per cent
Death	32	28.4
Deteriorated health	57	50.4
Drug resistance	20	17.7
Complications	4	3.5
Total	**113**	**100,0**

All respondents who did not perceive any danger if they did not take their drugs as prescribed, adduced God's intervention or faith-related reasons for this. Mostly, these set of respondents felt secured in their God and believed that health and healing comes from God. As such, they were certain that no danger would befall them if they did not take their drugs all the time. This is ironic because faith did not prevent them from becoming infected in the first place.

More than half the respondents (57.0%) possessed good knowledge of treatment (see Figure 4.1). Respondents' knowledge of treatment is presented in Table 4.5 according to selected characteristics.

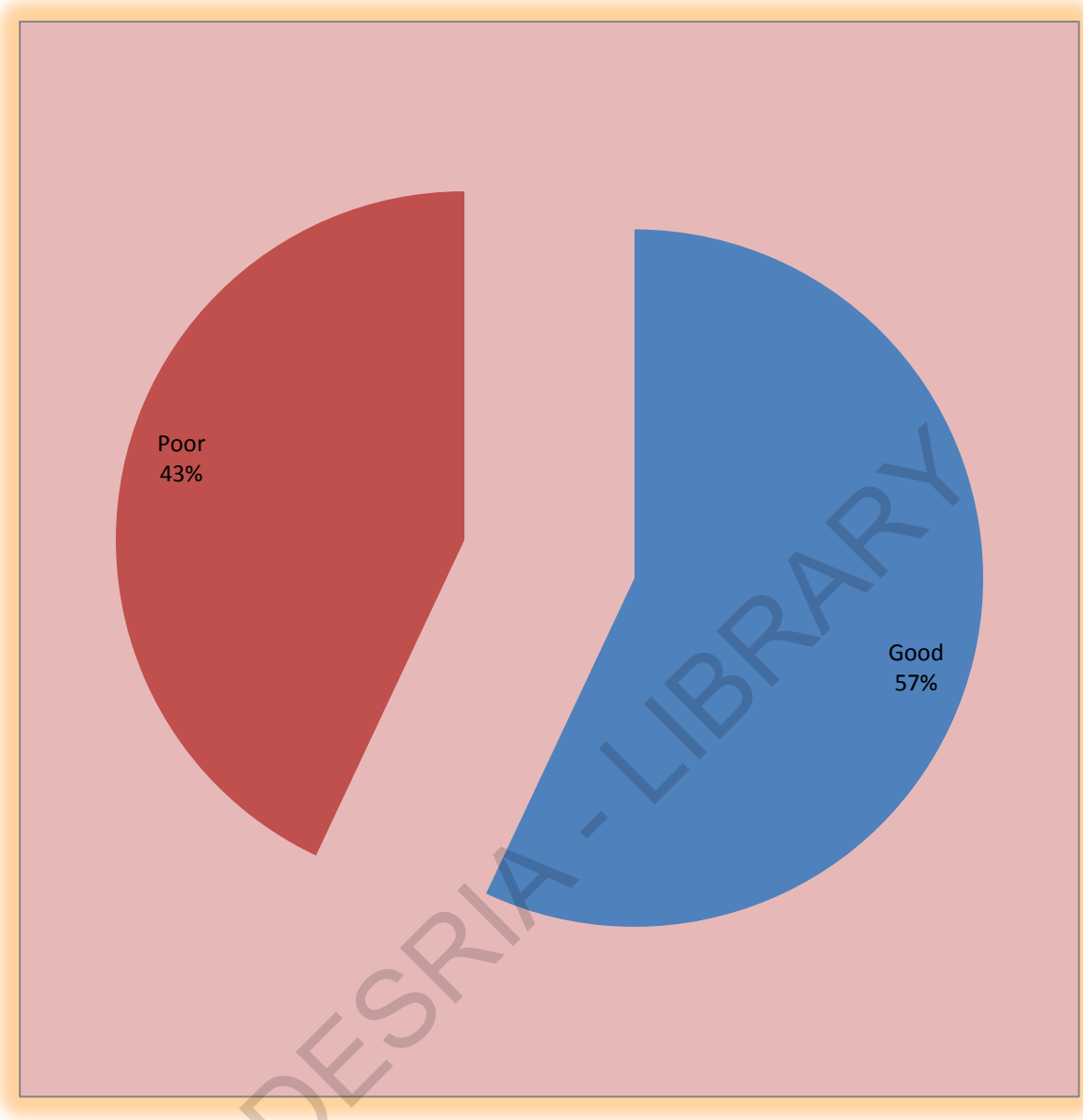


Figure 4.1: Distribution of Respondents According to Knowledge of Treatment

Table 4.5: Percentage Distribution of Respondents According to Knowledge of Treatment by Selected Characteristics

	Levels of Knowlege		
Characteristics	% Poor knowledge	% Good knowledge	Total
Sex:			
Male	43.3	56.7	127
Female	42.7	57.3	206
Educational Attainment:			
No formal education	56.7	43.3	30
Primary	57.1	42.9	56
Secondary	40.7	59.3	150
Post Secondary	34.0	66.0	97
Age Group:			
≤ 20	52.9	47.1	17
21 – 30	46.2	53.8	117
31 – 40	36.0	64.0	125
41 – 50	52.8	47.2	53
≥ 51	33.3	66.7	21
Monthly Income*:			
≤ N5,000.00	47.3	52.7	74
N5001 – N10,000	48.0	52.0	50
N10,001 – N15,000	19.0	81.0	21
≥ N15,001	31.4	68.6	51
Time on HIV Drugs:			
Less than 1 year	40.4	59.6	136
1 – 2 years	47.5	52.5	139
More than 2 years	36.5	63.5	52
Time on TB Drugs:			
3 – 4 months	39.3	60.7	242
5 – 6 months	38.9	61.1	18
7 – 8 months	63.9	36.1	36
More than 8 months	46.9	53.1	32
Patient Type			
HIV and TB	47.2	52.8	144
HIV only	39.7	60.3	189
Total	**42.9**	**57.1**	**100.0**
Number	**143**	**190**	**333**

*No responses were excluded

Male (56.7%) and female (57.3%) respondents had similar levels of good knowledge However, more respondents who had post secondary education (66.7%) than secondary school (59.3%); primary school (42.9%) and no formal education (43.3%) had good knowledge. A further examination of the data revealed that more respondents who were 51 years and older (66.7%) than those 41-50 years (47.2%) and ≤ 20 years (47.1) possessed good knowledge. Other details can be found in Table 4.5.

Respondents who had spent more than two years on HIV drugs (638.6%) were slightly more adequately knowledgeable than those who had spent less than one year (59.6%).

4.4 Adherence to Treatment

A majority (65.2%) of the respondents reported they had never missed any of their medications. Moreover, about half the respondents (51.4%) reported that even though they did not miss their medication an entire day, sometimes they missed the specific times they were expected to take them (see Figure 4.2 for details).

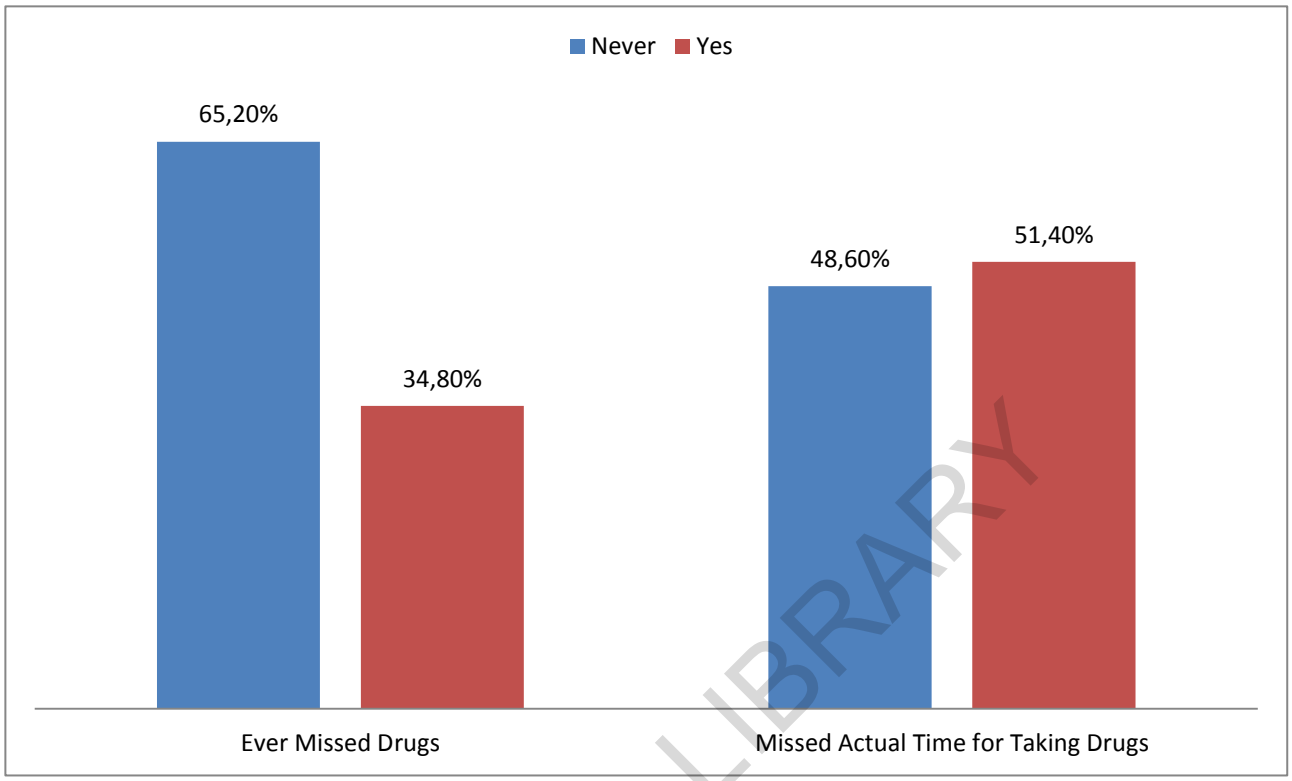


Figure 4.2: Proportion of Respondents Who Had Ever Missed their Drugs or the Actual Time of Taking Drugs

Figure 4.3 presents respondents' levels of adherence to treatment. Overall, more respondents (38.1%) were in the high adherence category than in low and moderate categories. Respondents in the low adherence category constituted 32.4% of the sample.

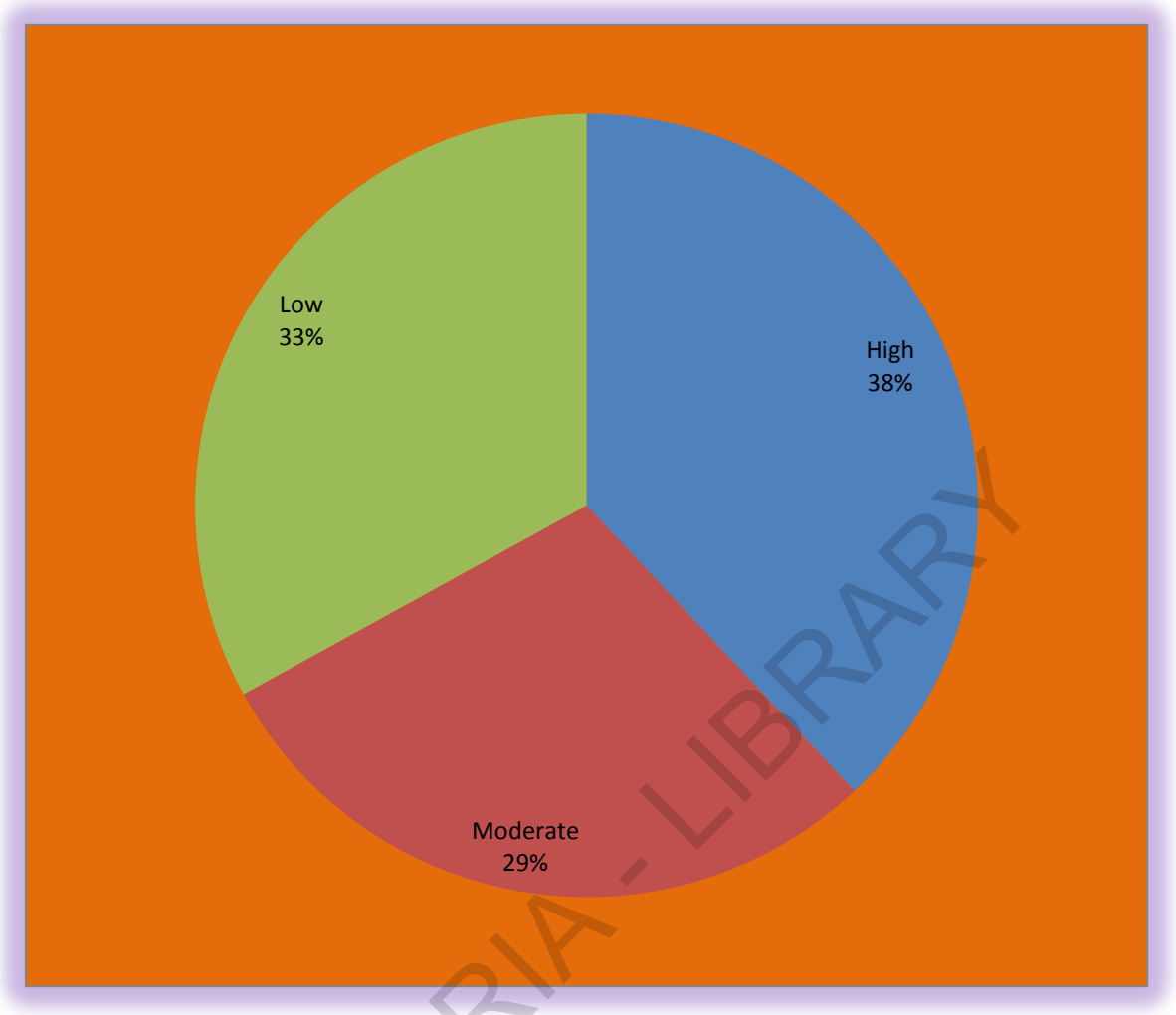


Figure 4.3: Respondents' Level of Adherence to Treatment

Table 4.6 shows the estimated number of days that respondents may have been without medication because they were out of stock. Overall, 48.9% of respondents always attended clinics and collected their drugs as at when due and so could not have been without drugs; however, the rest of the respondents may have had no drugs between 1-3 days (38.4%) and four or more days (12.6%). More respondents in the high adherence category (51.2%) than moderate (49.0%) and low (46.3) were estimated to have missed none of their medication days.

Table 4.6: Estimated Days Respondents Missed Medication Two Months Prior to the Study Using Hospital Records by Selected Variables

Variables	Estimated days without drugs			Total
	None	1-3 days	≥ 4 days	
Level of Adherence				
Low	46.3	40.7	13.0	108
Moderate	49.0	37.8	13.3	98
High	51.2	37.0	11.8	127
Transport Cost to Clinic				
Walking distance	60.7	35.7	3.6	28
≤ N500.00	50.0	35.8	14.2	232
> N500.0	41.4	48.6	10.0	70
Monthly Income:				
≤ N5,000.00	50.0	37.0	13.0	100
N5001 – N10,000	37.5	45.8	16.7	24
N10,001 – N15,000	57.1	38.1	4.8	21
≥ N15,001	58.8	31.4	9.8	51
No Response	45.3	40.9	13.9	137
Total	**48.9**	**38.4**	**12.6**	**100.0**
Number	**163**	**128**	**42**	**333**

Source: Patients' hospital records

Table 4.7: Respondents' Level of Adherence According to Selected Characteristics

Selected Characteristics	Adherence level			Total
	Low	Moderate	High	
Sex:				
Male	30.7	33.1	36.2	127
Female	33.5	27.2	39.3	206
Age Group:				
≤ 20	29.4	29.4	41.2	17
21 – 30	27.4	29.1	43.6	117
31 – 40	41.6	27.2	31.2	125
41 – 50	18.9	39.6	41.5	53
≥ 51	42.9	19.0	38.1	21
Marital Status:				
Single	31.0	28.2	40.8	142
Married	35.1	30.7	34.2	114
Separated/Divorced/widowed	31.2	29.9	39.0	77
Level of Education:				
No formal education	43.3	26.7	30.0	30
Primary	37.5	32.1	30.4	56
Secondary	24.0	27.3	48.7	150
Post Secondary	39.2	32.0	28.9	97
Ethnic Group:				
Efik	29.9	29.9	40.3	77
Ibibio/Oron/Annang	36.7	22.5	40.8	120
Other Cross River groups	30.7	39.6	29.7	101
Others/No response	28.6	22.9	48.6	35
Occupation:				
Unemployed	38.9	20.4	40.7	54
Farmer	33.3	42.9	23.8	42
Businessman/Trader	31.3	28.4	40.3	67
Civil/Public Servant	39.0	27.3	33.8	77
Self-employed Professional	30.8	13.5	55.8	52
Student/No response	14.6	53.7	31.7	41
Monthly Income:				
≤ N5,000.00	34.0	19.0	47.0	100
N5001 – N10,000	33.3	33.3	33.3	24
N10,001 – N15,000	38.1	38.1	23.8	21
≥ N15,001	43.1	29.4	27.5	51
No Response	26.3	35.0	38.7	137
Total:	**32.4**	**29.4**	**38.1**	**100.0**
Number:	**108**	**98**	**127**	**333**

As the level of education increases from no formal to secondary education, so does the proportion of respondents who reported high level of adherence to treatment. For example, for no formal education, the proportion that reported high adherence was 30.0%, while 48.7% of those with secondary education reported high adherence. Almost the reverse was the case in terms of income, as more respondents who earn 5000 naira or less (47.0%) were in the higher adherence category followed by those who did not report their income (38.7%), while more of those who earn above 15000 naira (43.1%) had low adherence with 27.5% in the same category reporting high adherence. Similar proportion of males (36.2%) and females (39.3%) were observed to have had high adherence (see details in Table 4.7, page xx).

Further details on the level of adherence are presented in Figure 4.4.

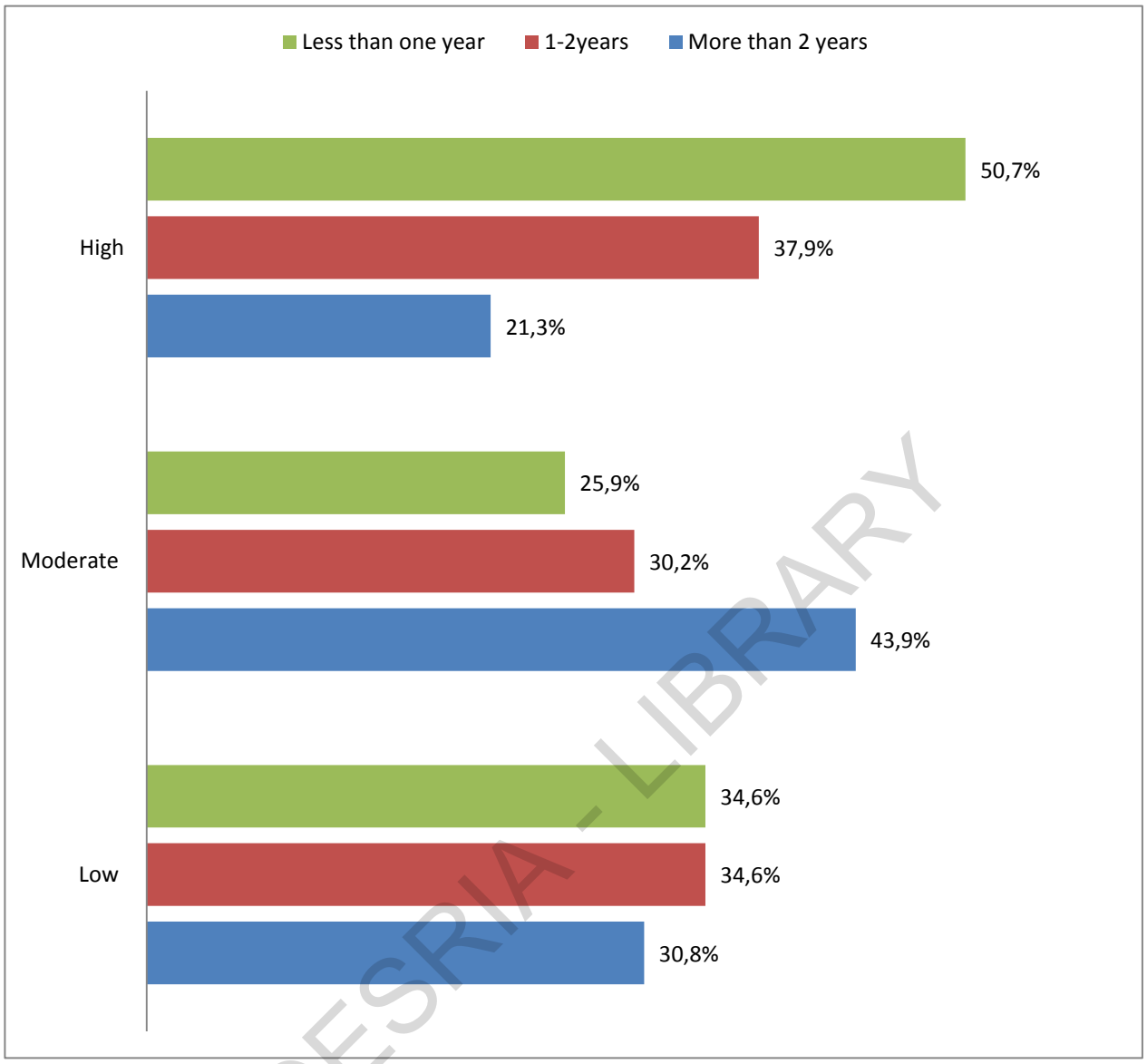


Figure 4.4: Level of Treatment Adherence by Time on HIV Treatment

Half of the respondents (50.7%) who had spend less than one year on treatment for HIV were highly adherent compared with 25.9% of those who had spent between one to two years and 34.6% of those who had spend more than two years (see Figure 4.4).

Sixty-one percent of respondents who had been on TB drugs between 5-6 months reported high level of adherence compared with 28.1%, 41.7% and 36.4% for respondents who had spent more than 8 months, 7-8 months and 3-4 months, respectively as shown in Figure 4.5.

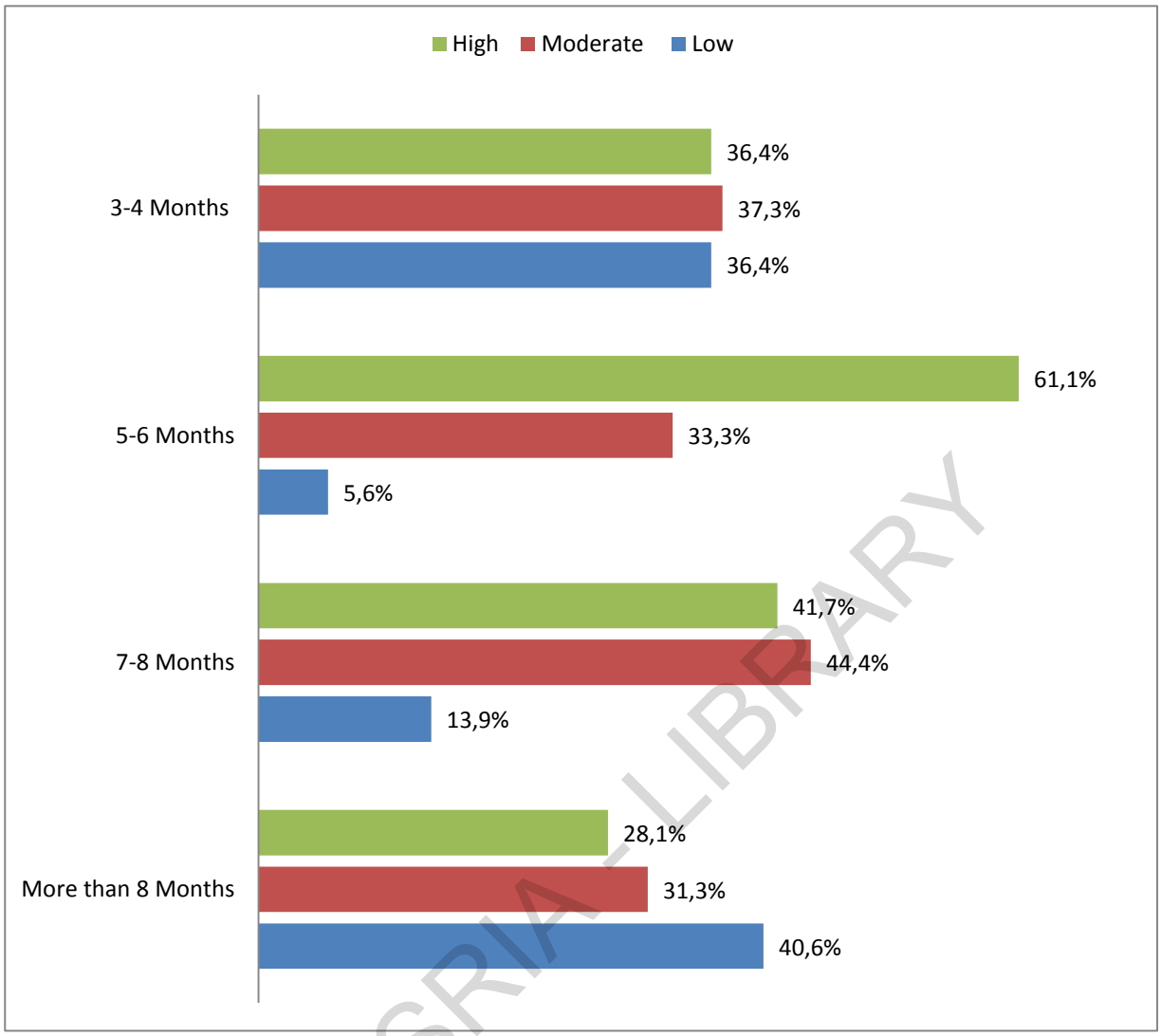


Figure 4.5: Level of Treatment Adherence by Time on TB Treatment

Table 4.8: Distribution of Respondents according to Level of Adherence by selected variables

Selected variables	Level of adherence			Total
	Low	Moderate	High	
Knowledge of treatment				
Poor	25.2	32.2	42.7*	143
Good	37.9	27.4	34.7	190
Time on HIV Drugs:				
Less than 1 year	21.3	27.9	50.7***	136
1 - 2 years	43.9	30.2	25.9	139
More than 2 years	30.8	34.6	34.6	52
Time on TB Drugs:				
3 - 4 months	36.8	27.6	35.5	76
5 - 6 months	0,0	22.2	77.8	9
7 - 8 months	16.1	41.9	41.9*	31
More than 8 months	40.7	33.3	25.9	27
Perceived Self-efficacy:				
Low self-efficacy	38.6	24.7	36.7	158
High self-efficacy	26.9	33.7	39.4*	175
Cost of Transport Fare:				
Walking distance	39.3	21.4	39.3	28
≤ N500.00	29.7	29.3	40.9	232
≥ N500.00	35.7	34.3	30.0	70
Total:	**32.4**	**29.4**	**38.1**	**100.0**
Number:	**108**	**98**	**127**	**333**

*Significant at p<0.05; *** Significant at p<0.001

Examination of level of adherence by knowledge of treatment reveals that more respondents with inadequate knowledge (42.7%) compared to those with adequate knowledge (34.7%) were in the high adherence category. Inversely, higher proportion of respondents who had adequate knowledge of treatment (37.9%) was in the very low adherence category compared to those with inadequate knowledge (25.2%). Respondents who had exhibited high perceived self-efficacy (39.4%) compared to those categorised as having low self-efficacy (36.4) were in the high adherence category.

Moreover, 50.0% of respondents who had been on HIV drug for less than one year, were in the high adherence group in contrast to those who had spent between one and two years (25.9%), and those who have spent more than two years (34.6%). Qualitative data further threw more light on the fact that patients who are just starting treatment adhere more than those who have spent considerably longer time, as a nurse, during an IDI session, insisted that:

> *I have personally observed that HIV/TB patients are eager to receive treatment once the treatment is given, they want immediate healing. Some, if there is little delay in collecting drugs, are worried and disappointed. The early stage is not that difficult for them to take medications. This is because they are very anxious at that early stage to get well. After some months, some will begin to complain of the drugs. Some will begin to say 'I have no food to eat', 'I have no money to come to the hospital', 'I am tired of this medicine', and 'my pastor says I should not take these drugs again because I am ok'*

Another nurse observed that patients are anxious to get better, and so, adherence to treatment is not a big problem:

> *It is not difficult for them to take their medications. These are people who are anxious to get well, so nothing stops them from taking their medication. It is when some have fear that it becomes a little difficult. Once they overcome fear, their medication becomes very easy to take. What is very important is your ability to counsel and encourage them. If that is accepted, it becomes easy for them. If anything makes it difficult, then it is fear and lack of encouragement from some of us nurses or counsellors.*

Table 4.9: Level of Adherence According to Family Support Received and Level of Anxiety

Selected variables	Level of adherence			Total
	Low	Moderate	High	
Family Support				
No support at all	39.7	27.6	32.8	58
At least one form of support	30.5	23.2	46.4*	151
More than one form of support	31.5	37.9	30.6	124
Level of Anxiety				
Not anxious at all	27.8	35.2	37.0	54
Somewhat anxious	26.7	40.7	32.6	86
Very anxious	36.3	22.8	40.9*	193
Number of Children:				
None	29.6	35.2	35.2	108
1-2 Children	37.5	20.5	42.0	112
3-4 Children	27.6	32.9	39.5	76
≥ Children	35.1	32.4	32.4	37
Social Stigma:				
No stigma at all	33.8	29.4	36.9	293
Some level of stigma	22.5	30.0	47.5	40
Self Stigma:				
Low	34.1	23.5	42.4***	217
High	29.3	40.5	30.2	116
Satisfaction with Family Support				
Not satisfied	39.1	31.3	29.6	115
Satisfied	28.9	28.4	42.7*	218
Total:	**32.4**	**29.4**	**38.1**	**100.0**
Number:	**108**	**98**	**127**	**333**

*Significant at $p<0.05$; *** Significant at $p<0.001$

Data on level of satisfaction with support received revealed that a higher proportion of respondents who felt satisfied (42.7%) compared to those who were not satisfied (29.6%) were in the high level of adherence (see details in Table 4.9). Also, patients who received more than one form of support (30.6) were lesser than those who received at least one form (46.4%) in the high adherence category.

Qualitative data also supported this finding as a nurse offered some explanations of why patients who had family support may be non-adherent:

> *Some complained about staying with family members to whom they did not want to disclose their status. For instance, a student who was residing in female hostel in the University of Calabar had this problem, we had to approach her parents, who understood and obtained accommodation for her outside the school. In fact, to be more honest with you, accommodation is one of the major problems making it difficult for many of the patients to take medication. As I said earlier, now it is becoming less difficult for the patients to take medication because of the level of exposure*.

Table 4.9 also shows that respondents with low self-stigma (42.4%) were in the high adherence category compared to those who were highly self-stigmatised (30.2%). It seems that HIV infected people experience more self-stigma than any experience of social stigma.

4.1.5 Factors Affecting Adherence to Treatment

Quite a number of factors were examined for their influence on adherence. This section presents results from the analysis.

Self-efficacy

The personal belief of an individual in their ability to act in ways to change or improve a situation, in other words referred to as self-efficacy (measured as described in section 3.8), is an important factor in the explanation of adherence to treatment. The self-efficacy belief of the respondents was tested and results are presented in Table 4.10.

Table 4.10: Percentage Distribution of Respondents' Perceived Self-Efficacy According Selected Characteristics

Characteristics	Perceived self-efficacy		Total
	% Low	**% High**	**(n)**
Sex:			
Male	50.4	49.6	**127**
Female	45.6	54.4	**206**
Educational Attainment:			
No formal education	50.0	50.0	**30**
Primary	71.4	28.6	**56**
Secondary	45.3	54.7	**150**
Post Secondary	36.1	63.9	**97**
Age Group:			
≤ 20	29.4	70.6	**17**
21 – 30	47.9	52.1	**117**
31 – 40	48.0	52.0	**125**
41 – 50	45.3	54.7	**53**
≥ 51	61.9	38.1	**21**
Marital Status:			
Single	49.3	50.7	**142**
Married	43.9	56.1	**114**
Separated/Div/Widowed	49.4	50.6	**77**
Ethnic Group:			
Efik	46.8	53.2	**77**
Ibibio/Oron/Anang	60.0	40.0	**120**
Other Cross River	27.7	72.3	**101**
Others/no response	62.9	37.1	**35**
Monthly Income:			
≤ N5,000.00	68.0	32.0	**74**
N5001 – N10,000	50.0	50.0	**24**
N10,001 – N15,000	28.6	71.4	**21**
≥ N15,001	49.0	51.0	**51**
No response	34.3	65.7	**137**
Time on HIV Drugs:			
Less than 1 year	52.2	47.8	**136**
1 – 2 years	48.9	51.1	**139**
More than 2 years	34.6	65.4	**52**
Time on TB Drugs:			
3 – 4 months	55.0	45.0	**242**
5 – 6 months	33.3	66.7	**18**
7 – 8 months	16.7	83.3	**36**
More than 8 months	37.5	62.5	**32**
Total	**47.9**	**52.1**	**100.0**
Number	**157**	**171**	**333**

On the whole, 52.1% and 47.9% of respondents indicated high and low self-efficacy, respectively in their ability to adhere to medication in spite of all obstacles. Slightly more female (54.4%) than male (49.4%) respondents exhibited high self-efficacy; more of the married (56.1%) than the singles (50.7%), and those separated/divorced and widowed (50.6%) showed high self-efficacy.

Distance to treatment

About nine in ten (92.9%) respondents lived in places where they must use a taxi or motorcycle to get to their places of treatment (details in Table 4.11).

Table 4.11: Distribution of Respondents according to means of transportation to Treatment Facilities by Selected Characteristics

Selected characteristics	Distance to treatment centre		Total
	Walking distance	**Need to take taxi/bike**	
Sex:			
Male	7.3	92.7	**123**
Female	7.0	93.0	**199**
Educational Attainment:			
No formal education	3.3	96.7	**30**
Primary	12.7	87.3	**55**
Secondary	6.4	93.6	**141**
Post Secondary	6.3	93.8	**96**
Age Group:			
≤ 20	6.7	93.3	**15**
21 – 30	13.3	86.7	**113**
31 – 40	0.8	99.2	**121**
41 – 50	11.3	88.7	**53**
≥ 51	0.0	100.0	**20**
Marital Status:			
Single	10.9	89.1	**137**
Married	6.3	93.7	**111**
Separated/Div/Widowed	1.4	98.6	**74**
Monthly Income:			
≤ N5,000.00	12.1	87.9	**99**
N5001 – N10,000	0.0	100.0	**24**
N10,001 – N15,000	0.0	100.0	**21**
≥ N15,001	4.2	95.8	**48**
No response	6.9	93.1	**130**
Time on HIV Drugs:			
Less than 1 year	6.8	93.2	**132**
1 – 2 years	8.9	91.1	**135**
More than 2 years	4.1	95.9	**49**
Time on TB Drugs:			
3 – 4 months	6.5	93.5	**232**
5 – 6 months	16.7	83.3	**18**
7 – 8 months	5.7	94.3	**35**
More than 8 months	9.4	90.6	**32**
Total	7.1	92.9	**100.0**
Number	23	299	**322***

*No responses were excluded

Table 4.12: Mean Amount Paid on Transport Fare to and from Treatment Facilities by Selected Characteristics

Selected characteristics	Mean amount (Naira)	Total
Sex:		
Male	561.40	116
Female	508.70	186
Educational Attainment:		
No formal education	362.50	28
Primary	414.90	47
Secondary	458.70	137
Post Secondary	747.20	90
Age Group:		
≤ 20	234.70	17
21 – 30	504.20	100
31 – 40	532.20	118
41 – 50	661.50	46
≥ 51	576.20	21
Marital status:		
Single	496.40	127
Married	497.40	103
Separated/Div/Widowed	631.50	72
Monthly Income:		
≤ N5,000.00	496.70	86
N5001 – N10,000	240.40	24
N10,001 – N15,000	761.00	21
≥ N15,001	531.30	46
No response	566.60	125
Time on HIV Drugs:		
Less than 1 year	387.60	123
1 – 2 years	631.40	124
More than 2 years	611.20	49
Time on TB Drugs:		
3 – 4 months	549.30	222
5 – 6 months	313.30	12
7 – 8 months	571.80	34
More than 8 months	389.00	29
Total	**528.90**	**302**

This has serious financial implications as respondents spend a mean amount of N528.90 on transport fare to and from the treatment centre (see details in Table 4.12). Given that appointments at the treatment centres are on a bi-weekly basis, the cumulative cost that respondents bear on transport fare only in a month will be more than N1000.00. This is more evident especially for those whose monthly income varies from five thousand naira and below but who spent a mean transport fare of 496.7 naira per visit to the treatment centre.

All respondents indicated that both HIV and TB drugs were free, but that they always paid for drugs to treat other symptoms or illnesses like malaria, which they may experience during this time of treatment. However, 47.4% of respondents reported to have spent extra money on feeding (see Figure 4.6 for details). This may have been more cost incurring for those who come from long distances, as 95.4% of respondents who spend money on feeding while in the treatment centres were those who also had to pay transportation to the centres.

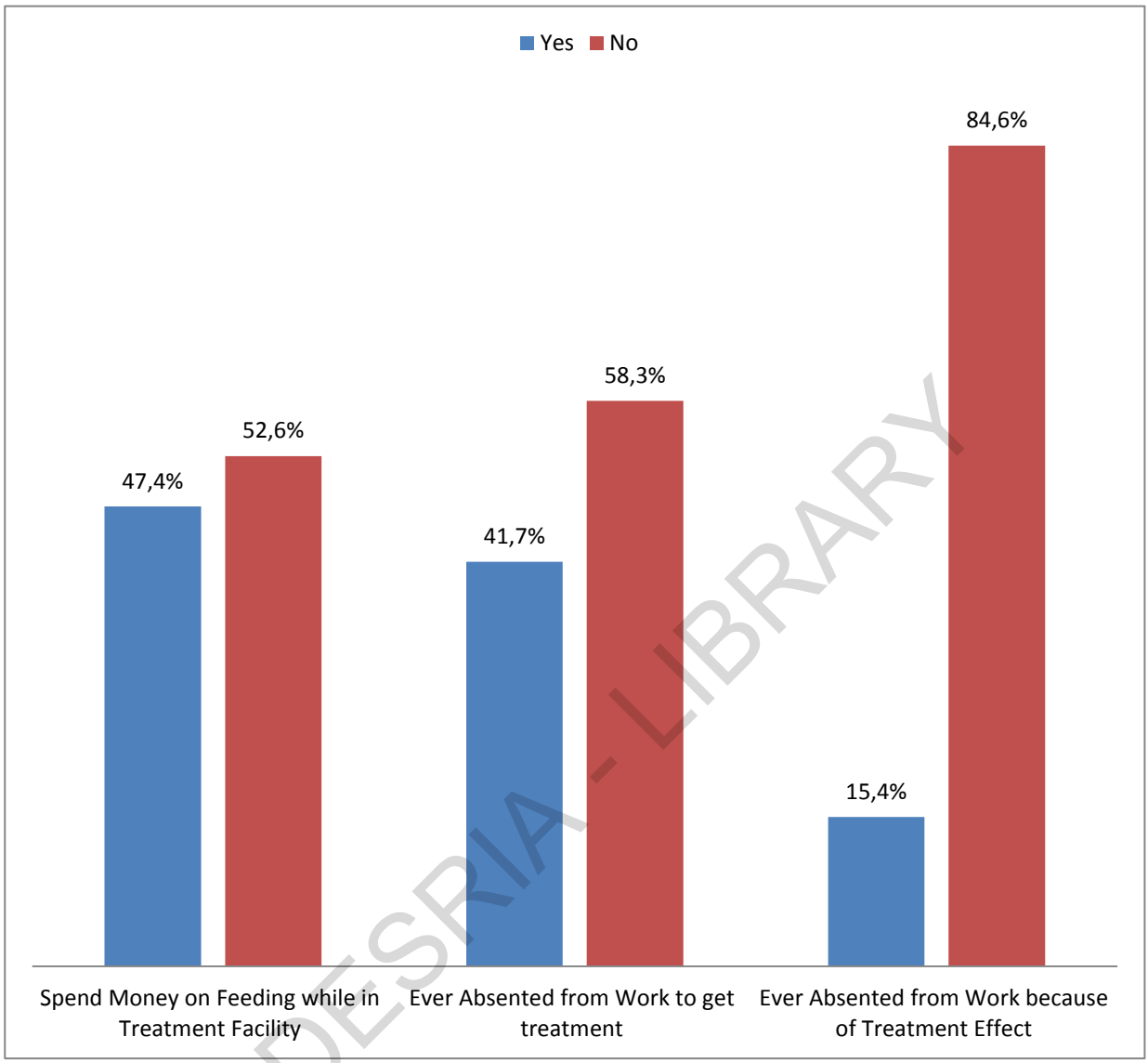


Figure 4.6: Proportion of Respondents Who Absented from Work to Attend Clinic and Who Spent Money to Eat while in the Treatment Facility

Participants were asked to give reasons why they missed their medication. Reasons given for missing drugs and scheduling problems can be seen in Figure 4.7. Although the study could not accurately calculate the cost of treatment (transport, tests, feeding, loss of man hours due to absence from work, among others), it is quite obvious that being on treatment is nevertheless costly to the patients. A calculation or experience of the costs could influence a patients treatment-taking or health seeking behaviour.

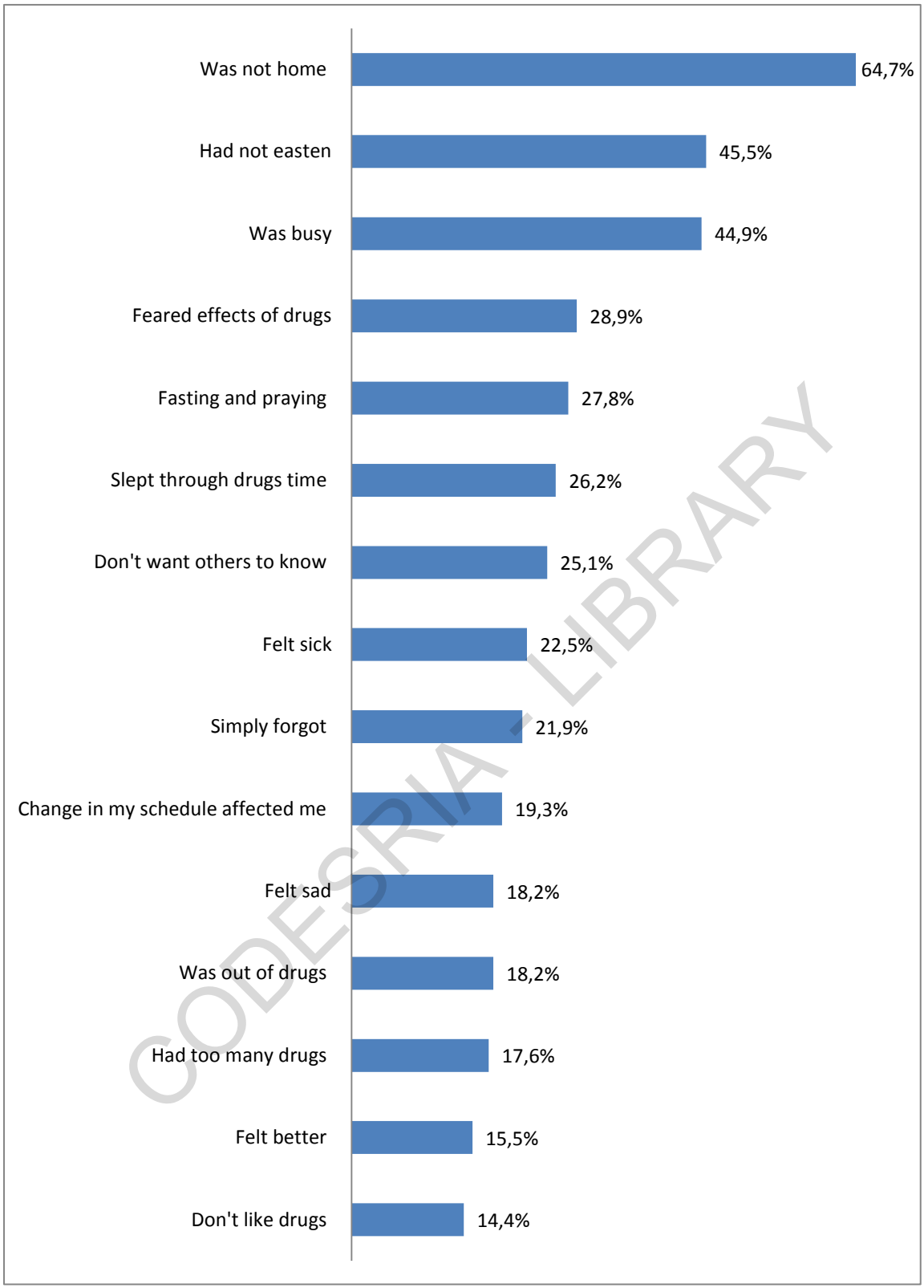


Figure 4.7: Respondents' Reasons for missing drugs

Respondents who reported not missing medication on account of any of the reasons made up 43.8%. This proportion represents respondents who reported they had never missed their medication at all. Figure 4.7 shows that, of the 56.2% who reported missing their medication, the highest proportion was for respondents who reported 'was not at home' (64.7%) as the reason for missing treatment, followed by 'had not eaten' (45.5%) and 'was busy with other things' (44.9%).

Qualitative data examined what respondents meant by not being at home. Findings revealed that whenever patients are in the company of people (parents, siblings), they would not want to reveal their status by taking drugs, as depicted by these narrative from a case study:

> *Let me tell you the truth, the only times that I miss my drugs would be when I travel home to visit my parents and siblings. I do not want them to see me taking drugs, because I do not want to answer questions about my condition. So I usually do not carry my drugs when I go home. I have no problem telling you of my status, but my people will die if they knew. Not that they will not support me, they will, I know. But they will worry too much . . . and start to pity me, which is what I do not want. One time I tried to take my drugs at home in secret and was nearly caught.*

Similarly, another patient had this to say during an FGD session:

> *Sometimes when I travel to Aba (that was I think two times) I do not carry my drugs along. After those times, I have not missed my drugs again* (FGD, female, University of Calabar Teaching Hospital, UCTH).

A further enquiry on why respondents could not take their drugs when they were not at home revealed an underlying problem bordering on fear of rejection from relatives and friends on knowing that they were infected by HIV and/or Tb.

Patients also complained of not being able to take the drugs because they had not eaten as at the time they were supposed to take them, and that they were usually advised to eat much food by the nurses. Getting support from loved ones in terms of providing what to eat is really important; and for some, this is being provided. A friend of one of the patients insisted during an IDI session that:

> *I sell food, and sometimes I make food for my friend to eat before taking her drugs. I do not want my friend to stay without drugs because there is no food. It is in those days that I used to feel that anybody infected deserved it because of their wayward living. Now I know better (IDI, female friend, food-seller).*

Similarly, a patient in a case study did not consider food availability as a problem when noting that:

> *I take my drugs even when I have not had food. The nurses said we should drink plenty of water and take our medicine if there is no food. At times, if my medicine finishes, and I have no money to go to the hospital, I go and borrow or walk. I take my medicine very serious and I carry it everywhere I go (Case Study, Male patient, 43).*

In the same vein another patient had this to say:

> *I live with my parents. They provide me with all I need including food. I do not need to worry about getting help from people.*

One unavoidable problem that can cause patients to go without their medication is in a time of industrial strike. A nurse in one of the hospitals reported how patients faced this challenge:

> *During strike, we were not available to give them drugs. The venue was changed and many people were not aware. This caused a lot of the patients to go without drugs during that period*

It is a well known fact in Nigeria that labour struggle with the government frequently lead to a disruption of critical services, including those in the health sector.

Although it was not the highest, fasting and prayer accounted for 27.8% of why respondents missed their medicines, and appeared to be a strong factor responsible for level of treatment adherence. Some patients, and even nurses in the qualitative data, revealed that missing drugs because they were fasting and praying was mostly among patients who also sought faith healing. With these types of respondents, religious leaders usually advise them that drugs cannot heal them, but that only God can, if they went through fasting and praying.

Anxiety

Another important variable that was also considered as having influence on patients' degree of adherence to treatment of HIV and Tb was level of anxiety that the patients feel as a result of their illness state. Table 4.13 shows the distribution of respondents according to level of anxiety by selected characteristics.

Table 4.13: Distribution of Respondents According to Level of Anxiety by Selected Characteristics

Characteristics	Level of Anxiety			Total
	Not at all anxious	**Somewhat anxious**	**Very anxious**	
Sex:				
Male	16.5	26.0	57.5	**127**
Female	16.0	25.7	58.3	**206**
Educational Attainment:				
No formal education	16.7	26.7	56.7	**30**
Primary	3.6	23.2	73.2	**56**
Secondary	20.7	24.0	55.3	**150**
Post Secondary	16.5	29.9	53.6	**97**
Age Group:				
≤ 20	47.1	29.4	23.5	**17**
21 – 30	10.3	24.8	65.0	**117**
31 – 40	16.0	20.8	63.2	**125**
41 – 50	20.8	37.7	41.5	**53**
≥ 51	14.3	28.6	57.1	**21**
Marital Status:				
Single	14.1	23.2	62.7	**142**
Married	21.1	28.1	50.9	**114**
Separated/Div/Widowed	13.0	27.3	59.7	**77**
Ethnic Group:				
Efik	9.1	26.0	64.9	**77**
Ibibio/Oron/Anang	6.7	26.7	66.7	**120**
Other Cross River	37.6	21.8	40.6	**101**
Others/no response	2.9	34.3	62.9	**35**
Monthly Income:				
≤ N5,000.00	3.0	23.0	74.0	**100**
N5001 – N10,000	29.2	25.0	45.8	**24**
N10,001 – N15,000	9.5	33.3	57.1	**21**
≥ N15,001	19.6	13.7	66.7	**51**
No response	23.4	31.4	45.3	**137**
Total	**16.2**	**25.8**	**58.0**	**100.0**
Number	**54**	**86**	**193**	**333**

A broad picture of the level of anxiety indicates that more than half of the respondents (58.0%) were very anxious, with 25.8% somewhat anxious, and only 16.2% reporting not being anxious at all about their health situation and life generally. However, there were significant variations between various categories. For example, level of anxiety tended to be higher among respondents with lower monthly income as the category ≤ N5000.00 had the highest proportion (74.0%) of respondents who were very anxious compared with 45.8% of those who earn 5001.00 to 10,000.00 naira. There were similar proportions of male and female respondents with regard to level of anxiety while single (62.7%) respondents exhibited higher level of anxiety than those who were married (50.9%). Single respondents still grapple with the possibility of being able to attract a suitable partner and to marry.

When people are infected, their first source of worry is whether their spouses or sexual partners are going to discontinue with the relationship. By virtue of their status, they stop a lot of things, which will normally give them pleasure and are almost solely dependent on their partners for the happiness they can get. If this is not forth coming, pressure comes, which can be an inhibitor to adherence. This story below clearly illustrates this point:

> *I have really stopped many things. I reduce how I go out. I regulate what I eat; I do not drink alcohol, I eat more of fruits and vegetables. My boyfriend and parents are all caring. My friends who know of my status are helping me. I have not stigmatised. I pray more, and go to church frequently. Since I started taking drugs, I have been serious. I do not miss my clinic days and my health has improved. As you can see, if I do not tell you that I am positive you will never know.*

However, she complained that:

> *The only problem I have for now is my boyfriend who is asking me to stop taking the drugs, because, according to him, I am not positive. There was a time he seized my drugs for several days, and I could not take them during those days. He has been insisting that I go and see his pastor for prayers instead of taking drugs. . . What worries me is that my boyfriend is not positive. He has gone for test several times and the results have been negative. To be sincere, he has gone for test more than four times. He does not believe that I am positive. He still sleeps with me without using condom. All my appeals to him to use condom have not yielded any result (Case Study, Female patient, 26, trader).*

Further details on anxiety relating to location of treatment centre, time on drugs and number of children are presented in Table 4.14.

Table 4.14: Level of Anxiety by Location, Time on Drugs and Transport Cost

Characteristics	Level of Anxiety			Total
	Not at all anxious	Somewhat anxious	Very anxious	
Location:				
Rural	45.9	31.1	23.0	**61**
Urban	9.6	24.6	65.8	**272**
Time on HIV Drugs:				
Less than 1 year	14.7	19.9	65.4	**136**
1 – 2 years	18.0	30.9	51.1	**139**
More than 2 years	11.5	28.8	59.6	**52**
Time on TB Drugs:				
3 – 4 months	8.7	25.6	65.7	**242**
5 – 6 months	11.1	22.2	66.7	**18**
7 – 8 months	44.4	30.6	25.0	**36**
More than 8 months	40.6	25.0	34.4	**32**
Transport Cost:				
Walking Distance	7.1	17.9	75.0	**28**
≤ N5,000.00	18.1	26.3	55.6	**232**
≥ N5,000.00	14.3	28.6	57.1	**70**
Total	**16.2**	**25.8**	**58.0**	**100.0**
Number	**54**	**86**	**193**	**333**

The pattern is generally similar when level of anxiety is examined by location, number of children, transport cost to treatment centre and time spent on HIV and TB drugs. However, majority of the respondents who did not have to pay for transportation to treatment centre (75.0%), because the centre was not far from where they stay, were in the category of very anxious. This may be because they live within the neighbourhood and may be known by people around who see them going to the treatment health facility.

Social Isolation

Persons infected with HIV are often reluctant to disclose their positive status owing to fear of stigma and discrimination. This secrecy leads to social withdrawal from other people, and as such infected persons become socially isolated. This study examined social isolation as one of the factors that may have influence on adherence behaviour. Information on social isolation is presented in Table 4.15.

Table 4.15: Respondents' Feeling of Social Isolation by location, Time on Drugs, Transport Cost and Number of Children

Characteristics	Feeling of Social Isolation			Total
	Not at all	Somewhat	Very	
Location:				
Rural	50.8	8.2	41.0	**61**
Urban	8.8	18.8	72.4***	**272**
Time on HIV Drugs:				
Less than 1 year	14.7	14.7	70.6	**136**
1 – 2 years	18.7	15.1	66.2	**139**
More than 2 years	11.5	28.8	59.6	**52**
Time on TB Drugs:				
3 – 4 months	9.5	19.4	71.1	**242**
5 – 6 months	5.6	16.7	77.8***	**18**
7 – 8 months	44.4	11.1	44.4	**36**
More than 8 months	40.6	6.3	53.1	**32**
Transport Cost:				
Walking Distance	10.7	14.3	75.0	**28**
≤ N5,000.00	16.4	17.7	65.9	**232**
≥ N5,000.00	15.7	15.7	68.6	**70**
Number of Children				
None	20.4	15.7	63.9	**108**
1-2 children	8.0	17.0	75.0	**112**
3-4 children	21.1	19.7	59.2	**76**
5 children+	21.6	13.5	64.9	**37**
Total	**16.5**	**16.8**	**66.7**	**100.0**
Number	**55**	**56**	**222**	**333**

*** Significant at p<0.001

Significantly, more respondents who were resident in the urban areas experienced more social isolation than those in the rural areas as (72.4%) and (41.0%) respectively, reported feeling very socially isolated. Similarly, more respondents who had spent 5-6 months on Tb treatment (77.8%) than those who were 3-4 months (71.1%), 7-8 months (44.4%) and those who were more than eight month (53.1%) to feel very socially isolated (further details in Table 4.15).

Table 4.16: Distribution of Respondents' Feeling of Social Isolation by Selected Characteristics

Characteristics	Feeling of Social Isolation			Total
	Not at all	Somewhat	Very	
Sex:				
Male	15.0	17.3	67.7	**127**
Female	17.5	16.5	66.0	**206**
Educational Attainment:				
No formal education	16.7	13.3	70.0	**30**
Primary	3.6	10.7	85.7*	**56**
Secondary	21.3	16.0	62.7	**150**
Post Secondary	16.5	22.7	60.8	**97**
Age Group:				
≤ 20	52.9	23.5	23.5	**17**
21 – 30	12.0	13.7	74.4**	**117**
31 – 40	14.4	16.8	68.8	**125**
41 – 50	20.8	20.8	58.5	**53**
≥ 51	14.3	19.0	66.7	**21**
Marital status:				
Single	15.5	15.5	69.0	**142**
Married	19.3	14.9	65.8	**114**
Separated/Div/Widowed	14.3	22.1	63.6	**77**
Ethnic Group:				
Efik	9.1	16.9	74.0	**77**
Ibibio/Oron/Anang	5.8	19.2	75.0	**120**
Other Cross River	38.6	13.9	47.5	**101**
Others/no response	5.7	17.1	77.1***	**35**
Monthly Income:				
≤ N5,000.00	2.0	14.0	84.0***	**100**
N5001 – N10,000	20.8	33.3	45.8	**24**
N10,001 – N15,000	14.3	19.0	66.7	**21**
≥ N15,001	19.6	25.5	54.9	**51**
No response	25.5	12.4	62.0	**137**
Total	**16.5**	**16.8**	**66.7**	**100.0**
Number	**55**	**56**	**222**	**333**

*Significant at p<0.05; ** Significant at p<0.02; *** Significant at p<0.001

There is no difference in the level of anxiety between as similar proportions male (67.7%) and female respondents (66.0%) experienced very high social isolation. However, significantly, more respondents who earn 5000 naira or less monthly (84.0%) experienced more social exclusion than those in other income categories (details in Table 4.16).

Qualitative data provided a deeper insight into the social isolation that patients feel. A patient recounted a rather frustrating and potentially dangerous situation:

> *What really gave me headache was that I needed to marry because I was still single. I knew I had to have a rethink about my life. Above all, the counselling I received really helped me not to worry myself too much. But I told my girlfriend and she got very upset and decided to leave me. That was when I felt worried. I felt like just falling down and giving up living. I saw myself as not worthy of life any longer. I was nervous, worried and restless. I thought about a lot of things, whether to kill myself and then I made up my mind to spread the disease. My belief was that somebody gave me the disease and spoilt my life, so I had to give it to another person. But through counselling I changed my mind and did not do so, it was, however, not easy. Whenever I think of that moment, I get depressed for days on end. During such times I may miss my drugs, but it does not happen frequently.*

Another patient has faced social exclusion from friends as a result of HIV infection and had this to say:

> *Some of my friends stopped being close, but my very good friends still treat me well. Just that the level at which we were is not like that again.*

Alcohol use

Use of alcohol may be important in understanding risky sexual and other behaviours which hold negative health consequences. As such, information on respondents' rate of alcohol consumption was collected. Only 6.0% of all respondents reported that they take any drinks with alcoholic content as shown in Figure 4.7.

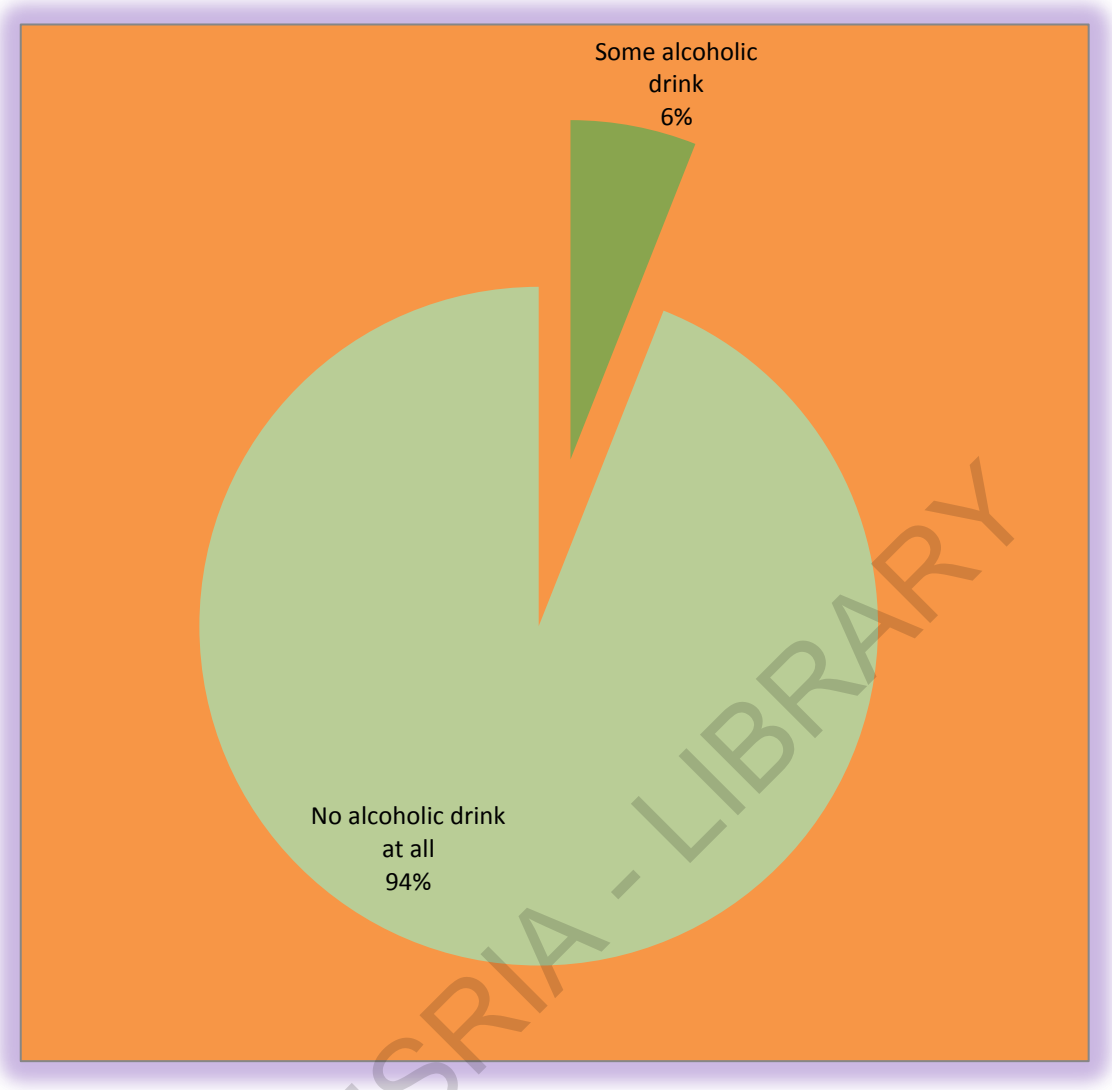


Figure 4.7: Proportion of Respondents Who Had any Alcoholic Drink

Of the 6.0% who takes alcoholic drinks, a negligible proportion (less that 1.0%) took more than one bottle of alcoholic drink in the one month preceding the study. This may not constitute much of a problem in terms of being a hindrance to treatment adherence.

Family Support

This study also investigated the part respondents' social capital play in maintaining an acceptable level of treatment adherence. Figure 4.8 shows results of respondents who lived with family or friends and who had received any form of support from them since they started treatment.

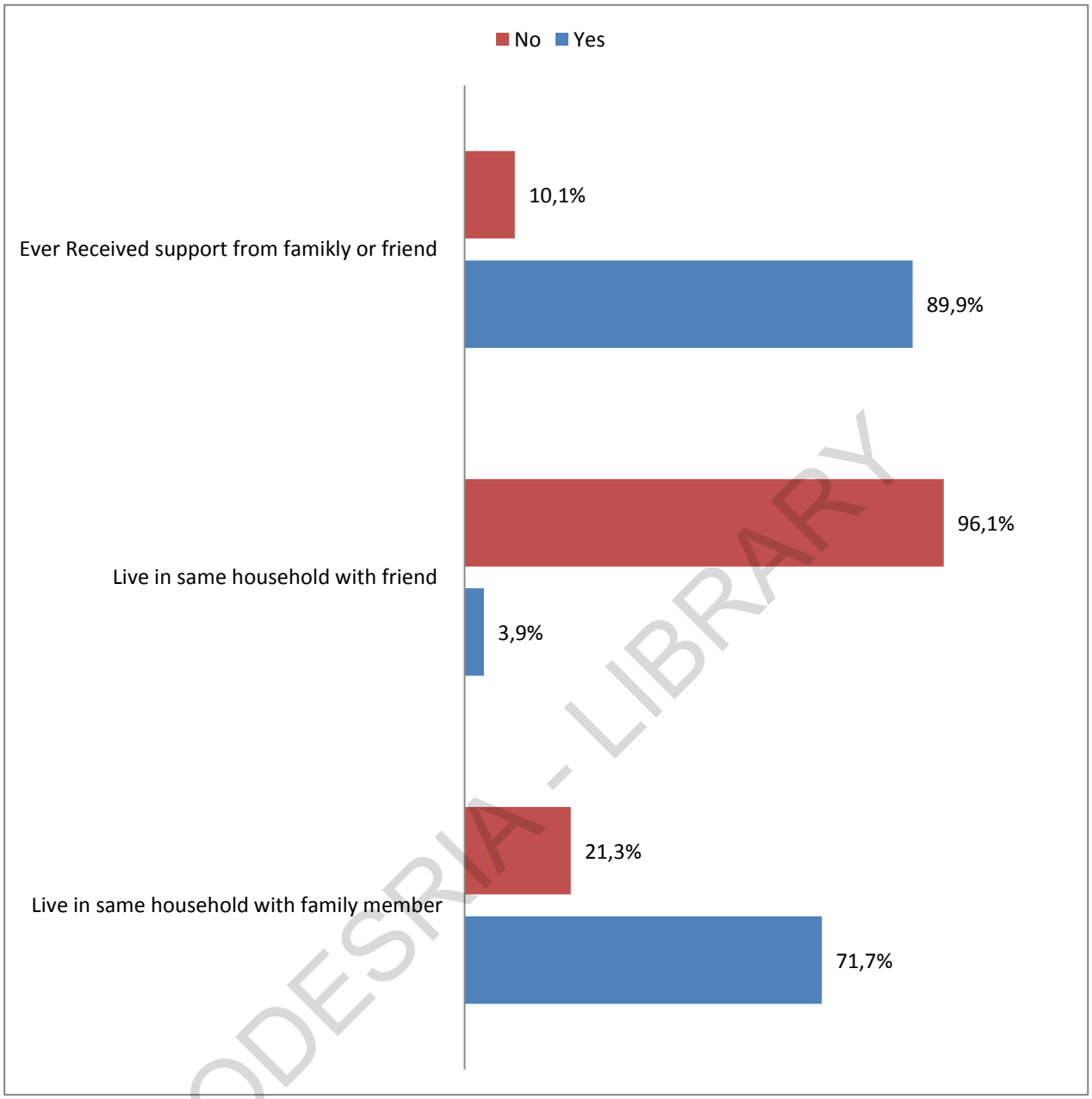


Figure 4.8: Respondents who Live in the Same Household with Family and Friends and who Have Received any Support

Table 4.17: Distribution of Respondents by Type of Support Received from Family and Friends

Type of support	Frequency	Per cent
Financial	139	25.1
Advice	182	33.1
Reminded me to take my drugs	64	11.5
Physical care and support	30	5.4
Nutritional/feeding support	69	12.4
Income generating activities	3	0.5
Spiritual/prayers	67	12.1

Multiple responses allowed

Data on the type of support received revealed that 25.1% of respondents received financial support as can be seen in Table 4.17. The most mentioned support received by respondents was advice with 33.1% in a multiple response variable. Equally important were spiritual/prayer (12.1%), nutritional/feeding support (12.4%), and reminders to take drugs (11.5%). Financial support was a generally recognised and discussed issue among participants in this study. For example, a 38-year old, married male participant in a case study recognised the help he received from friends thus:

> *I tell many of my friends who care to know about my health situation. I have told many of them that I am positive. Many assisted financially and supported me in different ways to get married. They . . . from time to time, send money for me and my wife. They visit me. I thank God that I did not feel ashamed to tell them about my status.*

An important point here is that the financial support does not necessarily have to be geared towards treatment, but to the particular needs of the infected person at the time; and by removing the burden, their concentration in other things, including medication, can improve. A point that must be made here is that inasmuch as supporting someone on HIV and TB treatment financially can be a facilitator of adherence, it can also be a barrier if there is a feeling that they are a burden to their friends and family. A male participant was unhappy that '*instead of contributing to helping the family, as the first son should, I am the one depleting family resources'*. Such feeling of guilt in receiving financial help from friends or family members can have unanticipated consequences of becoming a barrier instead of facilitator. Nevertheless, participants mainly discussed it in favourable terms with regards to adherence.

When an infected person feels that the support is mechanical without any real feeling of love and affection involved, instead of being motivated they get depressed and let down. A 54 years old widow who lost her husband three years prior to the study insisted that she '*cannot tell my children or anybody that I am infected and on drug'* because what they will give is hypocritical. She insisted that:

> 'N*o one will be real with you again; people will pretend to love you so that they can sit with their friends later and gossip you. It is better to die instead of telling people about your situation, because no one really cares for you once they know. Maybe my late husband would have helped, but now he is dead and gone. I can take care of myself.*

There were contrasting messages coming from giving spiritual support and prayer. Whereas one can feel reassured in the grace of God and his power to heal, the feeling that one

disobeyed him by sinning with their bodies is there every time the word of God is preached. But beyond this, patients have a strong fear of gossip when people, even in the church, know about their condition. Help and love shown is seen as a means for people to be able to later gossip. Many times participants reported that they had to force themselves to go to church because of the feeling of guilt when the priests preach on the virtue of chastity and abstinence, and also the punishment for sins. But participants in the study were generally of the view that:

> *Of all the things that can help one carry on with life, prayer is the most important. It is prayer that helps you know that even if you became infected through your own fault; God can help you to live long and can forgive your sins (male FGD*).

The phrases patients used most frequently include '*God is the author and finisher of my faith*', *my father who made me will not allow me to die young', 'Healing comes from God', 'I pray all the time',* and *'I go to church regularly'*.

Some of the key points from the qualitative data reveal much usefulness of family and friends, in reminding patients to take their drugs, as aptly captured by these views:

> *My family knows of my situation and many of them are helping me. My friends call from time to time to remind me to take my treatment seriously (Case Study, Male, 38).*

Corroborating this view, another patient in a case study noted that:

> *Two of my friends call me or send text messages regularly to ask me if I have taken my drugs. Even though I sometimes feel bad that they will call me only to tell me that I need to take drugs, I still find it useful. Actually, some days when I do not get any message I feel lonely, as if I have been forgotten by all who used to be close to me. It is not that I really need somebody to remind me to take my pills, the only thing is that since I do not go out much or associate a lot now, getting those calls really make me feel great (Case Study, Female Patient, 30).*

Just as the infected persons need the love of others and their support to live a quality life, so do those around them who see helping friends as an opportunity to do good deeds. A friend of a patient expressed this succinctly thus:

> *Sometimes I escort my friend to the hospital, like today. If I did not come you would not have seen me. When I knew that my friend was infected, I started coming with her to the hospital, whenever I have time. I was not*

> *used to visiting people sick people in the hospital. Now I know that my help and support can really be very useful. It also makes me feel that I am contributing something to humanity, by giving help to my friend, and encouraging anyone I know who is infected.*

On whether respondents were satisfied with the kind and level of support received, Table 4.18 reveals that more patients who received financial support (86.4%), advice (79.1%) and reminders to take drugs (82.8%) were more satisfied than any other type of support received.

Table 4.18: Distribution of Respondents According to Level of Satisfaction with Type of Support Received

Type of support	Level of satisfaction with support		Total
	Not Satisfied	Satisfied	
Financial:			
No	43.3	56.7	**194**
Yes	22.3	77.7***	**139**
Advice:			
No	51.0	49.0	**151**
Yes	20.9	79.1***	**182**
Reminded me to take my drugs:			
No	38.7	61.3	**269**
Yes	17.2	82.8**	**64**
Physical care and support:			
No	36.6	63.4	**303**
Yes	13.3	86.7*	**30**
Nutritional/feeding support:			
No	37.9	62.1	**264**
Yes	21.7	78.3*	**69**
Income generating activities:			
No	34.8	65.2	**330**
Yes	0.0	100.0	**3**
Spiritual/prayers:			
No	34.3	65.7	**327**
Yes	50.0	50.0	**6**
Total	**34.5**	**65.5**	**100.0**
Number:	**115**	**218**	**333**

*Significant at p<0.05; ** Significant at p<0.02; *** Significant at p<0.001

Table 4.19: Distribution of Respondents by Level of Support Received according to Selected Characteristics

Type of support	Level of support		Total
	Little/None	Adequate	
Sex:			
Male	29.1	70.9	**127**
Female	29.6	70.4	**206**
Age Group:			
≤ 20	23.5	76.5	**17**
21 – 30	33.3	66.7	**117**
31 – 40	27.2	72.8	**125**
41 – 50	28.3	71.7	**53**
≥ 51	28.6	71.4	**21**
Marital status:			
Single	31.7	68.3	**142**
Married	21.9	78.1	**114**
Separated/Div/Widowed	36.4	63.6	**77**
Monthly Income			
≤ N5,000.00	22.0	78.0	**100**
N5001 – N10,000	41.7	58.3	**24**
N10,001 – N15,000	33.3	66.7	**21**
≥ N15,001	35.3	64.7	**51**
No response	29.9	70.1	**137**
Number of Children:			
None	32.4	67.6	**108**
1-2	33.0	67.0	**112**
3-4	23.7	76.3	**76**
≥ 5	21.6	78.4	**37**
Total	**29.4**	**70.6**	**100.0**
Number:	**98**	**235**	**333**

Patients usually tend to become too critical of close family members' or friends' every action and analyze them for 'hidden messages' aimed at them. Of course, it is possible that human beings are likely to make people who are different from themselves feel unwanted and shamed. The excerpts from the qualitative data captured this view appropriately:

> *I still have friends and relatives who relate well with me. But the truth is that many people who hear that you have this type of sickness will not want to come close to you again. When they do, they will not be real again. It is that time when you have a problem that you know people who love you. Some of my friends have left me but some are still good to me. I am very happy; my sisters are really standing by me.*
>
> *I told my sister and my elder brother about my condition. At first they were not happy but later they took things normal with me. Now they are really helping me. They call me early in the morning for prayers and encourage me to put all my worries to God in prayers because only God can decide our faith. I feel that I am now closer to them than before I fell sick.*
>
> *I was not really happy with myself. I tell you the truth, nobody will know that he has this problem and will be happy*
>
> *I want to marry, but you know it is not easy with my condition. But I still believe that God will help me to marry. I take my drugs always to keep healthy and strong. I am sure I will marry one day*

A daughter of a female patient who brought her mother to the clinic for her appointment and drugs maintained that:

> *I really feel pity for them. Like my mother, I always feel pity for her because she has to take drugs continuously. I don't really blame any of them for their health condition. HIV does not come through sex alone. Even if sex is the most common means of transmission, many prostitutes have not been infected. Some had it through sharing barbing clippers while some through blood transfusion. I don't see the rationale for blaming any person who is infected. Many people believe that any person with HIV contracted it through sex, which is not true. Can you tell me that my aged mother sitting down there got HIV from sexual intercourse? TB is still the same thing, but people show a lot of understanding if HIV is not involved. These days, anybody with TB, or any suspicious cough is suspected of HIV.*

Stigmatisation

Self- and social-stigmatisation are key issues relating to the management of people living with certain behaviour-related illnesses. Results on self-stigma are presented in Table 4.20 according to selected patient characteristics.

Table 4.20: Distribution of Respondents Level of Self-stigma According to Selected Characteristics

Type of support	Level of Self-stigma		Total
	Low	High	
Sex:			
Male	69.3	30.7	**127**
Female	62.6	37.4	**206**
Age Group:			
≤ 20	23.5	76.5**	**17**
21 – 30	71.8	28.2	**117**
31 – 40	64.8	35.2	**125**
41 – 50	66.0	34.0	**53**
≥ 51	61.9	38.1	
Marital status:			
Single	66.2	33.8	**142**
Married	65.8	34.2	**114**
Separated/Div/Widowed	62.3	37.7	**77**
Monthly Income			
≤ N5,000.00	86.0	14.0	**100**
N5001 – N10,000	75.0	25.0	**24**
N10,001 – N15,000	61.9	38.1	**21**
≥ N15,001	62.7	37.3	**51**
No response	49.6	50.4	**137**
Educational Attainment:			
No formal education	63.3	36.7	**30**
Primary	75.0	25.0	**56**
Secondary	68.7	31.3	**150**
Post Secondary	54.6	45.4	**97**
Total	**65.2**	**34.8**	**100.0**
Number:	**217**	**116**	**333**

** Significant at p<0.02

Respondents with low level of self-stigmatisation accounted for 65.2% with no significant relationship between the independent (background characteristics) apart from respondents' age group. The highest proportion of respondents who felt self-stigmatised were in the age category less than or equal to 20 years (76.5%) compared to those 21-30 years, and those above 50 years with 28.1 and 38.1%s, respectively. Slightly more male (37.4) than female (30.7) respondents experienced self-stigmatisation. Similarly, respondents who had a post-secondary educational qualification (45.4%) felt more self-stigma than those with no formal education (36.7%), primary (25.0%) and secondary (31.3%).

Table 4.21: Distribution of Respondents Level of Social Stigma According to Selected Characteristics

Type of support	Level of social stigma		Total
	None	Some	
Sex:			
Male	92.9	7.1	**127**
Female	85.0	15.0*	**206**
Age Group:			
≤ 20	82.4	17.6	**17**
21 – 30	89.7	10.3	**117**
31 – 40	89.6	10.4	**125**
41 – 50	83.0	17.0	**53**
≥ 51	85.7	14.3	**21**
Marital status:			
Single	91.5	8.5	**142**
Married	84.2	15.8	**114**
Separated/Div/Widowed	87.0	13.0	**77**
Monthly Income			
≤ N5,000.00	97.0	3.0	**100**
N5001 – N10,000	91.7	8.3	**24**
N10,001 – N15,000	90.5	9.5	**21**
≥ N15,001	92.2	7.8	**51**
No response	78.8	21.2**	**137**
Educational Attainment:			
No formal education	80.0	20.0	**30**
Primary	89.3	10.7	**56**
Secondary	90.7	9.3	**150**
Post Secondary	85.6	14.4	**97**
Live in Same household with family member:			
No	97.1	2.9	**69**
Yes	85.5	14.5**	**255**
Total	**88.0**	**12.0**	**100.0**
Number:	**293**	**40**	**333**

*Significant at p<0.05; ** Significant at p<0.02

Table 4.21 presents respondents' experience of social stigma according to selected patient characteristics. Comparison by sex revealed that more female (15.0%) than male (7.1%) respondents reported some level of social stigma. Discounting respondents who did not indicate their monthly income (50.4%), there was an increase in the percentage of respondents reporting some social stigma, as the level of income increased from ≤ N5000 (14.0%) to ≥ N15001 (37.3%). A higher proportion of respondents ≤ 20 years of age (76.5%) than those in all the other age groups which have less than 40% for the highest proportion. More interestingly, more respondents who lived in the same household with a family member (14.5%) experienced social stigma compared with those who did not live with family members (2.9%).

To predict factors that determine adherence to treatment, ordinal regression test, presented in Table 4.22, was used.

Table 4.22: Ordinal Regression Predicting Adherence to Treatment

Selected covariates	Estimated coefficient	95% confidence Interval	
		Lower	Higher
Sex:			
Male	1.803***	0.360	2.350
Female	1.0	-	-
Marital Status:			
Single	-2.514***	-2.962	-0.380
Married	-1.836***	-2.157	-0.156
Sep/Div/Widowed	1.0	-	-
Educational Level:			
No formal education	-1.902**	-2.181	1.033
Primary	-0.438	-.258	2.223
Secondary	2.699***	1.216	3.439
Post Secondary	1.0	-	-
Occupation:-			
Unemployed	-3.872**	-6.214	-1.008
Farmer	-3.125**	-5.340	-0.256
Businessman/Trader	-.828	-3.706	1.174
Civil/Public Servant	-.492	-2.621	2.323
Self-employed Professional	-.275	-2.520	2.763
Student/no response	1.0	-	-
Monthly Income:			
≤ N5,000.00	-1.347	-2.430	0.320
N5001 – N10,000	-3.572***	-4.034	-0.419
N10,001 – N15,000	-4.046***	-6.616	-2.121
≥ N15,001	-3.910***	-7.057	-2.464
No response	1.0	-	-
Time on HIV Drugs:			
Less than 1 year	0.057	-.360	2.071
1 - 2 years	-1.457**	-1.570	0.487
More than 2 years	1.0	-	-
Time on TB Drugs:			
3 - 4 months	0.778	.095	2.806
5 - 6 months	3.925*	-4.296	7.272
7 - 8 months	2.327**	1.441	5.263
More than 8 months	1.0	-	-
Family Support			
No support at all	2.538***	1.323	4.687
At least one form of support	1.601***	1.623	4.228
More than one form of support	1.0	-	-
Transport Cost			
Walking Distance	1.093	-.370	1.071
≤ N500.00	1.707***	1.340	3.350
>N500.00	1.0	-	-

*Significant at p<0.05; ** Significant at p<0.02; *** Significant at p<0.001

Building the regression test started with the inclusion of all possible factors (variables) that could predict adherence levels, however, those that were found to contribute nothing were excluded from the final analysis. Only useful (significant) variable were included in the final model which is presented in Table 4.22. Coefficients showed that living within a walking distance of the treatment facility did not significantly predicts respondents being in the higher level of adherence category (p = 0.25), but respondents who needed to spend money to the treatment centre were more likely to be in the higher adherence category (p = 0.01).

There was a significant relationship between family support and level of adherence. Both respondents who reported that they received no family support and those who received any level of support were shown to have a positive relationship with adherence level. However, those who received no support had a higher coefficient (OR = 2.538) compared to those who received (OR = 1.601). Respondents who have been on HIV treatment are less likely to be in the higher adherence category than those who had been on treatment for less than a year. Respondents who reported that they received little or no family support had higher odds of being in the higher adherence category (OR = 2.538) than those who received at least one form of support (OR = 1.601). Male respondents had higher probability of being in the higher adherence category than female respondents. Patients who had spent between five to six months (OR = 3.925) on treatment had the highest odds of being in the high adherence group than other categories, namely those who had been on treatment between three to four months (0.778), seven to eight months (OR = 2.327).

Being single (OR = -2.514) and married (OR = -1.836) predisposed respondents to being in the low adherence category. The higher the monthly income, the higher the odds are that respondents will be in the low adherence category. While respondents with no formal education (OR = -1.902) and primary school (OR = -0.438) were more likely to be in the low adherence category, those with secondary education had higher odds (OR = 2.699) of being in the high category.

4.3 Discussion of Findings

There are a variety of complex factors which promote and/or hinder adherence to treatment. As such, the effectiveness of any intervention is unpredictable. Understanding the predictors of adherence is the first step in trying to improve adherence to antiretroviral therapies. A detailed understanding of the possible factors that can contribute to non-adherence will

greatly aid in the development of interventions to improve adherence, particularly for susceptible patients. It was, therefore, necessary to conduct context-specific research to unearth issues that must be dealt with for the improvement in the level of treatment adherence for HIV and TB co-infections.

The study found significant differences in the proportion of male and female in the sample. This difference may have been due to the fact that women are more at risk of HIV than men, as other studies have also indicated (Afolabi, *et al*., 2009; Olisah, Baiyewu and Sheikh, 2010; Landman, Ostermann, Crump, Mgonja, Mayhood, Itemba, Tribble, Ndosi, Chu, Shao, Bartlett and Thielman, 2008; Floridia, Giuliano, Palmisano and Vella *et al*., 2008). A study in Zimbabwe found out that risk of HIV infection in women increased with increased number of sex partners, but did not in men (Gregson, 2006). Another possible explanation for the gender difference observed in this study is that women get tested more often than men. This is because they have to necessarily undergo HIV screening during antenatal clinical services and, consequently, are more aware that they are infected (Olisah, *et al*., 2010). Other studies have also found out that more women than men are tested for HIV repeatedly, thus explaining why women may be appear to be more infected than men (Le Coeur, Collins, Pannetier and Lelièvre, 2009; Venkatesh, Madiba, De Bruyn, Lurie, Coates and Gray, 2011). Subsequently, on competent advice on the benefit of taking antiretroviral drugs, more women take up treatment.

It is instructive, and of grave concern that a majority of the respondents (72.6 %) were within the labour force, that is, the ages at which people are expected to be economically productive. Besides, they are ages at which most reproductive activities take place. The economic implication of the HIV and TB epidemics is devastating, especially, because of the age it affects most. The impact of HIV on the economically productive age has long been recognised and documented (Morison, 2001). Hilhorstaa, van Liereb, Odec and de Koningd (2006) examined the socio-economic impact of HIV in Benue State, Nigeria and argued succinctly about the costs. Hilhorstaa *et al*. (2006) reported high cost in terms of expenditures for health care, funeral and mourning, and time spent providing care for the infected, which places serious demands on income and productivity; while the diversion of resources have implications for investment and savings.

Results also suggest that more young women are exposed than young men. The older men usually target younger women for sexual pleasure, since they are the ones who have money,

and can afford to satisfy the needs of young girls for sexual gratification. This exposes the young women to sexually transmitted diseases including HIV. The fact that older men are more exposed to HIV and TB than older women suggests that, and is also confirmed by the data on marital status; when women grow older and get married, their risk level reduces to a smaller rate. On the contrary, men who still engage young girls in sexual intercourse, even after marriage, are at a higher risk.

The problem then is that as married men get exposed, their wives invariably get exposed as well. Although the proportion of singles in the sample is higher than the married, the proportion of the married is still high enough to raise concern and alarm. It must be noted that the proportion of those widowed is high (14.4 %). This reveals one of two things: that their spouses may have already died of the diseases (HIV and/or TB) or that because their spouses had died, they started some other sexual liaisons, thereby exposing themselves to infections.

More than half of the respondents had adequate knowledge of their treatment and the implication of not adhering to drugs. Knowledge was however modified by the length of time patients had been on HIV, but not TB, treatment. The longer the period on drugs the better understanding of treatment. However, this study found out that knowledge of treatment and the implication of non-adherence is not significant in predicting level of adherence. The presupposition that knowledge of treatment plays an important role in patients' adherence to treatment is therefore brought into serious question. On one hand, this finding revealed that there gap between knowledge and practice. On the other hand, it is contrary to studies that found knowledge to be predictive of higher level of medication adherence. For example, Kalichman, *et al*. (2008) had found a positive association between health knowledge and adherence to treatment.

The level of adherence was found to be low with a mean of adherence of 51.7%. Only 38.1% were in the high adherence category. Patients in the high adherence category were those that would fit into the category that the WHO defined as reaching 90% to 95% level of adherence. The level of adherence found in this study is lower than that reported by Erah and Arute (2008), which noted a 59% adherence. In fact, another study in Nigeria that involved HIV and TB co-infected patients reported a 41% adherence to 95% of medication taking (Njepuome and Odume, 2009), which is closer than the rate observed in the present study. The fact that the level of adherence in the present study is closely related to that of Njepuome and Odume (2009), which like this study, involved co-infected patients, suggest that co-

morbidity may play a significant role in adherence behaviour. Other studies had previously reported a higher level of adherence (see Kalichman *et al*., 2008; Osborn, Davis, Bailey and Wolf, 2010). For example, Osborn *et al*. (2010) reported a 71% mean level of adherence; the only drawback was that they conducted a phone-based pill-counting survey which can be fraught with bias. From the perspective of public health and service delivery, treatment non-adherence undermines the efficient distribution of scarce resources and represents wastage of public resources (Erah and Arute, 2008).

Different levels of adherence have been reported in earlier studies in Nigeria. For instance, the levels reported for studies conducted in Kano (northern Nigeria), Sagamu, Niger Delta and Benin City (Southern Nigeria) were 49.2% (Nwauche, Erhabor, Ejele and Akani, 2006), greater than 85% (Idigbe, Adewole, Eisen, Kanki, Odunukwe, Onwujekwe, Audu, Araoyinbo, Onyewuche, Salu, Adedoyin and Musa, 2005) and 80% (Mukhtar-Yola, Adeleke, Gwarzo and Ladan, 2006); while Afolabi *et al*. (2009) reported 44%. In several countries in sub-Saharan Africa and North America, varying levels have also been reported (Mills, *et al*., 2006). However, 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.

It is important to also note that patients may take the total number of prescribed doses, but may not take these at the appropriate times. Melbourne *et al*. (1999) in a previous study had found out that within a subgroup of patients who took more than 90% of doses, there was significant dosing fluctuation in 50% of patients during the first two months of treatment. The dosing fluctuation ranged from taking the medication within two hours of the prescribed dose time to greater than two hours of that defined time.

It is quite possible that adherence may be under- or over-estimated because of the difficulties involved in its measurement. Bell *et al* (2007) had stressed this reality when they concluded from their study that there were serious complexities in the measurement of adherence and probable overestimation of adherence by pill count and self-report. Of course, these are the main methods used in developing countries; this consequently raises concerns about the development of drug resistance.

Although gender of respondents did not predict adherence at the bivariate level, it was a significant factor at a higher level of analysis. Male respondents were more likely to be in the

higher level of adherence than females. This may be related to other factors like income and ability to afford their needs such as food and transportation to treatment centres for drugs. It was found that men have higher chances of being in the high adherence category than women. By access to resources and ability to afford health care, men are better placed than women, and as such, have the better chances of continuing in treatment-taking. Gender differences in adherence to treatment have also been reported by other studies. Similarly, Mirjam-Colette, Pisu, Dumcheva, Westfall, Kilby and Saag (2009), Salami, Fadeyi, Ogunmodede and Desalu (2010), Applebaum, Richardson, Brady, Brief and Keane (2011) and Hawkins, Chalamilla, Okuma, Spiegelman, Hertzmark, Aris, Ewald, Mugusi, Mtasiwa and Fawzi (2011) found out that the male gender adhere more to treatment than the female. Contrary to this study's findings, Daniel and Oladapo (2006) reported more defaulting among males than females in a survey of TB patients in Sagamu. Daniel and Oladapo argued that the role of men as breadwinners of the family, where they are expected to leave the house so early in the morning in search of work to provide for the family makes men more likely to default from daily clinic appearance for their DOT medication.

The unemployed and patients who were farmers were more likely to default, that is, be found in the low adherence category than those who had better or less strenuous jobs. Similar findings have been reported that indicated livelihood security to predict adherence to treatment (Rachlis, Mills and Cole, 2011).

Moreover, both marital status and income per month also significantly predicted patients' adherence to treatment behaviour. However, instead of a positive relationship, the study found an inverse association, that is, the higher the income the more likely the patient will be in the low adherence category. This is in contrast to studies by Brinkhof, Dabis, Myer, Bangsberg, Boulle, Nash, Schechter, Laurent, Keiser, May, Sprinz, Egger and Anglaret (2008) and Falagas, Zarkadoulia, Pliatsika and Panos (2008) review. Although Falagas *et al*. (2008) found no conclusive support for existence of a clear association between socio-economic status and adherence; they found income, occupation and education to be positively associated with adherence. In Biadgilgn *et al*. (2008), a number of variables were found to be significantly associated with adherence, which touched on financial security.

Biadgilgn *et al.* (2008) found out that children whose parents did not pay a fee for treatment and children who had ever received any nutritional support from the clinic were less likely to adhere. The implication of Biadgilgn *et al*.'s (2008) findings, especially the fact that children

whose parents did not pay for the treatment are less likely to be adherent, is that whereas financial hardship is a strong factor in non-adherence, completely free provision of medication can also become a negative factor. People usually presuppose that free medications are substandard and not important, and are wasteful of it. Although this issue could not be examined because all patients were receiving free medicines for HIV and TB, financial burden came up as a serious reason why respondents missed their medication.

This study also found out that patients who were resident in urban areas were more socially isolated than those in the rural areas. This finding was contrary to expectation. The rural community is where patients should have felt more isolated because everybody knows everybody else and the news that one is HIV positive can spread quite easily leaving the patient at the scorn of the entire village. The rural areas strong community spirit, which may work positively to counter the shame that would otherwise be felt by infected person. However, the broader sociology of urban life holds that there is generally more social isolation in the urban than the rural areas. Given that social isolation did not significantly explain patients' adherence level, this rural-urban difference was of no effect in the explanation of adherence behaviour.

It also appeared that the shorter the time patients spend on medication for HIV, the more isolated they feel. This is because having newly enrolled in the treatment regime, the patient will still be very sensitive and ashamed of their status, but gradual counselling and the realisation that being positive is not the end of life, and that drugs can sustain and maintain one's life as long as any other person, the patients will feel less troubled and associate more. Nevertheless, patients newly placed on treatment were more likely to be adherent than those who have spent longer time. This might be as a result of the zeal and hope with which a newly diagnosed patient may have compared to those who have been on the treatment relatively longer, and who have witnessed the effects and frustration of constant and continuous medication. Thus, it can be argued that the perceived benefits of taking medication, a basic postulate of the health belief model, works for HIV patients in the earlier stages of treatment, but the effects wane with time.

Given that appointments at the treatment centres are on a two-week interval, the cumulative cost that respondents bear on transportation in only a month will be more than N1000.00. This is more evident, especially for those whose monthly income ranged from five thousand naira and below, who showed a mean transport fare of 496.7 naira per visit to the treatment

centre. However, it was discovered that patients who lived within walking distance of the treatment facility, and those who pay more than 500 naira were more likely to be non-adherence than those who pay a maximum of 500 naira. By implication, patients who live sufficiently far from the treatment facility but not too far to be financially too difficult to become an access problem, are more likely that those who live close to the facility to adhere to treatment. This finding corroborates the findings of Charurat, Oyegunle, Benjamin, Habib, Eze, Ele, Ibanga, Ajayi, Eng, Mondal, Gebi, Iwu, Etiebet, Abimiku, Dakum, Farley and Blattner (2010) who also found this to be the case in a Nigerian study. Although the number of treatment facilities in Nigeria continues to increase, patients may continue to avoid accessing care from facilities within their communities, because of stigma (Charurat *et al*. 2010). As a result, scale up of treatment facilities must be coupled with support from the communities.

Family support is expressly seen by patients as central to medication adherence. One of the main drawbacks to its maximal utilisation is that the infected persons tend to deprive themselves of it by becoming withdrawn and cynical about expressed or given support-related behaviour. The fear of condemnation and stigma from family members and friends, and for the family as a whole, make them to hide their status. Even when they disclose their status, they lack the emotional ability to receive and appreciate support. They have mixed feelings about the support promised and received. Just as in Roberts and Mann (2003) and Edwards (2006), this study found out that difficulty with taking medicine in the presence of loved ones (family and friends) is a strong reason why patients default in their treatment regimen.

However, those who are open about their problem with their family, and have received support thereof found family support very useful in attaining the required level of adherence. In some cases, family support may be difficult because both the family and community can become stigmatised as a result of an infected individual member of a family. When families are stigmatised, uninfected members experience unhappiness, making it difficult for family support to be provided and received with love. This study confirmed the finding of Shin *et al*.'s (2009) that low social support is associated with non-adherence. Adherence interventions may be unsuccessful unless they target the underlying psychosocial and social challenges faced by patients living with Tb and AIDS.

Similarly, Mavandadi *et al* (2009) found out that social relationships play a significant role in the well-being of HIV positive people. As is the case with other chronic health conditions, individuals co-infected with HIV and TB often experience challenges that place a lot of demands on coping resources and impact their quality of life, including a reduced ability to participate in daily activities (O'Dell, 1996), adherence to complicated treatment regimen (Tsasis, 2000) and changes in social network composition (Shippy and Karpiak, 2005). This last factor is very significant because in cases where people suffer from diseases which are stigma-related, they tend to lose that network of social relationships, a resource which otherwise should be useful to them in coping with the condition.

Family support for people who should be the breadwinner of the family can produce negative results if considerable understanding is not applied. In such cases patients have a heavy feeling of irresponsibility because they cannot carry out the requirement of providing for their families. Support can, however, help to counter the effect of the personal guilt and shame they feel.

Another problem that could hinder the effective deployment of family support in improving adherence is the feeling that the infected person is going to die irrespective of the support the family gives. Both infected persons and their family have a fatalistic belief at the back of their minds that once somebody has HIV with a TB co-infection, they will die even if not immediately. Fatalism creates a feeling of hopelessness for both family and the patient, leading to resignation, which is not conducive to improved medication taking. This finding is in tune with those of Wrubel, Stumbo and Johnson (2008) that discovered that discordant couples have this fear that their infected partner will pass away.

Moreover, it appears that what patients really need from family is emotional connectedness more than material or instrumental support, although both are necessary. In a study on perceived social support and medication adherence among African American women, Edwards (2006) had found out similarly that emotional and instrumental support were important, but the former is more in terms of expressed love, care and commitment is necessary in scaling up adherence. Ciambrone (2002) found that where families give instrumental support without emotional support, its effectiveness as a means of encouraging sustained treatment adherence is diminished.

Fear of perceived and actual side-effects of medicines was also an issue with many patients. This is in tandem with a research on the factors hindering HIV positive people from taking up antiretroviral therapy and remaining in it. In that study, Rogowska-Szadkowska *et al* (2009) demonstrated a significant degree of prejudice regarding antiretroviral therapy among asymptomatic patients, which contributes to the decision of HAART refusal. The implication is that most HIV positive people would not want to adhere to treatment, because of the fear they have of the antiretroviral. When HIV is complicated by other infections, such as TB) as is the case with patients in the present study), the fear of the combined drug may become morbid, and act as a determining factor in patients' observance of their treatment.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

This study examined determinants of treatment adherence among 333 tuberculosis-infected HIV patients on treatment in facilities across Cross River State. Adherence was measured based on patients' self-reports. The following were key findings from the study:

In terms of socio-demographic characteristics of respondents, there was a higher prevalence among female than male, which was undoubtedly due to higher female vulnerability to HIV. The majority of respondents were within the productive labour force and aged between 24 and 49 years. Younger women than younger men were infected. On the other hand, older men than older women were infected. Single respondents were more infected and thus, at risk than married or ever-married respondents. More married men than married women were infected while more single women than single men were infected. Many of the respondents had at least a secondary level of education with women gradually reducing as the level of education increased. Many (30.1%) earn less than or equal to five thousand Naira per month and this has serious implications for access to medicines, especially with regards to transport and feeding. The majority of respondents (81.7%) resided in urban areas.

It is seen that knowledge of treatment and the implications of non-adherence all respondents were aware, and had accurate information about therapeutic instructions. Moreover, half the respondents knew that there were consequences if they did not take their medicines as prescribed. Knowledge of the implications of not adhering to treatment was influenced by level of education of respondents. The longer the time respondents had spent on treatment, the better their knowledge of health implication lower- or non-adherence. Respondents who felt that there were no consequences to non-adherence indicated God- or faith-related reasons. This is because getting healthy can only be granted by God, but not the medicines they take. More than half (57.1%) of the respondents had good knowledge of treatment. No difference in level of knowledge of treatment was observed between male and female respondents.

Adherence to treatment was defined at three levels: Low, Medium and high. Main findings were that: about half (51.7%) of respondents met at least the mean level of adherence.

Adherence was low as only 38.1% of respondents were in the high adherence level. Based on the review of patients' records, 48.9% may not have missed their medication, because they kept clinic appointments regularly. About 35% of respondents expressly reported ever missing their medicines schedules. Also, a higher proportion of respondents (51.4%) missed the exact timing but not an entire day of not taking drugs.

Various factors were examined to see how they modify adherence behaviour among patients. The variables and key findings are: Male respondents adhered more to treatment-taking than female while the likelihood of defaulting from treatment was more likely among the unemployed and farmers. In addition, higher income earners were more associated with lower adherence than lower income earners. While low income earners were more concerned with lack of money, high income earners were more worried about stigmatisation. Place of residence (rural versus urban) was not important in explaining adherence level.

Counter-intuitively, good knowledge of treatment and implication of non-adherence was associated with lower level of adherence to treatment at bivariate levels of analysis while poor knowledge was associated with higher adherence. At the multivariate level, knowledge of treatment was not a significant predictor of adherence. The lesser the length of time spent on HIV treatment the better chances of attaining higher adherence levels. Also, the time frame of about six months, and below spent on tuberculosis treatment was more likely to engender higher levels of adherence.

Receipt of family support significantly influenced adherence behaviour among TB-infected HIV patients. Satisfaction was received family support was a predictor of higher levels of adherence. Respondents who do not live in the same community as the location of their treatment facility were more likely to achieve higher levels of adherence than those living near treatment facility, and those who pay high transportation to the clinics.

Furthermore, higher perception of self-efficacy was associated with higher levels of adherence. Patients who were very anxious about their health were likely to attain good adherence, while low self-stigma was significantly associated with higher levels of adherence. Low level of social stigma was generally reported among patients with much of it experienced by women, patients who were 20 years old or less, and those who lived in the same household with family members. However, social stigma was not a significant predictor of adherence. Situational factors such as 'not being at home', 'had not eaten' and 'being busy with other things' were important reasons why patients missed taking their medicines.

5.2 Conclusion

Based on the results and findings of this study, the following conclusions were drawn:

The level of patients' adherence to treatment regimen is below recommended levels and there is a serious need to scale-up adherence. This will lead to an improvement in treatment-taking behaviour, and subsequent improvement in the health and well-being of infected persons.

Measurement of adherence is complex, and may create an over- or underestimation of the level of patients' observance of recommended treatment. Factors on the individual level including socio-economic status, motivation, perceptions and knowledge are important in understanding, and explaining adherence to treatment of long-term illness.

Structural level factors including location of treatment facility, relationship between care-providers and patients, disruption in the provision of services and cost of reaching treatment facility are also as important as the individual level factor is explaining adherence to HIV and TB treatment.

5.3 Recommendations

Improving the up-take and increased adherence require multifaceted efforts. These efforts must address issues relating to both the patients themselves and the structure and social dynamics of treatment provision and taking. Consequently, the following recommendations are made:

1. Improving access to income-generating activities, especially for women can improve financial well-being and the ability to access health care (HIV and TB treatment) and quality nutrient intake to boost the nutritional status as drugs cannot be taken on empty stomachs.

2. Sustained patient counselling focusing on improving self-perception and the reduction of self-stigma can improve adherence. This will counter the shame and guilt feeling that infected persons usually have (that they caused their own problems), and because the conditions are stigma-related, counselling can improve the perception of self-worth, leading to higher levels of adherence.

3. Assignment of patients to treatment centres that are acceptable to them, and also within a reasonable distance to shield them from neighbours who will identify them as

HIV patients and treat them with scorn. Patient-selected treatment facility options can be initiated. This will reduce the fear of discovery and potential social isolation as a result of their illnesses becoming public knowledge.

4. It is important to intensify continuing counselling of patients to improve their understanding of the treatment and the adverse implication of not adhering strictly to medications. This will counter the overly fatalistic faith and belief that healing comes from God and not from regular drugs taking.

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APPENDIX I

Research Questionnaire
Department of Sociology
Faculty of the Social Sciences
University of Ibadan, Ibadan

Interviewer, please ensure that the respondents give their consent before beginning the interview

S/N	Question	Response	Value
a.	Location	Urban	1
		Rural	2
b.	Name of treatment centre	----------	
c.	Type of treatment centre	HIV Centre	1
		TB Centre	2
		HIV and TB Centre	3
d.	Questionnaire number		
e.	Date of interview	___/_____/____ Day/Month/Year	
f.	Name of interviewer		
g.	Time of interview		
h.	Mode of administration	Self	
		Interviewer	
		Both	

SECTION A: DEMOGRAPHIC INFORMATION

Please circle or fill in response

No	Questions	Response	Value	Skip
A1.	**Interviewer:** Observe and record sex of respondent	Male	1	
		Female	2	
A2.	How old were you on your last birthday?	----------		
A3.	What is the name of the local government area where you live?	----------		
A4.	Which ethnic group do you belong?	----------		
A5.	What is the highest level of school you have completed?	No formal school	0	
		Primary school	1	
		Junior secondary	2	
		Senior Secondary	3	
		Post secondary (specify)----	4	
		Others (specify)	77	
A6.	Are you currently in school?	No	0	
		Yes	1	
A7.	What is your religion? (Specify denomination) ----------	Christianity	1	
		Islam	2	
		African traditional religion	3	
		Other(specify) _____	77	

A8.	What is your marit al status?	Single	1	
		Married	2	
		Cohabitation	3	
		Divorced	4	
		Separated	5	
		Widowed	6	
A9.	Do you have children?	No	0	A13
		Yes	1	
A10.	How many children do you have?	_____		
A11.	What is the age of your oldest child?	_____		
A12.	What is the age of your youngest child?	_____		
A13.	What is your present occupation?			
A14.	How much money do you earn from your present job per month?	₦ _____		

SECTION B: KNOWLEDGE OF HIV AND TB TREATMENT

S/N	Question	Responses		Value	Skip
B1	Are you currently taking	No	Yes		
	a) HIV drugs?	0	1		
	b) TB drugs?	0	1		
B2	Do you know how you are supposed to take your	No	Yes		
	a) HIV drugs?	0	1		
	b) TB drugs?	0	1		
B3	Will anything happen if one does not take their drugs as prescribed?	No		0	B5
		Yes		1	
B4	If yes, please, tell me what will happen.	_____ _____			
B5	Do you know that taking drugs at the **right** time as directed is good for the patient?	No		0	
		Yes		1	
B6	Is there need to be worried about accurate number of doses provided one takes the prescribed drugs?	No		0	
		Yes		1	
B7	Is there any need to take TB drugs when one is already taking HIV drugs?	No		0	
		Yes		1	
B8	Is there any need to take HIV drugs when one is already taking TB drugs?	No		0	
		Yes		1	
B9	Do you know the number of doses of the different medication you are supposed to take?	No		0	
		Yes		1	
B10	Do you sometimes get confused about which drug to take at a particular time?	No		0	
		Yes		1	
B11	Can anti-retroviral drugs cure HIV?	No		0	
		Yes		1	
B12	Are you aware that anti-retroviral drugs can prolong a person's life?	No		0	
		Yes		1	
B13	Do you know that anti-retroviral drugs can prolong a person's life?	No		0	
		Yes		1	
B14	Do you think anti-retroviral drug only prolong a person's life?	No		0	
		Yes		1	

SECTION C: ADHERENCE TO TREATMENT

S/N	Question	Response	Value	Skip
C1.	How many different types of drugs do you take daily for			
	a) HIV?	_____		
	b) TB?	_____		
C2.	How many tablets do you take at one time for			
	a) HIV?	_____		
	b) TB?	_____		
C3.	How many tablets are you expected to take at a given time for			
	a) HIV?	_____		
	b) TB?	_____		
B4	How many tablets would you prefer to take at any given time?	_____		
B5.	How many times do you take your drugs per day?	_____		
C6.	How many times are you expected to take drugs per day?	_____		
C7.	Are there some times or days when it is not possible to take your drugs as you should?	Never	0	C9
		Yes	1	
C8.	How many times have you missed your medication in the last:			
	a) 1-7 days?	----------		
	b) 8-14 days?	----------		
	c) 15 days and above?	----------		
C9.	Are there times when you take your drugs but not exactly on time?	Never	0	C11
		Yes	1	
C10.	How many times has this happened in the last:			
	a) 1-7 days?			
	b) 8-14 days?			
	c) 15 days and above?			
C11.	Have you ever missed your appointment with the doctors or nurses because of any reason?	No	0	
		Yes	1	
C12.	Do you only come to the clinic when you are feeling sick?	No	0	
		Yes	1	

SECTION D: PERCEPTION OF SELF AND MEDICAL EFFICACY

Please circle one response for each question

S/N	Questions	Not at All Sure	Somewhat Sure	Very Sure
D1.	**How sure are you that:**	0	1	2
	a) You have been able to take all your medications as directed?			
	b) You will be able to take all your medications as directed?			
	c) The medications have a positive effect on your health?			
	d) The medications will continue to have a positive effect on your health?			
	e) If you do not take these medications exactly as instructed, the disease in your body will become more serious?			

	f) You have the ability to act to improve your health condition?			
	g) You can adhere strictly to your medications?			

SECTION E: INTERACTION WITH TREATMENT FACILITIES

E1.	What conditions are you receiving treatment for at this treatment centre?	HIV	1	
		TB	2	
		HIV and TB	3	
E2.	How long have you been on HIV drugs?	_____		
E3	How long have you been on TB drugs?	_____		
E4.	How long have you been receiving your drugs from this centre?	_____		
E5.	Is this the only clinic you attend for treatment?	No	0	
		Yes	1	E7
E6.	**If no to E5**, which other treatment centre do you attend?	_____		
E7.	Who usually attends to you when you come to the treatment centre?	Doctor	1	
		Nurse	2	
		Other (Specify)_____	77	
E8.	Do you see doctors and nurses only on appointment?	No	0	
		Yes	1	
E9.	Are there specific appointment dates for you?	No	0	
		Yes	1	
E10.	Do you **only** come to the treatment centre when your drugs are finished?	No	0	E12
		Yes	1	
E11.	**If Yes to E10**, do you come when your drugs are about to finish or when they have finished?	When drugs are about to finish	1	
		when drugs have finished	2	
E12.	How many days after you finish your drugs do you come to get other ones?	_____		
E13.	Are there times when you cannot get your drugs because the treatment centre has run out of them?	Yes	0	E15
		No	1	
E14.	Whenever you do not get drugs at the treatment centre, what do you usually do?	I go to another clinic	1	
		I go back home	2	
E15.	Do the doctors and nurses usually pay much attention to you?	No	0	
		Yes	1	
E16.	Compared to other patients, do you think the doctors/nurses treat HIV and TB patients well?	No	0	
		Yes	1	
E17.	Do you have confidence in the ability of the doctors/nurses here to take good care of you?	No	0	
		Yes	1	
E18.	How often does your doctor/nurse talk with you about your treatment?	Not at all	0	
		Rarely	1	
		Frequently	2	
		Always	3	

E19.	Do they explain the drugs to you adequately for you to know when to take them?	No	0	
		Yes	1	
E20.	Do they take adequate time to explain the benefits of taking drugs according to prescription?	No	0	
		Yes	1	
E21.	Have they ever told you about possible side-effects of the drugs?	No	0	
		Yes	1	
E22.	If you have the opportunity, can you recommend these doctors/nurses to another person with TB or HIV?	No	0	
		Yes	1	
E23.	Are there times when the treatment centres use somebody from your community to bring you drugs or encourage you?	No	0	E25
		Yes	1	
E24.	**If YES to E23**, do you like it?	No	0	
		Yes	1	
		No response	99	
E25.	**If NO to E23**, would you like to have somebody in your community to check on you?	No	0	
		Yes	1	

SECTION F: COST

F1.	Is it far from where you live to this treatment centre?	No	0	
		Yes	1	
F2.	How many kilometres?	_____		
		I do not know	88	
F3.	It is a walking distance or do you need to take a cab/taxi or motorcycle?	Only a walking distance	1	F6
		Need to take taxi/motorcycle	2	
F4.	What is the transportation cost to and from the treatment centre?	~~N~~ ---------		
F5.	Are you able to afford the transportation cost?	No	0	
		Yes	1	
F6.	Do you pay for the treatment and drugs received from this treatment centre?	No	0	F9
		Yes, all the time	1	
		Yes, some of the time	99	
F7.	In general, how much money do you pay for			
	a) Tests?	~~N~~ ----------		
	b) Drugs?			
F8.	Can you afford the money you need to pay for your treatment and drugs?	No	0	
		Yes	1	
F9.	Does the government give free drugs and treatment for HIV and TB infections in this treatment centre?	No	0	
		Yes	1	

F10.	Apart from the government, who else pays for your drugs and treatment?	Myself	1	
		Friends	2	
		Family	3	
		Charity	4	
		NGO	5	
F11	Do you have to spend money on food and water when you come to the treatment centre?	No	0	F13
		Yes	1	
F12	How much money do you spend on food and water each time you come to the treatment centre?	_____		
F13	Have you ever missed work or business to come to the treatment centre?	No	0	F15
		Yes	1	
F14	How much money do you lose if you leave your work or business to come to the treatment centre?	_____		
F15	Have you ever missed work or business because you are drugs?	No	0	G1
		Yes	1	
F16	How much money do you lose if you leave your work or business because you are on drugs?	_____		

SECTION G: TIME AND SCHEDULING OF DRUGS IN-TAKING

Please circle one response for each question.

S/N	QUESTION	**Never**	**Rarely**	**Sometimes**	**Often**
G1.	**In the past month, how often have you missed taking your medications because you:**	0	1	2	3
	a) Were away from home?				
	b) Were busy with other things?				
	c) Simply forgot?				
	d) Had too many pills to take?				
	e) Wanted to avoid side effects?				
	f) Did not want others to notice you are taking medications?				
	g) Had a change in daily activities?				
	h) Felt like the drugs were toxic or harmful?				
	i) Fell asleep when it was time to take your drugs?				
	j) Felt sick or ill?				
	k) Felt unhappy?				
	l) Had problem taking drugs at specified times because you had not eaten?				
	m) Ran out of drugs?				
	n) Felt better?				
	o) Were fasting and praying?				
	p) Just do not like drugs?				
	Others (specify) _____				

G2. When was the last time you missed taking any of your medications? _____

G3. Please, what are some of the reasons that make you miss your medications? _____

SECTION H: ANXIETY

Please circle one response for each question

S/N	QUESTIONS	Never Rarely	Sometimes	Often	Mostly or Always
H1.	**In the <u>past week</u> how often did you:**	0	1	2	3
	a) Feel like you could not do anything to stop you from feeling sad?				
	b) Have trouble keeping your mind on what you were doing?				
	c) Have trouble sleeping?				
	d) Feel lonely?				
	e) Feel sad?				
	f) Feel like you do not have the power to do anything?				

Please circle one response for each question

S/N	QUESTIONS	Never	Almost Never	Sometimes	Very often
H2.	**In the <u>past month</u> how often have you:**	0	1	2	4
	a) Been saddened because of something that happened without warning?				
	b) Felt unable to control the important things in your life?				
	c) Felt worried and "stressed"?				
	d) Felt sure in your ability to handle your personal problems?				
	e) Felt that things were going your way?				
	f) Found that you could not cope with all the things that you had to do?				
	g) Been able to control irritations in your life?				
	h) Felt that you were very comfortable?				
	i) Been angered because of things that happened that were outside of your control?				
	j) Felt problems were piling up so high that you could not overcome them?				

SECTION I: ALCOHOL USE

S/N	Question	Responses	Value	Skip
G6.	How often have you had a drink containing alcohol in the last 30 days?	Daily	6	
		Nearly every Day	5	
		3 or 4 Times A Week	4	
		Once or Twice A Week	3	
		2 or 3 Times A Month	2	
		Once A Month	1	
		Never	0	
G7.	On days when you drank alcohol in the last days, how many drinks did you usually have altogether?	1 or 2 drinks per day	0	
		3 or 4 drinks per day	1	
		5 or 6 drinks per day	2	
		7 or 8 drinks per day	3	
		9 or 11 drinks per day	4	
		12 or more drinks per day	5	
G8.	During the past 30 days, how often have you had 5 or more drinks of alcohol in a row?	Daily	6	
		Nearly every Day	5	
		3 or 4 Times A Week	4	
		Once or Twice A Week	3	
		2 or 3 Times A Month	2	
		Once A Month	1	
		Never	0	
G9.	How often have you smoked Indian hemp or any of such substance in the last 30 days?	Daily	6	
		Nearly every Day	5	
		3 or 4 Times A Week	4	
		Once or Twice A Week	3	
		2 or 3 Times A Month	2	
		Once A Month	1	
		Never	0	

SECTION J: SOCIAL SUPPORT

H1.	Do you have a person who is close to you that you can open your heart to?	No	0		
		Yes	2		
H2	What is your relationship with this person?	A family member	1		
		A friend	2		
		A neighbour	3		
		Others (specify)_____	77		
H3.	Do you live in the same household with any of your family members?	No	0		
		Yes	2		
H4	Do you live in the same household with any of your friends?	No	0		
		Yes	1		
H4.	Have you ever received any type of support from these your family members and friends while on treatment?	No	0		I1
		Yes	1		
H5.	What kind of support have you received?	**Type of support:**	No	Yes	
		a) Financial	0	1	
		b) Advice	0	1	
		c) Remind me to take my drugs	0	1	
		d) Physical care and support	0	1	
		e) Nutritional/feeding support	0	1	
		g) Income generating activities	0	1	
		h) Others (specify) _____	0	1	
H6.	In general, how happy are you with the overall support you get from your family members?	Very satisfied	4		
		Somewhat satisfied	3		
		Somewhat dissatisfied	2		
		Very dissatisfied	1		
H7	In general, how happy are you with the overall support you get from your friends?	Very satisfied	4		
		Somewhat satisfied	3		
		Somewhat dissatisfied	2		
		Very dissatisfied	1		
H8.	To what point do your friends or family members help you remember to take your drugs?	A lot	4		
		Somewhat	3		
		A Little	2		
		Not at all	1		

SECTION K: STIGMATISATION

A) SELF STIGMA

Check one option

S/N	Item	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
		5	4	3	2	1
IA1	It is not easy to tell people that I have HIV or TB infections					
IA2	Being HIV and TB positive makes me feel dirty					
IA3	I feel guilty that I am HIV and TB positive					
IA4	I am ashamed that I am HIV and TB positive					
IA5	I sometimes feel useless because I am HIV and TB positive					
IA6	I hide my HIV and TB status from others					

B) SOCIAL STIGMA

S/N	Question	No	Yes
		0	1
IB1	Has anybody ever looked at you differently because you have HIV and TB?		
IB2	Has a hospital worker treated you wrongly because of your HIV and TB status?		
IB3	Has a healthcare worker refused to touch you because you have HIV and TB?		
IB4	Have you been told not to share your food or utensils with relatives because of your HIV and TB status?		
IB5	Have you been asked not to touch or care for children because of your HIV and TB status?		
IB6	Have you been refused medical care or denied hospital services because of your HIV and TB status?		
IB7	Have family members forced you to move out of your home because you have HIV and TB?		
IB8	Has someone threatened to hurt you physically because you have HIV and TB?		
IB9	Has any hospital worker in this treatment centre treated you wrongly because of your HIV and TB status?		

APPENDIX II

IN-DEPTH INTERVIEW GUIDE FOR HEALTH CAREGIVERS

Place interview takes place	
Name of person interviewed (optional)	
Title of interviewee	
Name of interviewer	
Date of interview	
Time of interview	

Good morning/afternoon. How is your work and the family? I hope all is well? My name is Boniface Ushie. I am a student in the University of Ibadan and I am currently undertaking research as part of the requirements for my graduation. I need your help to complete this research. This is the reason why I have invited you to participate in this interview. The research is trying to understand factors that enhances or hinders adherence to treatment among people who have both HIV and Tuberculosis. I depend on the information you will supply here to understand these factors. Let me make it clear to you that you are under no obligation to grant me this interview but doing so will help me tremendously. Information shared here will be treated in the strictest of confidentiality. Feel free to express your opinion about any issues as you see it. Do I have your permission to begin the interview?

Now, I will ask you some questions:

1. What is your experience with patients who are receiving treatment for HIV and Tb
2. What makes it difficult for patients to take their medication?
3. How often do you talk to them about their medicine?
    - What do you talk to them about?
4. What is your opinion about giving both HIV care and TB care in the same treatment facility?

    Probe:
    - How will this be helpful to patients in adhering to treatment?
    - How will this be a barrier to adherence?

5. What are some of the reasons your patients often give for missing medication?

Probe:

- Psychological factors
- Social factors
- Economic factors

6. Please tell me about your relationship with the HIV and TB patients

   Probe:

   - Do you often feel stigmatised for working with infected persons?
   - Will you consider them a difficult to care-for patients? How?
   - What kind of feelings do the patients arouse in you when taking care of them?
   - What are some of the challenges you encounter with HIV and TB patients?

7. What do you think is the best way to ensure patients achieve near perfect compliance with treatment recommendations?

APPENDIX III

IN-DEPTH INTERVIEW GUIDE FOR FRIENDS AND FAMILY MEMBERS

Good morning/afternoon. How is work and the family? I hope all is well? My name is Boniface Ushie. I am a student in the University of Ibadan and I am currently undertaking research as part of the requirements for my graduation. I need your help to complete this research. This is the reason why I have invited you to participate in this interview. The research is trying to understand factors that enhances or hinders adherence to treatment among people who have both HIV and Tuberculosis. I depend on the information you will supply here to understand these factors. Let me make it clear to you that you are under no obligation to grant me this interview but doing so will help me tremendously. Information shared here will be treated in the strictest of confidentiality. Feel free to express your opinion about any issues as you see it.

Place interview takes place	
Name of interviewee (Optional)	
Educational background of interviewee	
Age	
Occupation	
Marital status	
Ethnic group	
Title of interviewee	
Name of interviewer	
Date of interview	
Time of interview	

Salutations and rapport building

Now, please,

1. What do you know about the treatment for HIV and TB co-infection?
2. How do people in your culture or community think about HIV and TB?

Probe for cultural perception about:

- Causes
- Treatment

3. What do you think or feel about people who are on HIV AND TB drugs?

   Probe:

   - Do you think they are to blame?

4. Would you help a friend, family member or anyone who is infected with HIV and TB?

   Probe:

   - What kind of help would you give?
   - What do you think is the best way of treating family members and friends who are on HIV and TB medication?

APPENDIX IV

FOCUS GROUP DISCUSSION GUIDE FOR HIV AND TB CO-INFECTED PATIENTS

Place interview takes place	
Title of interviewee	
Name of interviewer	
Date of interview	
Time of interview	

Good morning/afternoon. How are you today? I believe you and your family are good? I hope all is well? My name is Boniface Ushie. I am a student in the University of Ibadan and I am currently undertaking research as part of the requirements for my graduation. I need your help in completing this research. This is the reason why I have invited you to participate in this interview. The research is trying to understand factors that enhances or hinders adherence to treatment among people who have both HIV and Tuberculosis. I depend on the information you will supply here to understand these factors. Let me make it clear to you that you are under no obligation to grant me this interview but doing so will help me tremendously. Information shared here will be treated in the strictest of confidentiality. Feel free to express your opinion about any issues as you see it during this discussion. I have come to you because I do not know about these things. Be candid in your opinion. Every of your opinion will be useful to me.

If you agree to be involved in this discussion, give me the permission to begin.

1. How do people feel about HIV and TB?

   Probe:

   - What do you know about HIV and TB co-infection?

2. What makes patients want to take their medication?

   Probe:

   - What are the benefits of taking medication?

3. What makes patients not want to take their medication?

   Probe:

   - Are there risks to patients' health as a result of taking medication?

- What makes some patients feel that it is not worth it to keep taking the drugs

4. What are the benefits of giving HIV drug in the same place with TB drugs?

   Probe:

   - Please tell me how this can helped to make getting treatment for HIV and TB easier?
   - What are the difficulties patients face because the treatment for HIV and TB are put together?

5. Who are those important people who can help people on treatment of HIV and TB infections?

   Probe:

   - What kind of help can they provide?
   - In what ways do they relate with people living with HIV and TB that do not make them feel happy?
   - How would patients on drugs want to be treated by family members and friends?

6. Please tell me how people see HIV and TB in your culture.

   Probe:

   - What do they think causes HIV AND TB?
   - Are there local ways of treating these illnesses?

APPENDIX V

CASE HISTORY

Place interview takes place	
Title of interviewee	
Name of interviewer	
Date of interview	
Time of interview	

Good morning/afternoon. How are you today? I believe you and your family are good? I hope all is well? My name is Boniface Ushie. I am a student in the University of Ibadan and I am currently undertaking research as part of the requirements for my graduation. I need your help in completing this research. This is the reason why I have invited you to participate in this interview. The research is trying to understand factors that enhances or hinders adherence to treatment among people who have both HIV and Tuberculosis. I depend on the information you will supply here to understand these factors. Let me make it clear to you that you are under no obligation to grant me this interview but doing so will help me tremendously. Information shared here will be treated in the strictest of confidentiality. Feel free to express your opinion about any issues as you see it during this discussion. I have come to you because I do not know about these things. Be candid in your opinion. Every of your opinion will be useful to me.

If you agree to be involved in this discussion, give me the permission to begin.

1. How did you know that you were infected?
2. What did you do when you became aware that you had been infected?
3. From the time you started treatment, what are the things that normally help you to carefully take your medicine as prescribed?
4. How do these things help you?
5. What are the problems you normally encounter in the process of taking your medicine?
6. Who are the important people who help make it easy for you to take your drugs regularly? How do they help?

APPENDIX VI

PATIENTS' HOSPITAL RECORD GUIDE

(To be completed by a NURSE or any other auxiliary staff of the hospital from Patients' records)

1. Patient identification number _____
2. Patient sex _____
3. For what condition is this patient being treated in this treatment centre? _____
4. Is this patient being treated for any other infectious disease apart from HIV and TB? _____
5. When was this patient registered for treatment in your clinic? _____
6. How many times has the patient attended clinic since registration? _____
7. Has the patient failed to report for appointments at the appointed times?
8. If yes, estimate the number of days the patient could have gone without drugs. _____
9. From the record, what was the patient's HIV condition at the time of registration? _____
    - From the record, what is the patient's HIV condition now? _____
    - From the record, would you say that this patient has been adhering to medication? _____
    - What reason would you adduced for this? _____
10. What was this patient's TB condition at the time of registration? _____
    - From the record, what is the patient's TB condition now? _____
    - From the record, would you say that this patient has been adhering to medication? _____
    - What reason would you adduced for this? _____

APPENDIX VII

Research Questionnaire
Department of Sociology
Faculty of the Social Sciences
University of Ibadan, Ibadan

Interviewer, please ensure that the respondent gives his/her consent before beginning the interview

S/N	Question	Response	Value
a.	Location	Urban	1
		Rural	2
b.	Name of treatment centre	----------	
c.	Type of treatment centre	HIV Centre	1
		TB Centre	2
		HIV and TB Centre	3
d.	Questionnaire number		
e.	Date of interview	___/_____/____ Day/Month/Year	
f.	Name of interviewer		
g.	Time of interview		
h.	Mode of administration	Self	
		Interviewer	
		Both	

SECTION A: DEMOGRAPHIC INFORMATION

Please circle or fill in response

No	**Questions**	**Response**	**Value**	**Skip**
A1.	**Interviewer:** Observe and record sex of respondent	Male	1	
		Female	2	
A2.	Wetin be your years since the time for your last birthday?	----------		
A3.	Wetin be the name for the local government where you dey stay now?	----------		
A4.	Which one be you bribe?	----------		
A5.	Wetin be the level of education wey you get?	No formal school	0	
		Primary school	1	
		Junior secondary	2	
		Senior Secondary	3	
		Post secondary (specify)-----	4	
		Others (specify)	77	
A6.	You dey school now?	No	0	
		Yes	1	
A7.	Wetin be your religion? (Specify denomination) ----------	Christianity	1	
		Islam	2	
		African traditional religion	3	
		Other(specify) _____	77	

A8.	You get husband or wife?	Single	1	
		Married	2	
		Cohabitation	3	
		Divorced	4	
		Separated	5	
		Widowed	6	
A9.	You get pikin?	No	0	A13
		Yes	1	
A10.	How many pikin you get?	_____		
A11.	Wetin be the age of your first pikin?	_____		
A12.	Wetin be the age of last pikin?	_____		
A13.	Which work you de do?			
A14.	Wetin be the money wey you dey collect for every month?	₦ _____		

SECTION B: KNOWLEDGE OF HIV AND TB TREATMENT

S/N	Question	Responses		Value	Skip
B1	You dey drink any medicine for	No	Yes		
	a) HIV?	0	1		
	b) TB?	0	1		
B2	You kow how you suppose drink your	No	Yes		
	a) HIV medicine?	0	1		
	b) TB medicine?	0	1		
B3	You think say anytin fit happen if you no drink your medicine de way dem tell you?	No		0	B5
		Yes		1	
B4	If you gree say sometin fit happen, tell me the kin tin wey fit happen.	_____ _____			

For question B5 go reach question B8, after every talk, tell me how you follow gree and how you follow no agree.

B5	If you drink medicine for the proportion wey dem tell you, e no good for sick person	No	0	
		Yes	1	
B6	E no matter whether person drink the number of medicine dem tell am since na de medicine dem tell am him drink.	No	0	
		Yes	1	
B7	Medicine for HIV fit, cure TB sickness so if person dey drink HIV medicine the person no no need for drink TB medicine.	No	0	
		Yes	1	
B8	Medicine for TB fit cure sickness for HIV, so if person dey drink medicine for TB the person no need drink HIV medicine.	No	0	
		Yes	1	
B9	For the different medicine wey you dey drink you sabi the number of medicine you suppose drink?	No	0	
		Yes	1	

B10	You dey confuse for the medicine to drink for time to time?	No	0	
		Yes	1	
B11	You think say anti-retroviral drugs fit cure HIV?	No	0	
		Yes	1	
B12	You sabi say anti-retroviral medicine fit make person live long?	No	0	
		Yes	1	
B13	You bin know say anti-retroviral medicine dey make person live long?	No	0	
		Yes	1	
B14	Abi na think you de think say anti-retroviral medicine dey make person live long?	No	0	
		Yes	1	

SECTION C: ADHERENCE TO TREATMENT

S/N	Question	Response	Value	Skip
C1.	How many kin of medicine you dey drink for			
	a) HIV?	_____		
	b) TB?	_____		
C2.	How many tablets you dey drink one time for			
	a) HIV?	_____		
	b) TB?	_____		
C3.	How many tablets them say make you drink for so so time for			
	a) HIV?	_____		
	b) TB?	_____		
C4	How many tablets you go wan take for so so time?	_____		
C5.	How many times you dey drink your medicine for one day?	_____		
C6.	How many times dem say make you drink your medicine for one day?	_____		
C7.	E get any time or day wey you know drink your medicine as dem tell you?	Never	0	C9
		Yes	1	
C8.	How many times you kow fit drink your medicine for			
	a) 1-7 days?	----------		
	b) 8-14 days?	----------		
	c) pass 15 days?	----------		
C9.	E get time when you drink your medicine but ne bi the time you suppose drink am?	Never	0	C11
		Yes	1	
C10.	Na for how many times this kin thing don follow happen.			
	a) 1-7 days?			
	b) 8-14 days?			
	c) Abi e pass 15 days?			
C11.	E get anything wey done do you no see doctor or nurse before?	No	0	
		Yes	1	
C12.	Na only when body no fine you na him you dey go hospital?	No	0	
		Yes	1	

SECTION D: PERCEPTION OF SELF AND MEDICAL EFFICACY

Please circle one response for each question

S/N	Questions	Not at All Sure	Somew hat Sure	Very Sure
D1.	**You sure say:**	0	1	2
	a) You drink all your medicine the way dem tell you?			
	b) You go drink your medicine as dem tell you?			
	c) The medicine dem fine for your body?			
	d) the medicine dem go dey fine for your body			
	e) You think say if you no drink your medicine as dem tell you, your body no go strong?			
	f) You fit help your body to strong?			
	g) You fit drink your medicine as dem tell you?			

SECTION E: INTERACTION WITH TREATMENT CENTRES

E1.	Which kin sickness dey make you come here?	HIV	1	
		TB	2	
		HIV and TB	3	
E2.	For which kin time you don dey drink HIV medicine?	_____		
E3	For which kin time you don dey drink medicine for TB?	_____		
E4.	For which kin time you don dey collect medicine from this place?	_____		
E5.	Na only this place you dey come for treatment?	No	0	
		Yes	1	E7
E6.	**If you say No** for the question before, which place you dey go again?	_____		
E7.	Na who dey talk with you when you come for this place?	Doctor	1	
		Nurse	2	
		Other (Specify)_____	77	
E8.	Na the only time wey dem say make you came na him you dey see doctor and nurse?	No	0	
		Yes	1	
E9.	You get time wey dem say make you dey come here?	No	0	
		Yes	1	
E10.	Na when you medicine finish na him you dey come here?	No	0	E12
		Yes	1	
E11.	**If you say yes,** you dey come when your medicine won finish you dey come or na wen e don finish kpatakpata?	When drugs are about to finish	1	
		when drugs have finished	2	
E12.	How many deys e dey take for you to come when your medicine finish.	_____		
E13.	E get the time wey you no fit get medicine because e done finish?	Yes	0	E15
		No	1	
E14.	If you no get medicine here, wetin you dey	I go to another clinic	1	

	do?	I go back home	2	
E15.	The doctor and nurse they look you eye well well?	No	0	
		Yes	1	
E16.	You think say doctor and nurse dey look you wey get HIV and TB well well like the people wey e no get TB and HIV?	No	0	
		Yes	1	
E17.	You think say the doctor and nurse fit look you well well?	No	0	
		Yes	1	
E18.	How many times doctor and nurse dey talk about your body?	Not at all	0	
		Rarely	1	
		Frequently	2	
		Always	3	
E19.	Dem dey tell you well well how and the time to drink your medicine?	No	0	
		Yes	1	
E20.	Dem dey take time tell how e go good if you take your medicine well well?	No	0	
		Yes	1	
E21.	Dem done tell you before about the thing won fit happen when you drink your medicine?	No	0	
		Yes	1	
E22.	If fit tell people wey got TB and HIV mey them come see the doctor and nurse wey dey treat you?	No	0	
		Yes	1	
E23.	E get anytime wey people for your area bring medicine and tell you mey you drink?	No	0	E25
		Yes	1	
E24.	**If gree,** you like am?	No	0	
		Yes	1	
		No response	99	
E25.	**If you no gree,** you kike somebody for your area to dey come greet you?	No	0	
		Yes	1	

SECTION F: COST

F1.	The place wey you live far from here	No	0	
		Yes	1	
F2.	How e far?	_____		
		I do not know	88	
F3.	You fit wake come here or you must enter motor or okada?	Only a walking distance	1	F6
		Need to take taxi/motorcycle	2	
F4.	Na how much you dey pay motor come here?	₦ ---------		
F5.	You get that kin money?	No	0	
		Yes	1	
F6.	You dey pay for the medicine wey dem dey give you for this place?	No	0	F9
		Yes, all the time	1	
		Yes, some of the time	99	

F7.	Kpatakpata, how you dey pay for			
	a) Tests?	₦ ----------		
	b) Medicine?			
F8.	You fit pay for the tests and the medicine you dey collect?	No	0	
		Yes	1	
F9.	Government dey give una medicine for this place for dash?	No	0	
		Yes	1	
F10.	Remove government, e get another people wey dey give una medicine?	Myself	1	
		Friends	2	
		Family	3	
		Charity	4	
		NGO	5	
F11	You dey buy food and water wit your money anytime you come here?	No	0	F13
		Yes	1	
F12	How much you dey spend for food and water anytime you come here?	_____		
F13	You no go work sake of say you wan come here before?	No	0	F15
		Yes	1	
F14	How much done thowey for work or business sake of say you dey drink medicine?	_____		
F15	Sake of say you dey drink medicine you no fit go work or do business?	No	0	G1
		Yes	1	
F16	How much money done throwey for work or business sake of say you dey drink medicine?	_____		

SECTION G: TIME AND SCHEDULING OF DRUGS IN-TAKING

Please circle one response for each question.

S/N	**QUESTION**	**Never**	**Rarely**	**Sometimes**	**Often**
G1.	**For months wey don pass, how many times you don miss to drink your medicine sake of say:**	0	1	2	3
	a) You been no dey house?				
	b) You been dey do somethin?				
	c) You forget?				
	d) Medcine been too plenty to drink?				
	e) No wan take sake of say you dey fear another thin way fit happen?				
	f) You bin no wan people know say you dey drink bad sickness medicine?				
	g) The thing wey you dey do everyday change?				
	h) You bin dey fear say the medicine fit wound you?				
	i) Bin dey sleep when I suppose drink my medicine?				
	j) You bin sick?				
	k) You bin no happy?				

	l) You bin not drink medicine for time dem tell you because you never chop?				
	m) Your medicine finish?				
	n) My body bin well small?				
	o) You bin dey fasting and prayer?				
	p) You no just like medicine? ?				
	Get other thing wey no dey here? Talk				

G2. Wetin be the last time you know drink your medicine? _____

G3. A I beg oh, wetin pass de one we talk here way make you no drink your medicine? _____

SECTION H: DEPRESSION AND WORRY

Please circle one response for each question

S/N	QUESTIONS	Never Rarely	Sometimes	Often	Mostly or Always
H1.	**For the week wey don waka so how you!**	0	1	2	3
	a) You just feel say make you no do anytin wey go make happy again?				
	b) You dey get wahala to put your mind for the tin wey you dey do?				
	c) You dey get wahala for sleep?				
	d) Nobody wey you go tori wilt?				
	e) Belly no sweet you?				
	f) Be like say power to do anytin don finish?				

Please circle one response for each question

S/N	QUESTIONS	Never	Almost Never	Some times	Very often
H2.	**For the month wey don wake how many times wey:**	0	1	2	4
	a) Belly no sweet you sake of say something happen wey you no know say e go happen?				
	b) You ko w fit control the thins wey dey you important?				
	c) You dey worry and tire?				
	d) You bin sure say you fit control things wey dey you important?				
	e) You bin think say things dey happen d wey you like dem to happen?				
	f) You bin think say you known fit do all the tins you suppose do?				
	g) You bin fit control the things wey sweet you for your life?				
	h) You bin think say you dey kakaraka?				
	i) Belly no sweet you sake of say things happen wey you no get power to control?				

	j) Feel say wahala dey plenty wey you know fit control?				

SECTION I: ALCOHOL USE

S/N	Question	Responses	Value	Skip
G6.	How many times you dey drink drink wey e get alcohol?	Daily	6	
		Nearly every Day	5	
		3 or 4 Times A Week	4	
		Once or Twice A Week	3	
		2 or 3 Times A Month	2	
		Once A Month	1	
		Never	0	
G7.	For d days wey you dey drink drink wey get alcohol how many you dey drink?	1 or 2 drinks per day	0	
		3 or 4 drinks per day	1	
		5 or 6 drinks per day	2	
		7 or 8 drinks per day	3	
		9 or 11 drinks per day	4	
		12 or more drinks per day	5	
G8.	For the 30 days wey don waka so, how many times wey you don drink 5 or pass 5 for one time?	Daily	6	
		Nearly every Day	5	
		3 or 4 Times A Week	4	
		Once or Twice A Week	3	
		2 or 3 Times A Month	2	
		Once A Month	1	
		Never	0	
G9.	How many times you don smoke Igbo or weewee for the 30 days wey e waka so?	Daily	6	
		Nearly every Day	5	
		3 or 4 Times A Week	4	
		Once or Twice A Week	3	
		2 or 3 Times A Month	2	
		Once A Month	1	
		Never	0	

SECTION K: SOCIAL CAPITAL/SUPPORT

H1.	E get person wey you fit open your belley for am?	No	0		
		Yes	2		
H2	How that person be to you?	A family member	1		
		A friend	2		
		A neighbour	3		
		Others (specify)_____	77		
H3.	You dey stay for the same house with any of your family person?	No	0		
		Yes	2		
H4	You don get help from your family or friend for the time wey you dey do treatment?	No	0		
		Yes	1		
H5.	Which kin help dem give you?	**Type of support:**	No	Yes	

		a) Financial	0	1	
		b) Advice	0	1	
		c) Remind me to take my drugs	0	1	
		d) Physical care and support	0	1	
		e) Nutritional/feeding support	0	1	
		g) Income generating activities	0	1	
		h) Others (specify) _____	0	1	
H6.	Kpatakpata, how belley sweet you reach for the help your family dey give you?	Very satisfied	4		
		Somewhat satisfied	3		
		Somewhat dissatisfied	2		
		Very dissatisfied	1		
H7	Kpatakpata, how belley sweet you reach for the help your friends dey give you?	Very satisfied	4		
		Somewhat satisfied	3		
		Somewhat dissatisfied	2		
		Very dissatisfied	1		
H8.	How e reach wey your family members and friends help you drink your medicine?	A lot	4		
		Somewhat	3		
		A Little	2		
		Not at all	1		

SECTION L: STIGMATISATION
A) SELF STIGMA

Check one option

S/N	Item	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
		5	4	3	2	1
IA1	Eno easy to tell person say I get HIV or TI O.					
IA2	E dey make me feel say I be bad person sake of say I get HIV and TB.					
IA3	Belley ne de sweet me at all sake of say I carry HIV and TB for body.					
IA4	Shame dey catch me sake of say HIV and TB dey my body.					
IA5	Sometimes e dey make me feel say I no get use because of HIV and TB wey I get.					
IA6	I ne dey tell people say I get HIV and TB.					

B) SOCIAL STIGMA

S/N	Question	No	Yes
		0	1
IB1	Person don look you one kin sake of say you get HIV and TB?		
IB2	Person wey dey work for hospital done do you bad sake of say you get HIV?		
IB3	E get time wey hospital person o gree touch you because you get HIV and TB		
IB4	Dem bin don tell you say make you no follow your family members chop or use spoon and plate because you get HIV and TB?		
IB5	Dem bin don tell you make you no carry or look after pikings because you get HIV and TB?		
IB6	Dem bin don refuse to give you medicine or hear your body wahala for hospital because you get HIV and TB?		
IB7	Your family members don by force to comot for house because you get HIV and ADIS?		
IB8	Person don tell you say him go do you bad thing because you get HIV and AIDS?		
IB9	E get any hospital person wey don treat you bad here because you carry HIV and TB?		

APPENDIX VIII

Research Questionnaire

Department of Sociology
Faculty of the Social Sciences
University of Ibadan, Ibadan

Interviewer, please ensure that the respondent gives his/her consent before beginning the interview

S/N	MBUME	IBORO	SEITAKDE
a.	Ting itie emi ufok Ibok	Akamba Obio	1
		Obio-Inwang	2
b.	Enying ufok-Ibok	----------	
c.	Ltto Usobo emi	Usobo HIV	1
		Usobo Akpai Kpai Ikong	2
		Usobo HIV ye Akpai-kpan Ikong	3
d.	Idiongo Mbume		
e.	Usen Offiong ekenamde nduongode	___/_____/_____ Usen/Offiong/Isua	
f.	Enying owo emi ekenyenede nneme		
g.	Ini ekenamde nudongode		
h.	Ada Ibok fo didie?	Nda Ikpong	
		Owo esinomi	
		Ami ye anisino I isise mkpo Ibanga	

SECTION A: DEMOGRAPHIC INFORMATION

Please circle or fill in response

No	MBUME	IBORO	SETIAKDE	Skip
A1.	Obub Mbume edi nsuto owo?	Erenowo	1	
		Nwan	2	
A2.	Ekedi isua ifang ke akpatre usen usoro emana fo?	----------		
A3.	Enying esop ukara emi afo odungde ekere didie?	----------		
A4.	Ewe Obio ke afo oto?	----------		
A5.	Nso idi nwed itoro to emi okonde akan?	Nkakaha nwed	0	
		Ekpiri ufoknwed	1	
		Ekpiri ufoknwed secondry	2	
		Mekure ufoknwed secondry	3	
		Ufok nwed Ntaifiok)siak enying)	4	
		Siak efen edieke odude	77	
A6.	Ndi afo osuk odu ke ufok-Nwed>	Hihi	0	
		Hi	1	
A7.	Ewe edi se afo enimde ke akpaniko? Siak enying ufok Abasi fo?	Abasi	1	
		Muslem	2	
		Ibok mme Ndem	3	
		Edieke efen odude, ting	77	

A8.	Nso idi Idaha fo ken do?	Ndoho-ndo	1	
		Modo-ndo	2	
		Ndo Abiara	3	
		Ndo ama adi ngade	4	
		Ndi ebekpa	5	
		Ndi nwanakpa	6	
A9.	Ndi menyene Ndito	Menyene	0	A13
		Nyeneke	1	
A10.	Enyene ndito ifang	_____		
A11.	Isua eye for emi okponde akan edi ifang?	_____		
A12.	Eyen foe mi ekpiride akan edi isua ifang?	_____		
A13.	Nso idi ubok utom fo Idaha emi			
A14.	Oku ifng ke ekpe fi ke ofiong?	₦ _____		

SECTION B: IFIOK UDONGO HIV YE TB

S/N	MBUME	IBORO		SETIAKDE	BEKPONS
B1	Ndi ke ada usobo?	Kenda	Ndaha		
	c) Udongo HIV	0	1		
	d) Udongo Akpaikpai Ikong	0	1		
B2	Ndi modiongo nte enyenede nida mme Ibok fo?				
	c) Eke HIV ?	0	1		
	d) Eke Akpaikpai Ikong?	0	1		
B3	Ndi mkpo ekeme nitibe edieke owo udongo mimenke Ibok esie nte etemede?	Ekeme		0	B5
		Ikemeke		1	
B4	Edieke Odohode hi, ting se ukemede nitibe	_____ _____			
B5	Ndi modiongo ette ke otim ofon ye owo udongo edieke enye adade ibok ke eti ini nte etemede enye?	Ndiongoke		0	
		Modiongo		1	
B6	Ndi ufon odu owo nifiana mbanga nnennen ini emi anade enye emen Ibok, ama akam ad auto ibok esiakde?	Ufondo		0	
		Ofon Idughe		1	
B7	Ndi Ufon odu nida Usobo Akpaikpai ikong, kea ma akadada usobo udongo HIV?	Ufondo		0	
		Ufon Idughe		1	
B8	Ndi ufon odu nida usobo udongo HIV ke amakadada usobo Udongo Akpaikpai?	Ufondo		0	
		Ufon Idughe		1	
B9	Ndi Modiongo Mme nsio-nsio ibok nade ada?	Ndio-ngoke		0	
		Modiongo		1	
B10	Ndi esitimeda fi usuk ini, uto ibok emi akpadade ke mme ini esie?	(Itemekede)		0	
		Etimede		1	
B11	Ndi Ibok editibe ediongoda nte – "Anti-Retroviral" ekeme nisobo udongo HIV?	Ekeme		0	
		Ikemeke		1	
B12	Ndi menyene ifiok abanga ke Ibok oro	Ekeme		0	

	esiakde ho ekeme nidian isua uwem nno owo Udongo?	Ikemeke	1	
B13	Ndi modiongo ke ibok oro ekeme ninam wo Udorgo odu uwem ebighi?	Modiongo	0	
		Ndiongoke	1	
B14	Ndi afo ekere ke ibok oro ikpong ekeme ninim owo uwem mgighi?	Mekere	0	
		Nkereke	1	

SECTION C: USOBO ETIEDIDIE

S/N	MBUME	IBORO	SETI-AKDE	BEK-PONS
C1.	Uto Ibok ifang ke afo ada ke usen nisobo			
	c) Udongo HIV	_____		
	d) Udongo Akpaikpai Ikong?	_____		
C2.	Mkpasib Ibok ifang ke afo esimen inikiet ke udongo			
	c) HIV?	_____		
	d) Akpaikpai Ikong?	_____		
C3.	Mkasib Ibok ifang ke afo ekpenyene nida ke udongo:			
	c) HIV?	_____		
	d) Akpaikpai Ikong?	_____		
C4	Mkpasib ibok ifang ke afo akpade kini kini?	_____		
C5.	Ikafang ke afo esimen Ibok ke usen?	_____		
C6.	Ikafang ke afo ekpenyene nimen Ibok ke usen?	_____		
C7.	Ndi nyene usuk usen mme ini, emi mukemeke nids ibok fo nte akpandade edi?	Akananam	0	C9
		Edintre	1	
C8.	Ikafang ke afo etre nimen Ibok, tongoda			
	(a) ke akpa usen tutu oyeho usen Itiaba?	----------		
	b) Oyeho usen itiaita tutu esim duopenang?	----------		
	(c) Usen efut mme ebede odo?	----------		
C9.	Ndi enyene mme usen emi emende ibok edi idighe ke nnen – nnen ini>	Akananam	0	C11
		Ihi	1	
C10.	Ikafang ke uto mkpo emi elibe ono fi?			
	(a) Ke usen keit sim usen itiaba			
	(b) ke usen itiaita, sim duopenang.			
	(c) Ke usen efut mme ebede oro.			
C11.	Ndi akanam mefre nisobo Ye Abia Ibok mbakara ke usen ekenimde eno fi, oto ke ntek kiet mme eken?	hihi	0	
		ihi	1	
C12.	Ndi nukure ini emi akade ufok Ibok edi kini idem fo misongke?	hihi	0	
		ihi	1	

SECTION D: PERCEPTION OF SELF AND MEDICAL EFFICACY

Please circle one response for each question

S/N	Questions	Not at All Sure	Somew hat Sure	Very Sure
D1.	**Anam didie Odiongo**	0	1	2
	a) Ke afo medisa Ibok fo nte etemede?			
	b) Ke Afo eyekeme nida Ibok fo nte edohode fi ada?			

	c) Ke mme Ibok emi enyene ufon ono fi onyong okok mme idongo fo?			
	d) Ndi menim ke akpaniko ke mme ibok enode fi eyekakaiso enyene ufon, onyoung, udongo fo?			
	e) Edieke afo mudaha Ibok enode fi nte etemede, ukereke ke udongo ke idem fo eyekakaiso awak onyong Odiok ye afo?			
	f) Ndi afo menyene ekeme ninam idem fo osong?			
	g) Ndi mekeme nisin ifik nda mme Ibok enode fi?			

SECTION E: INTERACTION WITH TREATMENT CENTRES

E1.	Ndo idi mme ntak mme Mfiana emi anamde fi obo Usobo oto ufok Ibok? ?	Udongo HIV	1	
		Akpaikpai Ikong	2	
		Udongoemi Iba	3	
E2.	Ebighi didie okotongo nida Usobo Udongo HIV?	_____		
E3	Egighi didie okotongo nida usobo Akpaikpai Ikong?	_____		
E4.	Ebighi didie okotongo obo Usobo Oto ufok Ibok?	_____		
E5.	Ndi Ufok Ibok enyemi Ikpong ke afo obo Usobo?	hihi	0	
		ihi	1	E7
E6.	Edieke Midighe ntre, efe ufok Ibok efen ke afo esibo usobo?	_____		
E7.	Anie owo esise mkpo abanga fi ke ufok Ibok?	Abiaibok Mbakara	1	
		Nurse	2	
		Mme owo efen?	77	
E8.	Ndi esikut Mbia – Ibo Mbakara ye mne Nurse Ikpong ke mne usen Ufok Ibok fo?	hihi	0	
		Ihi	1	
E9.	Ndi esinyene mme sanga – sanga usen eno fi?	hihi	0	
		Ihi	1	
E10.	Ndi esika ufok Ibok kini Ibok fo okurede Ikpong?	hihi	0	E12
		Ihi	1	
E11.	Edieke edide ntre, ndi esika kini Ibok fo ekperede nikure? Mme okurede ama?	Kini ekperede nikure	1	
		Kini okurede ama	2	
E12.	Usen ifang esibe ke ibok fo ama okokure, mbemiso afo afiak okobo ibok efen?	_____		
E13.	Ndi enyene ini emi musukemeke nibo Ibok koro Ibok nudughe ke ufok Ibok?	Ihi	0	E15
		Idughe	1	
E14.	Ke mme ini emi mukemeke ninyene ibok nto ufok Ibok nso ke afo esinam?	Nsika Ufok Ibok efen	1	
		Nsinyong ufok	2	
E15.	Ndi Mbia ibok Mbakara ye mme Nurse esino fi oyoho mkpang utong?	Esino	0	
		Isinoho	1	
E16.	Da uwat mkpo ke mbio udongo eken, ndi mekere ke mbia Ibok Mbakara Y mme Nurse esisobo Udongo HIV Ye Akpaikpai Ikong ofon?	Esobo ofon	0	
		Isoboke ofon	1	

E17.	Ndi menyene oyoho Idorenyin ke mbia ibok Mbakara ye nurses ekeme nitum Nse mkpo Mbanga fi?	Menyene	0	
		Nuyeneke	1	
E18.	How many times doctor and nurse dey talk about your body?	Akananam	0	
		Isisopke	1	
		Kini-Kini	2	
		Kpukpuru ini	3	
E19.	Ndi mmo esiting anwanga fi, mme ini emi anade emen mme Ibok fo?	Esiting	0	
		Isitingke	1	
E20.	Ndi mmo esida ini eting eno fi ufon emi Odude ke afo nida Ibok nte etemede?	Esiting	0	
		Isitingke	1	
E21.	Akanam mmo eting eno fi se ikemede nitibe nno fi ke ntak mme ibok oro emende?	Esiting	0	
		Isitingke	1	
E22.	Edieke okutde owo efen obode ufen ofo udongo HIV ye Akpaikpai ikong, ndi mekeme nida enye usungnisobo ye mbia ibok mbakara Ye Nurses?	Mekeme	0	
		Nkemeke	1	
E23.	Ndi akanam ufok-Ibok eno owo ke obio fo mme ibok esok fi, niwut ke mmo ekere ebanga fi?	Eno	0	E25
		Inoho	1	
E24.	Edieke edide ntre, ndi afo mama Edinam mmo?	Mmaha	0	
		Mma-ma	1	
		Iboro Idughe	99	
E25.	Edieke Midighe ntre, ndi akpama mbon usobo edi obio fo edise nte idem fo etiede?	Mkpoma	0	
		Mmaha	1	

SECTION F: MKPO NTAK

F1.	Ndi Itie Odungite Oniong Usung Okpong Ufok Ibok?	Iniongke	0	
		Oniong	1	
F2.	Oyom Usung didie?	_____		
		Ndiongoke	88	
F3.	Ndi mekeme nisanga ke ukod nsim, mme edi se ada mkpo Isang?	Edi se esanga	1	F6
		Oyom mkpo-Isang	2	
F4.	Ukpe usung fo uka ye unyong edi okuk ifang?	~~N~~ ---------		
F5.	Ndi Mekeme nikpe usung idem fo?	Nkemeke	0	
		Mmekeme	1	
F6.	Ndi mme sikpe okuk ke mme Ibok enode fi?	Nsikpehe	0	F9
		Mesikpe	1	
		Usuk-Usen	99	
F7.	Okuk Ifan ke abiat ke kpukpuru			
	c) Nduongode	~~N~~ ----------		
	d) Mme Ibok			
F8.	Ndi menyene Okuk emi ekemde usobo ye mme ibok fo?	Nnyeneke	0	
		Menyene	1	
F9.	Ndi ukara ono mme Ibok ye Usobo mfon ke	Inoho	0	

	ufok Ibok Oro?	Ono	1	
F10.	Ke Osiode ukara fep, anie owo efen ekpe okuk usobo ye mme Ibok fo?	Ami kmpe	1	
		Mme ufan	2	
		Ubon mi	3	
		Mme nka	4	
		Nka emi midighe ukara enyene	5	
F11	Ndi mme esibiat okuk ke udia ye mmong ke edide ufok Ibok?	Nsibiatke	0	F13
		Mme sibiat	1	
F12	Okuk Ifang ke esibiat ke udia ye mmong ini ekededi emi edide ufok ibok?	_____		
F13	Ndi akananam metre utom mme mbubeghe ke ntak nidi ufok ibok?	Ntreke	0	F15
		Metre	1	
F14	Okuk ifang esitak fi ke okpongde utom mme Mbubeghe edi ufok Ibok?	_____		
F15	Ndi akanam metre utom mme Mbubeghe ke ntak emi Ibok onode fi mfiana ?	Ntreke	0	G1
		Metre	1	
F16	Okuk ifang atak fi ke ntak etrede utom mme Mbubeghe koro Ibok emende onode fi mfiana?	_____		

SECTION G: MME INI ENIMDE ENO FI NIMEN IBOK

Please circle one response for each question.

S/N	**MBUME**	**Akananam**	**Iwake**	**Usukini**	**Ataedi wakwi**
G1.	Ke offiong emi ebede, ikafang ke etre nimen Ibok fo? Ke ntak	0	1	2	3
	a) Mukudughe ukpere Ufok				
	b) Ke ntak akanamde mme mkpo efen				
	c) Ekefefre				
	d) Ama enyene ediwak Ibok nimen				
	e) Ukuyomke Ibok anam fi.				
	f) Ukuyomke mme owo ediongo ke odu ke usobo				
	g) Mme edinam fo keusen kusen ama okpohore				
	h) Ndi ekere ke mme Ibok oro ekedi Mbiara mme ikofonk aba ye afo?				
	i) Idap ama oboho fi kini akanade ada Ibok fo?				
	j) Idem ama afiana fi eti eti?				
	k) Esit fo ikenemke?				
	l) Ekenyene mfiana kow muka diaha mkpo?				
	m) Ibok fo ama okure?				
	n) Idem fo ama osong?				
	o) Okodu ke utre udia ye edigong Akam?				
	p) Unyoung umaha Ibok?				
	Tina mme mkpo eken?				

G2. Ekefre nida mme Ibok fo ini ewe? _____

G3. Nso idi mme nsio-nsio ntak eken emi afo eketrede nida mme Ibok fa? _____

SECTION H: DEPRESSION AND WORRY

Please circle one response for each question

S/N	MBUME	Akananam	Usukini	Ediwakini	Kpukpuru ini
H1.	Ke urua ifang emi ebede, ini awak didie	0	1	2	3
	a) Emi etiede fi ke idem nte ukemeke ninam mkpo ndomokiet ke ntak mukopke inemesit?				
	b) Etie fi mfiana-mfiana ukemeke nisin esit ke se anamde?				
	c) Ukemeke nide idap??				
	d) Ndobo anam fi?				
	e) Etie fi mfuho mfuho?				
	f) Unyeneke odudu ninam mkpo ndomokiet?				

Please circle one response for each question

S/N	MBUME	Alama mam	Isopkeitibe	Nusukwi	Ediwa kini
H2.	Ko offion ifang emi ebede	0	1	2	4
	a) Ikafang kea nana inemesit, ke ntak emi mbuat-mbuat mkpontibe esimde fi?				
	b) Ukemeke nikama se idide akpan mkpo ke uwem fo?				
	c) Etie fi ekaha Ekaha ke idem?				
	d) Mokop uko niyo mme mfiana emi esimde fi??				
	e) Etie fi nte mme mkpo ke etibe ke usung fo?				
	f) Moku ke ukemeke ninam se akpanamde?				
	g) Ndi mekeme nisio ido ke uwem fo mfep?				
	h) Ndi mokut ke pkukpur mkpo ke uwem fo asanga nta ofonde?				
	i) Ndi afo odu ke iyatesit koro mukemeke niyo mme mkpontibe esimde fi?				
	j) Ndi edi ke ntek emi mukemeke nikan ke mme mkposong mfiana esimde fi?				

SECTION I: UWONG OKPOSONG MMIN

S/N	MBUME	IBORO	SETIAKDE	BEKPONS
G6.	Utim Ikatang ke owong okposong mmin ke usen edip ye duop emi ebede?	Kpukpuru usen	6	
		Ata ediwak usen	5	
		Ikata mme ikaba ke urua	4	
		Inikiet mme irehere	3	

		usen		
		Ikaba mme ikata ke offiong?	2	
		Inikiet ke offiong	1	
		Akanam moongke	0	
G7.	Ke mme usem emi esiwongode okposong mmin, Epeme mmin ifong ke esiwong ke usen?	Ekpeme kiet mme Iba ke usen	0	
		Ekpeme its mme inang ke usen	1	
		Ekpeme Ilion mme itiokiet ke usen	2	
		Ekpeme itiaba mme itiaits ke usen	3	
		Ekpeme Usukiet mme duopekiet ke usen.	4	
		Ekpeme duopeba mme ebede oro	5	
G8.	Ke usen edip ye duop emi ebede usen ifang ke etie owong ekpeme okposong mmin ition inikiet?	Kpukpuru usen	6	
		Ekpere nidi Kpukpuru Usen	5	
		Ikata mme ikata ke offiong	4	
		Inikiet mme ikaba ke urua	3	
		Ikaba mme ikata ke offiong	2	
		Inikiet ke offiong	1	
		Akananam	0	
G9.	Utim Ikafang Reesiwong Ikong Ekpo, mme okposong Ibok ke usen edip ye duop emi ebede?	Kpukpuru usen	6	
		Ekpere nidi kpupuru usen	5	
		Ikata mme Ikanang ke urua	4	
		Inikiet mme Ikaba ke urua	3	
		Inikiet mme ikaba ke offiong	2	
		Inikiet ke offiong	1	
		Akananam	0	

SECTION K: SANGA – SANGA IBEREDEM

H1.	Ndi mmenyene owo emi ekperede fi idem, nte ekemede niting ndibe iko fo nno enye?	Mmenyene	0	
		Nyeneke	2	
H2	Nso idi ebuana fo ye owo oro?	Oto ubon mi	1	
		Edi Ufan mi	2	
		Edi mboho mi	3	

		Ling uto ebuana efen emi enyenede ye enye _____	77		
H3.	Ndi enyene owoke ubon foe mi mbufo mbiba edungde ufok kiet?	Udughe	0		
		Modo	2		
H4a	Ndi enyene ufan fo ndomokiet emi mbufo edungde ufok kiet?	Idughe	0		
		Modo	1		
H4b	Ndi akanam owo ke ubon fo, mme ufan ono fi uwam kini oyomde usobo?	Ihono	0		
		Ono mi	1		
H5.	Nsuto Iberedem ke obo?		Mboho	Mobo	
		a) Okuk?	0	1	
		b) Item?	0	1	
		c) Eti fi nda Ibok?	0	1	
		d) Ono fi uwam ke Utom Nsong idem?	0	1	
		e) Ono fi nti udia	0	1	
		g) Siak mme Iberedem efen emi enye onode fi?	0	1	
H6.	Enem fi didie ke kpukpuru Iberedem emi Obode oto mme owo ke ubon fo?	Moyuho eti eti	4		
		nntimke nyuho	3		
		Nyuhoke	2		
		Odiok eti eti	1		
H7	Enem fi didie ke kpukpuru mme iberedem emi obode ofo mme ufan fo?	Emen mi eti-eti	4		
		Ntimke nkop inemesit	3		
		Inemke mi	2		
		Esit odiok mi et-eti	1		
H8.	Ubon fo ye mme ufan, ewam fi didie, ke nitie fi ette emen Ibok?	Ewam eti-eti	4		
		Ewam	3		
		Ewam ke ekpiri ukeme mmo	2		
		Inyeneke uwam ino mi.	1		

SECTION L: STIGMATISATION
C) SELF STIGMA

Check one option

	MME MKPO	Enenghede Afanga	Afanga	Itimke idiongo	Enyime	Enenghor Enyimz
		5	4	3	2	1
IA1	Imemke utom ninam mme owo ediongo ke mme enyeme udongo HIV ye Akpaikpai ikong					
IA2	Udongo HIV ye Akpaikpai Ikong emi nyene de anam mi ndeghe ke iso owo					
IA3	Esit mi amis mi ufen eti eti koro nyenede udongo HIV ye Akapaikpai Ikong					
IA4	Bud anam mi eti eti, moro edide akponiko ke mme nyene Ujonaro HIV ye akpaikpai Ikong					
IA5	Ke nusuk ini mforo ats nisime ke ntak emi					

	nyenede udongo HIV ye akpai kpai Ikong.					
IA6	Nsidedibe, koro mmenyomke ke mmenyene udongo HIV ye Akpaikpai Ikong					

D) SOCIAL STIGMA

S/N	**MBUME**	Hihi	Ihi
		0	1
IB1	Ndi akanam owo ndomokiet ese fi ke mbio, ke ntak emi enyenede udongo HIV ye Akpaikpai Ikong?		
IB2	Ndi Mibo enamde utom ke ufok-Ibok enam fi mkpo ke usung emi mifonke koro edide owo udongo HIV ye Akpaukpai Ikong?		
IB3	Ndi Mbio emamde utom ke ufok-Ibok enam fi mkpo ke usung emi mifonke koro edide owo udongo HIV ye Akpai-kpai Ikong?		
IB4	Ndi mme anam utom ufok Ibok, etre nituk fi ubok ke ntak emi enyenede udongo HIV ye Akpaikpai Ikong?		
IB5	Ndi akanam edoho fi okutuk mme nise mkpo mbanga ndito isong, ke ntak emi, udongo HIV ye Akpaikpai Ikong esimde fi?		
IB6	Ndi akanam esin nino fi usobo ke ufok Ibok, ke ntek emi enyenede Udongo HIV ye Akpaikpai Ikong?		
IB7	Ndi akanam mme owo ke ubon fo edoho fi oworo okpong ufok ke ntak edide owo Udongo HIV ye akpai-kpai ikong?		
IB8	Ndi akanam owo ndomokiet oyom usung niyat fie sit ke ntak emi afo edide owo udongo HIV ye Akpai-kpai Ikong?		
IB9	Ndi anam utom ufok Ibok Ndomokiet, anam fi mkpo ke usung emi mifonke, ke ntak emi edida owo udongo HIV ye Akpai-kpai Ikong?		

APPENDIX IX

LOKAA LANGUAGE TRANSLATION

YIWENEPA-LIBLABLA
Department woh Sociology
Faculty woh Social Sciences
Eto-nweneyeden ye eyaki Ibadan

Keblai liblabla, Ko-nbo iponai liblablama toh oyama eninong toh otoh okowo-ojeobi odeyake toh opona liblablama

Kofukeh	Loblabla	Kopona	Kobana
a.	Local government woya-yaka yabla liblabla jimin	_____	
b.	Apa-ma	Opondeng	1
		Oponwen	2
c.	Ebo-to		
d.	Number liblabla		
e.	Lewi liblabla	___/_____/_____ Lewi/Epeh/Kebohtam	
f.	Jen-jonen liblabla ah		
g.	Kebeh liblabla		
h.	Nti-pan yatoh aneng liblablama		
I	Deh aseng aneng	Awu	
		Kiblai liblabla	
		Ababema yapoo	

KEKPAN SEKE-KELE ETI: Liblabla eto-owoa

Ko-nbo pona mo apakoponama

Kofukeh	Liblabla	Kopona	Kobana	Gaba ako
101.	Weya ayini afun kiponaliblama obideh odem or obideh yanen	Odem	1	
		Yanen	2	
102.	Awu atami abongho yan ajajima?	----------		
103.	Local government area oba okpoyang?	----------		
104.	Odena kopon kpatuwa asenka?	----------		
105.	Awu akoke nwene?	Heyhey	0	108
		Heyah	1	
		Kopona oyeni	99	108
106.	Awu akoi nwene akom dendeh?	Nwene a-Primary	1	
		Nwene a-Junior secondary	2	
		Nwene a-Senior Secondary	3	
		Nwene yoden (Yinmon)-----	4	

		Kopona oyeni	99	
		Bikaa (Yimon) ----------	77	
107.	Awu aya ko nwene ajajimin?	Heyhey	0	
		Heyah	1	
108.	Awu akuyi na ikobasa? (Yimon yodeh) ----------	Okobasi nen	1	
		Ikobasi ya yabakpa	2	
		Nsekpa	3	
		Bika(Yimon) _____	77	
109.	Awu abeke odem or yanen ajajima?	Heyhey	1	111
		Heyah	2	
110.	Abeke, odeh benbe?	Yanen wana	3	112
		Banen bayasoo	4	112
		Koyene	5	112
111.	Aya awu awu new anino abeke o	Heyhey	0	
		Oblenke	1	
		Oyakepolopo	2	
		Odema or yanena oboke	4	
		Kopona oyeni	99	
112.	Nwe ayeni ben?	Heyhey	0	116
		Heyah	1	
		Kopona oyeni	99	116
113.	Nwe odoh ben yapanma ayeni?	_____		
114.	Wen owu wo otami otabe odeh mbotam npang?	_____		
115.	Wen owu wo onugha odoh mbotam npang?	_____		
116.	Nwe ajajimin anoyi yononon apa adodoh?	Heyhey	0	201
		Heyah	1	
		Kopona oyeni	99	201
117.	Anoyi na yononon ajajima?			
118.	Liman lipang ayanon moh yononon yowuma ke-epeh?	~~N~~ _____		

YEKPAN YEPOWA: Yoyimayima obagha yatnyatle oba ekpetem

Kofukeh	Loblabla	Lipona	Kobana	Gaba ako
201	Nwe anai lebo ajajimi o?	Heyhey	0	
		Heyah	1	
		Kopona oyeni	99	
	Ayimake doh nna-asegha anan libo liwu o?			
202	Nwe bon ofibi odobeke ko onen obi otoli adoh ajeye nmo owa liboliwe?	Heyhey	0	204
		Heyah	1	
		Kopona oyeni	99	204

203	Ko odoh aja, konbo yin bon won no odebe.	_____ _____		
204	**Mo liblabla jo 204 otoh okem 211, yimon abinoh adeyake or abibi adeya.** Tawalibo adoh yajo o oyiyi okoh onen obi-ofe	Kopona oyeni	0	
		Ndehya kani!	5	
		Ndehya	4	
		Min oseli	3	
		Ndehyake	2	
		Ndehyake kani!	1	
205	drugsAgorgor ka adoh ta apero etem obagha doh awai libo ma ko akakam awai libo ma	Kopona oyeni	0	
		Ndehya kani!	5	
		Ndehya	4	
		Min oseli	3	
		Ndehyake	2	
		NDehyake kani!	1	
206	Libo yatenyatele ah noh abongho abo ekpetem, edoh agorgor ka adoh ta awa libo yatenyatele ah	Kopona oyeni	0	
		Ndehya kani!	5	
		Ndehya	4	
		Min oseli	3	
		Ndehyake	2	
		Ndehyake kani!	1	
207	Libo ekpetem ah noh abongho abo yatenyatele, edoh agorgor ka adoh ta awa libo yatenyatel ah ka awai ekpetem ah	Kopona oyeni	0	
		Ndehya kani!	5	
		Ndehyah	4	
		Min oseli	3	
		Ndehyake	2	
		Ndehyake kani!	1	
208	Nwe aniyimei-ke Mboti yaniwai?	Heyhey	0	
		Heyah	1	
		Kopona oyeni	99	
209	Nwe onifunononyoke ke libo kewa etiyakadoh?	Heyhey	0	
		Heyah	1	
		Kopona oyeni	99	
210	Nwe libo jo yawai yatenyatele ah ma libe boi yatenyatele?	Heyhey	0	
		Heyah	1	
		Kopona oyeni	99	
211	Nwe abaloka abi libo jo yawai yatenyatele ah ma likami toh litika ka etom onen?	Heyhey	0	
		Heyah	1	
		Kopona oyeni	99	

LIKPAN LITELAH: Kebo nani

Kofukeh	Lobblabla	Kopona	Kobana	Gaba ako
301.	Abo kpong apang awai kelewi?	Lekpong jana otoh okem akpong apo	1	
		Akpong atele otoh okem akpong ana	2	
		Akpong aten otoh okem akpong aten-ajana	3	
		7 types and aboveAkpong aten-apo otoh obole	4	
302.	Nboka mpang awai ke-etyana?	_____		
303.	Abo kpong apang abalo abi ayom tah awa koh kebe?	_____		
304.	Nti npang ma awai libo liwu koh lewi?	Heytiyan kolewi		
		Nti mpo kolewi		
		Nti ntele kolewi		
305.	Abo kpong apang abalo abi ayom tah awa kolewi?			
306.	Nwe kebe keyaka or awi ayakah yo obi jan wo-ofe toh awa libo liwu?	Jang	0	308
		Heyah	1	
		Kopona oyeni	99	308
307.	Odoh nti npang ma ayoke tah awa liboliwu koh:			
	Lewi jana jo lebolike?	----------		
	Nkobase npo yo nbolike?	----------		
	Epe yana yo ebolike?	----------		
308.	Nwe kebe keyaka soh aniwai liboliwu koh kebe kebi keka keyo?	Jang	0	310
		Heyah	1	
		kopona oyeni	99	310
309.	Odoh nti npang odebeke aja koh:			
	Lewi jana otoh oya awi aten-apo?			
	Awi aten-atele otoh oya awe jo ana?			
	Awi jim otoh obole?			
310.	Abinino ablanake toh ako anan liboliwo osegha oba bon?	Heyhey	0	
		Heyah	1	
		Kopona oyeni	99	
311.	Nwe obidoh ko oninoh nkonkoh ani koyi ebotoh?	Heyhey	0	
		Heyah	1	
		Kopona oyeni	99	

konbo, telikeh kopona kankankanya koloblablajonjonnaya

Kofukeh	Liblabla	**Minoseli**	**Ose-limowewen**	**Ose-lim**	**Ose-limkani!**
312.	**Awu oseloyan:**				
	a) Awu onifeyai yo or no-ofeyo anan liboliwu adoh yakuwo?	0	1	2	3
	b) Liboma liyiyi-oyin likoh?	0	1	2	3
	c) Liboma nolikoh lokor liyi likoh?	0	1	2	3
	d) Abeliboma anani adoh yayino, yatenyatele oba epetem yo oyawo ma awoma libo emung enan?	0	1	2	3

YEKPAN YENA: Litona obo nbotoh

401.	Odoh nalbowa anai mo nbotoh imin?	Yatenyatele	1	
		Ekpetem	2	
		Yatenyatele oba Ekpetem	3	
402.	Ogornor obegha ya ka aya ma liboma	Ikobase yana	1	
		Epe yana	2	
		Npe nten-ayana	3	
		Kebontam sana	4	
		1 year and aboveKebontam sana otoh obelo	5	
403.	Ogornor obegha yan koh anai libo mo obotoh imin?			
404.	Obidoh ebotoh imin nyo nyo anai ka libo?	Heyhey	0	
		Heyah	1	
		Kopona oyeni	99	
405.	Ajei heyhey, odoh dendema odoh ayinai liboma?	_____		
406.	Nyema anekoi ayoma ebotoh ma?	Doctor	1	
		Nurse	2	
		Doctor oba nurse	3	
		Bikaa (Yimon)_____	77	
407.	Nwe anikoi yabowobowo bimin koyadoka?	Heyhey	0	
		Heyah	1	
		Kopona oyeni	99	
408.	Nwe yani ko yo kebe oboh lewi jo nna atoh ayoma?	Heyhey	0	
		Heyah	1	
		Kopona oyeni	99	
409.	Nyei doh ebotoh min koh abo aba agake. **(Konbo, yimon kotongha kimin kobidoh lotumajo or libem)**	Libem	0	411
		Lotumajo	1	
		Kopona oyeni	99	411

410	**Odoh lotumajo**, Aniyai ma koh libo liwoi toh ligake or koh ligake?	Koh liwoi toh ligake	1	
		Koh ligake	2	
		Kopona oyeni	99	
411	Odoh awi apama koh aweke libo liwu ayini ayema toh anan lidoh-lidoh?			
412	Nwe obino oyenike kebe sa ayoma toh anan libo, ebotoh ma eyeni?	Heyhey	0	414
		Heyah	1	
		Kopona oyeni	99	414
413	Ka abi libo anani ebotoh ma abini noghi yan?	Nko doh ebotoh edoh-edoh	1	
		Nbloke nkoh ke etoh	2	
		eKopona nyeni	99	
414	Nwe doctors ma oba nurses ma yabini kaloh litung a-yoma?	Heyhey	0	
		Heyah	1	
		Kopona nyeni	99	
415	Ka-ayomah oba yapenopeno bi dah, nwe doctor ma oba nurse ma yabi boyi yatenyatele oba ekpetem yakoloh-okoloh?	Heyhey	0	
		Heyah	1	
		Kopona oyeni	99	
416	Nwe abini ayoke abi doctors min oba nurses min agorgor yayeni o?	Heyhey	0	
		Heyah	1	
		Kopona oyeni	99	
417	Odoh nti-npan ma ah doctor owu oba nurse owu yatongha oba awu obangha liboliwu kenani?	Jangke aja yanoi	0	
		Etiyakadoh	1	
		Yanoi aja kebe obo kebe	2	
		Kopona oyeni	99	
418	Nwe yaniyino doh nnah asegha awa libo ma?	Heyhey	0	
		Heyah	1	
		Kopona nyeni	99	
419	Nwe yabini deloi be kebe toh atoh yanino ulu wo oyaka toh atoli doh ayino atoh awa libo ma?	Heyhey	0	
		Heyah	1	
		Kopona oyeni	99	
420	Nwe yabini yino obagha okpoloh wo-nno obogho oyaka?	Heyhey	0	
		Heyah	1	
		Kopona oyeni	99	
421	Nwe kafi yeni lowoni nofiyo adeh yanen yadoh-yadoh toh yafuken yanan libo mu doctor oba nurse bimin?	Heyhey	0	
		Heyah	1	
		Kopona oyeni	99	
422	Nwe oyenike kebe soh ebotoh min etomi onen toh ofuken okoh libo or okoh ekoo?	Heyhey	0	
		Heyah	1	424
		Kopona oyeni	99	424
423	**AJEI HEYHEY**, Nwe no-odewo toh ayeni onen wo-nno opimoi-yo?	Heyhey	0	
		Heyah	1	
		Kopona oyeni	99	

424	**AJEI HEYAH**, Odewoke ajah?	Heyhey		
		Heyah		
		Kopona oyeni		

YEKPAN YETEN: Epla-ewe

501.	Nwe obi pelo-opelo dah awunidah otoh oye toh ebotoh dah?	Heyhey	0	
		Heyah	1	
		Kopona oyeni	99	
502.	Ogorno obogha yan?	----------		
503.	Nwe abino asegha nfe-nfe or abino anoma motor or okada?	Nasegha nfe-nfe	1	505
		Na anoma motor or okada	2	
		Kopona oyeni	99	505
504.	Odoh liman lipan ma nna abogho akoh motor ma or okada ma atoh akow ayini awon doh eboto dah	~~N~~ ---------		
505.	Nwe ayoma ani nai libo ma o?	Heyhey	0	
		Heyah	1	
		Kopona oyeni	99	
506.	Nwe akoyika liman moh abo yanai mo ebotoh ma?	Heyhey	0	508
		Heyah, kebe obo kebe	1	
		Heyah, etiyakadoh	99	
		Kopona oyeni		508
507	Ke-eboh odeh liman lipan ma ani koyi akoi toh anan libo?	~~N~~ ----------		
508.	Nwe government yabi koyi libo yatenyatele ma oba libo ekpetem ma kokekagha mo ebotoh ma?	Heyhey	0	
		Heyah	1	
		Kopona oyeni	99	
509	Koh adelikeka government nneodoh-odoh oni koyi liman ma?	Ami	1	
		Yamunobang	2	
		Etoh-emon	3	
		Koton	4	
		Akpala ya-abi ya government adoh (NGO)	5	

YEKPAN YETEN-ASANA: Likpakpawa jo noh lino o toh aje libo anani

Konbo, telikeh kopona kana nkoh-nkoh koh loblabla jang-janaya.

Yanen na yabeghne yayoke toh yanan abo abe osegha oba agong. Mina odoh agong yana abogho anogho toh ayoke libo liwu kenani <u>ke npeh yo nbolike.</u>

kofukeh	LOBLABLA	**Jangkeh**	**Otum otawa mmo odebe**	**Eti yakadoh**	**Kebe oboh-kebe**
601.	**Ke epeh yo ebolikeh odoh nti npan ma ayokeh toh anan libo liwu osegha oba:**				
	a) Mo lopon adoh?	0	1	2	3
	b) Otum osoh oba blon bi ka?	0	1	2	3
	c) Ayo-keh?	0	1	2	3
	d) Ayeni dah libo joh lisoso o?	0	1	2	3
	e) Awoi bon toh odoh be o koh?	0	1	2	3
	f) Awoi yanen toh yayimo yajoh anai libo?	0	1	2	3
	g) Aponokeh libo ma kenani?	0	1	2	3
	h) Abaloka libo ma litum libuwo?	0	1	2	3
	i) Adokeh ka awa libo ma?	0	1	2	3
	j) Oninoh ka awa libo ma?	0	1	2	3
	k) Etem or wo ka awol odal ka awa libo ma?	0	1	2	3
	l) Ayenoi agorgor toh atoh awa libo eti yokadoh (oboh luji or kewafal)	0	1	2	3
	m) Libo li gor keh?	0	1	2	3
	n) Koh odaloke ka awol?	0	1	2	3

602. Odoh na kebe ya so kekpo-ngum so ayoke toh anan libo liwu? Tehli (X) mo ukowen ma ka abongh wana

Mo ikobase yana ☐ 4
Mkobase mpo ☐ 3
Mkobase nnah ☐ 2
Epeh nanah ☐ 1
Janke libo awo kenani ke-eti yanayana ☐ 0

Konbo tehlikeh kopona kanah koh loblabla jangjanaya

Kofukeh	**LIBLABLA**	**Jangkeh**	**Etiyakado**	**Etiyang-yanaya**	**Kebe obo kebe**
603.	**Koh nkobase yo nbolike odeh nti npang ah:**				
	a) Abalo abi wo ofeya ado akokona	0	1	2	3
	b) Ayeni agorgor toh ayo etem ka abon	0	1	2	3

	wa atoh anoyi?				
	c) Abalo ka ajow bong wa anoyi atum ajaka?	0	1	2	3
	d) Ayeni agorgor toh adowah?	0	1	2	3
	e) Abalo ayaw awu-awu?	0	1	2	3
	f) Etem eboh edali?	0	1	2	3
	g) Abaloka wo ofeya akoh lokor koh etom?	0	1	2	3

Konbo tehlikek kopona kanah koh loblabla jangjanaya

KOFUKEH	LIBLABLA	**Jangkeh**	**Obi ojewu ajo odeh**	**Etiyakadoh**	**Kebe oboh kebeh**	**Kebe oboh kebe kani!**
604.	**Koh epeh yo ebolike odoh nti npanah:**					
	a) Etem eko-nno osegha oba bon wo odobe won bi-nyi?	0	1	2	3	4
	b) Oboh ofeh toh amana bon wo oyiyi koh etom ewu?	0	1	2	3	4
	c) Owogho kah awol?	0	1	2	3	4
	d) Koh abalo abi no ofeyo toh amana agorgor awu?	0	1	2	3	4
	e) Abalo abi blong yeh kuyi nti-nwu?	0	1	2	3	4
	f) Ka ayi abi wo ofeya akolokoh ka ablong ba ayeni toh anogh?	0	1	2	3	4
	g) Ofoh tah amna blon boh yejina koh etom ewu?	0	1	2	3	4
	h) Abi jangkeh lokor akoi?	0	1	2	3	4
	i) Etem ekon-nno osegha oba blong ba yeboh keman yefeh?	0	1	2	3	4
	j) Abalo abi agorgor aso ananake doh nna amana?	0	1	2	3	4

605. **Yanen yayeni apen ka kpon kakpon. Liblabla joli tolikaken libimai obagha lotu oba abo yatawa.**

a. Odoh nti-npang awa yatu boh yatawa – obidoh beer, yatu eteh-eti, etufunonoh, or yatu banbanaya – koh awi leya opeli jo ya abolikeh? Teli wana.

Lewilewi	Lewi jangjanaya	Nti-ntele or nti-nnah	Etiyana or nti-npo keh ekobase	Nti-npo or nteleh keh epeh	Etiyana keh epeh	Jangkeh
6	5	4	3	2	1	0

b. Koh awi yani wai yatu boh yatawa odoh nkpoma npang ayiwei? Njiyi etu-kpoma ya beer, yatu-etehti or otupopoh. Telikeh wana.

Yatu-bana or yapoh koh lewi	Yatu-yateleh or yana koh lewi	Yatu-yaten or yaten-abana koh lewi	Yatu-yaten yapoh or yaten-yateleh koh lewi	Yatu yaten-yana or jo-abana koh lewi	Yatu jo-yapo otoh oboleh
0	1	2	3	4	5

c. Koh awi leya opeli jo yabolikeh ma odoh nti npan ma awakeh ntukpoma nten yatu boh yatawah keh etiyana (Koh nkanika npo otoh okem nnah)? Telikeh wanah.

Lewilewi	Lewi jangjanaya	Nti-ntele or nna ki ikobase	Eti-yana or nti-npo ki ikobase	Nti-npo or nti-ntele keh epeh	Eti-yana koh epeh	Jangkeh
6	5	4	3	2	1	0

d. Odoh nti npan awakeh igboo or blon boh yetawa koh awi leyawu opeli jo yabolikeh? Telikeh wana.

Lewilewi	Lewi Jangjanaya	Nti-ntele or nna ki ikobase	Eti-yana or nti-npo ki ikobase	Nti-npo or nti-ntele koh epeh	Eti-yana koh epeh	Jangkeh
6	5	4	3	2	1	0

YEKPAN YETEN-YEPO: Nkami akpalah

701.	Nwe ayeni omonowoh or ojemonen owu wa ba baghana?	Heyah, ojemonen	1		
		Heyah, omonowoh	2		
		Nboh bi ma yapo	3		
		Heyhey	0		801
702.	Nwe awuyi koh etoh yana oboh ojemonen owu or omonowoh?	Heyhey	0		
		Heyah	2		
		Kopona oyeni	99		
703.	Nwe aninai nkama doh nboh yoyanen bi min ma anai abo ma?	Heyhey	0		
		Heyah	1		
		Kopona oyeni	99		
704.	Odoh na nkama anai?		N	Y	
		a) Nkama limana	0	1	
		b) Nkama kedeiya	0	1	
		c) Eh-ko	0	1	
		d) Toh abalam toh nwa libo limi	0	1	
		e) Nkama eteh-ti	0	1	
		f)Nkama lujah	0	1	
		g) Nkama nsowu wa	0	1	
		h) Nkama liman kenoi ya	0	1	

		i) Bikaa (Yimon) _____	0 | 1	
		Kopona oyeni	99	
705.	Koh eboh odoh yan ma etem edalo ekoh nkama yo anai?	Obonghokeh denene	4	
		Obi obongho	3	
		Obi oje wo obongho	2	
		Wodenene obongho	1	
706.	Odoh na nkama ah ya monoboh oboh yajemo nen yaba ya koyokeh toh atoh awa libo liwu?	Jangkeh	0	
		Oweweng	1	
		Etiyakadoh	2	
		Ntisusu u	3	
		Jangwekeh odoh boh	99	

YEKPAN YETEN-YETELEH: Ke-mowo o
Telikeh wana

Kofukeh	Bong	Lipona				
		Jangkeh ndeyah	Ndeya	Min oseli	Ndeyakeh	Ndeyakeh kani
801	Keh omemi toh nyin na nen obagha yaten-yatele oba ekpetem emi	5	4	3	2	1
802	Yaten-yatele oba ekpetem emin enoyim nji-na	5	4	3	2	1
803	Apen imina anoyim ndah nno njkekobi	5	4	3	2	1
804	Apen imina anoyim lenenjen	5	4	3	2	1
805	Apen imina anoyim ndoh kenen kagha	5	4	3	2	1
806	Nduwoi keh apen ami doh nno anen ajew yayi	5	4	3	2	1

Kofukeh	Bong	Kopona	
		Heyhey	Heyah
807	Nwe yanen ya bimni koi yo bleng osegho ba yaten-yatele/ekpetem?	0	1
808	Nwe yanen ebotoh wa ma abino anogho keh bleng osegho ba yaten-yatele/ekpetem?	0	1
809	Nwe obotoh nen obinino ojekeh wo opana osegho oba yaten-yatele/ekpetem atoh?	0	1
810	Nwe yanini yajokeh luji nna-afono oba yajimo nen yawu?	0	1
811	Nwe yanini yajokeh benben nna-apan osegha oba yaten-yatele/ekpetem ewu?	0	1
812	Nwe yabotonen yanini yasokeh osegha oba yaten-yatele/ekpetem ewu?	0	1
813	Nwe yajemonen yawu yanino yawugho keh	0	1

	osegha oba yaten-yatele/ekpetem ewu o?		
814	Nwe yabotoh nen ma abini fughi apen mina mo yewene pah foh yakoyo ma?	0	1
815	Nwe onen onini oyoghoke doh nno okono osegha oba yaten-yatele/ekpetem yato?	0	1
816	Nwe yanini ya ga-mokeh etoh osegha oba yaten-yatele/ekpetem yato?	0	1

APPENDIX X

Consent form

Approval by UI/UCH IRC No: **UI/EC/10/0006**

Dear participant,

You are invited to participate in a research study. You are being asked to participate in a research study titled: **Determinants of Treatment Adherence among TB-infected HIV Patients in Cross River State, Nigeria**. This treatment centre has been selected among others in state to be studied. All patients who are infected with HIV and TB who consent to participate will be included in this study. Participation in this study is completely voluntary.

Procedures: An interviewer will administer a survey to you in a place where you are comfortable. No one else other than you and the interviewer will be present during your interview. Each interview will take about 45 minutes to one hour.

Risks: There are no physical risks associated with participation in this study. However, you may be uncomfortable with some of the questions and issues you will be asked. But, you may decide not to answer any questions you feel uncomfortable about. If during the interview you feel emotionally upset when answering some of the questions and wish to stop the interview, tell the interviewer that you are not able to continue and you will be allowed to stop and referred to a counsellor or social worker for help.

Benefits: There are no direct and immediate benefits for participation in this study. Your participation in this study may improve understanding of what hinders treatment adherence.

Confidentiality: Unless required by law, only the researcher, members of the researcher's staff and representatives from the **Universities of Ibadan** and/or **Calabar Ethical Committees** may have access to study records. They are required to keep your identity confidential. Results of this study may be used for research publications, or presentations at scientific meetings, but your individual results will never be discussed. No identifying information will be kept on the actual survey form so nobody will be able to connect your name to the survey.

Financial Information: You will not receive any money for your participation in this study, but will receive a gift as a token of appreciation for your time.

Subjects' Rights: You are free to withdraw from the study at any time if you no longer wish to go on. Should you have any concerns, you can contact the principal researcher: **Mr. Boniface A. Ushie, Department of Sociology of University of Ibadan.**

Consent: "I have read this form (it has read to me) and the research study has been explained to me. I have been given the opportunity to ask questions and have answers that satisfy me. I agree to participate in the research study described above".

_____ _____

Thumbprint of Participant Date

_____ _____

Signature of Person Obtaining Informed Consent Date