KNOWLEDGE, ATTITUDE AND PRACTICE WITH REGARD TO TUBERCULOSIS AND HUMAN IMMUNODEFICIENCY VIRUS CO-INFECTION AMONG PATIENTS WITH TUBERCULOSIS IN WALVIS BAY DISTRICT, NAMIBIA.

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A mini-thesis submitted in partial fulfilment of requirements for the degree of Master of Public Health (MPH) at the School of Public Health, University of Western Cape

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February 2011

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KEY WORDS:

Knowledge

Attitude

Practice

Tuberculosis

HIV/Aids

Patients

Co-infection

Stigma

Counselling

Walvis Bay

Namibia

DECLARATION

I declare that *"Knowledge, attitude, and practice with regard to tuberculosis and human immunodeficiency virus co-infection among patients with tuberculosis in Walvis Bay District, Namibia"* is my own work, that it has not been submitted for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

Jean-Paul Ilunga Musasa

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Signature

Date : February 2011

ACKNOWLEDGEMENTS

I would like to praise the almighty God for the gift of life and strength to continue with my education.

I highly appreciate the valuable assistance and guidance of my supervisor Ms. Jeanine Uwimana and my co-supervisor, Dr. Ehimario Igumbor, who despite their fixed schedules, accepted to grant direction to this research. Above all, I express my gratitude to all the lecturers of the MPH program at UWC.

I would like to thank my wife, Emerence Mbuyamba Ilunga, for the support during these long years of my studies as well as my children Tresor Ilunga, Alex Ilunga, Salva Ilunga, Raissa Ilunga, and my baby sister Emerence Odia. I also thank my friends Dr. And Mrs Tshibumbu for their support. Finally, I extend my gratitude to all those who participated in this study such as TB/HIV patients, my research assistants for data collection and all the staff of Walvis Bay State Hospital.

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ACRONYMS

AIDS:	Acquired Immuno Deficiency Syndrome
ART:	Anti-retroviral Therapy
ARV:	Anti-retroviral Medicine
CDC:	Centre for Disease Control
CPT:	Cotrimoxazole Prophylaxis Therapy
DCC:	District Coordinating Committee
DOT:	Directly Observed Therapy
DSP:	Disease of Special Programme
DTC:	District TB Coordinator
HAART:	Highly Active Anti-retroviral Therapy
HIV:	Human Immuno Deficiency Virus
IPT:	Izoniazide Preventive Therapy
KAP:	Knowledge, Attitude and Practice
KNCV:	Koninklijke Nederlandse Centrale Verning (It is an NGO of Royal Centre of Nederlands funding TB activities)
MOHSS:	Ministry of Health and Social Services
MDR-TB:	Multiple Drug Resistant Tuberculosis
NDHS:	Namibia Demographic Health Survey
NTCP:	National Tuberculosis Control Programme
N:	Number
P:	P Value
PEPFAR:	President's Emergency Fund for AIDS Relief
PICT:	Provider Initiated HIV Counselling and Testing
PTB:	Pulmonary Tuberculosis
PLWHA:	People living with HIV and AIDS
R:	Pearson's Correlation Coefficient
SPSS:	Statistical Package for Social Sciences
STD:	Standard Deviation
STI:	Sexually Transmitted Infection
UNAIDS:	Joint United Nations Programme on HIV/AIDS
VCT:	Voluntary Counselling and Testing
WHO:	World Health Organization
XDR-TB:	Extensive Drug Resistant Tuberculosis

DEFINITION OF CONCEPTS

Co-Infection: This refers to two infections co-existing in one individual. For this study, it refers to a patient infected with TB and HIV infections.

Knowledge: This refers to what is known by a TB patient regarding TB and HIV, such as signs and symptoms, mode of transmission, prevention, and treatment for both TB and HIV.

Attitude: This refers to the thinking or feeling of a TB patient regarding, HIV testing for the unknown status TB patient, the use of a condom, treatment of HIV and stigma against TB and HIV sufferers.

Practice: The way in which a TB patient applies what he/she knows about TB and HIV in real life such as engaging in unprotected sex, adherence to TB and HIV treatment, choice of treatment, and use of alcohol with TB and HIV treatment.

Counselling: This is the advice given to a TB patient regarding HIV testing, adherence to TB and HIV treatment, and the benefits of using a condom.

Stigma: This refers to the disgrace of TB and HIV patients and the social discrimination regarding people infected with TB and HIV.

ABSTRACT

Background: Recent estimates from the Ministry of Health and Social Services in Namibia indicate that, 74% of TB patients have a known HIV status, and that among them 58% are HIV positive (MOHSS, 2010). It is in light of this, that the study aimed to assess the level of knowledge, attitudes and practices of TB patients with regard to TB and TB-HIV co-infection in the district of Walvis Bay, in the western part of Namibia. The study was conducted among TB patients aged 18 years and older who were registered from January to June 2010.

Methodology: A quantitative research method using a cross-sectional survey design was used. Data was collected from 267 respondents using a structured questionnaire administered by research assistants in face-to-face interviews with the respondents. The data was analyzed using descriptive statistics, Guttman scaling, Q-sort technique and factor analysis, ANOVA and Chi-square test procedures in Statistical Package for Social Sciences (SPSS) software version 16.

Results: The majority of the respondents (78.2%) had a high level of knowledge on prevention and 73.5% had a low level of knowledge on care. More than sixty percent (65%) of respondents with an unknown HIV status had a positive attitude towards VCT. The majority of respondents (84.4%) with an unknown HIV status were willing to be tested for HIV when there were diagnosed with TB.

Discussion and Conclusion: The findings showed a high level of knowledge on TB/HIV prevention and a low level of knowledge on TB/HIV treatment and care. The study also showed that respondents who did not know their HIV status had a positive attitude towards VCT

services, while those who knew their status had a positive attitude towards HIV/TB prevention and care programmes. Finally, the findings also showed that most respondents trusted conventional medicine more than traditional medicine. All these findings suggested that respondents had good knowledge of HIV and TB co-infection, had a positive attitude and practiced favourable behaviour towards programmes related to the prevention and care of this co-infection.

CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION

Tuberculosis is a defining opportunistic condition in a patient infected with the Human Immunodeficiency Virus (HIV). HIV increases the likelihood of reactivation and re-infection of *Mycobacterium* Tuberculosis (TB) among people living with HIV/AIDS (PLWHA) (Datiko, Yassin, Chekol, Kabeto and Lindtjorn, 2008). It has been documented that the burden of TB infection has increased since the occurrence of HIV infection (WHO, 2004). TB and HIV co-infection are increasing worldwide, but especially in developing countries. In Sub-Saharan Africa the co-infection rate is as high as 50 – 70%. South Africa, for instance, had a co-infection rate of 73% in 2007 (Kigozi, Heunis, Chikobvu, Van den Berg, Van Rensburg and Wouters, 2010). In countries like Australia, TB/HIV co-infection is not considered a major problem, since only 11 HIV/TB patients were identified in 2006. The National TB notification system recorded only 35.2% of TB patients co-infected with HIV (Bastian and Krause, 2007).

Namibia has a co-infection rate of 59% while Walvis Bay district in particular has a co-infection rate of 58% (MOHSS, 2009). The dual epidemics of TB and HIV have raised the need for the implementation of collaborative TB/HIV programmes, in order to reduce the burden of TB among PLWHA and the burden of HIV among people with TB. The problem is further compounded by the fact that TB is a leading cause of morbidity and mortality among people living with HIV (Sharma, Mohan and Kadhiravan, 2005; Nunn, Reid and Decock, 2007).

Therefore, knowing the HIV status of a TB patient is very important and is considered as an entry point for the comprehensive treatment/care of a TB patient co-infected with HIV. Efforts should, therefore, focus on increasing TB patients' awareness or knowledge of the association

between TB and HIV, so that patients can make informed decisions on the uptake of Voluntary Counselling and HIV Testing (VCT). Patients should be offered counselling on safer sex by the use of condoms, and they should benefit from the total care offered to TB patients co-infected with HIV, such as, Isoniazid Preventive Therapy (IPT), Cotrimoxazole Preventive Therapy (CPT) and Antiretroviral Therapy (ART). Patients should also be counselled on how to live positively.

1.2 BACKGROUND

According to Sterling, Pham & Chaisson (2010), TB is currently known as the most potent opportunistic infection and killer disease amongst PLWHA. Co- infection of TB and HIV has also created new challenges for national TB control programmes, especially in sub-Saharan Africa and Asia, where these diseases continue to have a devastating effect. Between 1980 and 2005, the World Health Organization (WHO) reported more than 90 million cases of TB and nearly 95% of these cases were in resource-limited settings (WHO, 2008). In 2008, the global estimate of new TB cases was 9.4 million, and 1.4 million of these new TB cases were infected with HIV (WHO, 2009).

Furthermore, the relative risk (RR) of TB among HIV infected people compared to those without HIV, ranges from 20 – 37 folds (Getahun, Gunneberg, Granich and Nunn, 2010). In the same year of 2008, among the 1.4 million TB patients tested globally for HIV, only 4% were screened for TB symptoms (Getahun et al, 2010). In 1993, the WHO declared TB a global emergency and in 2001, the United Nations (UN) declared HIV/AIDS a global emergency of devastating impact, and stated that morbidity and mortality related to TB/HIV were expected to accelerate significantly in future (Colombani, Banatvala, Zaleskis and Maher, 2004). TB and HIV are

intertwined and fuel each other and together make up a leading cause of mortality worldwide (Muktar and Hamisu, 2003). It is estimated that mortality rates among TB patients co-infected with HIV are 3 to 4 times higher than among those who are not HIV infected. Co-infection accounts for about 30-40% of deaths among those who are infected with HIV (Marston, 2002; Munseri, Talbot, Mtei and Von Reyn, 2008). According to the recent report of UNAIDS (2010), it is documented that TB infection accounts for 23% of mortality among PLWHA worldwide.

TB-HIV co-infected cases are treated with first line anti-TB medication, however, most of the patients who are on both anti-TB medication and ART's tend to have poor outcomes compared to those who are not (Harries, Zachariah and Lawn, 2009). One could argue that this could be due to various reasons such as poor counselling, drug toxicities and adverse interactions between ARV's and anti-tuberculosis drugs. In Namibia, the 2008/2009 report from the Ministry of Health and Social Services (MOHSS) indicated that 67% of patients with pulmonary TB (PTB) knew their HIV status. Of these 59% were also HIV positive (MOHSS, 2009). An earlier report, in 2004, by the MOHSS estimated that 50-70% of admissions in hospitals were related to HIV/AIDS conditions (MOHSS, 2004).

In 2009, the Walvis Bay District had a total of 868 new TB cases (all forms). These included 43 cases of multiple drug resistant TB (MDR-TB) and one case of extensive drug resistant TB (XDR-TB). Among the 868 TB cases, 616 (71%) were tested for HIV and 357(58%) were positive (MOHSS, 2009). In 2008, the HIV sentinel survey showed that, the Walvis Bay District had an HIV prevalence rate of 21.4%. The uptake of VCT was estimated at 71% among TB patients yet the National target is 95%. The Namibian Demographic Health Survey (NDHS)

estimated the uptake of VCT among the general population in Namibia during 2006 to 2007 to be 34.3% (MOHSS, 2008).

Based on these results one could argue that the uptake of VCT in Namibia is still low given the national target of 95%. This could be due to the stigma related to HIV as has been reported by Ottmani, Obermeyer, Bencheikh and Mahjour (2008). VCT among TB patients is provider–initiated and the stigma attached impedes TB patients from going for an HIV test on a voluntary basis. Nevertheless, there is a need for establishing strategies nationwide to increase the uptake of VCT. With regard to anti-retroviral (ARV) treatment adherence, 16 districts (out of the 34 offering ART) in Namibia reported that 93% of patients had more than 95% adherence in 2009 (MOHSS, 2009).

According to the National TB and leprosy annual report (2009-2010), the treatment outcomes of new smear positive TB cases registered in 2008, were as follows: the national cure rate was 72%, while that for Walvis Bay was 77%; the national defaulter rate was 4% while that for Walvis Bay was 1.6%; the national death rate was 5.6% while that for Walvis Bay was 3.4% and the national failure rate was 4.2% while that for Walvis Bay was 6.8%.

The high burden of the dual TB and HIV epidemics calls for the need to explore all possible factors such as behaviour, knowledge and access to care that could contribute to the increasing rate of HIV co-infection among TB patients. It is with this background on the high rate of HIV-TB co-infection in sub Saharan Africa in general, and Namibia in particular, that this study was conceived. The focus on Walvis Bay district is because it is one of the most TB and HIV affected districts within Namibia. The study endeavoured to assess the level of knowledge, attitudes and risks of TB patients related to HIV co-infection in order to make recommendations, to policy makers and health providers on how best to address issues related to TB-HIV co- infection.

1.3 PROBLEM STATEMENT

It has been widely documented that the incidence of TB is increasing in countries with high HIV prevalence and that TB is the leading cause of death among HIV infected individuals in sub-Saharan Africa and Asia (WHO, 2007). In addition, the co-infection, coupled with patients behavioural factors are leading to the emergence of severe and resistant forms of TB (Mangesho, Shayo, Makunde, Keto, Mandara, Kamungisha, et al, 2007). The uptake of VCT by TB patients is 71% in Namibia, but WHO and the Namibian national TB guidelines recommend that VCT must be offered to each and every TB patient to achieve 100% uptake (MOHSS, 2010). It is very important for a TB patient to know his/her HIV status because of the close association between TB and HIV. This enables patients to also benefit from total HIV care in case of co-infection.

A KAP study on HIV conducted in Namibia by Grötzinger (2006), revealed that the average level of knowledge of participants was 82.3%. 1.9% had a negative attitude regarding HIV patients and 73.9% had gone for an HIV test. Komu (2008) found that 64% of patients in Rundu hospital in Namibia had about with 95% or higher adherence to Highly Active Antiretroviral Therapy (HAART). In addition, the nationwide defaulter rate among TB patients is 4% while that for Walvis Bay district is 1.6%. Regarding CPT in Namibia, 35% of TB patients were started on ART nationwide, but only 22% were on ART in Walvis Bay. There is a 78.1% TB/HIV co-infection rate nationally and a 52.8% co-infection rate in Walvis Bay (MOHSS, 2010). Concerning IPT, the MOHSS report (2008) revealed that 22% (209) of HIV positive patients were on IPT in Walvis Bay.

It can be argued that while the adherence level among HIV patients for CPT is quite good, there is still room for improvement. The low percentage of TB patients co-infected with HIV

accessing ART indicates the need for more effort to start all eligible PLWA and TB on ART. There are various factors contributing to the high rate of TB/HIV co-infections and low uptake of VCT in Namibia in general and in Walvis Bay District in particular. These include factors related to service delivery and those related to patients' knowledge, behaviour and attitude towards the epidemic and access to services. The report of support supervision done by MOHSS revealed factors such as, the shortage of medical officers delivering care in TB/HIV facilities. The result is that more than 80% of people in need of ART are not receiving it (MOHSS, 2009). Therefore, the aim of this study is to assess the level of knowledge, the attitude and practices of TB patients with regard to TB-HIV co-infection, in order to identify contributing factors related to the rise in TB-HIV co-infection in Walvis Bay district.

1.4 STUDY RATIONALE

The district reported 868 cases of all forms of TB, 616 (71%) were tested for HIV and 357 (58%) were positive (MOHSS, 2009). It is evident that the majority of these patients became aware of their HIV status while already having TB. They still faced the challenges of preventing new HIV infection or re-infection while coping with the prospect of combined TB-ART therapy. Those who did not test for HIV may be suspected of having attitudinal problems towards VCT services.

The researcher's assumption is that if the TB patient knows the relationship between TB and HIV, and knows his/her HIV status such a patient can change to less risky behaviour or daily practices if HIV negative. If they are HIV positive the patient would decide on the next step in accessing care and support. This information would also permit the healthcare provider to maximize the management of both infections. However, in order to identify the factors that could contribute to high rates of TB-HIV co-infection it is imperative to assess the knowledge, attitude

and practices of TB patients regarding HIV co-infection. This could shed more light on which strategies or interventions are patient centered for TB and HIV programme implementers in Walvis Bay District. The results of such an assessment would also help policy makers and healthcare providers develop strategies tailored to curtailing the high co-infection rate and improve TB and HIV treatment outcomes. Finally, this study will provide baseline data regarding KAP on TB-HIV co-infection in the Walvis Bay District which can be generalised to similar districts in Namibia.

1.5 STUDY AIM AND OBJECTIVES

1.5.1 Aim

The aim of this study is to assess the knowledge, attitudes and practices of TB patients with regard to TB and TB-HIV co-infection in Walvis Bay district, Namibia.

1.5.2 Study Objectives

1) To assess the level of knowledge of TB patients on TB-HIV co-infection in Walvis Bay district
2) To determine the attitude of TB patients with unknown HIV status towards VCT services in Walvis Bay District
3) To identify risk practices related to prevention and treatment of TB-HIV co-infection among TB patients in Walvis Bay District

1.6 RESEARCH QUESTIONS

Given the aim and objectives above, the research questions of this study are:

1) What is the level of knowledge among TB patients with known and unknown HIV status with regard to TB-HIV co-infection in Walvis Bay district?

2) What is the attitude of TB patients with unknown HIV status towards VCT in Walvis Bay district?

3) What are the practices related to the prevention and treatment of TB-HIV co-infection among TB patients with both known and unknown HIV status in Walvis Bay district?

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents the review of literature in relation to the study interests. The review covers theoretical aspects of TB, HIV and TB-HIV co-infection related to knowledge, attitude and practices of patients, and the implications of these aspects for the current study. The review also summarizes the findings of previous studies on this topic and identifies gaps that this study aims to fill. The methodology as well as the country profile in relation to TB and HIV programmes compared to the regional and global standard is also explored.

2.2 SCOPE OF THE LITERATURE REVIEW

The literature review consulted included primary and secondary sources (Burns & Grove, 2005). In this study primary sources were the most used. An internet search was also done and it provided a huge amount of information on knowledge, attitude and practices of TB patients regarding TB-HIV co-infection.

2.3 THE EPIDEMIOLOGICAL LINK BETWEEN TB AND HIV EPIDEMICS

Tuberculosis is a bacterial infection caused by Mycobacterium TB, and is spread from person to person through droplets. Occasionally TB is caused by Mycobacterium bovis and Mycobacterium africanus (WHO, 2004). TB is mainly an airborne transmitted disease, but in a small proportion of cases, TB is transmitted to humans from infected cows through drinking non-sterilized milk (Khaled and Enarson, 2003). At the start of the new millennium, TB remains the most important infectious disease worldwide despite efforts made in the past decade to bring it

under control. Although TB is curable and controllable, it has not been eliminated in many industrialized countries (Caminero, 2003). Without treatment, 50% of patients with active TB will be dead after 5 years, 25% will be healthy (self-cured by a strong immunity), and 25% will remain ill with constantly infectious TB (WHO, 2004).

2.3.1 HIV Transmission

HIV is present in the blood, semen and other body fluids such as breast milk and saliva. Exposure to infected fluids leads to risk of contracting the infection. Major modes of HIV spread are; all forms of sexual activity (the most common), parenteral (blood or blood product recipients, injection drug users and occupational injury), and vertical transmission e.g. mother to child transmission (Davidson, 2002). In the early 1980s, HIV infection was regarded exclusively as a disease of homosexuals. Then bisexual males started getting infected and currently we have HIV infections in the heterosexual population throughout the world (Lachman, 1991).

2.3.2 TB-HIV Co-Infection and Integration of Services

Tuberculosis has proven to be difficult to control in regions with a high prevalence of HIV infections (Bekker & Wood, 2010). TB and HIV infections are interconnected, hence the terms "co-epidemic" or "dual epidemic'' are often used to describe their relationship. Ngamvithayapong, Winkivist, & Diwan, (2000) and Ayaya, Sitienei, Odero & Rotich (2003), describe this duo epidemic in terms of the following characteristics: Firstly, both diseases are more prevalent in poverty stricken areas with limited capacity for diagnosis, treatment and infection control; secondly, they represent major public health system failures regardless of the great achievements that have been made in the past; and thirdly, both diseases are linked biologically. HIV infection has been recognized to be a major modifier of the clinical

presentation of TB, such that TB symptoms may be relatively minor, atypical or sub-clinical in HIV co-infected individuals and obscure the diagnosis. In healthy individuals formerly exposed and infected with TB, hot cell-mediated immunity keeps latent TB infection dormant. HIV interferes with cell-mediated immunity by escalating the risk of developing TB disease. However, in early HIV infection the clinical picture of TB resembles that observed in immuno-competent individuals and it frequently is extra pulmonary in late HIV infection. These factors coupled with low sputum smear-positivity, often result in a delayed diagnosis. In developed countries any form of TB is considered as an AIDS-defining condition. In contrast WHO staging system regards only extra-pulmonary TB as an AIDS-defining condition, since TB can occur even in HIV negative individual (Maartens, 2010).

TB patients co-infected with HIV respond well to the standard 6-month anti tuberculosis treatment regimens, although mortality is high (Sharma, Mohan, and Kadhiravan, 2005). According to Nahid, Gonzalez, Rudoy, Jong, Unger, Kawamura et al (2007), TB patients co-infected with HIV who received a 6 month Rifampicin based regimen for TB treatment or those who received intermittent therapy had a higher relapse rate than HIV infected TB patients who received longer therapy or daily therapy. It can be concluded that the standard 6 month therapy may be insufficient to prevent a relapse in TB patients co-infected with HIV.

According Emerson and Post (2009) delayed diagnosis and improper management of TB cases co-infected with HIV may lead to the spread of TB within the community and contribute to the development of drug resistant TB. It can lead to poorer health outcomes for those living with HIV/AIDS.

According to Sharma, et al (2005) about 25% to 65% of HIV positive patients have some form of TB. TB accelerates the progression of HIV through increased systematic immune activation and also the possibility of increased HIV replication. The risk of TB increases after HIV sero-conversion, doubling-up within the first year, then the risk gradually increases with dilapidated immunity (Maartens, 2010).

Bartlett (2007) stated that HIV positive individuals are 6 to 50 times more likely to develop TB than those who are HIV negative. According to Friedland et al (2007), in quite a lot of countries with limited resources, the TB case rate has increased 5 to 10-fold from the time when HIV was discovered, and the prevalence of HIV infection among individuals newly diagnosed has surpassed 80%.

The 2008-2009 Khayelitsha annual activity report by Medecins Sans Frontieres in Western Cape (2010) revealed that approximately 50% of HIV patients starting ART have TB at the time of initiation. However, the integration of ART within TB services has enhanced efficiency, decreased waiting times before initiation of both TB and HIV treatment, and improved the percentage of TB/HIV co-infected patients accessing ART. Integration of ART in TB clinics provides an incentive for TB patients to take an HIV test. In 2008 99% of TB patients received counselling and 95% accepted to be tested. Among them 99% had CD4 counts done and were started on cotrimoxazole prophylaxis (Medecins sans frontiers, 2010). There are also the surfacing phenomena of MDR-TB and XDR-TB which need more research. According to Carter (2010) there was high prevalence of drug resistant TB among HIV patients in South Africa. In his cohort study, 21% of co-infected patients had MDR-TB and a further 4% had XDR-TB. A significantly higher rate of MDR-TB was found in patients with a previous history of TB therapy than those without a history (27% and 12% respectively). According to Wells, Ceigieski,

Nelson, Laserson, Holtz, Finlay et al (2007), the global HIV infection epidemic has increased TB incidence and may also be contributing to increases in MDR-TB prevalence. Institutional outbreaks of MDR-TB have primarily affected HIV infected individuals. The emergence of MDR-TB and XDR-TB represents the consequences of both TB and HIV co-infection (Bartlett, 2007).

The WHO (2010) report on drug-resistant TB indicated that due to a large proportion of missing data from the reporting countries regarding drug-resistant TB cases co-infected with HIV, it has not been possible to conclude whether an overall association exists between MDR-TB and HIV. However, TB patients co-infected with HIV living in Estonia, Latvia, Lithuania and in the Republic of Moldova appear to be more at risk of harbouring MDR strains. Similar results were found in a survey conducted in Mozambique in 2007 (WHO, 2010).

In terms of mortality, Wood, Middelkoop, Myer, Grant, Whitelaw, Lawn et al (2007) state that TB accounts for 38% to 40% of deaths among HIV patients in sub-Saharan Africa. Similar findings were reported by Carter (2006) who stated that TB kills 30% of people living with HIV/AIDS (PLWHA) worldwide and up to half of these deaths occur in African countries. Carter also estimated that one-third of the 40 million PLWHA are co-infected with TB. To reduce the burden of TB-HIV co-infection, WHO has recommended collaboration between TB and HIV/AIDS programmes at all levels with interventions such as the use of condoms, HIV testing for all suspected or known TB patients, increased awareness on the modes of HIV transmission as well as use of Isoniazide Prophylaxis Therapy (IPT) and cotrimoxazole prophylaxis (CPT). A study conducted in Malawi on TB patients co-infected with HIV showed that case fatality rate fell from 43% to 24% with the adoption of WHO recommendations. This suggests that CPT must be part of the routine care for a TB-HIV positive patient in order to

improve survival rates (Mwaungulu, Floyd, Crampin, Kasimba, Malema, Kanyongoloka et al, 2004).

2.3.3 The Burden of Tb and HIV Infection

The burden of TB and HIV is of great concern. According to Medecins sans frontiers (MSF 2007), the two conditions are intricately linked. Currently, 11million people are co-infected with TB and HIV, and half of all deaths of PLWHA are due to TB. Even though there is rising international recognition of the nature of the relationship connecting the two diseases, there is a massive failure to respond to the twin epidemic in an integrated way. Although there are clear guidelines from WHO on implementation of collaborative TB/HIV activities, TB and HIV programmes continue to work in isolation from each other (MSF, 2007). Harries, Zachariah, Corbett, Lawn, Santos-Filho, Chimzizi et al (2010), in the Lancet noted that, TB accounted for more than a quarter of the two million deaths due to AIDS related illnesses in 2008, yet efforts to contain TB-HIV co-infection have been 'timid', slow and uncoordinated.

The devastating burden of disease due to both TB and HIV is common in resource-limited countries and the hardest hit among these are in sub-Saharan Africa (Tsiouris et al, 2007). TB and HIV are currently the most deadly infectious diseases worldwide and takes the lives of roughly 10,000 people daily (Fauci, Mayer, Harrington, Burman, Cegielski and Wafaa, 2010). Regardless of the major progress made in the treatment of HIV, the AIDS epidemic remains an unmatched public health challenge, with an estimated 33 million people currently living with the virus and every year there are 2.7 million new HIV infections (WHO, 2008). On the other hand although the TB cure was found more than 5 decades ago, there is more TB today than ever before. Currently one-third of the world population is stricken by TB. In 2008, there was an

estimated 9.4 million new cases of TB. HIV/AIDS has exacerbated the TB epidemic across developing countries, and is considered a booster in MDR-TB as well as XDR-TB (Fauci et al, 2010).

The driver of TB and HIV co-epidemic seems to be a high annual risk of *Mycobacterium* TB in the community due to unrecognized infections coupled with intense social interaction and crowding (Bekker and Wood, 2010). Therefore, there is need to understand the epidemiological factors driving the twin epidemics in regions with hyperendemicity in order to inform TB/HIV programme managers, policy makers and clinicians as well. Harries et al (2010), suggest a radical approach to reducing HIV-related TB. They suggest field trials of testing all adults for HIV once a year, and immediately starting each individual who tests positive on ARV's or alternatively doing so in no more than five years after infection.

2.3.4 The Impact of TB Infection on HIV Prevention and Care and the Impact of HIV Infection on TB

Active TB is thought to increase HIV replication and disease progression as has been observed in HIV positive patients who have been treated for TB. The HIV positive patients are efficient transmitters of TB. IPT given for 6 months to HIV positive patients protects them against the development of TB (Hempstone et al, 2004). The risk of developing TB in individuals with a positive tuberculin test is 50 to 100 times greater in HIV positive patients than in a sero-negative person (Desormeaux et al, 1996, p.2 as cited by Hempstone et al, 2004). In part TB accelerates the progression of HIV by increasing systemic immune activation in patients with HIV, and also increases HIV replication (Sharma et al, 2005). HIV may possibly limit the sensitivity of the alcohol acid-fast bacilli (AAFB) sputum smear, the most widely (and often the only) available TB diagnostic method in resource-limited settings (Tsiouris, Gandhi, Wafaa, Friedland, 2007).

People living with HIV have nearly 10 times the risk of developing TB in their lifetime compared with HIV-negative individuals (Bastian and Krause, 2008, Marks, Magee & Robison, 2007). In management of the disease there are problems of interactions between some anti-TB and anti-retrovirotherapy drugs. For instance, Rifampcin reduces the lifespan of Nevirapine, thereby reducing the blood level concentration of Niverapine. Tuberculosis kills up to 30% of PLWHA worldwide and up to half of them are in African countries. It is estimated that one-third of the 40 million people currently living with HIV/AIDS are co infected with TB. In sub – Saharan African, up to 70% of TB patients are co-infected with HIV in some countries (Carter, 2006). TB has been identified as the leading cause of death in HIV/AIDS patients (WHO, 2004; Bastian et al, 2008; Sharma et al, 2005).

Undoubtedly, HIV infection has greatly complicated the issue of TB control worldwide. TB and HIV infections have resulted in about 12-14 million people becoming infected with both M. tuberculosis and HIV. Between 1990 and 2005, the incidence of TB increased at an average rate of 7% per year in countries with high HIV prevalence (≥5%) compared to 1.3% in countries with low HIV prevalence (≤5%) among adults (Friedland, Churchyard and Nardell, 2007).

HIV infection probably increases susceptibility to Mycobacterium tuberculosis infection (WHO, 2004). HIV infection is the single most powerful factor that increases the risk of progression from TB infection to active TB disease. The higher the HIV prevalence in a population, the greater the impact of HIV on TB incidence (WHO, 2003). Indeed, the distribution map for HIV infection can be superimposed on the distribution map of TB infection as well as that of poverty. Poverty, HIV and TB infections are rampant in the most vulnerable parts of the world

In the industrialized world the situation is completely different. About 5% of all HIV /AIDS cases are found there, together with about 5% of HIV-TB co-infection. Furthermore, 80% of TB patients are over 50 years old, and 85% to 90% of all the HIV infected are under this age. So the two groups with TB or HIV infection are unlikely to overlap, and as a result the impact of HIV on TB has been limited. In contrast, the third world countries have large numbers of individuals from the same age group (ages 20-49 years) who are infected with both TB and HIV a the situation that will certainly worsen in the coming decades (Caminero, 2003). According to Faussett and Ayes (2002), no country with severe HIV epidemic is successfully controlling tuberculosis. Sputum conversion is rapid and even faster among HIV positive than HIV negative patients (Rieder, 2002). Appropriate treatment of HIV co-infected TB patients increases survival time by two years on average, and the risk of dying from TB is at least double among those who are co-infected (Nahid et al, 2007).

2.4 STRATEGIES TO REDUCE THE TB AND HIV CO-INFECTION BURDEN

The global HIV epidemic is fuelling a strange increase in TB cases, and the number of HIV co-infected patients. Management of TB patients co-infected with HIV is fragmented with little coordination of care between the two programmes (Tsiouris et al, 2007). WHO (2004) has developed a policy on collaborative TB/HIV activities aimed at reducing the burden of co-infection. This policy is based on the principle of creating a system of collaboration between TB and HIV programmes. The system involves instituting a committee from national to district level which would be responsible for the coordination of TB/HIV activities, planning for both programmes, monitoring and evaluating the planned activities and determining the prevalence of HIV among TB patients. This committee should include TB and HIV patients and their support groups so that every stakeholder is involved. The committee should also be responsible for

capacity building at operational level and should engage in training, social mobilization and resource mobilization for the joint TB/HIV programmes.

In order to reduce the burden of HIV in TB patients and of TB in PLWHA, WHO has set the following recommendations: VCT for all patients known or suspected to have TB, HIV prevention for TB patients, treatment of TB in PLWHA, providing cotrimoxazole preventive therapy to all TB patients co-infected with HIV, starting ART in all PLWHA with a CD4 count of $\leq$ 350 cells/mm3 diagnosed with TB or all PLWHA with extra pulmonary TB regardless of CD4 count, drug susceptibility testing and patient monitoring and ensuring comprehensive HIV care and support services (WHO, 2009). At some point between 2002-2004, WHO and the Stop-TB partnership came up with interventions to reduce the burden of TB-HIV co-infection through the use of TB prevention strategies which included INH preventive therapy (IPT), intensified case finding, and infection control in combination with ART. These are called the '3 I's. IPT reduces the risk of active TB in HIV infections with latent TB. However, in areas with hyperendemicity the impact of IPT is predicted to be small (Bekker et al, 2010). An integrated treatment system also has the additional advantage of reducing the case fatality rate of clients co-infected with TB and HIV. The use of HAART in patients with TB is associated with improvement in outcomes in terms of decreased morbidity and dramatically reduced mortality (Abdool –karim1, Abdool –karim2, Friedland, Lalloo, El-sadr, 2004).

According to Colombani, Banatvala, Zaleskis and Maher (WHO, 2004) there is also the European framework which sets out the rationale for effective collaboration between HIV/AIDS and tuberculosis national programmes. It identifies five strategic components, namely; political commitment, collaborative prevention, intensified case-finding, coordinated treatment and strengthened surveillance, and eight key operations, namely; central coordination, policy

development, surveillance, training, supply management, service delivery, health promotion and research.

2.5 PERFORMANCE OF TB AND HIV PROGRAMMES IN NAMIBIA AND WALVIS BAY DISTRICT

Namibia has an HIV prevalence rate of 17.8% which is considered high, and it is the main contributing factor to the scaling up of TB cases. The country has a TB case notification of 665/100 000 population and the TB/HIV co-infection rate is 59% (MOHSS, 2009). The MOHSS report of 2009 regarding TB/HIV revealed that, in Walvis Bay district there were 771 cases of which 59.3% were TB cases and were aware of their HIV status. Of these 32.4% were HIV positive, 22% were on ART and 52.8% on CPT (MOHSS, 2010). Walvis Bay district also reported a total of 932 new cases enrolled in HIV care of which 83 (9%) were co-infected with TB. These were started on TB treatment, while 209 (22%) who did not have active TB and were put on Isoniazide Preventive Treatment (IPT). In 2009, 3 401 new clients took up VCT. This was 5% of the general population of 62 000 people in Walvis Bay district (DCC, 2009). In South Africa, Wallrauch, Heller, Lessells, Kekana, Barnighausen, Newll (2010) found of 88% VCT uptake among TB patients in Kwazulu- Natal. It is still not the internationally recommended 90%, but it is higher when compared to the Walvis Bay uptake.

The low rate of VCT uptake in the district may be related to the lack of awareness and stigma. VCT uptake among TB patients estimated at 59.3% is low compared to the national target of 95% (MOHSS, 2009). Stigma is of particular concern and the 2008 NDHS found that, despite improvements from previous years, only 39% of the respondents expressed a positive attitude towards people with HIV/AIDS (MOHSS, 2008). The Government of the Republic of Namibia

shares the vision of WHO of stopping TB by 2015 (WHO, 2006). With the support of various cooperating partners, the National TB control programme is striving to implement the following components of the WHO strategy: (i) expanding and enhancing Directly Observed Therapy (DOT) (ii) addressing TB/HIV, MDR-TB challenges; (iii) health system strengthening; (iv) engaging all health care providers, (v) empowering patients and communities and (vi) enabling and promoting research. The integration of HIV care in TB settings needs the provision of HIV counselling and testing by health care providers, coupled with HIV testing to distinguish between patients with and without HIV co-infection.

The availability of HAART, Condoms, CPT, for eligible HIV infected patients, may serve as potent encouragement for TB patients to come forward for HIV testing (Abdool-karim et al, 2004). Ever since TB was declared a global emergency in1993 by WHO, the DOT strategy has been the key intervention method that has been implemented widely to shape TB control. It has been effective in most regions worldwide, but ineffective in countries with high prevalence of HIV (WHO, 2004). Namibia adopted the DOT strategy in one region in 1993 and by 1996 had achieved country wide was coverage. The strategy has been expanded at community level with assistance from partners such as KNCV, who recruited community field workers called Field DOT promoters, or Lifestyle ambassadors who implement the strategy and educate communities on TB. They form support groups which are very active in Walvis Bay and have scaled up the TB success rate, and helped reduce the TB defaulter rate as well.

Namibia has adopted the WHO policy on reduction of the TB/HIV burden but not in its totality. At national level there is a Directorate of Special Programmes (DSP), which deals with TB, HIV and Malaria. The DSP coordinates the activities of TB/HIV and is well represented at regional level. At district level, however, there is a nurse in charge who is the district TB coordinator

(DTC) and there is also a nurse in charge for the HIV/AIDS programme. Both nurses are under the district management committee, but there is no a special body to coordinate the activities of both programmes. Funding is also from different partners, for instance, the HIV programme is mainly funded by CDC, PEPFAR and the Global Fund while TB is mainly funded by the Tuberculosis Control Assistance Program (TB CAP). The MOHSS contributes to both programmes.

In Walvis Bay district collaboration between the two programmes exists with some weaknesses in the patient flow system. TB activities are integrated in HIV programmes with screening of HIV patients for TB, the provision of IPT to HIV clients without signs of active TB and the distribution of condoms. HIV activities are also integrated in TB programmes with the referring of TB patients for HIV testing. However, this collaboration has weaknesses. For example, a patient suspected of TB in an ART clinic must go to a TB clinic for sputum collection and a patient diagnosed with TB in an ART clinic must go to a TB clinic for treatment. In the same manner a patient from TB clinic will be sent to an ART clinic for VCT, or to draw blood for baseline testing. Then the patient must take the results to an ART clinic for treatment. Sometimes patients are lost in the referral system between the two programmes.

TB and HIV programme collaboration needs to be strengthened in Walvis Bay by health care managers, to remove leakages in the referral system between the two programmes and to eliminate the loss of patients. There is need for community counsellors and HIV testers as well as ARV medicines to be in TB clinics in Walvis Bay. Sputum collection must also be done in ART clinics when a patient is suspected of having TB. TB medicines must be availed in ART clinics as well. The best will be for the two programmes to be operating in one building so that the patient is assisted in one place for all of his/her needs.

2.6 KNOWLEDGE, ATTITUDE AND PRACTICES IN RELATION TO TB/HIV CO-INFECTION AMONG TB PATIENTS

Knowledge is the information that leads to understanding or taking of informed action (Glanz et al, 2002). In this study Knowledge refers to what is known by a TB patient regarding TB and HIV in general, such as signs and symptoms, mode of transmission, VCT, prevention, treatment and care for both TB and HIV.

In a cross-sectional survey conducted on the uptake of VCT by TB patients in Free State Province, South Africa it was revealed that, 71.7% of the participants had knowledge about the relationship between TB and HIV, while 28.3% had no understanding of the link involving both diseases. In the same study 88.6% perceived HIV/AIDS as a problem in the community while 11.4% did not (Kigozi et al, 2010). A quantitative cross-sectional survey conducted by Moverman, El-sadr, Colson (2002) in Harlem, New York revealed that, HIV-infected patients with TB faced significant barriers to completing TB treatment. The barriers included unemployment, homelessness, and drug use. However, more than 75% of TB patients with HIV had a higher level of knowledge of TB at 28.6% compared to 4.4% for those without HIV infection. They also had a higher level of knowledge of HIV at 69% compared to 44.3% for those without HIV infection. However, the TB treatment completion was practically similar among HIV infected and uninfected patients (93.1% vs. 96.8%).

In Indonesia, Mahendradhata, Ahamad, Lefevre, Boelaert and Stuyft (2008) assessed the barriers to introducing HIV testing to TB patients and reported low knowledge among the patients about HIV. Misconceptions about HIV transmission were the major barriers to VCT for HIV. Similar findings were reported by Kittikraisak, Burapat, Kaewsa-ard, Watthanaamorkiet, Sirinak,

Sattayawuthipong et al (2009) who found low TB/HIV knowledge (20% on TB and 47% for HIV) as a factor leading to defaulting on TB treatment and avoidance of HIV testing and treatment. In South Africa however, Kalichman and Simbayi (2003) did not find any difference in knowledge level between those who knew their HIV status and those who did not.

Grotzinger's (2006) quantitative cross-sectional study on employees' knowledge, attitude and practices relating to HIV/AIDS in Namibia revealed that there was high level of knowledge regarding transmission and prevention of HIV. However, risky behaviours were found among participants as follows: 5.3% indicated that one cannot get HIV/AIDS from having many sexual partners, 7.5% believed that there is a cure for HIV/AIDS and 8.4% reported that one cannot get HIV after a single act of sexual intercourse

Studies by Mahendradhata et al (2008) and by Ngamvithayapong et al (2000) in Thailand suggest that low levels of knowledge may lead to the attitude of self stigmatization among TB patients and generate unwillingness to be associated with HIV services. These findings are similar to those reported in South Africa by Day, Miyamura, Grant, Leeuw, Munsamy, Baggaley & Churchyard (2003) who also found that stigma was a barrier to VCT uptake.

A cross-sectional study using a structured questionnaire and a qualitative study based on the focus group discussion technique, in Addis Ababa, Ethiopia revealed that, 33% of respondents feared TB because they knew that TB is associated with HIV (Gelaw, Genebo, Dejene, Lemma and Eyob, 2001). Another cross-sectional study using a structured questionnaire in Vietnam by Hoa, Diwan, Co and Thorson showed that there was a high level of knowledge about TB and its treatment. 93% of the respondents indicated that they received information on TB from health

care staff while 71.4% of men and 51.3% of women indicated that they got information on TB from Television. The average knowledge score was 7.07 out of a maximum of 10.

In Namibia, Angala (2000) found that one of the causes of the failure to eradicate TB was the lack of knowledge among TB patients which led to their failing to take TB drugs regularly and efficiently to render their cure. Similar findings were reported by Devey (2001) in Bihar, India where only 20.5% of respondents had sufficient knowledge of TB. It can be said that knowledgeable patients will positively contribute to the fight against and lowering of TB cases in a community. TB patients without knowledge of HIV, if positive, may continue infecting other people and thereby increasing TB cases.

As stated above, KAP studies in Namibia are scarce. A Demographic Health Survey (DHS) report about HIV knowledge in the general adult population puts it at about 80% (MOHSS, 2008). It can be assumed that this high level of knowledge would reflect a low rate of HIV infection. It is not the case, however, because the antenatal sentinel survey of 2008 revealed an infection rate of 19.8%, which indicates that there, is no significant sexual behaviour change.

Another survey study conducted in Namibia by Parker and Connolly (2007), revealed a high level of knowledge on HIV prevention as follows; 81% in Keetmanshoop; 85% in Rundu; 85% in Oshakati and 88% in Walvis Bay where respondents knew that the consistent use of condoms does protect against contracting HIV.

Normally, knowing the HIV status (whether positive or negative) of TB patients will help the patient to change their behaviour. If they are HIV negative they change behaviour to protect themselves from infection, and if they are HIV positive they take steps to access health care. Knowing the HIV status of a patient also enables health care providers to optimize management

of the diseases, and helps public health agencies to identify HIV infected contacts of TB patients. HAART can reduce the progression from infection to TB disease, TB relapse and death.

A person who holds strong beliefs that positively valued outcomes will result from performing certain behaviours will have a positive attitude toward the behaviour. In the same vein, an individual who holds strong beliefs that negatively valued outcomes will result from the behaviour will have a negative attitude toward the behaviour (Glanz et al, 2002). Client-initiated HIV testing also known as VCT has helped millions of people to be aware of their HIV status. Globally the coverage of VCT remains low (WHO, 2009). In 2007, WHO encouraged the adoption of provider-initiated linked confidential testing and counselling (PITC), which can increase the VCT uptake.

In their survey of the uptake of VCT by TB patients in Free State Province, South Africa, Kigozi et al, (2010) found that 67.5% of the participants had been tested for HIV while 32.5% had never been tested. The study established that knowing or losing someone to HIV/AIDS was associated with the uptake of VCT. A study conducted by Kanara, Cain, Chhum, Eng, Kim, Keo, et al (2009) found that of 1 017 TB patients not previously tested for HIV, 708 (70%) were tested. VCT also depends on many factors such as availability of counselors and testers at TB clinics or in the neighbourhood and the availability of ARV medicines. Mahendradhata et al's, (2008) survey conducted in Indonesia found that out of 1 269 TB patients offered unlinked anonymous HIV testing, 989 (77.9%) accepted but did not all attend, only 133 expressed interest in VCT and among them only 52 (39%) subsequently attended VCT. More still needs to be done to addressing barriers to VCT and to enhance its uptake.

Miyamura, Grant, Leeuw, Munsamy, Baggaley and Churchyard (2003) found in their survey among mineworkers in South Africa that 14% of participants perceived HIV testing to be more acceptable if antiretroviral therapy (ARV's) became more available. The participants wanted to take VCT if they would benefit afterwards. So the availability of ARV's can be a motivation for people to undergo VCT and thereby increase its uptake.

A study done on characteristics, needs, and HIV/TB knowledge among HIV-infected and HIV negative patients undergoing treatment for TB in Harlem, United States of America, revealed that, TB patients with HIV infection were less likely to be employed at 2.4% compared to the HIV negative patients at 15% (Moverman et al, 2002).

A study done under a USAID project in Lusaka, Zambia revealed that VCT services form a critical opportunity to provide risk reduction counselling and HIV prevention information and to act as a gateway to HIV/AIDS services for clients who test positive (Harries et al, , 2010). The researcher further said that, in a generalized HIV epidemic where multiple concurrent sexual partnerships are a significant driver of new infections, discussion of risk-reduction methods should be a main focus of pre-test and post-test counselling.

In addition, there is an ethical debate surrounding the issue of HIV testing among TB patients, mostly with regard to the unlinked anonymous testing method, in view of the improved prospects for HIV/AIDS treatment. This has led to linked confidential testing through an 'opt in' approach, which has been offered in VCT centres. In 2007, WHO and UNAIDS issued guidelines for the adoption of provider-initiated linked confidential testing and counselling (PITC). In contrast to VCT, PITC is based on an 'opt out' approach in which the clinician initiates counselling when an individual is seeking medical care with signs or symptoms compatible with HIV infection.

Finally, decisions about how to implement HIV testing in TB patients, should be guided by an understanding of issues surrounding HIV testing among TB patients from the local stakeholders' perspectives. As said above studies on groups other than TB patients suggest that knowledge, fear and access may constitute important barriers to HIV testing (Mahendradhata et al, 2008).

Stigma and discrimination associated with tuberculosis and HIV are among the greatest barriers to the prevention of further spreading of TB and HIV, and to the provision of adequate care, support and treatment. Stigma is harmful as it can lead to feelings of shame, guilt and isolation in the people living with TB. The discrimination they suffer results in them being denied services such as health care and others or entitlements (WHO, 2006). TB-related stigma has its roots not only in lack of information but also in deep-seated social mores and structures.

In Zambia, research has revealed that TB/HIV stigma is unfolding because of the link between TB and HIV. TB/HIV stigma leads individuals to either hide their TB diagnosis, delay seeking treatment or refrain altogether from getting help out of fear that people will think they have HIV. Many people question whether TB is still curable. The high death rate from TB due to AIDS has resulted in the illness being labelled 'Satan's disease" by Zambian traditional healers (Bond, 2006). Visible TB symptoms such as extreme weight loss, body weakness, and coughing spark speculation about a person's HIV status. TB/HIV co-infection stigma leads to TB patients being socially shunned, physically isolated and considered sexually immoral because of the HIV link. The Zambian research shows that many vulnerable groups with TB are not making use of health services available to and for them because they fear the stigma and discrimination related to HIV.

Structured in-depth interviews with 427 patients with symptom of a cough for more than 3 weeks conducted in an urban health clinic in Lusaka, Zambia showed that 49% of participants strongly agreed that attending the clinic for a TB test will make people think that these patients are suffering from AIDS. So one can say their perception was a strong predictor of delay in seeking a diagnosis and care. This delay leads to increase transmission of TB in the community (Faussett et al, 2002). It is the same perception in Walvis Bay district that TB is linked to HIV.

In Morocco, Ottmani (2008) found that 32% of non-patient respondents believed that a TB patient must be avoided, 54% believed that a woman with TB should not marry and 18% believed in divorcing a woman with TB. The responses depended on the level of education. Since educated respondents understand how TB is transmitted the results could have been a bit lower. In Walvis Bay too, tuberculosis has a stigmatizing aspect because of the close link to HIV. Therefore the patients and their families have a fear of what people will say or think People ask questions such as," can a TB patient eat with us?" "Can he or she stay with the spouse?" Some avoid TB patients who then suffer double stigma. So there is need to educate communities that TB is curable even in presence of HIV.

In a study done in Omaheke, Namibia on community based TB care, a question was asked about sharing a plate of food with a TB patient. The results revealed that 63% of the respondents declined sharing food with a TB patient for fear of contracting TB while 37% agreed to share a plate of food with a TB patient (Zvavamwe et al, 2006). This shows the stigma carried by TB in the communities, and the fear of contracting TB which is a result of the lack of information on TB transmission. The WHO Interim Policy on HIV-TB recommends HIV testing among TB patients as an entry point for integrated HIV-TB care and surveillance. Stigmatization may generate TB patients' unwillingness to use HIV associated services, with a potentially negative

impact on TB case detection and the lack of detailed operational guidelines are among the important barriers.

Nnoaham (2006) conducted a qualitative study to understand the perceptions and experiences of TB among Africans attending a TB clinic in London. The study highlighted that most of the TB patients offered the HIV test initially declined the test, fearing stigma and poor illness outcomes if they turned out to be positive. Once again stigma is shown to be a barrier to accessing TB treatment because of the link between TB and HIV co-infection. More effort is needed to change focus to adapting counselling topics to the local realities of the HIV epidemic. This can improve the efficacy and uptake of VCT among TB patients.

In the present study risky practices or behaviours include, engaging in unprotected sexual activities, having more than one sexual partner, unhygienic coughing behaviour, non adherence to treatment and delays in seeking health care. Such behaviours place TB patients at risk of contracting HIV, re-infection with HIV or TB and worsening morbidity when health care is delayed.

According to Kalichman and Simbayi (2003) in a study done in South Africa more than 40% of tested respondents (whether HIV positive or negative) had 2 or more sexual partners and 35% reported to have a sexually transmitted infection. Similar findings are reported by Parker & Connolly (2007) in Namibia. There is need for education and counselling on sexual behaviour to be continuously carried out in the communities.

2.8 CONCLUSION

The literature consulted showed that there are many studies that have been conducted on knowledge, attitude and practices or behaviour with regard to TB and HIV. Most of them revealed that the respondents had either low or inadequate knowledge of TB. This is true even among health workers. However, the respondents showed good knowledge on HIV, especially its transmission, but poorer knowledge on TB co-infection with HIV. In relation to attitude the literature revealed stigmatization of TB and HIV sufferers. With regard to practices, VCT uptake is low in the general population and fair among TB patients. The adoption of provider-initiated testing and counselling (PITC) in health facilities can improve VCT uptake and HIV care. Risky practices such as having more than one sexual partner, non-consistent use of condoms and delays in seeking health care behaviour were revealed by the literature.

In addition, the literature was reviewed to get more insight and understanding on TB patients regarding co-infection with HIV, and to identify the gaps in literature which can support the selection of the research topic. Different sources were accessed to find the literature and these included the internet, library of the University of Namibia (UNAM) and many others. The literature reviewed helped in the conceptualization of and understanding of concepts such as co-infection of TB and HIV, knowledge, attitude and practice of TB patients. The current understanding of these concepts was highlighted in this chapter, as were the findings from previous studies. The strengths and weaknesses of the previous studies are identified below to justify the choice of the topic of this study.

2.9 STRENGTHS AND WEAKNESSES OF PREVIOUS STUDIES

The studies were of high scientific value and were drawn from a wide range of places. They were conducted on patients, health workers or the general population, and some of them were conducted in America, Europe and Asia on continents which have social conditions, levels of education, and cultures that are different when compared to Africa where Namibia belongs. Some of the studies were qualitative and used small samples, in-depth structured interviews, self administered questionnaires and cohort studies. However, none of the studies reviewed or consulted were done on knowledge, attitude and practice among TB patients regarding HIV co infection in the Walvis Bay district of Namibia. This justifies the choice of the topic of this study. It is hoped that the study will contribute to a true reflection of KAP vis-à-vis TB and HIV co-infection in the Walvis Bay setting.

2.10 THE THEORETICAL FRAMEWORK

The Health Belief Model, suggests that for individuals who display high-risk behaviours, perceived susceptibility is necessary before commitment to changing these risky behaviours can occur (Glanz, Rimer & Lewis, 2002; Janz, Champion, Strecher, 2002). In this study the Health Belief Model was used to identify beliefs that influence an individual's conscious decision to undertake certain health-related actions. Based on the model, it is assumed, for example, that if a TB patient with a known HIV status would use a condom to avoid being re-infected or infecting others with HIV, a TB patient co-infected with HIV would take TB treatment to be cured and ART to prevent a relapse, and an HIV positive patient without signs of TB will take IPT to prevent TB infection.

CHAPTER 3: METHODOLOGY

3.1 INTRODUCTION

This chapter describes the study setting, study design, study population, selection of participants and the methods used for data collection and data analysis. In addition, the validity and reliability of the study and ethical considerations of the study are discussed.

3.2 THE STUDY SETTING

The study was conducted in Walvis Bay district which is located in the Erongo region in the Western part of Namibia. Namibia is located in the south-western part of Africa with a surface area of 824,000 square kilometres and a population of 2,143,410 in 2010 (MOHSS, 2 008). It is bordered to the North by Angola and Zambia, to the South by South Africa, to the East by Botswana and Zimbabwe, and to the west by the Atlantic Ocean (MoHSS, 2006). Administratively, the country is divided into 13 regions inclusive of Erongo Region where the research took place. The Namibian economy is characterised by a heavy dependenceon the exploitation of natural resources such as minerals, fish and tourism. It has a per capita GPD of $4,135 (Global Property Guide, 2009), with a high unemployment rate estimated at 37%. Of the people aged 15years and older, 45% have some form of schooling while 15% never attended school (MOHSS, 2006; National planning commission, 2003).

With regards to health care provision, the health sector consists of public and private health care providers. Private and mission hospitals make important contributions to the health sector. However the public sector through the Ministry of Health and Social services is the main service provider. The public sector has roughly 1,150 outreach points, 260 clinics, 40 health centres, 30

district hospitals, 3 intermediate hospitals, and 1 national referral hospital, as well as many social welfare services (MOHSS, 2008). TB and HIV services are established in the above mentioned health facilities.

A recent report showed that, more than 80% of patients in need of ART in Namibia received treatment (MOHSS, 2010). The 13 332 cases of all forms of TB in 2009, translated into a case notification rate (CNR) of 634 per 100 000 population (MOHSS, 2010), and a treatment success rate of 82% against the national and global target of at least 85%. There was a treatment failure rate of 4%, a defaulter rate of 4%, and a death rate of 6%. There were 275 cases of MDR, 17 cases of XDR-TB, a VCT uptake of 74% among TB patients registered in 2009 and among them 58% were HIV positive.

Walvis Bay district is one of the four districts in the coastal region of Erongo in the western part of Namibia. It is essentially urban with a rural constituency. It covers 1 124.05 square kilometres and has a population of 62 000 people (Walvis Bay Municipality, 2007). Walvis Bay has a deep-harbour port with a well established fishing industry which makes it attractive for thousands of job seekers from other parts of the country. This has lead to overcrowding in poorly ventilated accommodation, the mushrooming of shebeens, high unemployment and poverty creating a recipe for the high prevalence of diseases such as TB, HIV and other sexually transmitted infections (STI's).

In 2008, Walvis Bay reported 880 TB cases of all forms of TB, out of which 284 cases (32%) were co-infected with HIV. In 2009 a total of 868 cases were noted. Of these 616 (71%) were tested and 58% were found to be HIV positive (MOHSS, 2009). Regarding HIV programmes, Walvis Bay reported in 2009 that 932 new cases were enrolled in HIV care. Out of these 83 (9%)

were co-infected with TB, 209 (22%) were started on IPT, and 667 (72%) on CTP. The health services provision in the district is mainly in public institutions. There is one District hospital which has 140 beds, one health centre, four clinics and three outreach points. There are also private care providers including a hospital, pharmacies, and ambulances providing care in partnership with the government institutions. The main languages spoken are Oshiwambo, Afrikaans, and English**.**

3.3 RESEARCH METHOD AND STUDY DESIGN

3.3.1. The Research method

The quantitative research method was used in order to answer the research questions of this study. According to Polit and Beck (2004), the quantitative methodology uses deductive reasoning to generate hunches that are tested in the real world. Therefore, to quantify and measure the knowledge, attitude and practices of TB patients regarding HIV co-infection a quantitative research method is required. Although a qualitative approach could have given a good exploration or in-depth analysis of participant's knowledge, it was not used in this study because it cannot quantify and measure the knowledge, attitude and practices of TB patients regarding HIV co-infection.

3.3.2. The Research design

A research design refers to the structured approach followed by a researcher to answer a particular research question (Joubert, Ehrlich, Katzenellenbogen & Abdool Karim, 2007). A cross-sectional design was used to conduct this study. According to Polit and Beck (2004), a cross-sectional design involves the collection of data at one point in time: hence the phenomena

under study are captured during one period of data collection. This study design was chosen in that it provides a proficient and rapid means of revealing the knowledge, attitude and practices of TB patients regarding HIV co-infection, and it analyses data with numerical comparisons. In addition, it has the advantage of being less costly and more economical in time than other designs. However, its core limitations are the probability of recall bias, bias in the design and using a questionnaire to collect sensitive information such as revealing the fact that one has more than one sexual partner.

3.4 THE STUDY POPULATION

The estimated study population was based on the average TB patients registered in the Walvis Bay district per year, aged 18 years and older. As discussed in section 3.1, in 2008 there were 868 registered TB patients, while in 2009, the number rose to 880 patients, giving an average of 874 TB patients per year. Therefore, the estimated study population was 874 TB patients.

3.5 SAMPLE SIZE AND SAMPLING TECHNIQUE

3.5.1 Sample size calculation

Based on the population size of 874 and a confidence level of 95%, the sample size of 267 was calculated using the method described by Saunders et al. (2009:581-582):

- The confidence level was estimated at 95% (*z* value of 1.96).
- The confidence interval or margin of error was estimated at +/-5

Assuming that 50 percent of the sample will have the specified attribute (Estimated from a worst scenario with p% =50 and q%=50)

The minimum required sample size was determined using the formula

$$n = p\% \times q\% \times \left[\frac{z}{e\%} \right]^2$$

where

n is the minimum sample size required

p% is the proportion belonging to the specified category

q% is the proportion not belonging to the specified category

The confidence level was estimated at 95% (z value of 1.96)

e% is the margin of error was estimated at +/-5

n' is the adjusted sample size

$$n = 50 \times 50 \times \left[\frac{1.96}{5} \right]^2$$

This calculation gave a minimum sample size n of 385

The adjusted sample size based on the minimum population size of 874 was calculated as follows:

$$n' = \frac{385}{1 + \left[\frac{385}{874} \right]} = \mathbf{267}$$

The minimum adjusted sample size used in this study is therefore 267 TB patients.

3.5.2 The Sampling technique

The sampling method used in this study was Stratified Random Sampling. This method according to Polit and Beck (2004), involves dividing the population into 2 or more groups of

homogenous strata followed by the random selection of elements in each group. In this study to select the sample units, the population was divided into two groups or strata of patients. Stratum 1 included all TB patients tested for HIV and whose HIV status was known as either HIV negative or HIV positive TB patients. Stratum 2 comprised of TB patients with unknown HIV status. The required sample size for each stratum was determined as follows:

For stratum I: Since an estimated 60% of TB patients in Walvis Bay have known HIV status (MOHSS, Government of Namibia, 2010), this stratum was to have 60% of the sample size. This worked out to be 158 respondents out of 267.

For stratum II: Since an estimated 40% of TB patients in Walvis Bay have unknown HIV status (MOHSS, Government of Namibia, 2010), this stratum will have 40% of the sample size of 267 meaning 109 respondents.

3.6 THE DATA COLLECTION PROCEDURE

3.6.1 The Data collection method

Data was collected through face-to-face interviews using a structured questionnaire administered by trained research assistants. The research assistants were TB field promoters who are employed in the District and are familiar with TB patients and the area. This questionnaire was translated from English to Afrikaans and Oshiwambo as these are the languages commonly spoken in Walvis Bay. The questionnaires were administered at Walvis Bay State Hospital, the TB clinic at Kuisebmund health centre and the 4 TB DOT points in the District namely, Tutaleni, Narraville, Coastal clinic, and Kondja. TB registers were used as source of information for details and addresses of participants not accessed through these points. One of the advantages of using this method to collect data is that it reduces the difficulties of recording answers, taking

into account the low literacy levels of some participants (Burns & Grove, 2005). However, the researcher acknowledges that there are some disadvantages related to this method. There is the risk of interviewer bias and the method prevents participant anonymity as some of interviewers knew some of the respondents personally (Polit & Beck, 2004).

The research instrument used was a structured questionnaire which collected data on knowledge, attitude and practice with regard to TB and HIV co-infection among TB patients. The questionnaire itself had four sections: Section 1 covered demographic characteristics; Section 2 with twenty items measured knowledge; section 3 with ten items measured attitude and section 4 with ten items measured practices (Appendix number A).

In developing the research instrument, the researcher adapted some items in the questionnaire from various studies such as Kalichman & Simbayi (2003); Talbot, Halabi, Machanda, Mwansa, and Wells (2004); Mahendradhata et al. (2008); Elsabe Grotzinger (2006) and finally the guide by WHO on developing KAP Surveys (WHO, 2008)

3.6.2 Variables measured by the instrument

The dependent variables measured are knowledge, attitude and practices related to TB and HIV. The independent variables include the HIV status of the respondent TB patients and demographic characteristics such as age, sex, and education.

3.7 DATA ANALYSIS

Prior to data analysis, data editing was performed to identify errors and strange values and to compare them to the questionnaire for correction. Then the data was captured and analyzed using

Statistical Package for Social Sciences (SPSS) software version 16. The forty questions in the questionnaire were grouped into 3 indices measuring the composite score of Knowledge, attitude and practices for data analysis. Q-sort technique, factor analysis and Guttman scaling were used (See chapter 4).

3.7.1 The Composite Measures of Knowledge, Attitude and Practices on TB and HIV

A total of 20 items on knowledge were initially included in the questionnaire and had answer options of "yes", "no" and "don't know". Affirmative answers scored 1 mark, while negative answers and don't know answers scored 0 marks. However, to facilitate analysis, data reduction was done and knowledge was divided into two dimensions namely, knowledge on TB/HIV prevention and knowledge on TB/HIV care. To achieve data reduction and the distribution of questionnaire items into the two dimensions, Q-sort technique and Factor Analysis using Principal Component analysis with varimax rotation were employed. Using the eigenvalue greater than 1.0 and items with factor loadings greater than 0.40, were included in the analysis of the two dimensions of knowledge were extracted. Nine items were retained for measuring Knowledge on TB/HIV prevention and 4 items for measuring knowledge on TB/HIV care (Field, 2009).

To measure attitude towards VCT services, the following steps were taken: four items that closely reflect the measurement of attitude towards VCT services were selected out of the initial ten and a scale was developed out of these items, using the Guttman scaling process (Trochim, 2006). These were items 3.1.5, 3.1.6, 3.1.7a and 3.1.10 (Questions assessing attitude towards VCT services, Appendix A & B). Then a cumulative scale (although not perfect) was developed out of these four items based on the fact that, generally, a person who agreed to item 3.1.6 tended

to also agree with items 3.1.10, 3.1.7a, and 3.1.5. The details of the scale are described in the next chapter.

To measure attitudes towards TB/HIV prevention and care, the following steps were taken: four items that closely reflect the measurements of attitudes towards TB/HIV prevention and care programmes were selected out of the initial ten and a scale was developed out of these four items, using the Guttman scaling process. These were items 3.1.1, 3.1.2b, 3.1.7b and 3.1.9b. Then a cumulative scale (although not perfect) was developed out of these four items based on the fact that, generally, a person who agreed to item 3.1.9b tended to also agree with items 3.1.2b, 3.1.7b, and 3.1.1. The findings are presented in chapter four.

To measure practices, the ten questionnaire items on practices were grouped in two dimensions namely, practices related to prevention (4.1.1, 4.1.5, 4.1.6, 4.1.8, 4.1.9 and 4.1.10) and practices related to care (4.1.2, 4.1.3, 4.1.4 and 4.1.7). Correct answers were marked as one point towards the respondents' total practice marks.

3.7.2 Descriptive and Inferential Statistics

Both descriptive and inferential statistics were used to analyse the data using SPSS version 16.0. Charts and figures were generated using Excel 2007.

The descriptive statistics used in this study include:

- Frequency distributions: They were used to report the frequency of occurrence of variables measured for both dependent (knowledge, attitude and practice) and independent variables (HIV status and demographic characteristics).
- Measures of central tendency: The arithmetic mean was used as a summary statistic in most of the descriptive statistics.

- Measure of dispersion: Standard deviation was the most used measure of dispersion around the mean.

The inferential statistics used in this study include:

- Pearson's correlation coefficient: This was used to measure the strength of association between some dependent and independent variables. To assess the significance of these statistics the two-tail t-test was used with a cut off p-value of 0.05.

- Analysis of Variance (ANOVA): It was used for the comparison of means between groups. A p-value of 0.05 was used to test for significance.

3.8 VALIDITY AND RELIABILITY

3.8.1 Validity

Validity refers to the degree to which a measure does what it is intended to do (Terre Blanche, Durrheim & Painter, 2007). It is a measure of truth or accuracy. Internal validity is the extent to which the effects detected in a study are a true reflection of the reality rather than the result of extraneous variables. External validity is the extent to which the study findings can be generalized beyond the study sample (Burns & Grove, 2005). Internal validity in this study was ensured by the fact that the questionnaire, translated into local languages, was pre-tested in order to improve on any identified problems in understanding amongst the respondents. The research assistants were trained in standardized data collection procedures and, in addition, the supervisor got a copy of the transcribed data to ensure consistency. Since the data was collected in different places, the samples were regarded as independent samples and consistency in responses assisted in assessing the validity of the data. With regard to external validity, the fact that the study

context is specific to the culture and environment of Walvis Bay District, which is an urban coastal town in Namibia, the sampling method and the sample size suggest that the findings might not be necessarily generalized to other areas that are not similar to the above district.

3.8.2 Reliability

According to Bowling (2002), reliability is a test of the stability of a measure (for instance, the reproducibility of responses to the scale), in its application to more than one epoch of time (test-retest) in which it is not expected to vary. In this study, reliability was assured by using a tool (questionnaire) already tested for reliability in the pilot study and in previous studies in similar settings. However, since some questions were formulated by the researcher and others were modified and translated into the local languages, the internal consistency of the questionnaire was re-assessed using Cronbach's alpha.

3.8.3 The Pilot Study

A pilot study was conducted prior to data collection. It was conducted at Tutaleni DOT point on 10 TB patients who were not included in the final study. This assisted in identifying questions which posed problems to both interviewers and respondents. For example, question 2.1.7 was not well formulated initially. It read HIV treatment cures the disease HIV instead of AIDS); for question 2.1.3B, the translation from English to Oshiwambo was not initially correct but was corrected after the pilot study; for question 4.1.5, casual sex encounter was replaced by sex worker and lastly some typing errors were corrected and missed words were inserted.

3.9 STUDY LIMITATIONS

Although it was expected that participants would answer honestly and with integrity, it is also possible that some of them might hide the truth when giving answers. This might affect the study results and should be considered as a possible study limitation. Another possible study limitation may be related to the fact that the study is context-specific to the culture and environment of Walvis Bay District in Namibia and this may limit the generalization of findings to other areas that are not similar to the above district.

3.10 ETHICAL CONSIDERATIONS

The following ethical issues were observed during the process of conducting this study:

(i) Ethical clearance was obtained from the University of the Western Cape Higher Degree Committee, while authorization to conduct research was sought from the Ministry of Health and Social Services, Namibia.

(ii) A written informed consent was obtained from the respondents after providing them with information on the purpose of the study and their rights of participation in the research (Appendix: C).

(iii) Anonymity and confidentiality was ensured by using questionnaire that did not require respondents to divulge their identity. The HIV status of participants was kept confidential by the research assistants who are part of the shared confidentiality team by virtue of being TB field promoters (Appendix: D).

3.11 CONCLUSION

This chapter discussed the methodology used to assess the level of knowledge, attitude and practice with regard to tuberculosis and human immunodeficiency virus co-infection among tuberculosis patients in the Walvis Bay district. The quantitative method and a descriptive cross-sectional survey design were used. The Stratified Random Sampling method was used to select a sample size of 267 respondents. In addition, the chapter discussed the data collection method, the research tool, and how the face-to-face interviews were carried out by trained research assistants using a structured questionnaire. The research instrument/tool also measured the dependent and independents variables. Data analysis, study limitations, validity, reliability and ethical considerations were also discussed.

CHAPTER 4: RESULTS

4.1 INTRODUCTION

This chapter presents the results of the analysis of the data collected from respondents through questionnaires. The findings are reported according to the objectives and research questions of this study.

4.2 RSPONSE RATE

All the targeted 267 respondents were interviewed and this gave a response rate of 100%.

4.3 DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

This section presents the descriptive statistics pertaining to HIV status and demographic characteristics of the respondents namely; age, gender, and education level and employment status.

4.3.1 HIV status, Age, Gender, Education and Employment Status of Respondents

As shown in table 4.1 below, 52.8% of the respondents were female and 47.2% were male. The same table also shows that most respondent were in the age categories of 25-34 years and 35-44 years. The table also shows that most HIV positive respondents were in the age group 18 to 24 years (47.2%), while the lowest proportion of HIV positive respondents were in the age category 55 years and above (22.2%).

Table 4.1: Categories of Respondents according to age, gender, education and employment

	Age groups	18-24 Yrs		25-34 Yrs		35-44 Yrs		45-54 Yrs		55 Yrs & above		Total	
		n	%	n	%	n	%	N	%	n	%	n	%
HIV status	Unknown status	13	12	47	43	37	34	10	9	2	2	109	41
	HIV positive	17	23	27	36	24	32	2	3	5	7	75	28
	HIV negative	6	7	28	34	37	45	10	12	2	2	83	31
Gender	Male	20	55.6	37	36.3	52	53.1	10	45.5	7	77.8	**126**	**47.2**
	Female	16	44.4	65	63.7	46	46.9	12	54.5	2	22.2	**141**	**52.8**
Education	None	1	2.8	3	2.9	6	6.1	5	22.7	1	11.1	**16**	**6.0**
	Primary	1	2.8	32	31.4	44	44.9	12	54.5	5	55.6	**94**	**35.2**
	Secondary	32	88.9	63	61.8	47	48.0	5	22.7	3	33.3	**150**	**56.2**
	Tertiary	2	5.6	4	3.9	1	1.0	0	0.0	0	0.0	**7**	**2.6**
Employed	No	19	52.8	48	47.1	43	43.9	11	50.0	5	55.6	**126**	**47.2**
	Yes	17	47.2	54	52.9	55	56.1	11	50.0	4	44.4	**141**	**52.8**
Total		**36**	**13.5**	**102**	**38.2**	**98**	**36.7**	**22**	**8.2**	**9**	**3.4**	**267**	**100**

With regards to the level of education, only 6% of respondents never attended school, while 94% of respondents attended school. Among those who have some form of education, 35.2% completed primary school, 56.2% completed secondary education and only 2.6% reached tertiary education. Regarding employment, Table 4.1 shows that 52.8% of respondents had some form of paid employment and 47.2% were unemployed. Most of the employed were general workers in the fishing sector, hospitality industry, construction industry, and in security services.

4.3.2 Level of Education, Employment Status and HIV Status of Respondents

The results of the distribution of HIV status according to the level of education and the employment status are presented in table 4.2 below. This table shows that majority (38.7%) of HIV positive respondents have secondary education, followed by those with primary and those with no education and the lowest is for those with tertiary education. The table also shows that

the proportion of HIV positive respondents is higher in the unemployed group (39.0%) than in the employed group (31.0%).

Table 4.2: HIV status according to education and employment

	HIV status	Unknown		Negative		Positive		Total	
		n	%	n	%	n	%	n	%
Education	None	9	56.3	2	12.5	5	31.3	**16**	**6.0**
	Primary	40	42.6	25	26.6	29	30.9	**94**	**35.2**
	Secondary	58	38.7	34	22.7	58	38.7	**150**	**56.2**
	Tertiary	2	28.6	3	42.9	2	28.6	**7**	**2.6**
Employed	No	54	42.9	33	26.2	39	31.0	**126**	**47.2**
	Yes	55	39.0	31	22.0	55	39.0	**141**	**52.8**
Total		**109**		**64**		**84**		**267**	

4.4 KNOWLEDGE OF TB/HIV PREVENTION AND CARE

4.4.1 Analysis of Knowledge

A total of 20 items on knowledge were initially included in the questionnaire and had answer options of "yes", "no" and "don't know". If the response was yes a score of 1 was assigned, else zero. The assessment of knowledge was divided into two dimensions: (1) knowledge on TB/HIV prevention; (2) knowledge on TB/HIV care.

For analysis purposes, Q-sort technique and Factor analysis using Principal Components was employed (Heyl, Kinicki and Callarman, 1984). Using the eigenvalue greater than 1.0 test and items that loaded greater than 0.40 , two components of dimensions of knowledge were generated (Field, 2009). The results are shown in table 4.3 and reveal that component 1 captured items on knowledge on prevention. These 9 items are highlighted in yellow and loaded greater than 0.4 as such were selected for the composite measure of knowledge on prevention.

Table 4.3: Factor analysis loading matrix for knowledge items

Items	Component	
	1. Knowledge on Prevention	**2. Knowledge on care**
2.1.14 TB can be transmitted between people living or working together	**0.679**	0.183
2.1.19. Correctly taking TB med, covering mouth, proper sputum disposal	**0.648**	0.179
2.1.6 HIV can be transmitted through one sexual intercourse	**0.647**	0.103
2.1.12 Is TB curable?	**0.632**	0.060
2.1.11 Can people protect themselves from HIV by abstaining?	**0.527**	0.061
2.1.15. In Namibia, TB medication is taken daily until the end	**0.524**	-0.053
2.1. 8 An HIV positive pregnant woman can transmit HIV to her baby	**0.444**	0.339
2.1. 5 HIV can be contracted through Handshake	**-0.435**	0.308
2.1.17. TB is transmitted through cough and sneezing	**0.422**	-0.140
2.1.18. Traditional medicines can cure TB	0.385	-0.261
2.1. 9 HIV/AIDS is caused by spirits/supernatural forces	-0.372	0.176
2.1.1 Signs and symptoms suggestive of TB	-0.106	-0.042
2.1.13 TB and HIV treatment can be taken together	0.104	-0.001
2.1. 10 Most people who have HIV show signs of the disease immediately	-0.028	**0.667**
2.1. 4 TB medications treat also HIV	-0.298	**0.437**
2.1.7 ART cures HIV	-0.334	**0.434**
2.1.16. An HIV+ person without TB can get IPT	0.173	**0.424**
2.1.20. Minimum duration of TB treatment in Namibia is six months	-0.073	0.353
2.1.3 A person with TB can also have HIV	0.279	0.325
2.1.2 Washing after sex protects against HIV	0.041	0.268

These items include:

- 2.1. 5 HIV can be contracted through handshake
- 2.1.6 HIV can be transmitted through one sexual intercourse
- 2.1. 8 An HIV positive pregnant woman can transmit HIV to her baby
- 2.1.11 Can people protect themselves from HIV by abstaining?
- 2.1.12 Is TB curable?
- 2.1.14 TB can be transmitted between people living or working together
- 2.1.15. In Namibia, TB medication is taken daily until the end
- 2.1.17. TB is transmitted through cough and sneezing

- 2.1.19. Correctly taking TB med, covering mouth, proper sputum disposal

Table 4.3 also shows that in component 2 (knowledge on care), 4 items (highlighted in yellow) loaded greater than 0.4 and were selected for the composite measure of knowledge on care. These items are:

- 2.1. 4 TB medications treat also HIV
- 2.1.7 ART cures HIV
- 2.1. 10 Most people who have HIV show signs of the disease immediately
- 2.1.16. An HIV+ person without TB can get IPT

The items highlighted in yellow in table 4.3 above are the items that loaded more than 0.4 when factor analysis was run. For each components of knowledge, these items were considered to be more likely to measure each component of knowledge. With the aim of data reduction, only the highlighted items were selected to measure each component of knowledge.

4.4.2 Knowledge on HIV/TB Prevention and Transmission

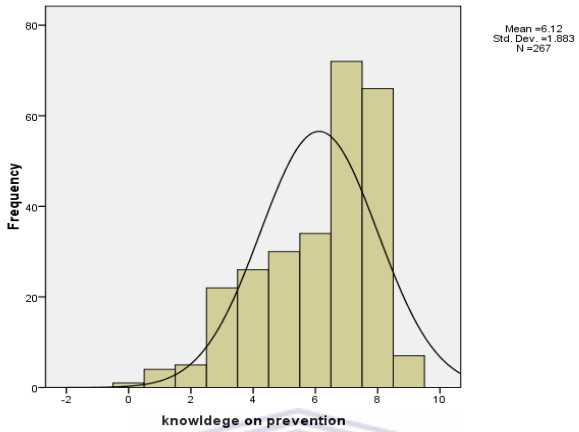
As discussed in the previous section, the composite knowledge on HIV/TB prevention was measured by 9 items. This section presents the descriptive statistics and ANOVA results pertaining to this dimension of knowledge.

4.4.2.1 Mean Level of Knowledge on HIV/TB Prevention

The average level of knowledge on this dimension was calculated by adding the totals marks scored by each respondent on the 9 items and dividing the total by the number of respondents (n=267). The result was a mean of 6.12 (out of 9) with a standard deviation (SD) of 1.8. These results are presented in form of a histogram below in Figure 4.1. The histogram shows the

distribution of respondents' levels of knowledge on prevention around the mean. The figure shows that most (54.3%) respondents have knowledge above the mean.

Figure 4.1: Distribution of respondents' level of knowledge on TB/HIV prevention



In addition, analysis of data on knowledge on prevention also revealed that 78.2% of respondents scored a level of knowledge on prevention of 5 or more (out of possible 9 marks) as shown in table 4.4 below.

Table 4.4: Distribution of respondents according to level of knowledge on TB/HIV prevention

Knowledge level	N	%	Cumulative %
0	1	0.40	0.4
1	4	1.5	1.9
2	5	1.9	3.7
3	22	8.2	12
4	26	9.7	21.7
5	30	11.2	33
6	34	12.7	45.7
7	72	27	72.7
8	66	24.7	97.4
9	7	2.6	100
Total	267	100	

4.4.2.2 Knowledge on TB/HIV Prevention and Demographic Characteristics

This section presents the results of the analysis of the relationship between Knowledge on TB/HIV prevention and selected demographic characteristics of respondents. The findings are summarised in Table 4.5 below.

Table 4.5 Knowledge on TB/HIV prevention according to demographic characteristics

		N	%	Mean	SD
Age groups	**18-24 years**	36	13	6.53	1.63
	25-34 years	102	38	6.12	1.86
	35-44 years	98	37	6.02	1.87
	45-54 years	22	8	5.45	2.44
	55 & above	9	3	7.11	1.27
Education Level	**None**	16	6	5.62	2.22
	Primary	94	35	5.54	1.97
	Secondary	150	56	6.47	1.72
	Tertiary	7	3	7.43	0.79
HIV Status	**Unknown**	109	40.8	5.83	1.97
	Negative	64	24.0	6.22	1.8
	Positive	94	35.2	6.37	1.81
Gender	**Male**	126	47	6.29	1.84
	Female	141	53	5.96	1.91
	Total	267	100		

To assess if the difference in the level of knowledge on TB/HIV prevention between the different groups of demographic characteristics, ANOVA F test was run and revealed that:

- There is no association between the level of knowledge on TB/HIV prevention and age of respondents: $F(4,262)=1.822$, $p=0.125$.
- There is a statistically significant association between the level of knowledge on TB/HIV prevention and education level of respondents: $F(3, 263) = 2.813$, $(p=0.004)$.

- There is no association between knowledge on TB/HIV prevention and the HIV status of respondents: F(2,264)=2.200, p=0.113.
- There is no association between knowledge on TB/HIV prevention and gender of respondents: F(1,265)=1.942, p=0.165.

4.4.3 Knowledge on HIV/TB treatment and care

The composite measure of Knowledge on HIV/TB care was assessed through the analysis of responses to 4 questionnaire items selected through the process described in section 4.3.1 above. This section presents the findings of this analysis.

4.4.3.1 Mean Level of Knowledge on HIV/TB Care

The average level of knowledge on this dimension was calculated by adding the totals marks scored by each respondent on the 4 items and divided the total by the number of respondents (n=267). The result was a mean of 1.01 (out of 4) with a SD=0.983. The findings presented in Table 4.6 below also revealed that 73.5% of respondents have a level of knowledge on care that is below 2 (out of possible 4).

Table 4.6: Distribution of respondents' level of knowledge on TB/HIV care

Level	n	%	Cumulative %
0	96	36	36
1	100	37.5	73.4
2	46	17.2	90.6
3	22	8.2	98.9
4	3	1.1	100
Total	267	100	

4.4.3.2 Knowledge on TB/HIV Care in Relation to Demographic Characteristics

This section presents the results of the analysis of the relationship between Knowledge on TB/HIV care and demographic characteristics of respondents and they are summarised in table 4.7 below.

Table 4.7 Knowledge on TB/HIV Care in Relation to Demographic Characteristics

		n	%	mean	SD
Age groups	18-24 years	36	13.5	0.78	0.989
	25-34 years	102	38.2	1.03	1.019
	35-44 years	98	36.7	1.03	0.947
	45-54 years	22	8.2	1.23	0.973
	55 & above	9	3.4	1.00	1.00
Education	**None**	16	6.0	1	0.966
	Primary	94	35.2	1.2	1.022
	Secondary	150	56.2	0.93	0.956
	Tertiary	7	2.6	0.29	0.488
HIV status	**Unknown**	109	40.8	0.83	0.848
	Negative	64	24.0	1.12	0.917
	Positive	94	35.2	1.15	1.136
Gender	**Male**	126	47.2%	1	0.963
	Female	141	52.8%	1.02	1.003
Total		267	100.0%		

To assess if the difference in the level of knowledge on TB/HIV care is due to the effect of demographic characteristics, ANOVA F test was run and revealed that:

- There is no association between knowledge on TB/HIV care and the age of respondents $F(4,262)=0.790$, $p=0.533$.
- There is a significant association between knowledge on TB/HIV care and the level of education of respondents: $F(3,263)=2.884$, $p=0.036$.

- There is a significant association between knowledge on TB/HIV care and the HIV status of respondents ($F(2,264)=3.352$, $p=0.037$). Thus the observed difference in knowledge on TB/HIV care may be associated with HIV status of respondents.
- There is no association between knowledge on TB/HIV care and the gender of respondents: $F(1, 265)=0.031$, $p=0.860$).

4.5 ATTITUDE OF RESPONDENTS WITH UNKNOWN HIV STATUS TOWARDS VCT SERVICES

To select items that closely reflect the measurements of attitudes towards VCT services and develop a scale out of these items, Guttman scaling process was used. The purpose of Guttman scaling is to establish a one-dimensional continuum for a concept to be measured. The aim is to come up with a set of items so that a respondent who agrees with any specific question in the list will also agree with all previous questions. The object is to find a set of items that perfectly matches this pattern, but in practice, it is difficult to find this cumulative pattern perfectly. In this study, Guttman analysis is used to examine how closely a set of items corresponds with this idea of cumulativeness.

From the initial 10 items on attitudes, four items were selected as they are more related to VCT services than the other four. These items with their code numbers are listed below:

- 3.1.5: Do you think a TB patient should get tested for HIV?
- 3.1.6: Do you think VCT services are useless?
- 3.1.7a: If your sexual partner is found to have HIV, will you go for HIV test?
- 3.1.10: Do you think that your results will be kept confidential if you get tested for HIV?

A cumulative scale (although not perfect) was developed out of these four items: it was noted that generally a person who agrees to item 3.1.6 tended to also agree with item 3.1.10, item 3.1.7a, and item 3.1.5. In terms of proportion, item 3.1.5 had 37.4%, item 3.1.7a had 30.9%, item 3.1.10 had 20.2% and item 3.1.6 had 11.5%.

The final scale developed out of these four items is presented in table 4.8 below.

Table 4.8: Scale for measuring attitudes towards VCT services

Items and their code number	Mark
No agreement to any item	0
Agreement to item 3.1.5: Do you think a TB patient should get tested for HIV?	1
Agreement to item 3.1.7a: If your sexual partner is found to have HIV, will you go for HIV test?	2
Agreement to item 3.1.10: Do you think that your results will be kept confidential if you get tested for HIV?	3
Disagreement to item 3.1.6: Do you think VCT services are useless?	4

The highest mark scored by a respondent was considered to be his/her level of attitude towards VCT services. The summary for all the respondents is obtained by calculating the average score across all respondents.

4.5.1 Respondents' Levels of Attitudes towards VCT Services

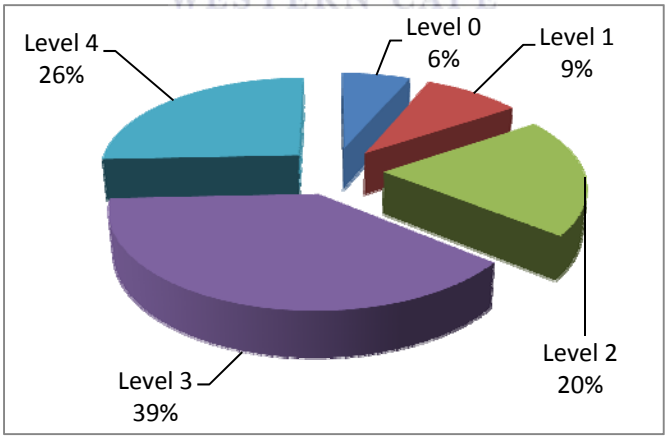
The findings reveal that majority of respondents with unknown HIV status had a positive attitude towards VCT services. As described in Table 4.8 above, there were 5 levels of attitudes towards VCT services namely, (Levels 0,1,2,3 and 4). The distribution of answers on the four items measuring attitudes to VCT is shown in Table 4.9 below. The table shows that items 3.1.6 scored the highest 91 "No" answers, followed by item 3.1.10 with 75 "yes" responses, followed by item 3.1.7a with 49 "yes" and finally item 3.1.5 with 28 "yes" responses.

Table 4.9: Distribution of answers to each item measuring attitudes towards VCT services

Items	Yes		No	
	N	%	n	%
Do you think a TB patient should get tested for HIV?	28	25.7%	81	74.3%
If your sexual partner is found to have HIV, will you go for HIV test?	49	45.0%	60	55.0%
Do you think that your results will be kept confidential if you get tested for HIV?	75	68.8%	34	31.2%
Do you think VCT services are useless?	18	16.5%	91	83.5%

As shown in Figure 4.2 below, out of 109 respondents, a total of 39% (n=42) were at level 3, and 26% (n=28) were at level 4. The two levels combined make up to 65% of respondents who have higher levels of positive attitudes towards VCT services. On a scale of 0 to 4, the mean level of attitude of respondents with unknown HIV status towards VCT services is 2.68 with a SD of 1.14.

Figure 4.2: Distribution of respondents according to attitudes towards VCT services



4.5.2 Attitudes towards VCT Services and Demographic Characteristics

This section presents results of the relationship between attitude towards VCT services and selected demographic characteristics of respondents with unknown HIV status. As described in the previous section (Table 4.9 above), there were 5 levels of positive attitudes towards VCT services (Level 0,1,2,3 and 4). The results are given in Table 4.10 below.

Table 4.10: Attitudes towards VCT services in relation to Demographic Characteristics

		n	%	mean	D
Age	**18-24 years**	13	11.9%	2.69	0.855
	25-34 years	47	43.1%	2.6	1. 097
	35-44 years	37	33.9%	2.81	1.221
	45-54 years	10	9.2%	2.5	1.509
	55 & above	2	1.8%	3	1.414
Gender	**Male**	46	42.2%	2.78	1.172
	Female	63	57.8%	2.6	1.129
Education	**None**	9	8.3%	2.67	1.323
	Primary	40	36.7%	2.58	1.259
	Secondary	58	53.2%	2.72	1.056
	Tertiary	2	1.8%	2.68	0.707
Employment	**No**	54	49.5%	2.57	1.175
	Yes	55	50.5%	2.78	1.117
Total		109	100%		

To assess if the difference in the level of attitude towards VCT services between the different groups of demographic characteristics of respondents with unknown HIV status, ANOVA F test was run and revealed that:

- There is no association between attitude to VCT services and the age of respondents: $F(4,104)=0.278$, $p=0.892$.

- There is no association between attitude to VCT services and gender of respondents: F(1,107)=0.650, p=0.422.
- There is no association between attitude to VCT services and the level of education of respondents: F(3,105)=0.476, p=0.700.
- There is no association between attitude to VCT services and employment status of respondents: F(1,107)=0,895, p=0.346.

4.6 ATTITUDES OF RESPONDENTS WITH KNOWN HIV STATUS TOWARDS TB/HIV PREVENTION AND CARE PROGRAMMES

To select items that closely reflect the measurements of attitudes towards TB/HIV prevention and care programmes and develop a scale out of these items, Guttman scaling process was used. The process of developing the scale was described in section 4.5 above. From the initial 10 items on attitudes, two items were selected as they are more related to HIV/TB care and prevention programmes. These items and their code numbers are listed below:

- Item 3.1.2b People who have HIV/AIDS cannot be trusted
- Item 3.1.7b If your sexual partner is found to have HIV you will not use condom if you are HIV positive?

Then a cumulative scale (although not perfect) was developed out of these two items. Generally a person who agrees to item 3.1.7b (23.8%) tended to also agree with item 3.1.2b (18.2%). The final scale developed out of these two items is presented in Table 4.11 below.

Table 4.11: Scale for attitudes towards TB/HIV care and prevention programmes

Item code numbers and statements	Mark
No agreement to any item	0
Agreement to item 3.1.7b If your sexual partner is found to have HIV you will not use condom if you are HIV positive?	1
Agreement to item 3.1.2b People who have HIV/AIDS cannot be trusted	2

The highest mark scored by a respondent was considered to be his/her level of attitude towards TB/HIV prevention and care activities.

4.6.1 Levels of Attitudes towards TB/HIV Prevention and Care Programmes

The findings reveal that majority of respondents with known HIV status had generally a slight positive attitude towards TB/HIV programmes with an average of 0.46 (SD = 0.614).

4.6.1.1 Level of Attitudes towards TB/HIV Programmes and Demographic Characteristics of Respondents with Known HIV Status

This section presents the results on the relationship between attitude towards TB/HIV prevention and care programmes and demographic characteristics of respondents with known HIV status. As described in the previous section (Table 4.11 above), there were 3 levels of positive attitudes towards TB/HIV prevention and care programmes (Level 0, 1, and 2).

The results in Table 4.12 below show the levels of attitude towards TB/HIV programmes and demographic characteristics of respondents with known HIV status.

Table 4.12: Attitudes towards TB/HIV programmes in relation to demographic characteristics

		n	%	Mean	SD
Age groups	18-24 years	23	14.6%	0.83	0.717
	25-34 years	55	34.8%	0.91	0.752
	35-44 years	61	38.6%	0.67	0.747
	45-54 years	12	7.6%	0.94	0.793
	55 & above	7	4.4%	1.14	0.690
Gender	Male	80	50.6%	0.77	0.729
	Female	78	49.4%	0.86	0.768
Education	None	7	4.4%	0.71	0.756
	Primary	54	34.2%	0.80	0.711
	Secondary	92	58.2%	0.87	0.773
	Tertiary	5	3.2%	0.20	0.447
Employment	No	72	45.6%	0.88	0.749
	Yes	86	54.4%	0.77	0.746
Total		158	100.0%	0.82	0.747

To assess if the difference in the level of attitude towards TB/HIV programmes was due to the effect of demographic characteristics of respondents, ANOVA F test was done and found

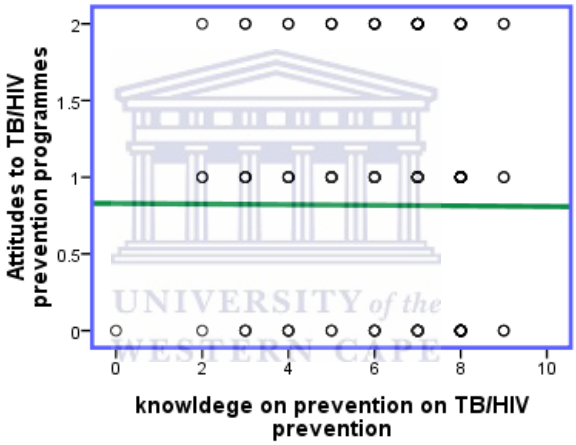
- There is no association between attitude to TB/HIV programmes and the age of respondents: $F(4,153)=0.278$, $p=0.892$.
- There is no association between attitude to TB/HIV programmes and the gender of respondents: $F(1,156)=1.346$, $p=0.248$.
- There is no association between attitude to VCT services and the level of education of respondents: $F(3,154)=0.078$, $p=0.972$.
- There is no association between attitude to VCT services and the employment status of respondents: $F(1,156)=0.425$, $p=0.515$.

4.6.2 The Effect of Level of Knowledge on Attitudes of Respondents towards VCT Services and TB/HIV Programmes

The influence of knowledge on the respondents' attitudes towards VCT services and TB/HIV programmes was measured by correlating the level of knowledge with the level of attitudes.

In Figure 4.3 below, the relationship between the level of knowledge on prevention and the attitudes towards TB/HIV prevention and care programmes is shown.

Figure 4.3: The relationship between the level of knowledge on TB/HIV prevention and level of attitudes towards TB/HIV prevention and care programmes



Attitude towards TB/HIV prevention and care programmes was measured among respondents with known HIV status and reported in section 4.5.1 above. The findings reveal that there is no relationship between the level of knowledge on TB/HIV prevention and the level of attitudes towards TB/HIV prevention and care programmes among respondents with known HIV status (R=-0.005, p=0.953).

Attitude towards TB/HIV prevention and care programmes was measured among respondents with known HIV status and reported in section 4.5.1 above. The findings reveal that there is no

association between the level of knowledge on TB/HIV care and the level of attitudes towards TB/HIV prevention and care programmes among respondents with unknown HIV status (R=-0.008, p=0.922).

4.7 PRACTICES RELATED TO TB/HIV PREVENTION AND CARE

The practices measured are related to a number of aspects of TB/HIV prevention and care. These include: uptake of HIV counselling and testing, the trust in conventional medicine as compared to traditional medicine in relation to TB/HIV care, continuous health care seeking behaviour during the course of TB treatment, and condom use as a prevention measure for HIV infection. Initially, ten items were included in the questionnaire measuring these practices. However, during analysis, only four items were selected as they reflected respondents' past experiences and practices on these aspects of TB/HIV prevention and care. These four items and their code numbers are listed below:

- 4.1.1 When diagnosed with TB were you willing to test for HIV?
- 4.1.3 Have you ever visited traditional healers when you were diagnosed with TB or/and HIV?
- 4.1.4 Do you report to the clinic when you experienced problems with TB medicine?
- 4.1.10 Have you used condoms in the last 3 months you had sex?

The following sections present the proportion of respondents who agreed to have conducted these practices in the past. The findings are presented in Table 4.13 according to demographic characteristics of respondents.

Table 4.13: Respondents' agreement to statement on practices

Statement	Yes		No		Total	
	n	%	n	%	N	%
4.1.1. When diagnosed with TB were you willing to test for HIV?	223	87.3	34	12.7	267	100
4.1.3 When diagnosed with TB/HIV did you get treatment from traditional healer?	11	4.1	256	95.5	267	100
4.1.4 Do you report to the clinic if you have problems with TB medicines?	221	82.8	46	17.2	267	100
4.1.10 Have you used condom in the last 3 month when you had sex?	157	58.8	106	39.7	263	98.5

4.7.1 Willingness to Test for HIV When Diagnosed with TB and demographic characteristics

The results on the respondents who were willing to be tested for HIV when they were diagnosed with TB are presented in the following sections in relation to HIV status, age, gender, and education level (see Table 4.14).

Table 4.14: Willingness to Test for HIV When Diagnosed with TB and demographic characteristics

		No		Yes		Total
		n	%	n	%	N
Age	18-24 years	1	2.8	35	97.2	36
	25-34 years	11	10.8	91	89.2	102
	35-44 years	15	15.3	83	84.7	98
	45-54 years	6	27.2	16	72.7	22
	55 & above	1	11.1	8	88.9	9
Gender	Male	18	14.3	108	85.7	126
	Female	16	11.3	125	88.7	141
Education	None	5	31.2	11	68.8	16
	Primary	10	10.6	84	89.4	94
	Secondary	19	12.7	131	87.3	150
	Tertiary	0	0	7	1	7
Employment	No	10	7.9	116	92.1	126
	Yes	24	17.0	117	83.0	141

To assess if the difference in the willingness to test for HIV among the different sub-groups of demographic characteristics (Age, Education and employment), a Chi-Square Test was run and revealed

- There is a significant difference in the level of willingness to test for HIV when diagnosed with TB between the different age groups (χ^2 =125.691, p=0.000).
- There is a significant difference in level of willingness to test for HIV when diagnosed with TB between the different levels of education level (χ^2 =185.661, p=0.000).
- There is no significant difference in level of willingness to test for HIV when diagnosed with TB between employed and unemployed respondents (χ^2 =0.004, p=0.948)
- There is no significant difference in level of willingness to test for HIV when diagnosed with TB between genders of respondents (χ^2 =1.240, p=0.265)

4.7.2 Respondents Who Visited Traditional Healers When Diagnosed With TB AND/OR HIV

The results on the characteristics of respondents who visited traditional healers when they were diagnosed with TB are presented in Table 4.15 below in relation to HIV status, age, gender, and education level.

Table 4.15: Respondents Who Visited Traditional Healers When Diagnosed With TB AND/OR HIV

		No		yes		Total
		n	%	n	%	N
age	18-24 years	34	94.4	2	5.6	36
	25-34 years	99	97.1	3	2.9	102
	35-44 years	94	95.9	4	4.1	98
	45-54 years	20	90.9	2	9.1	22
	55 & above	9	1.0	0	0	9
gender	Male	123	97.6	3	2.4	126
	Female	133	94.3	8	5.7	141
Education	None	15	93.8	1	6.3	16
	Primary	88	93.6	6	6.4	94
	Secondary	146	97.3	4	26.7	150
	Tertiary	7	1.0	0	0	7
Employment	No	123		3		126
	Yes	133		8		141

To assess the difference in accepting a visit to a traditional healer when diagnosed with TB among the different sub-groups of demographic characteristics (i.e. age, education and employment), a Chi-Square Test was run and revealed that:

- There is no significant difference of acceptance to visit a traditional healer when diagnosed with TB between the different age groups (χ^2 =1.000, p=0.801).
- There is no significant difference of acceptance to visit a traditional healer when diagnosed with TB between the different levels of education level (χ^2 =3.455, p=0.178).
- There is no significant difference of acceptance to visit a traditional healer when diagnosed with TB between employed and unemployed respondents (χ^2 =2.273, p=0.132)
- There is no significant difference of acceptance to visit a traditional healer when diagnosed with TB between genders of respondents (χ^2 =2.273, p=0.132)

4.7.3 Respondents Who Reported To a Clinic with TB Medicine Problems

The results of the analysis on the respondents who visited clinics when they experienced problems with TB medicines are presented in the following sections (see Table 4.16) in relation to HIV status, age groups, level of education and gender.

Table 4.16: Respondents Who Reported To a Clinic with TB Medicine Problems

		No		yes		Total
		n	%	N	%	N
Age	18-24 years	5	13.9	31	86.1	36
	25-34 years	9	8.8	93	91.2	102
	35-44 years	21	21.4	77	78.6	98
	45-54 years	8	36.4	14	63.6	22
	55 & above	3	33.3	6	66.7	9
Gender	Male	23	18.3	103	81.7	126
	Female	23	16.3	118	83.7	141
Education	None	5	31.3	11	68.8	16
	Primary	19	20.2	75	79.8	94
	Secondary	22	14.7	128	85.3	150
	Tertiary	0	0	7	1.0	7
Employment	No	18	14.3	108	85.7	126
	Yes	28	19.9	113	80.1	141

To assess the difference in accepting to report to the clinic after experiencing problems with TB medication among the different sub-groups of demographic characteristics (Age, Education and employment), a Chi-Square Test was run and revealed that:

- There is a significant difference in accepting to report to the clinic after experiencing problems with TB medication between the different age groups (χ^2 =135.810, p=0.000).
- There is a significant difference in accepting to report to the clinic after experiencing problems with TB medication between the different levels of education level (χ^2 =180.430, p=0.000).

- There is no significant difference in accepting to report to the clinic after experiencing problems with TB medication between employed and unemployed respondents (χ^2 =0.113, p=0.737)
- There is no significant difference in accepting to report to the clinic after experiencing problems with TB medication between genders of respondents (χ^2 =0.113, p=0.737)

4.7.4 Respondents Who Used Condoms in the Last 3 Months

The results of the analysis on the respondents who used condom in the last three months are presented in the following sections in relation to demographic characteristics (see Table 4.17).

Table 4.17 Respondents Who Used Condoms in the Last 3 Months in relation to demographic characteristics

		No		yes		Total
		N	%	N	%	N
age	18-24 years	12	33.3	23	63.9	36
	25-34 years	33	32.4	66	64.7	102
	35-44 years	40	40.8	58	59.2	98
	45-54 years	14	63.6	8	36.4	22
	55 & above	7	77.8	2	22.2	9
gender	Male	45	35.7	80	63.5	126
	Female	61	43.3	77	54.6	141
Education	None	10	62.5	6	37.5	16
	Primary	52	55.3	41	43.6	94
	Secondary	44	29.3	106	70.7	150
	Tertiary	0	0	4	57.1	7
HIV status	Unknown	55	51.4	52	48.6	107
	Negative	17	27.4	45	72.6	62
	Positive	34	36.2	60	93.8	94
Employment	No	57		69		126
	Yes	49		92		141

To assess the difference in accepting the of use of condoms in the last 3 months among the different sub-groups of demographic characteristics (Age, Education and employment), a Chi-Square Test was run and revealed

- There is a significant difference in accepting the use of condoms in the last 3 months between the different age groups (χ^2 =107.873, p=0.000).
- There is a significant difference in accepting the use of condoms in the last 3 months between the different levels of education level (χ^2 =173.420, p=0.000).
- There is a significant difference in accepting the use of condoms in the last 3 months between employed and unemployed respondents (χ^2 =3.981, p=0.046).
- There is a significant difference in accepting the use of condoms in the last 3 months between genders of respondents (χ^2 =0.057, p=0.811).

CHAPTER 5: DISCUSSION

5.1 INTRODUCTION

This chapter discusses the findings of this study in line with the literature and the research questions.

5.2 DISCUSSION OF FINDINGS ON DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

The findings of this study show that the majority (59.2%) of the respondents knew their HIV status. Among those who did not know their status the majority (57.8%) were females. For those who were TB-HIV co-infected the majority were males at 55%, compared to females at 45%. The findings of this study concur with the findings reported in the National TB and Leprosy Programme Annual Report, 2009-2010 which indicated that 59.3% of TB patients knew their HIV status in Walvis Bay District, (NTCP, 2010). Although the results indicate a VCT uptake of above 50% among TB patients, it is still not the desired level of 100% which is the national target (National TB guideline MOHSS 2006; Annual Report TB and Leprosy Control Programme 2009). Although VCT is offered to all TB patients in Walvis Bay and countrywide, the low uptake could be due to attitude problems. Patients are hesitant to take the HIV test because of the fear of being stigmatised. This has been reported in other studies mentioned in the literature review. It can, therefore, be argued that there is a need to enhance community awareness and education on the benefits of knowing one's status and to offer continuous counselling to TB patients on subsequent visits to healthcare facilities.

The findings of this study also reveal that the majority (53%) of respondents were female. These findings follow the trend of the general gender distribution of the Namibian population as per the National census of 2001 that also revealed a higher percentage of females in the Namibian population (National Planning Commission, 2003). With regards to age, 75% of the sample fell into the active age group of between 25 to 44 years. The National TB and Leprosy Control programme Annual Report 2009/2010 reported similar results in Walvis Bay District where 73.3% of all TB patients were in the 25 to 44 years age group (MOHSS, 2010). With regards to education, the study findings indicate that only 6% of the respondents never attended school while the rest of the respondents attained a certain form of schooling with 3% attaining tertiary education. This indicates a high literacy level in the district. The national population census revealed that 75% of the population have some form of education (National planning commission, 2003). These results concur with a study conducted in South Africa by Kigozi et al. (2010) which found that the majority of respondents (61%) had a secondary school education and only few (2%) had a tertiary level of education.

The findings also showed that the majority (53%) of the respondents were employed. However, most of them are general workers in the fishing sector, the hospitality and construction industries and security services. It is generally accepted that people with some form of income are less likely to suffer condition that can leading to exposure to TB infection, since TB largely affects the disadvantaged and dispossessed (Bastian et al, 2008).

However, with the emergence of HIV/AIDS, income has become a contributing factor to risky sexual behaviour which can lead to HIV infection transmission and subsequently to TB infection. The results of this study are different from those of Ottmani et al.'s (2008) study which indicated

that the majority of the respondents (52%) were unemployed but similar to those of Kittikraisak et al. (2008) who also found that the majority (60%) of respondents were employed.

The study findings also show that the highest proportion of HIV positive respondents is in the 18 to 24 years age group at 47.2%. This could be explained by the fact the 15-24 years age group is the most active age group relation to exploring their sexuality. They are, therefore, at times involved in risky social behaviours such as alcohol abuse and engaging in unprotected sex which leads to exposure to HIV infection (UNAIDS, 2008).

With regards to the association between HIV status and education level, the findings of this study show that the highest prevalence rate of HIV is in the group with secondary education (39%). These results suggest that respondents who reached tertiary education have a low rate of HIV. This may be explained by the fact that those who attend tertiary education have a better understanding of HIV transmission and may, therefore, choose to protect themselves against HIV infection. Kalichman and Simbayi (2003) found that people who had an HIV test had significantly more years of education than people not tested.

The results also show that the proportion of HIV positive respondents is higher in the unemployed group (39%), than in the employed group (31%). It can be argued that the unemployed have no means to finance safe entertainment and this may lead to alcohol abuse and engaging in unprotected sex (Fernandez, 2003). Kalichman and Simbayi (2003) found that 20% of unemployed participants with unknown HIV status will accept money or food for sex.

5.3 KNOWLEDGE ON TB/HIV PREVENTION

The findings show that 78.2% of the respondents had a high level of knowledge. These findings suggest that the level of knowledge on prevention TB and HIV infection is high among the majority of TB clients in Walvis Bay. It can be argued that this high level of awareness of prevention is due to ongoing health education campaigns on TB and HIV prevention at district and national level. The results are supported by the findings of a study in Vietnam on knowledge about tuberculosis and its treatment among new pulmonary TB patients by Hoa, Diwan, Co and Thorson (2004). This study indicated that 93% of the respondents had a high level of knowledge about TB and its treatment. Similarly, Grotzinger' (2006) study on employee knowledge, attitude and practices relating to HIV/AIDS at a mining company in Namibia, also found that 80% of the respondents had average knowledge of TB/HIV transmission and prevention.

The findings reveal that there is a significant relationship between education and the level of knowledge on HIV/TB prevention $F(3,263)=2.813$ ($p=0.004$). This suggests that the level of knowledge on TB/HIV is influenced by the level of a respondent's education. These findings concur with Santos et al. (2009) who found that co-infection of TB with HIV is mainly prevalent in countries with low levels of education. This may be explained by the fact that education enables one to access and process information and knowledge even in the area of TB and HIV prevention.

Respondents who knew their HIV status had higher levels of knowledge of HIV/TB prevention (at 6.37 for those who were HIV Positive and 6.22 for those who were HIV negative) compared to those who did not know their HIV status at 5.83. Respondents who were co-infected had a higher mean level of knowledge (6.37) compared to those who were not co-infected. TB patients

are usually given Knowledge on TB/HIV independently of their HIV status and this may explain why HIV status is not a significant factor in the level of knowledge.

The results show that the difference in the mean level of knowledge on prevention between male (6.29) and female (5.96) respondents is minimal. Similar results were reported in a survey done in Namibia in 2002 where it was found that the level of knowledge between males and females was 99% and 98% respectively (MOHSS, 2007).

5.3.1 Knowledge on TB/HIV Treatment and Care

The results reveal that the mean level of knowledge on TB/HIV treatment and care among respondents was low (1.01, on a scale of 0 to 4 with SD= 0.983). The findings also reveal that up to 73.5% of respondents have a level of knowledge on care that is below 2. These findings suggest that TB patients in Walvis Bay have very low knowledge on the care of TB/HIV co-infection. It could be that the TB patients are not taking the health education given by health workers seriously or the health workers should do more. Health education on TB/HIV needs to be given regularly as an ongoing activity at health facilities and through mass media. Similar findings were reported in a qualitative study by Ayenew, Leykun, Colebunders, Deribew (2010) which revealed low awareness of the association between TB and HIV care. In contrast Kigozi et al. (2010), found that most (71.1%) of the respondents knew the relationship between TB and HIV treatment and care. These studies differ from that of Grotzinger (2006) who studied employee knowledge, attitude and practices relating to HIV/AIDS at a mining company in Namibia and found a good level of knowledge on HIV care among 87.2% of the respondents.

The findings also show a significant association between knowledge on TB/HIV care and level of education (p=0.036). These results suggest that the level of education influences the level of knowledge on TB/HIV care. The explanation for this could be that through education people get information on TB and HIV, and educated TB patients are able to grasp information on TB and HIV care better then the uneducated ones. However, in Kenya Ayaya et al. (2003) found that educated people like medical practitioners could not say what the acronym DOTs stands for. Therefore, education on TB/HIV needs to be an ongoing activity.

The results further reveal that there is a significant association between level of knowledge on TB/HIV care and HIV status (p=0.037) suggesting that the level of knowledge on TB/HIV care is influenced by a patient's HIV status. This can be explained by the fact those who know their status have been exposed to information on TB/HIV care through counselling, and that all of them were on TB treatment at the time of the study. Peltzer, Matseke, Mzolo, and Majaja (2009) found that the knowledge about ARV's was not significantly related to knowing one's HIV status.

5.4 ATTITUDE OF RESPONDENTS WITH UNKNOWN HIV STATUS TOWARDS VCT SERVICES

The study found that the mean level of attitude of respondents with unknown HIV status towards VCT services is favourable in 65% of the respondents with a mean of 2.68 (SD=1.14) on a scale of 0 to 4. These findings suggest a positive attitude towards VCT services by respondents. the results may be explained by the fact that the respondents with unknown HIV status were aware of the benefits of accessing VCT services even though they have not so. Similar findings were reported by Talbot et al, (2002) who found that 75% of respondents with unknown HIV status

had positive feelings towards testing services and were willing to take an HIV test in order to qualify for ART. Differences in demographic characteristics of respondents did not influence their attitude towards VCT.

5.4 ATTITUDE OF RESPONDENTS WITH KNOWN HIV STATUS TOWARDS TB/HIV PREVENTION AND CARE PROGRAMMES

The majority of respondents with known HIV status had a positive attitude towards TB/HIV programmes. The results show a mean level of 2.36 (SD = 1.217) on a scale of 0 to 4. This suggests that the positive attitude of TB patients with known HIV status in Walvis Bay is due to the fact that these patients have been exposed to prevention and care programmes through counselling and testing. The patients, therefore, understood the benefits of the programmes.

5.6 PRACTICES RELATED TO TB/HIV PREVENTION AND CARE

This section presents an interpretation and discussion of the results of analysis on respondents' practices related to TB/HIV prevention and care. The results reveal a significant association between willingness to test, age and education. This suggests that education and age influence the willingness to be tested. Abebe and Mitikie (2009) found high (85%) levels of willingness to test among educated people.

The results of the study show that there is a significant association between education, age and health seeking behaviour for TB and HIV services. These findings suggest that age and education level have a positive influence on health seeking behaviour for HIV/TB services. Talbot et al. (2002) also reported similar results and found that 95% of respondents with some

level of education will talk to health care workers if they experience side effects from their medicines.

The findings show that the majority of the respondents with unknown HIV status did not use condoms in the three months prior to the study. The results also show that age, education and employment were all associated with the use of condoms. Respondents below 45 years used condoms more than those who were above 45 years, since they were younger and more sexually active. The Namibian DHS of 2007 of revealed that 24.5% of women and 40% of men engaged in high-risk sex used a condom in the year before the survey.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

The general knowledge on TB/HIV prevention was found to be high (78.2%) among the respondents in Walvis Bay. Patients who knew their HIV status showed higher mean levels of knowledge (6.37 for HIV positive patients and 6.22 for HIV negative patients) compared to those who did not know their HIV status (5.83). Those in the 55 years and above age group had the highest knowledge mean (7.11). Respondents with tertiary education showed the highest mean level (7.43). In comparison to female respondents and respondents were more knowledgeable with a mean level of 6.29 on TB/HIV prevention. In relation to care 73.5% of the respondents had low knowledge at below 2 out of possible 4. Patients with unknown HIV status showed a positive attitude vis-à-vis VCT services. Overall respondents in the 35-44 years age group were more positive in attitude with a mean level of 2.81, but the male respondents were more positive than their female counterparts with a mean level of 2.78 and 2.6 respectively. Fifty three (53%) of the respondents with secondary education were more positive and 50.5% of respondents with employment had a positive attitude towards VCT services. Regarding practices 65% of the respondents aged 25- 34 years used condoms in the 3 months prior to the study. Male respondents used condoms more than female respondents. Seventy one percent (71%) of the respondents with secondary education used condom, while sixty seven percent (67%) of the respondents with known HIV status (negative and positive) used condom in the 3 months prior to the study. Among co-infected patients 82% were on IPT and 49% on ART.

6.2 RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made:

- Since the attitude toward VCT is good, provider initiated HIV counselling and testing strategy should be strengthened and implemented at district level. VCT should be offered to all TB patients, as there is willingness to undergo VCT among the respondents.

- Health education for prevention with focus on care and treatment for TB/HIV infections should be strengthened.

- Collaboration between TB and HIV programmes should be strengthened by creating a coordinating body to ensure very close collaborative activities to avoid leakages in the referral system for both programmes.

- Preventive programmes such as male circumcision targeting young people in the sexually active and reproductive age group should be increased and strengthened.

- The Ministry of Health and Social Services should build the capacity of health workers by providing them with skills for better client education.

Future researchers could consider assessing the main reasons behind the low knowledge on TB/HIV care among TB patients in Walvis Bay.

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APPENDIX A: QUESTIONNAIRE A: FOR PARTICIPANTS WITH UNKNOWN HIV STATUS

Thank you for agreeing to participate in this research. As explained by the nurse and/or TB field promoter, the purpose of this study is to access your knowledge, perceptions and practices towards HIV/TB co-infection. To do this, I will need you to respond to the following questions. If unclear about any question you are free to ask me any time.

SECTION A1: DEMOGRAPHIC AND PERSONAL CHARACTERISTICS OF TB PARTICIPANTS WITH UNKNOWN HIV STATUS *(tick the appropriate box).*

How old are you at last birthday (in Years)? ……

1.2 Gender: [ ] [1.2.1] Male [ ] [1.2.2] Female

What is your highest level of school?

[ ] [1.3.1] Never attended school
[ ] [1.3.2] Primary school
[ ] [1.3.1] Secondary school
[ ] [1.3.4] Tertiary education

Do you currently have paid employment?

[ ] [1.4.1] Yes
[ ] [1.4.2] No

What is your occupation?

[ ] [1.5.1] Farmer
[ ] [1.5.2] Domestic worker
[ ] [1.5.3] Student/ Learner
[ ] [1.5.4] Unemployed
[ ] [1.5.5] Others (Specify)…….

SECTION A2: KNOWLEDGE REGARDING TB, HIV, TB AND HIV CO -INFECTION ON PREVENTION, TRANSMISSION, TREATMENT, CARE AND SUPPORT

This section measures your knowledge and awareness about TB, HIV, TB and HIV co-infection on prevention, transmission, treatment, care and support. For each of the following statements/questions, I will like you to tick the response ("Yes", "No", "I don't know") which you understand to be appropriate.

2.1. KNOWLEDGE REGARDIND TB AND HIV AMONG TB PARTICIPANTS WITH UNKNOWN HIV STATUS

		Yes	No	I Don't Know
2.1.1	Someone coughing for more than 3 weeks, losing weight and having night sweat may have TB			
2.1.2	Washing after unprotected sex protects you from being infected with HIV infection			
2.1.3	A person with TB can also have HIV infection			
2.1.4	TB medicines also treat HIV			
2.1.5	HIV can be transmitted through handshaking			
2.1.6	HIV can be transmitted after a single unprotected sexual intercourse			
2.1.7	HIV treatment cures the disease (AIDS)			
2.1.8	An HIV positive pregnant woman can transmit HIV to her baby			
2.1.9	HIV/AIDS is caused by spirits/supernatural forces			
2.1.10	Most people who get HIV show signs of the disease immediately			
2.1.11	Can people protect themselves from HIV, by abstaining from Sexual intercourse?			
2.1.12	Is TB curable?			
2.1.13	TB and HIV treatment can be taken together			
2.1.14	TB can be transmitted between people living in the same house or working together			
2.1.15	In Namibia, TB treatment is taken every day till it's finished			
2.1.16	An HIV positive person who does not have TB can take preventive treatment for TB (INH)			
2.1.17	TB is transmitted through cough and sneezing from a person to another			
2.1.18	Traditional medicines can cure TB?			
2.1.19	Correctly taking TB medication, covering your mouth when coughing, disposing sputum appropriately can prevent others from getting TB			
2.1.20	The minimum duration of TB treatment in Namibia is 2 months			

SECTION A3: ATTITUDE TOWARDS TB AND HIV CO-INFECTION

This section measures your attitudes towards TB and HIV Co-Infection. For each of the following statements/questions, I will like you to tick the response, ("Yes", "No", "I don't know") which you understand to be appropriate.)

3.1. ATTITUDE TOWARDS VCT SERVICES OF TB PARTICIPANTS WITH UNKNOWN HIV STATUS

		Yes	No	I Don't Know
3.1.1	It is important for a TB patient's partner to take an HIV test			
3.1.2	Can you escort a family member for an HIV test?			
3.1.3	If you test HIV positive will you be disclosing your status to someone close to you?			
3.1.4	Do you think a person with TB should be rejected by the community if he test HIV positive?			
3.1.5	Do you think a TB patient should get tested for HIV?			
3.1.6.	Do you think VCT services are useless?			
3.1.7	If your sexual partner is found to have HIV, will you go for HIV test?			
3.1.8	Getting tested for HIV protects people from getting HIV			
3.1.9	Do you think a sex worker can get tested for HIV?			
3.1.10	Do you think that your results will be kept confidential if you get tested for HIV?			

SECTION A4: PRACTICES TOWARDS TB, HIV, TB AND HIV CO -INFECTION (*Tick appropriate box*)

		Yes	No	I Don't Know
4.1.1	When diagnosed with TB were you willing to test for HIV?			
4.1.2	If you test HIV positive will you take Anti-retroviral medicines?			
4.1.3	Have you ever visited traditional healers when you were diagnosed with TB?			
4.1.4	Do you report to the clinic when you experienced problems with TB medicine?			
4.1.5	It is not necessary for a sex worker to use a condom?			
4.1.6	Is it important for 2 sexual partners who are HIV positive to use condoms?			
4.1.7	It is not necessary to finish TB treatment if I feel better after 2 months of treatment.			
4.1.8	Is it right to have two or more sexual partners?			
4.1.9	TB patient spitting everywhere will spread the disease			
4.1.10	Have you used condoms in the last 3 months when you had sex?			

APPENDIX B: QUESTIONNAIRE B: PARTICIPANTS WITH KNOWN HIV STATUS

We thank you for the consent you have signed to participate in the research. The trained nurse or TB field promoter has explained to you the purpose of the study. You are free to ask any question at any time for clarity if you like.

SECTION B1: DEMOGRAPHIC AND PERSONAL CHARACTERISTICS OF TB PARTICIPANTS WITH KNOWN HIV STATUS *(tick the appropriate box).*

How old are you at last birthday (in Years)? ……

1.2 Gender: [ ] [1.2.1] Male [ ] [1.2.2] Female

1.3 What is your highest level of school?

[ ] [1.3.1] Never attended school
[ ] [1.3.2] Primary school
[ ] [1.3.1] Secondary school
[ ] [1.3.4] Tertiary education

1.4 Do you currently have paid employment?

[ ] [1.4.1] Yes
[ ] [1.4.2] No

1.5 What is your occupation?

[ ] [1.5.1] Farmer
[ ] [1.5.2] Domestic worker
[ ] [1.5.3] Student/ Learner
[ ] [1.5.4] Unemployed
[ ] [1.5.5] Others (Specify)……

SECTION B2: KNOWLEDGE REGARDING TB AND HIV AMONG TB PARTICIPANTS WITH KNOWN HIV STATUS

This section measures your knowledge and awareness about TB, HIV, TB and HIV co-infection on prevention, transmission, treatment, care and support. For each of the following statements/questions, I will like you to tick the response ("Yes", "No", "I don't know") which you understand to be appropriate

		Yes	No	I Don't Know
2.1.1	Someone coughing for more than 3 weeks, losing weight and having night sweat may have TB			
2.1.2	Washing after unprotected sex protects you from being infected with HIV infection			
2.1.3	A person with TB can also have HIV infection			
2.1.4	TB medicines also treat HIV			
2.1.5	HIV can be transmitted through handshaking			
2.1.6	HIV can be transmitted after a single unprotected sexual intercourse			
2.1.7	HIV treatment cures the disease (AIDS)			
2.1.8	An HIV positive pregnant woman can transmit HIV to her baby			
2.1.9	HIV/AIDS is caused by spirits/supernatural forces			
2.1.10	Most people who get HIV show signs of the disease immediately			
2.1.11	Can people protect themselves from HIV, by abstaining from Sexual intercourse?			
2.1.12	Is TB curable?			
2.1.13	TB and HIV treatment can be taken together			
2.1.14	TB can be transmitted between people living in the same house or working together			
2.1.15	In Namibia, TB treatment is taken every day till it is finished			
2.1.16	An HIV positive person who does not have TB can get preventive treatment for TB (INH)			
2.1.17	TB is transmitted through cough and sneezing from a person to another			
2.1.18	Traditional medicines can cure TB			
2.1.19	Correctly taking TB medication, covering your mouth when coughing, disposing sputum appropriately can prevent others from getting TB			
2.1.20	The minimum duration of TB treatment in Namibia is 2 months			

SECTION B3: ATTITUDE TOWARDS TB, HIV, TB AND HIV CO – INFECTION

This section measures your attitudes towards TB and HIV Co-Infection. For each of the following statements/questions, I will like you to tick the response, ("Yes", "No", "I don't know") which you understand to be appropriate.)

3.2. ATTITUDE TOWARDS TB AND HIV CO-INFECTION OF TB PARTICIPANTS WITH KNOWN HIV STATUS

		Yes	No	I Don't Know
3.1.1	It is important for a TB patient's partner to take an HIV test			
3.1.2	People who have HIV/AIDS cannot be trusted			
3.1.3	If you test HIV positive will you disclose your status to someone close to you?			
3.1.4	Do you think a person with TB should be rejected by the community if he test HIV positive?			
3.1.5	Do you think a TB patient should get tested for HIV?			
3.1.6	Do you think VCT services are useless?			
3.1.7	If your sexual partner is found to have HIV you will not use condom if you are HIV positive			
3.1.8	Getting tested for HIV protects people from getting HIV			
3.1.9	Condom/Femidom makes sex unpleasant			
3.1.10	Do you think that your results will be kept confidential if you get tested for HIV?			

SECTION B4: PRACTICES TOWARDS TB, HIV, TB AND HIV CO – INFECTION (*Tick appropriate box*)

		Yes	No	I Don't Know
4.1.1	When diagnosed with TB were you willing to test for HIV?			
4.1.2	If you test HIV positive will you take Anti-retroviral medicines?			
4.1.3	Have you ever visited traditional healers when you were diagnosed with TB?			
4.1.4	Do you report to the clinic when you experience problems with TB medicine?			
4.1.5	It is not necessary for a prostitute to use a condom			
4.1.6	Is it important for 2 sexual partners who are HIV positive to use condoms?			
4.1.7	It is not necessary to finish TB treatment if I feel better after 2 months of treatment			
4.1.8	Is it right to have two or more sexual partners?			
4.1.9	TB patients spitting everywhere will spread the disease			
4.1.10	Have you used condoms in the last 3 months when you had sex?			

Appendix C: CONSENT FORM

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-959, Fax: 27 21-959

E-mail:

CONSENT FORM ALL PARTICIPANTS

Title of Research Project: Knowledge, Attitude and Practice With Regards to TB and HIV Co-infection Among TB patients in Walvis Bay District, Namibia.

The study has been described to me in language that I understand and I freely and voluntarily agree to participate. My questions about the study have been answered.

I understand that my identity will not be disclosed and that I may withdraw from the study without giving a reason at any time and this will not negatively affect me in any way.

Participant's name……..

Participant's signature……

Date……

Appendix D

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-959, Fax: 27 21-959

E-mail:

INFORMATION SHEET

Project Title: Knowledge, Attitude and Practice With Regard to TB and HIV Co-infection Among TB patients in Walvis Bay District, Namibia

What is this study about? Currently it is known that new cases of TB are increasing in countries with high HIV prevalence, TB is a leading cause of death among HIV infected individuals. These two infections have very close relationship to each other. Walvis Bay district is hit by TB and HIV infection. We want to collect information on the knowledge, attitude and practice of TB patients regarding co-infection with HIV. This information will be analyzed and the findings will be presented to policy makers, clinicians and all the stakeholders to improve service delivery and outcomes concerning both infections.

What will I be asked to do if I agree to participate? To answer some question on the study, we wish to learn about your knowledge, attitudes and practices with regards to TB-HIV co-infection. To see how much do you know about TB and HIV co-infection, how do you react and your practices regarding these two infections.

What are the risks of this research? None, your name will remain anonymous, the same as your answers, your relationship with the staff at the facilities will also remain the same, nothing will happened to you or any of your family member, you will be treated with the same respect and dignity in the Walvis Bay health facilities.

What are the benefits of this research: To improve care on TB and HIV infection, after analysis of the data and identification of problems or gaps.

Do I have to be in this research and may I stop participating at any time? Yes as you wish, without giving any reason why you are stopping and it will not affect your care at any facility in Walvis Bay district.

What if I have questions? You can ask any question at any time to get more clarity regarding this present study.

This research is being conducted by **UWC**, name of the institution where I am coming from. If you have any questions about the research study itself, please contact me at the following address:

Tel: +26464216302

Cell: +264812885282

Fax: +26464216345

Email: jpilunga@yahoo.fr

Should you have any question regarding this study and your right as a research participant or if you wish to report any problem you have experienced related to the study, please contact:

Name of the supervisor: Ms. Jeanine Uwimana

Head of Department: Prof Uta Lehmann

Dean of the Faculty of Community and Health Sciences:

University of the Western Cape

Private Bag X17

Bellville 7535

This research has been approved by the University of the Western Cape's Senate Research Committee and Ethics Committee.

Appendix E

9 - 0/0001

REPUBLIC OF NAMIBIA

Ministry of Health and Social Services

Private Bag 13198
Windhoek
Namibia
Enquiries: Ms. H. Nangombe

Ministerial Building
Harvey Street
Windhoek
Ref: 17/3/3

Tel: (061) 2032562
Fax: (061) 272286
E-mail: hnangombe@mhss.gov.na
Date: 26 May 2010

OFFICE OF THE PERMANENT SECRETARY

Dr. J. P. Ilunga Musasa
P.O. Box 3185
Walvis Bay

Dear Dr. Musasa

Re: Knowledge, Attitude and Practice with regard to Tuberculosis and HIV Co-infection among TB patients in Walvis Bay District

1. Reference is made to your application to conduct the above-mentioned study.
2. The proposal has been evaluated and found to have merit
3. Kindly be informed that approval has been granted under the following conditions:

3.1 The data collected is only to be used for academic purpose;
3.2 A quarterly progress report is to be submitted to the Ministry's Research Unit;
3.3 Preliminary findings are to be submitted to the Ministry before the final report,
3.4 Final report to be submitted upon completion of the study;
3.5 Separate permission to be sought from the Ministry for the publication of the findings

Yours Sincerely,

MR. K. KAHUURE
THE PERMANENT SECRETARY

"Health for All"