



**OBSTACLES TO TUBERCULOSIS CONTROL AMONG PATIENTS IN GHANZI
DISTRICT: HEALTHCARE WORKERS' PERSPECTIVES**

Submitted in partial fulfillment for the completion of
Master of Nursing Science

By

Itireleng Olefile

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Supervisor: Dr Monau

STATEMENT OF ORIGINALITY

DECLARATION

I declare that OBSTACLES TO TUBERCULOSIS CONTROL AMONG PATIENTS IN GHANZI DISTRICT: HCWs PERSPECTIVES is my own work and that all the sources that I have quoted have been indicated and acknowledged by means of complete references, and that this work has not been submitted before for any other degree at any other institution.

Itireleng Olefile
200202461
(Student Number)

Abstract

Tuberculosis (TB) remains a major global health problem with 8.6 million incident cases and 1.4 million deaths. The African region has approximately one quarter of the world's cases and the highest rates of cases and deaths relative to the population. The infection poses a health threat to Botswana with Ghanzi being the most tuberculosis afflicted district in the country, as indicated by the national TB report of 2012. Literature search revealed a paucity of qualitative TB research particularly related to healthcare workers perceptions, attitudes and beliefs about TB and TB clients in African countries. There was no literature found from Botswana on the subject showing that TB is one area in the country that needs to be researched. The proposed study intends to utilize a qualitative approach framed on phenomenology to determine the healthcare workers' perceptions to obstacles to TB control among patients in Ghanzi district. Semi-structured face to face interviews will be conducted with healthcare workers in the district to determine what they perceive as the obstacles to TB control. Data will be analyzed according to the themes that emerge from the data or within the categories of data using MAXQDA 12 software. The findings from this study could be used to influence policy, practice and may as well be foundational for future research.

Keywords: Tuberculosis control, obstacles, perceptions, views, healthcare workers.

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ACRONYMS

BNTP	Botswana National Tuberculosis Program
BTP	Botswana Tuberculosis Program
BTLP	Botswana Tuberculosis and Leprosy Program
CMS	Central Medical Stores
CTBC	Community TB Care
DOTS	Directly Observed Treatment, Short course
HBC	High Burden Countries
HCWs	Healthcare workers
HIV	Human Immunodeficiency Virus
IPC	Infection Prevention and Control
MDR-TB	Multi Drug Resistant-Tuberculosis
MOH	Ministry Of Health
M&E	Monitoring and Evaluation
NTRL	National TB Reference Laboratory
PHC	Primary Health Care
PHS	Public Health Specialist

SADC Southern African Development Committee

TB Tuberculosis

TBC TB Coordinator

TST Tuberculin Skin Test

WHO World Health Organization

XDR-TB Extensively Drug Resistant TB

Operational Terms and Definitions

The words listed below provide operational definitions as per the context of the study:

Co-infection: Concurrent infection of a cell or organism with two microorganisms

Control: the progressive decline in the incidence and prevalence of a disease in a population ultimately leading to its elimination.

Cured: a patient who was initially smear-positive, and has become smear negative in the last month of treatment and on at least one previous occasion.

Defaulted: a patient whose treatment was interrupted for 2 or more consecutive months for any reason.

Died: a patient who dies for any reason during the course of TB treatment

Healthcare worker: an individual that provides preventative, curative, promotional healthcare services in a systematic way to individuals, families or communities, the individual may be a healthcare professional within medicine, nursing, pharmacy or allied health professions. A healthcare worker may also be a public/community health volunteer that has received basic training in a certain program, e.g. TB.

MDR-TB: a case of MDR-TB is a person with bacteriologically proven TB; with at least one positive culture and drug susceptibility results showing resistance to Rifampicin and Isoniazid.

MAXQDA: a Qualitative Data Analysis software. “MAX” is a reference in honor of Max Weber the famous German sociologist.

New case: a patient who has never had treatment for TB or who has taken anti-TB drugs for less than one month.

Obstacles: a thing that obstructs progress, kind of a barrier.

Perspective: A way of seeing something, personal opinion, belief, or attitude about a particular situation or subject.

Relapse: a patient who previously received TB treatment and was declared cured or treatment completed and has once again developed sputum-smear or culture positive TB.

Re-Treatment case: a patient previously treated for TB; who is started on a re-treatment regimen. This can be after previous treatment has failed, or re-treatment after default, or when a patient previously declared cured or treatment completed has been diagnosed with bacteriologically positive (sputum smear or culture) TB (relapse).

Sputum conversion rate: the proportion of new smear positive cases that converted (become smear negative) at the end of the 2nd or 3rd month of treatment.

XDR-TB: is defined as resistance to at least isoniazid and rifampicin, and to any fluoroquinolone, and to any of the three second-line injectables (amikacin, capreomycin, and kanamycin).

Treatment completed: a patient who was initially smear positive and has completed treatment without proof of cure (no smear results at the end of the treatment), or a patient who was smear negative or had Extra-pulmonary TB (EPTB), who has completed treatment.

Treatment failure: a patient who, while on treatment is smear-positive at five months or later after starting treatment and became smear-positive after the second month of treatment.

Transfer in: a patient transferred from one TB register to continue treatment in the receiving treatment unit across districts.

Transferred Out: a patient transferred to another TB register to continue treatment in the receiving unit across districts.

Treatment Success rate: the proportion of TB patients cured and those who complete treatment for a given cohort.

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CHAPTER ONE

Introduction

This study proposes to focus on perspectives of healthcare workers on the obstacles to tuberculosis (TB) control among patients in Ghanzi district, Botswana. The district has more than double the national equivalent in TB notifications and rates in 2010 and 2012 respectively (Botswana TB and Leprosy Program Report, 2012). The chapter presents the background of the study, problem statement, significance, research questions and the conceptual framework.

Research Context: Background

TB remains a major global public health problem, ranking the second leading cause of death from an infectious disease worldwide after the HIV (WHO Global TB Report, 2012). There has been major progress in reducing TB cases and deaths in the past two decades, with TB incidence falling globally for several years and declining at a rate of 2.2% between 2010 and 2011. Globally, the TB mortality rate has fallen by 41% since 1990. Mortality and incidence rates are falling in all of WHO's six regions and in most of the high burden countries (HBCs) that account for 80% of the world's TB cases. Cambodia provides an important new success story for TB control in a HBC. A national population-based survey completed in 2011 showed that TB prevalence had fallen by 45% since a baseline survey in 2002 (WHO Global TB Report, 2012).

Despite this encouraging progress, the global burden of TB remains enormous. There were 8.7million incident cases of TB in 2011(13% co-infected with HIV) and an estimated 8.6 million new cases in 2012 which translates to 122 cases per 100 000 population. There were also 1.4 million deaths from TB (990 000 deaths among HIV-negative individuals and 430 000

among people who were HIV-positive). This information is significant because deaths of TB patients have been mostly blamed on HIV co-infection (WHO Global TB Report, 2012; Lawn, 2005).

Globally, 3.7% of new cases and 20% of previously treated cases are estimated to have multi drug resistant TB (MDR-TB) (WHO Global TB Report 2012). MDR-TB is defined as a disease caused by *Mycobacterium tuberculosis* with resistance to at least isoniazid (INH) and rifampicin (R), two of the most effective first line anti-TB drugs. Extensively drug resistant TB (XDR-TB) is caused by *Mycobacterium tuberculosis* isolates that are resistant to INH, R, antituberculars and to at least one of the three injectable second line anti-TB drugs: amikacin, kanamycin or capreomycin (Abubakar et al., 2013; Palacios et al., 2003; WHO MDR-TB and XDR-TB Progress Report, 2010; WHO, 2006). According to the Global TB Report (2013), progress toward targets for diagnosis and treatment of MDR-TB is far off track. Worldwide and in most high MDR-TB burdened countries, less than 25% of the people, out of an estimated 450 000 people who developed MDR-TB were detected in 2012 and there were 170 000 death from MDR-TB (Global TB Report, 2012).

Geographically the burden of TB is highest in Asia and Africa. India and China combined have almost 40% of the world's TB cases; the south-east Asia and western pacific regions of which they are part account for 60%. The African region has approximately one quarter of the world's cases, and the highest rates of cases and deaths relative to population, 255 incident cases per 100 000 population on average, more than double the global average of 122. Of the estimated 8.6 million incident cases in 2012, 1.1million (13%) were HIV positive, among whom 75% were from the African region. Incidentally the African region is not on track to halve the 1990 levels of mortality and prevalence by 2015 (WHO Global TB Report 2012).

According to the WHO Global TB Report (2012) Southern African Development Committee (SADC) member states bear the effects of TB epidemiology mainly on account of the heavy burden of HIV. Five countries in the region are among the 22 high TB burdened countries, namely the Democratic Republic of Congo (DRC), South Africa (SA), Zimbabwe, Mozambique and Tanzania. SA and DRC are among the 27 high MDR-TB burdened countries and SA has confirmed as high as 69, 442 MDR-TB cases cumulatively and 5,442 extensively drug resistant-TB (XDR-TB) cases. Eight of the member states had TB/HIV co-infection rates as high as 50-80%, underscoring the relative contribution of HIV to the burden of TB in the region (WHO Global TB Report, 2012).

TB remains a public health problem in Botswana. It was during the 1990's when the country witnessed a dramatic rise in the number of patients with TB (Botswana National TB Program, 2011). According to the BNTP (2011) the annual risk of infection survey carried out in Botswana showed a decline from 5.8% in 1956 to 0.1% in 1989. In 1975, TB notification rates were 506 per 100, 000 and declined to 199 per 100, 000 by 1989. Regretably this downward trend reversed in 1990 and notification escalated to a peak of 623 per 100, 000 population in 2002, one of the highest in the world. Prior to 1990, the efforts to control TB were very successful and case counts fell off dramatically to the point that experts believed that tuberculosis could be virtually eliminated. This was due to improved economic and social conditions and the development of effective drugs (Martinson, Hoffmann and Chaisson, 2011).

TB resurgence in the year 1990 and the reversal of the long standing trend in TB incidence was fueled by the onset of human immune deficiency virus (HIV). TB is linked to the HIV epidemic and trends in TB burden have followed trends in HIV prevalence over the years (BTLP, 2012). HIV is the most potent risk factor for TB and it increases the risk of TB by 20

fold compared with HIV seronegative individuals in high prevalence countries (WHO, 2009). HIV increases the progression of TB infection to active disease and increases the risk of TB recurrence. In like manner, TB also increases HIV progression to AIDS by decreasing CD4 counts and increasing viral loads (WHO, 2009). Co-infection with TB and HIV markedly increases the mortality and morbidity from both diseases and represent an ongoing public health problem in Botswana. Based on the studies of TB and HIV co-infection, it has become clear that the increase in TB was a result of the increasing prevalence (37.3%) of HIV in Botswana (BAIS III, 2008). Since 2002 the rate of TB has decreased to 505 per 100, 000 in 2009 which may reflect the increasing proportion of people living with HIV who have enrolled in the anti-retroviral program (BNTP 2011) which was rolled out in 2002. Despite clear signs of progress over the years, with sustained decline in TB notification rates, the estimated incidence still ranks among the highest globally. The year 2011 recorded as high as 455 per 100 000 population close to 4 times the global equivalent which is 122 cases per 100 000 world population and 331 per 100 000 population in 2012, more than double the global equivalent (BTLP Report 2012).

Despite the fact that drugs to treat and cure TB have existed for centuries now, significant challenges remain for TB prevention and control. Of particular concern is the rise in the cases of drug resistant forms of TB (Palacios et al., 2003; WHO, 2006). According to the BTLP (2012) the threat of drug resistant forms of TB remained real with the prevalence among new cases increasing by twelve fold from 0.2% in 1995 to 2.5% in 2008, while among retreatment cases prevalence was as high as 6.6 %. In 2010 the Ministry of Health (MOH) reported that they confirmed close to 100 new cases of MDR-TB and over the years close to 10 cases of XDR-TB were confirmed (MOH Government Report, 2010).

During the early 1990s, a combination of a large population of HIV-infected susceptible hosts with poor TB treatment success rates, limited drug resistance testing and an overburdened TB treatment program provided ideal conditions for increased TB incidence of unparalleled magnitude (Andrews et al., 2010). It was during that time in 1993 that WHO declared TB a global emergency and TB control has since become a matter of greater concern among the global, international and local health authorities.

In Botswana, TB infection and disease poses a health threat in Ghanzi district which is said to be the most tuberculosis afflicted district in the country (BTLP, 2012). In 2010 the district had an average of 1 100 cases per 100 000 people while the national rate had an average of 506 cases per 100 000 population (Government of Botswana Report, May, 2010).

Currently, Ghanzi has a case notification rate (CNR) of 722 per 100,000 population (BTLP, 2012) and the cause of this high CNR in the district is not known but thought to be due to a multitude of factors that include poor housing, alcoholism, poor nutrition, language barrier and nomadic lifestyle (Government of Botswana, Ministry of Health Report, May 2010) but there has not been any study done to confirm any of these factors. Poverty, TB and HIV co-infection and poor access to high quality health services has been cited by many authors as some of the main causes of this TB epidemic (Naidoo, 2009; BNTP, 2011; GOB MOH Report, 2010). All these mentioned factors linger on as unanswered research priorities among this highly vulnerable segment of Botswana. Again, consistent with the 2012 BTLP report, the South-western part of the country (where Ghanzi is located), has the lowest co-infection rates, but TB burden has been mostly blamed on HIV in several studies and reports.

Problem Statement

Botswana is one of the countries significantly troubled by TB and the south-western part bears the brunt of the epidemic, with the Ghanzi district carrying the highest burden. Between 2006 and May 2010, Ghanzi registered about 2 500 TB patients. Previously the district used to have an average number of 350 patients on treatment per year, even though the number could rise to 400. There were about 25 MDR-TB cases in the area during the same period. The TB case notification rates in the district were escalating as cases were even detected in areas which were not known to be prone to TB such as Grootlaagte settlement. In 2008, the TB cure rate in the district was 11 percent. It rose to 56 and declined by 21 percent in 2010 and 2011 respectively (BTLP, 2012) and yet, comparatively, the national rate should have been 85 percent, according to the World Health Organization (WHO Global TB Report 2012). The number of TB defaulters in the district is also high, currently at 7% higher than the national target of <1% (BTLP, 2012). The implication therefore, is that the high incidence of TB cases and low TB cure rates in Ghanzi, relative to the rest of the country, points to obstacles in TB control worthy of research.

In Ghanzi, TB treatment is taken by the patients on a daily basis at the health facilities. However, the healthcare workers have noticed that TB patients living on farms stop the treatment once they go back after being discharged from the TB ward at the district hospital. Concerns related to high population mobility, and significant prevalence of substance abuse, such as alcoholism, are thought to be part of the factors that obstruct TB control in this district.

In addition to that, even the healthcare workers in this district are at great risk of contracting the disease. According to the district TB team, there is a considerable number of staff members who have contracted TB and are currently on treatment. Despite the healthcare

workers' commitment to TB control, the TB burden remains unacceptably high in Ghanzi (Government of Botswana Report, May, 2010). At this time, looking at the high TB notification and defaulter rates with lower cure and treatment success rates in this district, there seems to be some factors that obstruct or interfere with TB control that public health is not cognizant of. These factors need to be researched, understood and addressed to improve TB prevention and control. Indeed, failure to reduce the number of TB cases globally has been attributed to a lack of support, not of science (Bleed, Dye, Raviglione, 2000; Reichman, 1997; Thomas, Frieden, Sonal, Munsiff, 2005). With sufficient political commitment and resources, many believe that Directly Observed Therapy Short course (DOTS) can effectively control global TB (Blanc, Floyd, Norval, 2001; Dujardin, Kegels, Buve, Mercenier et al., 1997; Henderson 1998; Styblo, 1989).

After almost 20 years of progress in TB control, largely as a result of the development and implementation of the DOTS (WHO, 2006), much of the world, Botswana included, remains no closer to achieving total TB control. In Botswana especially in Ghanzi district, TB control seems unlikely to improve despite the 100% DOTS coverage that has been reported (BNTP, 2009; BTLP, 2012) for over a decade now. In response to this lack of progress, WHO has called for further expansion of DOTS but the benefits have been modest. TB control needs to be reassessed in this area. Answers must be given as to why there is still a burden of TB that is greater than the national, regional and global average. After all, we know the pathogenesis, transmission, diagnostic techniques, treatment and prevention of almost all the cases. Further, TB is 100% preventable and curable and yet it is nowhere near being eliminated despite the BNTP's major objective to eliminate it. To date, TB remains our companion and priority must be accorded to its elimination as it places the heaviest burden on our country's healthcare and certainly ranks as the second highest killer after HIV.

Significance of the Study

Findings from this study, if carried out, would be beneficial in the following areas:

Practice

It is envisaged that the findings of the study would be used to improve TB prevention and control because TB control seems bleak. The burden of TB in Ghanzi is unacceptably high, being more than double the national target, despite the precautionary measures and prevention guidelines that are in place. Therefore, the findings would help guide practice and reduce the burden through setting of new strategies of interventions for prevention and control. Management and healthcare service providers in public health sectors would be sensitized on the importance of early interventions against obstacles to TB control.

Education

The findings would be utilised during curriculum development and review to ascertain whether the TB content is adequate and relevant to the students' level of study.

Research

The research findings would form a baseline for further research to be utilized by healthcare workers.

Policy

The findings may also be used to influence policy development and implementation, especially the National TB control Program. Policy makers may use the findings in setting up standards and protocols that would impact healthcare delivery thus reducing TB burden. Healthcare providers would use the findings to contain the scourge by developing a framework for effective strategies in combating obstacles to TB control in public health sectors.

Research Questions

- What are the obstacles to TB control among patients in Ghanzi district?
- What are the healthcare workers' perceptions and attitudes concerning TB infection prevention and control?
- What are the strategies employed by healthcare workers to control TB?
- What recommendations can be provided to management for improved TB control?

The Conceptual Framework

In this study the ACCESS Framework developed by Obrist, Iteba, Lengeler, Makemba et al., (2007) will be used. The framework was developed in the frame of the ACCESS Program which focused on understanding and improving access to prompt and effective malaria treatment and care in rural Tanzania as an empirical case study (Hetzel, Msechu, Goodman, Lengeler et al., 2006; Hetzel, Iteba, Makemb, Mshana et al., 2007) The framework has been used for analysis and action to explore and improve access to healthcare in resource poor settings in Africa like Mali and Tanzania. The study will focus on the ACCESS framework as it applies to obstacles to TB control among TB patients in Ghanzi district in Botswana and will be adapted to the Botswana context. The researcher will address how the framework will guide the study in answering the research questions.

Obrist et al., (2007) consider access as a general concept summarizing a set of more specific dimensions namely: availability, affordability, accessibility, adequacy and acceptability. The authors talk about the interventions to reduce supply barriers and improve the delivery of services, including availability of health facilities, equipment, qualified staff, and staff skills,

protocols of diagnosis, treatment and quality of care. Interventions on the demand side, which include information, education and communication, are also discussed by the authors.

The ACCESS framework highlight that once people recognize an illness and decide to initiate treatment, access becomes a critical issue. Five dimensions of access influence the course of the health-seeking process: Availability, Accessibility, Affordability, Adequacy, and Acceptability. What degree of access is reached along the five dimensions depends on the interplay between (a) the healthcare services and the broader policies, institutions, organizations, and processes (PIOP) that govern the services, and (b) the livelihood assets people can mobilize in particular vulnerability contexts. However, improved access and healthcare utilization have to be combined with high quality of care to reach positive outcomes (Obrist et al., 2007) of which in this study will be effective tuberculosis control manifested by decreased CNR, decreased defaulter rate and high cure and treatment success rates.

Constructs of the ACCESS Framework and its Application

The ACCESS Framework consists of the following constructs:

Healthcare Services and the Policies, Institutions, Organizations and Processes (PIOP)

The framework suggests that patients do not seek help only from health facilities or private practice, but also in drug shops and pharmacies as well as from healers representing a wide array of medical traditions. Access to these providers is governed by cultural norms, policies, laws and regulations which are themselves influenced by broader trends in society, global health policy, research and development (Obrist et al., 2007).

Questions pertaining to facility, DHMT and ministerial management support and contribution to TB infection prevention and control will be addressed by exploring the PIOP and Healthcare Services constructs of the framework.

This will provide information as to whether the policies, standards, regulations and protocols set by the organizations (such as MOH) and institutions (like Ghanzi Hospital) and the processes (e.g. case finding) of healthcare provision are adequate and relevant to TB control. That is, do they improve TB control or are they the major obstacles to effective TB control? The Healthcare services construct of the framework would also help in probes and research questions related to the facilities and the type of healthcare providers the patients consult before presenting to the health facility and they will be able to be identified as whether they improve access to healthcare or serve as obstacles.

Five Dimensions of Access, Livelihood Assets and the Vulnerability Context

The framework suggests, for example, that essential drugs availability is considered a prerequisite to the availability of health services. Problems of accessibility including long distances to health facilities, scarce public transport, and lack of other transport means are access barriers. Issues related to affordability are also major obstacles, for example, frequent complaints about fees, even if official fees are exempted (e.g. for children under five years) or waived (for example, for persons temporarily unable to pay), the people end up paying for drugs, small charges and even ambulance fees. Poor people have to resort to short-term coping strategies like selling critical assets such as crops to pay for healthcare (Obrist et al., 2007). The framework suggests, for example, that long waiting times indicate a distribution of staff and equipment not in accordance with need; unwelcoming staff attitudes or poor interpersonal skills as well as

complex billing systems at hospitals and the pricing of services is determined by the health facilities meaning that both factors are outside the control of the public as users of health services, and these acting as adequacy barriers.

With regard to acceptability, lack of trust by users in healthcare workers or the intermediates that link the community with the healthcare system, make people reluctant to use the services. Also lack of assertiveness and low self-esteem by users from among the poor, increase the difficulty of accessing services. The five dimensions of access construct will help in probing whether these dimensions do obstruct TB control among patients.

According to Obrist and others (2007):

Livelihood approaches as the name implies emphasizes assets (including material and social resources) and activities needed to gain and sustain a living under conditions of economic hardship. This construct suggests that people face difficulties in gaining access to household and community assets which in turn constrain their strategies to cope with the disease. (p. 1585)

In other words, not only possession but mobilization of household and community assets is a critical factor in influencing people's access to healthcare.

Whether people actually recognize an illness and seek treatment in pharmacies or through other healthcare services depends to a large extent on their access to livelihood assets of the household, the community or the wider society, this comprise human capital (local knowledge or ignorance about the disease, education, skills), social capital (social networks and affiliations), natural capital (land, water and livestock), physical capital (infrastructure, equipment and means of transport) and financial capital (Hetzl et al., 2007)

The research questions pertaining to the obstacles to TB control among patients will be addressed by exploring the livelihood assets with particular focus on the vulnerability context. The livelihood assets may provide insights as to whether they are the potential driving forces to or obstacles to TB control. The availability of these assets is influenced by forces over which people have little control, for example economy, politics or technology, climate variability or shocks like floods, drought, armed conflicts or epidemics. Such factors may be referred to as vulnerability context (Obrist et al., 2007).

Healthcare Utilization and Quality of Care

The framework purports that depending on access to healthcare services and livelihood assets, people develop multitude and changing healthcare utilization strategies.

According to Obrist and others (2007):

They may not take action at all or use different service providers simultaneously or in sequence. However, even if they gain access and utilize healthcare, the outcome in terms of health status (as evaluated by experts or by patients), patient satisfaction, and equity is subject to the technical quality of care. Technical quality of care includes provider compliance and diagnostic accuracy, safety of the product, and patient compliance or adherence. (p. 1587)

The questions that focus on the healthcare workers' perceptions, attitudes and the strategies they employ to prevent and control TB will be addressed by exploring the quality of care part of the construct of the framework. The attitudes of healthcare workers toward TB infection control and their compliance to procedures and standards of TB infection control will answer the question as to whether they contribute to the ineffective TB control in the district.

All the above mentioned ACCESS framework constructs will guide in formulating and constructing questions and probes for the research instruments that will be used to gather data on obstacles to TB control among patients in Ghanzi district. A positive health outcome which in this study is effective TB control can improve as healthcare services (including policies, institutions and organizations that govern them) become better aligned or interplay successfully with the livelihood assets, that is clients' needs, expectations and resources (Obrist et al., 2007).

Figure: 1 below illustrates the ACCESS Framework:

The ACCESS Framework

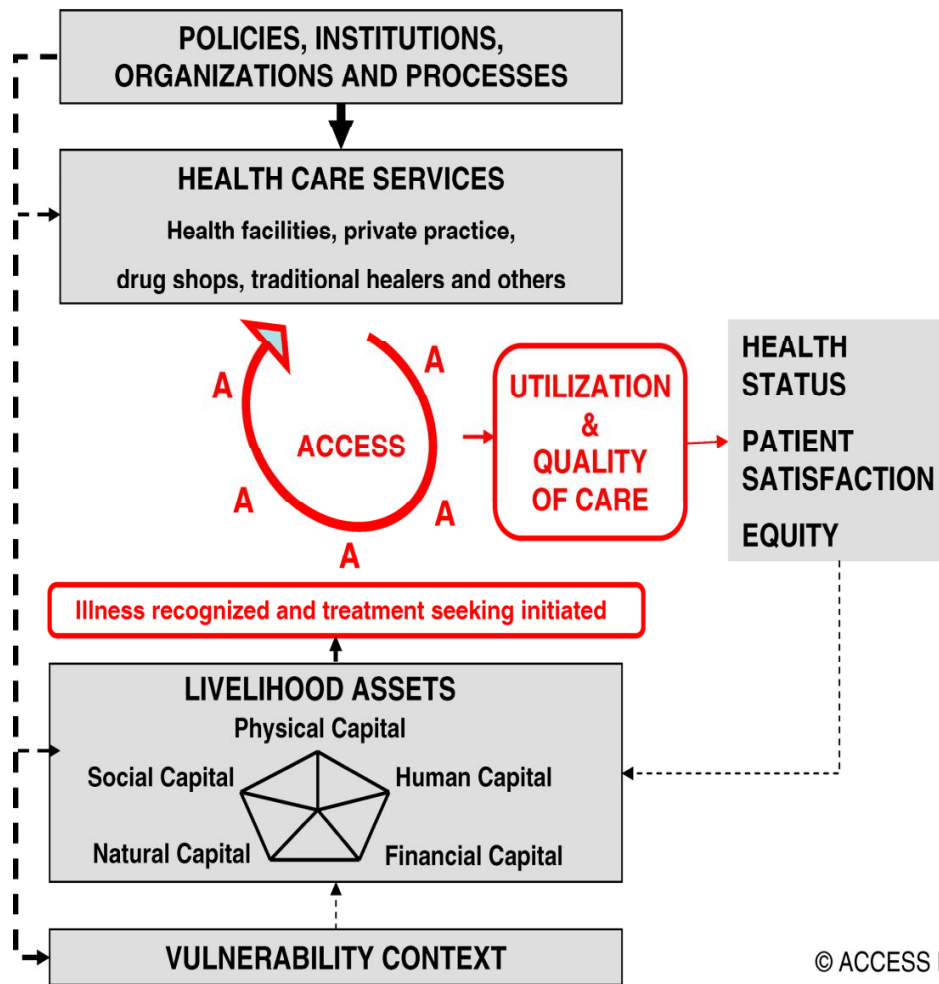


Fig 1: Adapted from: doi:10.1371/journal.pmed.0040308.g001

Accessed: 26 February 2014.

Summary

The chapter has covered the background of the study which commenced with a review of national and international literature which explored the epidemiology of TB globally, regionally and locally. The problem statement, significance of the study, research questions and the conceptual framework are presented. The Access framework has been identified as an appropriate theoretical framework to support this research as it fits well with the themes identified from literature. The following chapter will present the reviewed literature; first indicating literature search strategy and then present the findings in themes guided by the access framework.

CHAPTER TWO

Literature Review

This chapter presents a review of literature from previous studies on HCWs' perspectives on obstacles to TB control among patients. Literature search revealed an insufficiency of qualitative TB research particularly related to healthcare workers perceptions, attitudes and beliefs about TB and TB clients in African countries. There was deficient literature found on the subject with regard to Botswana. Non adherence, defaulting (Mishra, Hansen, Sabroe and Kafle, 2006); lack of knowledge, negative attitudes and beliefs, poor interpersonal relationships (Wares, Singh, Achrya and Dangi, 2003); stigma (Auer, Sarol, Tanner, Weiss, 2000) and many others (Porter and Odgen, 2002; Watkins et al., 2004) were revealed as the contributing factors to ineffective TB control. The identified obstacles to TB control will be presented according to the ACCESS framework because it has a comprehensive approach that succeeds in addressing the major factors that could obstruct TB control among patients.

Literature Search strategy

Relevant research concerning obstacles to TB control among patients was identified by searching the biomedical and social science databases for primary research material. A total of 12 databases were searched for publications from 2000 through to the present (2015), with the key articles obtained primarily from Google Scholar, SAGE, Medline, Science Direct, EBSCOhost, CINAHL and Health Source Nursing. Several research journals were consulted including the International Journal of Tuberculosis and Lung Disease, Biomedical Central and

Public Health, Journal of Infectious Diseases and Immunity, PLoS ONE and the TB Policy Guidelines and research reports.

Relevant abstracts and documents and the reference list of relevant studies were searched from the journals. A comprehensive search strategy to identify all relevant research related to the obstacles to TB control was used. In order to ensure that relevant studies were not missed, the search terms remained broad and included the following key-words: “obstacles” or “barriers”; “tuberculosis”, or “TB”; “control” and “factors affecting TB control”; “barriers to effective TB control” anywhere in the title or abstract. No language restrictions were employed. Studies were eligible for consideration in this review if: (a) the focus of the study was obstacles to TB control; and (b) there was at least one TB or TB treatment factor measured, for example compliance.

The next step was a detailed examination of the articles, and at this point studies were excluded if the obstacles or TB infection or TB treatment factor were insufficiently described, or if TB control factor was only a minor variable in the study, making the study to have insignificant contribution to this review.

For this literature review on obstacles to TB control among patients, a study was considered relevant if: 1) the study was related to TB and the study population comprised of HCWs or patients or patients’ family or community; 2) the stated objective of the research was directly linked to provision and/or utilization of services provided in the TB program, such as TB screening or 3) the stated objective was directly limited to the planning or provision of TB services. Studies investigating direct association between obstacles and patients and their families or communities and the NTP services and the obstacles to program implementation were included.

Obstacles to TB Control

Obstacles to TB control were identified in the following areas: obstacles associated with the healthcare system and patient related factors. These describe the inequitable situation where, socio-economic status and geographical location intertwine with poor and ineffective health systems to create serious health challenges for TB control (Dimitrova et al., 2006).

Healthcare Related Factors

Poor management of NTP, resources shortages, ((Finlay et al., 2012; Munro et al., 2007) poor intersectoral cooperation, healthcare workers' knowledge, attitudes and beliefs, relationships between HCWs and patients (Dimitrovia et al., 2007; Porter and Ogden, 2002) and poor infection control systems were identified as the main factors under healthcare systems that largely account for ineffective TB control (Jensen et al., 2005; Edington et al., 2006).

Poor Management of the NTP and Inadequate DOTS Strategy

Unfavorable health system factors such as failure of HCWs to offer health education; to articulate the need for treatment compliance and to appropriately manage side effects were identified by Muture, Keraka, Kimuu, Ombeka et al., (2011) as some of the reasons for default. This finding is supported by Munro et al., (2007) study in which it was shown that program failures such as inadequate supplies of drugs, delayed and misdiagnosis (Finlay et al., 2012), long waiting and inconvenient opening times (Loveday, Thompson, Ndlela, Doodley et al., 2007) all added to the economic discomfort for the TB patients and therefore negatively influenced adherence. In a study in Nepal inconvenient opening times for TB clinics situated far from patient homes accounted for defaulting in 28% of non-compliant TB patients (Bam, Chand and Shrestha, 2005). In contrast Pandit and Choudhary (2006) identified in their study that long

waiting times are not a major problem for treatment adherence. Their finding is further supported by Jittimanee, Madigan, Nontasood et al., (2007) who have shown that, long waiting times did not have an effect on treatment adherence.

In-depth interviews of a study in India that assessed the needs and perspectives of patients and HCWs in Delhi showed that reasons for defaulting were linked to poor correlation between patient and program priorities or needs and to particular characteristic of disease and its treatment. Patients' needs that are still to be met by health systems include arrangement for provision of treatment for family emergencies and provision for complicated cases such as alcoholics (Jaiswal, Singh, Ogden, Porter et al., 2003).

Resource Shortages

According to Dimitrova et al., (2006) insufficient financing was identified as the source of most problems in the health system, leading to restricted access to care, inadequate diagnostic capacity, poor drug procurement systems, lack of transportation for conducting home visits and tracing of patients; low salaries and poor motivation of staff. The under-resourced healthcare system was seen as unable to respond to the growing burden of disease (Dimitrova et al., 2006). Broadly speaking, human resource planning in relation to TB was widely seen as suboptimal. There are indications that in a situation of diminished resources and growing need, access to effective TB care might be problematic (Garrett 2000; Reichman and Tanne 2002; Coker et al. 2003; Atun et al. 2005a; Coker et al. 2005).

Intersectoral Cooperation

Suboptimal collaboration with general health services and social services limits opportunities for care and social support to patients. Members of the healthcare team for example, nurses, doctors and social workers have to work together in providing care for the

patients. Despite the recognition that TB is a complex disease requiring cooperation between the TB service and the rest of the healthcare system and social services, most HCWs in a Russian study reported working in isolation, with inadequate support. This was compounded by the fact that legislation defining the responsibilities of each institution was not available (Dimitrovia et al., 2006). Inadequate intra- and inter-sectoral collaboration, inadequate responsiveness of services to need, and the lack of flexible approaches were criticized. Effective inter-sectoral working relations are hindered by perceptions of risk. Social services (social workers) were insufficiently involved in supporting TB patients and facilitating their access to TB services because of the risk of contracting TB (Dimitrovia et al., 2006; Coker et al., 2005).

Healthcare Workers' Knowledge, Attitudes and Beliefs

Knowledge, attitudes and perceptions of the HCWs play an important role in the ability to diagnose and care for TB patients. Factors such as training, cultural and ethnic background, practice setting, preferred source of information and learning style influence the HCWs. It is of paramount importance that the HCWs caring for TB clients have and maintain positive attitudes (Dimitrova et al., 2006; Porter and Ogden 2002). HCWs come from a wide range of backgrounds, thus personal and cultural factors may affect their practice like challenging and destabilizing cultural interpretations therefore resulting in ineffective TB control.

According to Moro et al., (2005) the information and the education provided by the HCWs and the relationship they have with the TB patients is an essential component in the successful treatment of TB. The HCW has a critical role in providing accurate information and relevant knowledge to correct wrong beliefs and impart correct knowledge (Liefoghe, Michiels, Habib, Moran et al., 1995). Health educational efforts should not overstate TB as this could reinforce stigma and denial (Auer et al., 2000).

Major deficiencies have been found in physician knowledge and practices in appropriate TB management and dissemination of information to patients (Finlay et al., 2012; Lambert and van der Stuyft, 2005). Inaccurate knowledge of TB transmission or inappropriate TB treatment regimens may result in misdiagnosis or mistreatment (Lienhardt et al., 2001; Nair, George and Chacko, 1997). In many instances HCWs have uttered the need for comprehensive ongoing educational programs for themselves (Dimitrova et al., 2006; Mishra et al., 2006; Moro et al., 2005, Watkins et al., 2004; Messemer et al., 1998). Some reported feeling inadequately prepared for their role in TB control and that they have not received specific TB training. Correct information and content is essential for TB control program staff so that they feel comfortable within the care setting, otherwise incorrect TB education may be delivered like the HCWs in the Gambia who were found to have limited knowledge about the signs and symptoms of TB (Eastwood, 2002).

Several studies in India, Indonesia, Russia (Woith, Volchenkov and Larson, 2009) Kenya, Tanzania (Wandwalo and Morkve, 2000) and South Africa (Afari-Twunamasi, 2005) have shown that knowledge of TB is generally low in many settings among HCWs. A study in India (Singla, Sharma & Jain, 1998) that surveyed 200 nurses found that only 40% of TB nurses and 10% of general hospital nurses had a satisfactory knowledge of TB, and only 56% of general nurses knew that TB was caused by mycobacterium tuberculosis. About 36% of the participants thought TB was caused by a virus, while in the Indonesian study only 40% of the nurses knew the cause of TB (Wahyun et al., 2007). In Kenya, Ayaya, Sitienei, Rotich and Odero (2003) showed that most HCWs used treatment regimens not recommended by the NTP.

Relationships between HCWs and TB Patients

A good relationship between the healthcare worker and the patient is a strong factor for quality healthcare (Jin, Sklar, Oh, Li et al., 2008). Interventions to promote patient centered care may result in greater customer satisfaction and is associated with improved health outcomes (Dick et al., 2004; Watkins et al., 2004). The trusting relationships HCWs form with patients have been shown to strongly influence treatment success (Dordor, Kelly and Neal, 2009; Dordor and Afenyadu, 2005). A review of studies addressing healthcare worker behaviors suggested that patients respond to positivity, to attention and encouragement (Dordor and Afenyadu, 2005). Similarly Jin et al., (2008) have found that compliance is good when healthcare workers are emotionally supportive, give reassurance or respect and treat patients as equal partners. Volmink et al., (2000) showed that TB program success is frequently attributed to good patient staff relationships and friendly, competent staff. Poor relations between the HCWs and patients as well as rigid task orientated care delivery are major reasons for non-adherence as identified by the study of Dick et al., (2004) conducted in Cape Town, South Africa.

Bam et al., (2005) in a study that was conducted in Nepal found that the quality of the HCW and patient interaction and relationship contributed to differences in treatment adherence. There were diverse attitudes within HCWs as was demonstrated where contrasting behavior amongst HCWs was reported. HCWs working in the TB control program were found to have positive attitudes. A stark contrast of behavior among HCWs working in the wider community was reported in Nicaragua (Macq et al., 2003) whilst the TB control program staff exhibited empathy and compassion in caring for the clients and were described as barrier breakers in facilitating relationships between TB clients and HCWs from outside the program. The HCWs

working outside the TB program were wary of the TB clients and regarded them with suspicion, isolating all of them whether infectious or not.

According to Edington et al., (2002) HCWs in South Africa were described as being disrespectful and the behavior resulted in patients deciding not to return for further care. Furthermore, Finlay et al., (2012) identified that in South Africa certain healthcare workers had negative attitudes towards patients who had not treated them with respect; that patients often did not trust the healthcare workers and missed treatment because of negative attitudes portrayed by healthcare workers.

Similarly an Indian study by Jaiswal et al., (2003) demonstrated that poor interpersonal communication between HCWs and patients resulted in difficulties for patients to re-enter the system if they missed treatment. Patients reported being fearful of the healthcare team; in particular being rebuked by the doctor. According to Dordor and Kelly (2010) HCWs maltreated TB patients, doctors did not perform well and even less so with non-adherent patients; for instance shouting at them and asking them not to sit among the rest of the out-patient attendants. Sagbakken, Frich and Bjune (2008) reported from their qualitative study conducted in Ethiopia that some nurses were more flexible than others, but there were examples from all three clinics under study of patients who were threatened, humiliated or treated with anger by staff for not adhering to the rules of the program.

Communication between HCWs and TB patients

Communication between patients and HCWs is critical for effective healthcare. It is a fundamental element that helps to shape the patient-HCW relationship and foster trust. Good communication reflects the dynamics of the relationship and can impact on trust, satisfaction and adherence (Wares, Singh, Achorya, Dangi et al., 2003).

Poor quality communication between HCWs and patients was found to be the most significant factor associated with noncompliance (Mishra et al., 2006; Wares et al., 2003) which sometimes resulted in a complete breakdown in the care relationship. The manner in which the HCWs communicated with the clients resulted in patients not completing or adhering to treatment. (Dick, Lewin, Rose, Zwarenstein et al., 2004; Wares et al., 2003). A South African study established that the quality of HCW and patient communication coupled with correct causative belief, were associated with TB treatment compliance (Peltzer, Onya, Seoka, Tladi, Malima, 2002).

There have been reports of poor relationships between HCWs and patients ranging from rudeness to abuse and neglect (Dick et al., 2004), lack of attention and support (Jaiswal et al., 2003). A study among newly diagnosed patients in Nepal revealed that HCWs exhibited dominant traits at times. Clients reported HCWs' aggressive behavior (Macq, Solis, Martinez, Martiny and Dujardin, 2003), especially if they arrived late for appointments or forgot to bring their medications to the clinic (Wares et al., 2003). The HCWs delivered a rigid, task-oriented care, and conversed superficially with the clients.

The findings of a study amongst PTB cases in Nepal between 1999 and 2001 revealed that clients felt that they received inadequate explanations about their medications, the potential side effects and the length of the drug regimen. Clients believed that they were not listened to, taken seriously or treated as having any integrity or being worthy of respect (Mishra et al., 2006). In a similar study the clients reported good knowledge of their disease but lacked information about side effects and the consequence of non-compliance to the drugs (Wares et al., 2003). Poor communication and negative attitudes were directly associated with non-compliance in Nepal (Mishra et al., 2006), Bali and Manila (Weiss, 2000).

Infection Control

TB-infection prevention and control (TB-IPC) is based on a three-level hierarchy of controls, including administrative, environmental, and respiratory protection (Jensen et al., 2005). Measures for TB-infection prevention and control (IPC) were observed to remain the responsibility of individual healthcare facilities (Edgington et al., 2006).

Edgington et al., (2006) noted that there are suboptimal IPC provision such as the lack of isolation facilities and personal protective equipment, and the lack of a TB-IPC policy. Further influences included inadequate TB training for staff and patients, the excessive workload of nurses, and a sense of duty of care. Most facilities that provide TB care have no designated TB wards. Instead they offer a closed ventilation system with only a limited number of rooms having access to natural ventilation (Edgington et al., 2006)

Patient-Related Factors

Worsening socio-economic conditions were seen both as a cause of TB and a major obstacle to access to care. Education, treatment literacy, geography and cost of transport, poor interpretations of illness and wellness, use of alternative medicine and drug resistance were identified as critical obstacles to effective care and treatment. TB was profoundly associated with stigma, alcohol and substance abuse and these resulted in delays in accessing care and obstacles to ensuring treatment success.

Socio-economic barriers

According to Dimitrova et al., (2006) care for different socio-economic groups should be targeted through different strategies. In recent years there has been a marked shift in patients'

socio-economic status. Whilst in the past most patients came from low socio-economic status groups, TB is now not confined to this group but crosses socio-economic strata; patients are increasingly better off, better educated and well-integrated into society or, 'normal'. Differences exist as to whether employment and socio-economic status are contributory factors to patient TB treatment compliance (Pandit et al., 2006).

For some researchers, being employed may be associated with better socio-economic status, which enables one to afford cost of transport and healthcare fees, increasing the chances of treatment compliance (Okanurak et al., 2008; Tissera, 2003; Hasker et al., 2008). However a study in India did not find socio-economic status to be significantly associated with TB treatment compliance (Pandit et al 2006). On the other hand, Dimitrovia et al., (2006); Mette, Frich and Gunna, (2008); Yan et al., (2007) reported that fear of unemployment is a major obstacle to patients seeking care and a reason for delays in diagnosis. Despite treatment for TB being formally free, absence of benefits to cover housing, transport and food is especially problematic and obstructive to treatment, particularly when people potentially lose their jobs through illness.

Financial burden of TB treatment

Having TB was indicated as a challenge in the workplace in several studies (Khan, Walley, Witter, Shah and Javeed, 2005; Khan, Walley, Newell and Imdad, 2000; Jaiswal et al, 2003; Greene, 2004; Edington et al., 2002; Fong, 2004). Patients hid their disease for fear that employers might realize that they had TB, with consequent effects on adherence. Additional work-related issues included difficulty in obtaining sick off for treatment and fear of potential job loss.

The reports showed how some patients prioritized work over taking treatment (Khan et al., 2000; Jiswal et al., 2003). Patients had to choose between work and adherence (Khan et al.,

2000; Jiswal et al., 2003; Johansson and Wikvist, 2002; Allen 2006; and Fong, 2004). For patients in rural areas, there was a conflict between attending clinic-based treatment and the need to earn a living. This was manifested in patients feeling “forced” to choose between work and attending treatment (Martins, Grace and Kelly, 2005); patients having “no choice” but to abandon treatment because it was too difficult to combine the two; and patients not being able to afford treatment, but if they sought work, being unable to attend for treatment (Greene, 2004).

A study involving inner-city homeless people on TB preventive treatment reported that treatment posed an economic barrier for them because they often worked out of town (de Vos (2002). Patients often explained treatment interruption quoting the costs of treatment (Khan et al., 2000; Greene, 2004). In some settings, patients reported that drugs were expensive (Kendall et al., 2013) and, where treatment was free, hidden costs such as hospital stays, transport costs for regular checkups and review of X-ray results could be high. In some cases HCWs acknowledged patients’ financial constraints (Sanou, Dembele, Theobald, Macq, 2004).

However, there were examples of doctors not accepting that costs caused patients to stop taking treatment because, from the doctors’ perspective, treatment was provided for free (Greene, 2004). Failure to accept patients’ reasons for non-adherence may contribute to the negative attitudes sometimes expressed by HCWs towards defaulting patients, resulting in difficulties in patients returning to treatment following missed appointments.

Geography and cost of Transport

Lack of finance and the distance from the patient’s residence to the health facilities were the reasons reported for non-adherence to treatment (Wondimu, Michael, Kassahun and Getachew, 2007; Martins, Grace and Kelly, 2008). The study carried out in Hong Kong in 2000,

baseline socio-demographic and clinical characteristics were correlated with adherence to DOTS and found that geographical inconvenience was the prime reason among a significant proportion of patients who failed to stay on DOTS (Wondimu et al., 2007).

One study noted that access to healthcare facilities was better in urban areas than rural areas (Martins, Grace and Kelly, 2005) and both patients (Harper et al., 2003; George, 2003) and the HCWs noted that adherence was compromised if the distance from patients' homes to the nearest clinic was too great. If patients' homes were close to a clinic, however, the patients did attend regularly (Gleissberg, 2001). For patients on DOT, the time needed to present for direct observation of treatment-taking compromised their ability to attend to other daily tasks (Singh et al., 2002; Sanou et al., 2004; Greene, 2004). The remoteness of villages from town where TB units are located, and lack of means to cover the transportation costs, makes appropriate healthcare inaccessible to many rural inhabitants.

Cost of transport for patients is a problem not only in remote rural areas, but also in the larger cities because public transport is unaffordable to many. Patients are often referred for outpatient treatment to facilities, but transport may be inadequate, too costly or low on patients' lists of priorities (Martins, Grace and Kelly, 2008). The problem of geographical distance is compounded by poor transport infrastructure. The geographical distance that had to be covered to get to the health centre on a daily basis is seen as particularly challenging and prohibitive for the majority of patients, but especially for poorer patients from rural areas. Additional costs are often incurred, even though drugs are given free of charge, and this has an impact on the overall cost of care (Needham et al., 2004; Martins et al., 2008).

Studies in Nepal (Bam and Gunneberg, 2006), Uzbekistan (Hasker et al., 2008), Malaysia (O'Boyle et al., 2002) and Swaziland (Pushpanathan et al., 2000) indicated that cost

of transport accounts for non-compliance to TB treatment especially when the patient feels better. In a Malaysian study, cost and time of travelling to the treatment center were major contributory factors associated with compliance to treatment, as non-compliant patients paid significantly more for transport than those compliant (O'Boyle et al., 2002).

In a prospective cohort study in Southern Ethiopia that determined factors predicting adherence to treatment among smear positive PTB patients Shargie and Lindtjon (2007) found that among four hundred and four TB patients on treatment, 20% defaulted, in addition 91% of all treatment interruptions occurred in the continuation phase when the patient felt better and had higher cost of transport to a treatment facility.

Patient Literacy

Education and health awareness have strong impacts for the sustainability of TB care. The study conducted by Date and Okita (2005) that examined how gender and literacy influence TB diagnosis and treatment reported that illiteracy is linked to the non-adherence to treatment and cure. The reason for a significant proportion of the illiterate patients not adhering to treatment was found to be due to lack of knowledge about the importance of treatment under supervision. Illiterate patients have longer diagnostic delay than literate ones (Date et al., 2005). Conversely, an awareness study of TB and attitude towards DOTS among randomly selected patients belonging to low socio-economic group at one district TB clinic, South India, reported that all the patients had a fairly good knowledge of treatment but none about DOTS, despite 100% literacy achieved in that area (Sukumaran, Venugopal and Rejoy, 2002).

Several studies have looked at the relationship of the patient's educational level to their health status to gain a better understanding of the causes associated with adverse health outcomes (DeWalt et al., 2004; Date et al., 2005 and O'Boyle, Power, Ibrahim and Watson, 2002). In a

study that was carried out in Thailand that aimed at determining the patient factors predicting successful treatment, out of 1241 patients studied, 81% with higher educational levels and knowledge of TB were successfully treated, the argument being that these factors are associated with better compliance to TB treatment and subsequently treatment success (Okanurak, Kitayaporn and Arakasewi, 2008).

Several other studies have demonstrated educational levels of TB patients as significant predictors of treatment compliance (Balasubramanian, Garg and Santha 2004; Date et al., 2005; Johansson et al., 1999; Mishra et al., 2005). Meanwhile, a Malaysian study demonstrated that among other factors, non-compliance was associated with completed secondary education (O'Boyle et al., 2002). Conversely, a study in Ndola, Zambia found that educational levels were not significantly associated with compliance (Kaona, Tuba, Siziya, Sikaona et al., 2004).

Patients' Knowledge of TB and Treatment Literacy

Treatment literacy means providing accurate information about the science behind the disease and treatment so that the patients can be more responsible for their own care and be able to demand their rights when proper care is not provided (DeWalt et al, 2004). According to Smart (2010) knowledge and attitudes about TB and its treatment vary widely due to different cultural, religious, or traditional beliefs and access to education and information about the disease. Smart (2010), further states that patients' lack of knowledge of TB symptoms or failure to recognize them result in delays in seeking healthcare.

Denial may be high due to stigmatization among misinformed communities. These become obstacles to early diagnosis and treatment, resulting in increased risk of transmitting TB to other close contacts and the general community, as well as poor health outcomes for people with the disease (Afari-Twunamasi, 2005). According to DeWalt et al., (2004) lack of treatment

literacy is associated with poor health outcomes and conversely treatment literacy improves health outcomes and compliance. In Botswana, research found that compliance to treatment was related to availability of information, material and emotional support from family members (Kgatlwane et al., 2005).

Interpretations of Illness and Wellness

Often when patients commence treatment, they will be very sick and may be inactive. However as the treatment progresses and their condition improves and symptoms start to regress, the improvement in itself may become a barrier to continue with treatment (Williams et al., 2008). In a Nepal cross sectional study of 130 compliant and 25 non-compliant TB patients, 48% of the latter were more likely to think that they could stop TB treatment once they were free of the symptoms and feeling well because they thought they were cured (Bam et al., 2005).

Several studies reported that patients stopped treatment because they felt better and thought that they were cured (Khan et al., 2000; Jaiswal et al., 2003; Allen 2006; Pushpanathan, Walley and Wright, 2000; Rowe, Makhubele, Hargreaves, Porter, and Hausler, 2005) or because their symptoms faded away (Pushpanathan et al., 2000; Ito, 1999). Some studies noted that patients who felt worse than before treatment (Khan et al., 2000; Jaiswal et al., 2003; Greene 2004) or saw no improvement in their condition (Khan et al., 2005; Khan et al., 2000; Jaiswal et al., 2003; Watkins et al., 2004) might be more likely to interrupt treatment.

A study conducted in the Gambia reported that migrants arrived in the country to receive TB treatment and returned home once they felt better (Harper, Ahmadu, Ogden, Mc Adam et al., 2003). This problem may be linked to patients' conceptions of recovery, and of the cause of TB. Treatment interruption was also reportedly related to perceptions about TB as a disease; some patients did not believe that they had TB, only wanted a cure for their symptoms and ceased

treatment once the symptoms lessened (Watkins et al., 2004; Asamo, 1998). Studies in Malaysia and Zambia showed that non-compliance was associated with being free of symptoms (O'Boyle et al., 2002; Kaona et al., 2004). Another study reported that patients were motivated to continue treatment as a consequence of symptom relief (Gleissberg, 2001).

Alcohol and Substance Abuse

Alcohol and substance abuse have been cited as barrier to TB treatment and care as it leads to forgetfulness (Sansone & Sansone, 2008), poor compliance to medication (Jin et al., 2008; Muture et al., 2011; Gelmanova et al., 2007), default (Hasker et al., 2008; Gelmanova et al., 2007) and acquisition of MDR-TB (Gelmanova et al., 2007). The altered behavior under the influence of alcohol and other substances is believed to be one of the reasons for such observations.

Exploration of alcohol and substance use among TB patients and any indication of such behavior by HCWs would enable them to focus their treatment literacy on such patients (Fry et al., 2007). DOTS programs will be more likely to achieve better TB control outcomes; if interventions aimed at improving diagnosis of alcohol and substance abuse and treating it concurrently with TB are included (Fry et al., 2007; Sansone & Sansone, 2008).

Stigma and lack of support

Stigma associated with TB is universal and appears to be a significant barrier to access to care. TB stigma is frequently associated with diagnostic delay and poor or non-compliance creating negative impact on TB control (Auer et al., 2000). Many TB patients experience stigma at home, in the community, and at the work place (Auer et al., 2000) and this could be as a result of misinformation about TB transmission and HCW attitudes. Literature demonstrated some public attitudes which are likely to hamper access to care (Auer et al., 2000; Dodor and Kelly,

2010). Stigma was experienced as especially problematic in the work place and many patients have reported to HCWs of stigmatization by employers. TB is seen as an infectious, dangerous and threatening condition (Auer et al., 2000). These features are associated with widespread negative perceptions of TB as a 'social disease' confined to marginalized population groups, a "dirty disease", a "death sentence" affecting unclean people (Johansson, Long, Diwan & Winkvist, 2000).

The association of the disease with homelessness, crime and imprisonment, alcohol abuse and other forms of socially unacceptable behavior irrationally magnifies the perceived threat to public health and leads to further marginalization and social exclusion of those marked by the disease. People from less deprived sections of society were reported to react with denial and disbelief when diagnosed with TB and they refused to disclose their diagnosis to others feeling ashamed of having TB (Eastwood & Hill, 2004).

These individuals in particular, it was noted, struggle to accept their diagnosis and frequently sought for second opinions from other medical specialists, leading to delays in the initiation of treatment (Dodor et al., 2010; Coreil et al., 2010). Xu & Lu, Zhou, Zhu et al., (2009) reported from their research done in Jiangsu, China that the stigmatizing attitudes and behaviors of the community members towards the disease may lead those with TB to hide the diagnosis from others and to default from treatment. Perceptions of stigma also affect patients' choice of hospital. Indeed, many try to hide the fact that they have TB from their relatives and acquaintances and seek treatment in facilities remote from their home, which may result in intermittent treatment.

Stigma deters people from seeking care and diagnosis. Negative attitudes and lack of support from family, neighbors and the wider community are reported to be a significant obstacle

to ensuring continuity of treatment. The adverse effects of stigmatization on the individual's life can be compounded if treatment is delivered by healthcare workers to patients' homes or to their place of work, because of the potential for disclosure of information on health status to friends, family and neighbors (Dodor et al., 2010).

Patients may also be stigmatized because of other existing patient characteristics that are sources of discrimination such as ethnic group, and co-infection with HIV (Macq et al., 2006). According to Heymann et al., (2004) stigma has been associated with the dual diagnosis of HIV/TB in many parts of Africa. Patients who are co-infected with HIV experience increased levels of anxiety and avoid disclosing their health status for fear of stigma. Disclosure of their TB infected status and HIV positive status could possibly lead to double stigma (Xu et al., 2009). Findings of Cramm, Finkenflugel, Moller, Nieboer et al., (2010) in a study from the Eastern Cape revealed that patients accepted it as true that people with TB tended to hide their TB status because they were scared of stigma.

Study results of Gebremariam, Bjune and Frich (2010) revealed that social support was found to be crucial for patients' treatment. In their qualitative study in rural western Kenya, Ayisi, van't Hoog, Agaya, Mchembere, et al., (2011) showed that lack of family support might be a reason for non-compliance with TB treatment. Jin et al. (2008) confirmed that patients who had support from family members, friends or healthcare providers were more likely to be compliant to their treatment. Munro et al., (2007) supports this finding in the sense that family support, including financial assistance, collecting medication and emotional support appear to be a strong influence on patient adherence to treatment.

Alternative Medicine

Conventional care-seeking behaviors have been reported in literature; people who had symptoms possibly indicative of TB initially sought advice from traditional healing systems (Tadesse, Demissie, Berhane, Kebede et al., 2013) family members, neighbors/friends and/or cured patients or buy their own medicines over the counter before going to healthcare facilities (Neesdman et al., 2004). According to Tedesse et al., (2013) patients reported the treatment to be effective, helpful and they only sought for help from health facilities when self-medication using traditional medicine had failed and symptoms persisted for some time and their health deteriorated.

Seeking assistance from traditional healers is more common in rural areas, whereas in urban areas self-medication is the first option of choice, and if this is not successful it is frequently followed by a visit to a traditional healer. Financial and cultural practices appear to be the principal reasons for resorting to these first two strategies (Neesdman et al., 2004). In Tedesse et al., (2013) study some patients resorted to traditional medicine because HCWs failed to suspect and diagnose TB early in the course of their illness. The authors also observed, that health centers in the study area were not well-equipped with TB diagnostics, and their staff was not well trained on early diagnosis and DOTS treatment of patients presenting with symptoms of TB. This resulted in unnecessary trips to health facilities, hence the use of traditional medicine by patients.

Drug Resistance

A challenge to global TB control is drug resistance, which is increasing internationally (Grant et al, 2008). Non-compliance and default can result in acquired drug resistance, which requires a prolonged period of treatment with more expensive medicines than treatment for drug susceptible TB (Caminero, 2008; Chiang, Derin and Caminero, 2006; Singh, Upshur & Padayatchi, 2007). Treatment with second line drugs is likely to be less successful than treatment with first line drugs, mainly because the second line medicines are more toxic with longer treatment period that make it more difficult for patients to complete (Dye, 2009; WHO, 2008).

There are now strains of TB that are not only MDR but also resistant to second line injectable and oral drugs (WHO, 2008c), and are described as being virtually untreatable. These strains are known as extensively drug resistant, or XDR-TB. Management of MDR-TB and XDR-TB is difficult and extremely expensive, and patients are increasingly managed in specialized centers (Grant et al, 2008). The emergence of drug resistance in *Mycobacterium tuberculosis* has been associated with a variety of patient, HCW and management related factors. Irregular, incomplete and inadequate treatment along with improper drug regimens are the most common causes of drug resistance (Paramasivan and Venkataraman, 2004; Sharma and Mohan, 2004). Besides treatment failures, inappropriately prescribed anti-TB medicines may also contribute to drug resistance. This may cause a barrier in the control of TB and increase the risk for MDR-TB.

Summary

The chapter has reviewed current literature relevant to the proposed study. Obstacles to TB control have been explored and the key findings from the literature review were identified in to two broad topics: patient related and HCW related factors. The next chapter will present the research methods to be employed in the proposed study.

CHAPTER THREE

Methodology

In this chapter the researcher will present the research methodology that will be used in the study. Such description entails research setting, research design, population, sampling, data collection, data management and handling, research instrument, ethical considerations, standards of quality enquiry and data analysis.

Research setting

The study will be carried out in Ghanzi lying in the south-western part of Botswana. Ghanzi measures 117,910 square kilometers (29,140,000 acres) and is bordered by Ngamiland to the north, Central District to the east, and Kgalagadi and Kweneg Districts to the south. Its western border is shared with Namibia. Ghanzi is home to different ethnic groups such as Basarwa, Bakgalagadi and Baherero. This area has a population of 36675 inhabitants. At the time of the 2011 census, there were 12,167 people living in the town with others living nearby in the settlements. The study will be confined to Ghanzi Primary Hospital and all the clinics that provide DOT in Ghanzi.

Research Design

The proposed study will apply a qualitative approach framed on phenomenology. In this type of design experiences, views and or perceptions are examined through the descriptions provided by the people involved. The goal of phenomenological studies is to describe the meaning that experiences or perceptions hold for each subject (Donalek, 2004). Polit and Beck (2012) in a discussion of phenomenological research, posits that respondents are asked to describe their experiences as they perceive them. They may write about their experiences, but

information is generally obtained through interviews. The researcher engages in direct observation and the experience of the individuals in their natural setting to find patterns and meanings. Streubert and Carpenter (2011) contended that this research method is rigorous, critical, and systematic. The researcher would be able to determine the perceptions of the HCWs in their facilities to find patterns and meanings. Face to face interviews will be conducted with the participants and the interviews will be recorded.

Population

The population will comprise of the nurses, doctors, facility managers and NTP coordinator in the the district hospital and clinics. This population seem to meet the criteria since they are working in outpatients and inpatients settings where they take care of TB patients. Thus they may be able to point out to what they percieve as the obstacles to TB control among their clients.

Sample selection

The sample of the study will be purposively selected, that is non-probability sampling method in which the researcher select participants based on personal judgment about which ones will be most informative (Polit and Beck, 2012). The NTP coordinator, all the nurses and doctors working in the hospital TB ward including those that provide DOT in the hospital DOT center and outpatient clinics (OPD clinics) that provide DOT will be eligible to participate. For the proposed study all eligible HCWs who would consent to participate and possess the characteristics that meet the inclusion criteria will make up the sample.

inclusion criteria.

The study will include only those HCWs who work in the NTP program, managing and caring for TB patients, that is, diagnosing, prescribing and providing DOT. HCWs who will consent to the study, working in Ghanzi in the TB program despite the country of origin and are fluent in Setswana and/or English.

exclusion criteria.

Mentally incapacitated HCWs will be excluded from the proposed study.

recruitment.

For the proposed study, recruitment of study subjects will involve seeking approval of the study by the research and ethics review board at the Ministry of Health and the ethics review committee at the district respectively. The DHMT will help in identifying HCWs who are eligible and willing to participate. The subjects will be recruited in TB Units in the district. A formal letter will be written to the DHMT head informing him/her of the proposed study and the intended recruitment method as well as the assistance required from him/her.

Sample size

The sample size will depend on data saturation which according to (Polit and Beck, 2012; Zozelo, 2012) is when themes and categories in data become repetitive and redundant such that no new information can be gleaned by further data collection. So interviews will be stopped after reaching data saturation.

Data collection

The main method of data collection in qualitative research is through self report (Polit & Beck, 2008) where the researcher interviews the participants through face to face verbal exchange. Interviewing can be structured, semi structured or unstructured (Denzin & Lincoln, 1994). A semi-structured interview will be used as the most appropriate method to collect data. Semi-structured interviews are used widely in qualitative research to understand the reasons why people behave in particular ways, by exploring informants' perceptions, attitudes and experiences (Harvey-Jordan & Long, 2001).

Semi structured interviews allow respondents to answer questions in their own words which is a reflection of their thoughts (Kitchin & Tate, 2000). The interviewer's job will be to encourage the participants' active conversation and discussion (Polit & Beck, 2012) about what they perceive to be the obstacles to TB control among patients. These interviews will employ a series of open-ended questions based on the topic areas the researcher wants to cover and provide opportunities for various themes to emerge (Harvey-Jordan et al, 2001). It can include opportunities for clarification and discussion that are usually excluded from survey research or structured interview techniques. Open-ended questions are appropriate and powerful under conditions that require probing attitude and gleaning information that is interlocked in a social structure or personality (Burns and Groove, 2009; Polit & Beck 2012).

The researcher will develop interview guides following the ACCESS framework and literature, and will have two interview guides for the HCWs. An interview guide for the NTP coordinator and facility heads, another for those who are actively screening for and treating TB (nurses and doctors). These guides can be seen in appendix A and appendix B. In each case, the

researcher will prepare a written topic guide with a list of questions in numerics to be covered with each participant ensuring that the interviewer will obtain all the needed information while providing the participant with the freedom to give explanations as they wish. Probes which are numbered in alphabets under the questions will be used incase the answer provided is insufficient, or information is not forthcoming well. The researcher will guard against behavior that may influence data collection by being consciously aware of the the role she plays in the research process called flexivity or guarding against research bias (Barusch, Gringeri & George, 2011; Burns & Grove, 2009). The instrument will be in simple and clear English, which is easy for respondents to answer and it will be cross-checked by experts from the School of Nursing.

The data collected is likely to be more accurate because the interviewer is able to repeat and explain the questions, which can clarify the meaning of answers. The interviewer has more control over the interviews as he/she can guide questions and curb answers that are too voluminous or have gone in the wrong direction. The language of the interview is adapted to the ability or education level of the person interviewed.

The instrument will consist of sections A and B. Section A will consist of the health facility information, its type, and the respondent position (e.g nurse, doctor, NTP manager, etc) that will make up part of the PIOP and Healthcare Services construct of the framework. Section B will consist of the researcher-developed interview tool consisting of items guided by the ACCESS framework. The framework assists in collecting information on the main research questions covering in detail the patient related factors, the HCW and healthcare service related factors.

The tool will be developed first in English and then translated into Setswana. The tool will be given to my supervisor and members of the research committee to check for validation of

the questions for readability, language equivalence and usability, congruence, comprehensibility, relevance to the study purpose and questions. Assistance with translation will be sought at the Department of Languages (University of Botswana) from among lecturers who are fluent in both languages.

Data management and handling

MAXQDA 12 software which is a pioneer software program for qualitative data (Mangal & Mangal, 2013; Given, 2008) will be used for data handling, organizing, arranging, management and analysis. According to Mangal & Mangal (2013) MAXQDA software was released in 1989 and is based on the traditional methods of analysis such as qualitative content analysis, grounded theory and others. According to the authors, the software has been used in many academic fields such as psychology, sociology, medicine and educational science. The software has the central elements of allowing for easy sorting, structuring and analyzing of large amounts of data such as in audio and video materials. Recorded tapes and hard copies of field notes will be safely kept as backup for the data stored on computer systems.

Pilot Study and Instrument Testing

A pilot study will be conducted at a similar setting, whereby a representative sample will be selected from the facilities to develop and refine a data collection instrument or data collection process, and to check the reliability and validity of the research tool (Brink, 2003; Burns & Grove, 2005; Polit and Beck, 2008). The participating HCWs in each of the facilities will be interviewed and the data collected will be analysed.

Conducting a pilot study will help to test the use of the instrument and to assess its appropriateness and clarity, whether the questions will be understood before the main study is

conducted. After the pilot test it may be necessary to revise the instrument to avoid the identified errors such as ambiguous instructions and wording (Brink, 2003; Polit & Beck, 2008), therefore adding, amending or removing some questions.

Ethical considerations

Permission to conduct the study will be sought from the ethics and review board (ERB) of the University of Botswana (UB), IRB at the Ministry of Health, Ghanzi DHMT, participating clinics and hospitals where data will be collected. A letter requesting permission to conduct the study in appendix D will be copied to the above mentioned offices. It is imperative that everyone involved in research be aware of the general agreement shared by the researcher; that is, what is proper and improper in the conduct of scientific inquiry. In this regard my research will take into account the following ethical issues:

informed consent.

Before commencement of an interview, an information sheet will be read out to each participant explaining the nature and purpose of the interview. Each respondent will be informed that he/she has the option of refusing to participate and will not be required to answer any questions he does not feel comfortable with.

Once participants agree to take part in the study they will be given consent forms to sign in duplicate after which they will retain one copy for their records while the researcher will get the other. The researcher and the participant will both sign an informed consent form that is in appendix C. Field notes and audio tapes will be collected and stored in a secure location and will not be released to anyone without written consent or legal authorization. The participants' identity and responses will be kept confidential throughout the study. Codes and numbers will be

used to ensure confidentiality (Burns and Grove, 2005), and will not be marked with the participants names. Participants will be assured that all information they will give not be used in a manner that would compromise them socially or in their employment. Any publications done using the findings of the study will not disclose their identities.

Standards for qualitative inquiry

Trustworthiness of the study plays an important role and it includes credibility, dependability, transferability and confirmability. According to Polit & Beck, (2008) credibility refers to the extent at which the researcher shows confidence in the truth of the data and its interpretations (Klopper, 2008; Polit & Beck, 2008). This will be established by prolonged engagement, triangulation, member checking, peer debriefing and persistent observation (Brink, 2003). Engagement with research participants will be ensured by the researcher collecting data herself and through peer debriefing where the researcher will have discussions with the supervisor for the purpose of reviewing the proceedings as the study progresses. Member checking where the research participants validate and verify the researcher's interpretations and conclusions (Barusch et al., 2011) and this will be achieved by returning the transcribed data to each individual participant for validation and approval.

Dependability is a criterion for evaluating integrity in qualitative studies, referring to the stability of data over time and over conditions (Polit & Beck, 2012). Here an enquiry auditor follows the processes and procedures used by the researcher in the study to determine whether they are acceptable (Ryan et al., 2007; Brink, 2003). To ensure dependability the research supervisor will examine the collected data, its management, handling and analysis.

Transferability is the extent to which qualitative findings can be transferred to other setting or groups (Polit & Beck, 2008); analogous to generalizability. The researcher will ensure this by providing a context rich description so that the reader can determine whether the findings can be applied to another context (Ryan et al., 2007). The research setting, research sample and its characteristics, sampling methods, data collection strategies and data analysis will be thoroughly described.

Confirmability is a criterion for integrity in qualitative inquiry, referring to the objectivity or neutrality of data and interpretations. According to Brink, (2003) this can be achieved by engaging independent auditors to check if the researcher's findings and interpretations are accurate, relevant and well supported with evidence. To ensure confirmability the supervisor will be involved in auditing raw data, which is the audio tapes and field notes.

Data processing and analysis

Content analysis style will be used. This style according to Polit and Beck (2008) involves reading through the data in search of meaningful segments and units, once segments are identified, category scheme are developed and corresponding codes are used to sort and organize data. Data will be analyzed according to the themes that emerge from the data or within the categories of data. Data analysis follows the following steps:

data transcription.

Audio taped interviews will be used as sources of data for the proposed study. Verbatim transcription will be made from the audio tapes, which will then be played again to fill in the gaps identified after the first transcription to ensure accuracy and validity of the captured data. The transcribed data will be translated from Setswana to English and from English to Setswana,

by the researcher, using the process of translation and back translation. The purpose for this is to compare and contrast the translation with the source text with a view of assessing the quality of the translation.

coding.

After transcription, data will be read before coding in order to get the essence of the data. Coding will then be done using sentences as units according to Obrist et al., (2007) framework constructs. A coding frame will be developed where key themes will be systematically identified and categorized then coded text will be inserted into each frame. As new codes emerge, the frame will be adjusted and reread against the new frame. This process will be utilized to create categories that are then conceptualized into categories. The researcher will do all these alone to ensure consistency (Polit and Beck, 2012).

development of sub categories.

After grouping the data under the framework's construct, the researcher will then go through each construct and identify the categories for each that represent the empirical indication of the construct.

development of themes.

Themes are the structured meaning of units of data where similar data ideas are clustered together (Streubert-Speziale & Carpenter, 2003). Themes will be identified as the researcher reflects on the constructs and their sub-units; she will make interpretations about obstacles to TB control and make conclusions. Interpretations and conclusions made will then be subjected to peer debriefing and member checking for the establishment of rigor and trustworthiness.

Dissemination of information

The proposed study findings will be published and copies given to the University of Botswana for academic purposes. Preliminary research findings will be presented at a national TB conference. The research findings will also be published in The International Journal of Tuberculosis and Lung Disease.

Summary

The chapter presented the research methods to be used in the proposed study. Qualitative methods were an appropriate method to use for this study. In conclusion the success of the study will be of great value to policy makers, HCWs, the general public and other researchers.

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Appendix A

Section A

Put a check mark in the appropriate box:

Type of health facility: Hospital Clinic Health Post

Respondent position: Nurse Doctor

SECTION B

Questions

Diagnosis and Treatment Delays

1. In your opinion is the facility successful in controlling TB?
 - a. Of the patients who are diagnosed with TB at the facility do most of them get cured?
2. What in your opinion are the main barriers to TB treatment and control?
 - a. Are there any diagnosis and treatment delays that TB patients suffer in this region, what are they?
 - b. How is the ease of access to the facility?
 - c. On average, how long are patients symptomatic before they present to the facility for screening?
 - d. Is the facility staff sufficient to meet the needs of the TB program?
 - e. Do in your experience symptomatic patients receive treatment for their symptoms before presenting for TB screening/diagnosis?
 - f. What is the average time for the microscopy results in your facility? (e.g. Days, One week, More than one week)
 - g. On average, how long does it take to diagnose a symptomatic patient with TB in this facility?
 - h. Is the procurement of TB medications and other supplies a barrier in any way?
3. How do you think these barriers could be overcome?
4. What interventions are in place to improve access to TB services?
5. What recommendations can be provided to Management for improved TB control?

Patient Education and Counseling

6. Does the facility offer education and counseling for all TB patients? If so who is responsible for such?
7. Which topics are covered?
8. In your experience when most TB suspects come to the health facility, do they already have knowledge about TB?

Sources of information and social support

9. Where do people in this region get information about health and TB?

Capacity Building

10. Is the facility staff informed in TB infection, prevention and control?
11. Did you receive any training on TB, and if so how often did you receive training/update in TB?
12. When was the last TB training conducted?

Appendix B

National TB Program/Facility Manager Assessment Tool

1. What is the estimated TB burden in the district?
2. Is your DHMT functional?

TB Access and Delay Identification

3. Is TB prevention and control a success in your region/ facility?
4. In your opinion where are the bottlenecks for effective TB control in this region?
 - a. Is patient delay in accessing TB services a bottleneck in TB control?
 - b. What can you say about delay in TB suspicion, diagnosis, referral and treatment by HCWs as bottlenecks for TB control?
5. In your opinion what is the major overall obstacle to TB control in the region/facility?
 - a. Is it related to patients or healthcare services?
6. What systems are in place to improve TB control?
7. Are there any perceived threats to possible improvements?

Capacity Building

8. Does TB services staff get trained on TB?
 - a. What types of TB trainings are conducted for staff and how often are they conducted?
 - b. What is the number of personnel trained TB in the region?

TB Communication

9. Are TB messages being communicated to the population?
 - a. How often is the information on TB communicated?

APPENDIX C**INFORMATION SHEET**

Title: Obstacles to tuberculosis control among patients in Ghanzi district: healthcare workers' perspectives

Thank you for taking the time to meet with me today. My name is Itireleng Olefile, i am a Master's student a the University of Botswana. As part of my Master's Degree in Nursing, I am required to conduct a research project in an area of interest.

The purpose of this study is to determine the obstacles to TB control among patients and the HCWs perspectives concerning such. Understanding and identifying the obstacles to TB control, e.g. causes of delays in diagnosis and treatment initiation are critical to strengthening TB control programs overall. The findings of the study can inform the development of an integrated set of recommendations for TB program managers and service providers regarding the appropriateness of different strategies for mitigating the problem. Your participation is requested because you meet the criteria for people to participate in this study. Please note that your identity and information will be treated with confidentiality and feel free to ask if there is anything that is not clear or if you would like more information.

Please note that:

- You are free to participate or not to participate.
- You are free to withdraw at any time without giving a reason or without any negative consequences for you.
- There will be no risks attached to your participation
- The findings of this study will be made available to you on completion.

Do you agree to participate in this survey? ____ Yes ____ No.

Signed: _____

Name (Please print clearly) _____

Thank you

Researcher : Itireleng Olefile

Contact number: 3912198/72487733

University of Botswana

APPENDIX D

Itireleng Olefile
University of Botswana
P/ Bag 0022
Gaborone
11 May 2015

The Permanent Secretary
Ministry of Health
Private Bag 0038
Gaborone

Dear Sir /Madam,

RE: APPLICATION FOR PERMISSION TO CONDUCT A STUDY IN GANZHI DISTRICT

This serves to request your office for permission to conduct a research/study in Ganzhi District. I am a student currently pursuing a Masters Degree in Nursing Science at the University of Botswana. I am planning to conduct a research study in Ganzhi District-Obstacles to tuberculosis control among patients: healthcare workers perspectives. The proposed study will be conducted in the health facilities in the district. The target population for the study will be HCWs in the district.

Thank you in advance.

Itireleng Olefile
Cell: 72487733
Email: itirelengolefile@ymail.com

APPENDIX E**PROJECT BUDGET PROPOSAL**

Expenditure	Quantity	Amount (Pula)
Stationery and Supplies	1 ream A4 paper plain & lined @ P100.00 2 rubbers/pencil eraser @ P6.00 1 removable USB electronic hard disk @P180.00 Tape recorder and accessories @ P450.00	P200.00 P6.00 P180.00 P450.00
Typing Printing and Binding	Research Proposal 60 pages @ P2.00 per page. Interview guide (4pages) @ P2.00 per page for approx 10 people Binding@ P30.00 x 2	P120.00 P80.00 P60.00
Miscellaneous	Transport trip to Ghanzi @ P500.00 Around Ghanzi @ P50 x 14 days Meals P150.00 x 14 days Accommodation @ P300.00/day	P500 P700.00 P2100.00 P4200.00
Contingency (10% of Budget)		P859.60
Grand Total		P9455.60