Perceived provider barriers to tuberculosis case finding in people attending HIV services at primary health care facilities in a rural KwaZulu Natal District

UNIVERSITY *of the*
WESTERN CAPE

Nokuthula Portia Zulu

Student number: 4001429

A mini thesis submitted in partial fulfillment of the requirements for the degree of Master of Public Health at the School of Public Health, University of the Western Cape

Supervisor: Professor Helen Schneider

November 2022

Keywords

- Tuberculosis
- Human Immunodeficiency Virus
- People living with HIV/AIDS
- TB case finding
- HIV/TB integration
- TB screening
- TB investigation
- HIV Services
- Health Belief Model

Abstract

Background: HIV is the main driver of the tuberculosis (TB) epidemic. HIV positive patients have double the chances of being infected with TB than HIV negative ones, and TB is one of the largest contributing factors to mortality in HIV/TB coinfected patients. Policies have advocated for intensified case finding of TB in high-risk groups and numerous guidelines have been developed. Despite all the efforts and emphasis on HIV/TB integration, South Africa has not achieved the desired outputs in terms of finding TB cases in this group. Professional nurses working in HIV services are strategically located to contribute to increased TB case finding.

Aim: To explore the perceptions of professional nurses (PNs) working in primary health care clinics on barriers to TB case finding in people living with HIV/AIDS.

Methods: The study adopted a qualitative research methodology where in-depth interviews were conducted with 10 nurses working in HIV services in ten clinics and two of their supervisors in the Zululand District, Kwazulu-Natal. The interviews were preceded by two day-long field observations of health facilities and consultations. Drawing on the conceptual framework of the Health Belief Model, a thematic analysis of practices, barriers and cues to TB screening by PNs working in HIV services was conducted. Written informed consent was obtained from all participants and findings are presented anonymously.

Results: Sporadic and selective TB screening practices were observed, and also confirmed in interviews, at odds with the high recorded percentages of screening in the routine data. Providers appeared to know the theory and were conversant with the implications of TB infection for patients, communities and the health system (severity). However, the PNs did not necessarily perceive themselves to be at risk of acquiring TB from patients (susceptibility). They recognised the need and value of TB screening for patients (benefits), even if the observations did not reflect this. Barriers to TB screening identified included: material factors such as supplies (e.g. sputum jars) and space (coughing booths); lack of training and confidence in TB management; a division of labour between TB (enrolled) and HIV (professional) nurses along hierarchical lines; low prioritisation by managers; patient reluctance; and wider systems constraints such as inadequate staffing. The pragmatic response of providers to these barriers was to indicate compliance to universal TB screening while being selective about who they would test.

Conclusions & Recommendations

Improving TB screening in HIV services requires paying attention to the barriers identified. Integrating PNs into the TB programme and providing them with training will promote understanding of the risks of TB in HIV patients. Organisational cues such as individual screening targets and regular reporting on TB case finding indicators will shape practices. Engaging occupational health departments and implementing periodic TB testing of staff will make TB more visible as a risk to staff, and will help to eliminate TB stigma.

Declaration

I Nokuthula Portia Zulu declare that the research study titled **"Perceived provider barriers to tuberculosis case finding in people attending HIV services at primary health care facilities in a rural KwaZulu Natal District"** is a true reflection on my research work. This work has not been submitted for examination or degree purposes in any other institution of higher learning. All sources used in this research have been acknowledged with complete references.

Signed: 

Date:29 November 2022

Acknowledgements

I would like to thank God who carried me and gave me strength to persevere through my studies.

My sincere gratitude goes to my supervisor Professor Helen Schneider, without her support, guidance and patience, I would not have completed my thesis.

I appreciate my husband who was very supportive in my journey, encouraging me, cheering me on and ensuring I am not distracted from my goal. Sometimes it meant confiscating my phone and all distractors that would derail me, I really needed your support, Thank you my love.

To my two precious kids, thank you for bearing with me, I had to be on the books and laptop and you had to understand and ask me how I am doing always, you made this journey quite bearable for me.

The Institute for Health care improvement and leadership, thank you for the opportunity, The South African IHI team and our country Director Mrs. Tshabalala, your encouragement is appreciated.

To the Zululand district management, the TB coordinator Ms. Mncube, subdistrict and facility teams who supported my work, I appreciate you all.

Abbreviations

TB-Tuberculosis

HIV-Human Immune Virus

PLWHA-People Living With HIV And AIDS

PHC-Primary Health Care

PN-Professional Nurse

EN-Enrolled Nurse

ENA-Enrolled Nurse Assistant

TBASO-Tuberculosis Assistant Officer

HBM-Health Belief Model

HAST-HIV, AIDS, Sexually Transmitted Infections and Tuberculosis

NIMART-Nurse Initiated Management of Anti-retroviral Treatment

IRIS-Immune Reconstitution Syndrome

MDR-Multi Drug Resistance

DOH-Department of Health

ART-Anti Retroviral Treatment

TROA-Total Remaining On Anti-Retroviral Treatment

WHO-World Health Organization

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CHAPTER 1: INTRODUCTION

1.1 Background

TB is a global health problem with 10 million estimated infections in 2019 (WHO, 2020). TB is also among the top leading causes of mortality globally, with an estimated 1.2 million and 208,000 deaths in HIV negative and positive populations, respectively, in 2019. In this year, TB contributed to a one-third of HIV deaths globally (WHO, 2020). South Africa was among the top 20 countries with the highest burden of TB/HIV infections in the world and one of the eight countries that when combined contributed two thirds of the global TB burden (WHO, 2019). HIV is the driver of the TB epidemic due to the high TB/HIV coinfection rate of above 60% (Friedland et al., 2007).

The South African National Development Plan aims to reduce TB mortality by 50% by 2025 compared with 2015. One of the identified causes of TB mortality is late diagnosis (NDoH, 2015). This is due to many factors including poor TB screening practices. In 2017, the World Health Organization (WHO) estimated that there were 154,000 undiagnosed TB cases in South Africa (WHO, 2017), prompting the national Department of Health to make a call for health system actors to find these missing cases (NDoH, 2018).

The COVID-19 pandemic further affected the current TB case finding efforts - South Africa reported less TB numbers in the period January to June 2020 than previously (WHO, 2020). The lag in case finding has added complexity to HIV care as COVID-19 and TB have shared symptoms (Tamuzi et al., 2020), and there are now greater chances that more patients could die of TB than COVID-19 if health systems let their guard down on intensified TB case finding. Furthermore, a systematic review found that there was a higher recovery rate in HIV patients who developed COVID-19 without TB than those who had HIV/TB and COVID-19 (Tamuzi et al, 2020). In a post COVID-19 pandemic recovery phase, it is especially important to intensify TB screening efforts.

The United Nations (UN) Sustainable Development Goals aims to end TB by 2030. To achieve this goal, case finding must be improved, and strategies need to be in place to improve case finding (UNAIDS, 2015). One of the global strategies recommended by WHO is systematic screening, prioritizing screening of predetermined high-risk groups.

South Africa's National Strategic Plan on HIV and TB (NDoH, 2021) emphasizes two key strategies for case finding: TB screening of all people attending health facilities and contact tracing and investigation. South Africa also adopted the WHO-advocated End TB Strategy (WHO,2015) which emphasizes early diagnosis, screening of high-risk groups and

collaborative HIV/TB activities. However, there is still a challenge as to how these strategies will be implemented by health facilities in resource constrained systems. (Sinai et al., 2018) assert that TB case finding is primarily limited by the separation of HIV and TB services in health care clinics. In this regard, South Africa has endorsed service integration and has called for all HIV patients to be screened for TB (SANAC, 2017).

TB screening of HIV patients has been a priority for policy makers in primary health care but it remains poorly implemented in practice. To address this gap, the South African Department of Health partnered with the Institute for Healthcare Improvement (IHI) in a project aimed at improving TB case finding in HIV services through the application of Quality Improvement (QI) methods. From the researcher's experience, a member of the IHI team, it is evident that the WHO and South African recommended strategies to increase case finding are still not well implemented.

This study addresses the barriers to TB screening and testing of a high-risk population, namely people living with HIV/AIDS (PLWHA), with a focus on active TB case finding at facility level, recognizing that this is more effective than community-based strategies (Kagujje et al, 2020).

1.2.Problem statement

Sinai et al (2018) argue that integration of TB and HIV services can be "easily achieved". This may seem to be an easy gap to close, however practically it has proved to be the opposite. There have been improvements in integration of services in terms of treatment initiation and management, but there is still a gap in TB screening and testing. Research on integration has mostly focused on treatment and treatment outcomes, but not on case finding. Although policy has advocated for intensive case finding for a long time, facilities have tended to adopt a passive approach rather than an active one, such that South Africa started developing TB case finding targets only in 2017, when WHO made a call to find TB missing cases (WHO, 2017).

Professional nurses working with PLWHA do not seem to play an active role in TB case finding. Routine TB screening in health facilities is often recorded but this does not translate into identification of TB presumptive cases. For example, Zululand District in Kwazulu-Natal Province recorded a TB screening rate of 90% in 2019 (Massyn, 2020) thus meeting the 90-90-90 targets, but still very low TB suspicion rates (the outcome of screening).

The District Health Information System (DHISv2) provides routine monthly data on TB case finding. According to the 2017/18 Zululand District Health Plan, the allocated TB case-finding target for the district was 4000 annually and 333 per month (DHP 2017/2018). The district

median performance in from April 2019 to March 2020 was 250 per month, thus below target. When lockdown started, case finding performance fell to a new median of 200 per month (DHISv2), which meant that the district failed to diagnose an additional 50 TB positive patients per month. Efforts to restore the case finding performance are in progress and the district is on its road to recovery.

One of the problems identified during support visits across the District was the segregation of TB case finding activities. Nurses are defined in three categories (a) registered professional nurses (b) enrolled nurses (c) enrolled nursing assistants (SANC, 2017). All the categories are trained on TB screening. Professional nurses have been further trained to screen and conduct a clinical assessment of patients who are HIV positive through the Nurse Initiated Management of Antiretroviral Therapy (NIMART) programme and the primary health care specialization programme (referred to as nurse clinicians). In practice, TB screening is delegated to enrolled nurses and nursing assistants at clinic entrances, but from the researcher's observation this has proved to be sub optimal, with patients not disclosing symptoms at entry point screening areas. While the entrance area may enable initial triaging of patients with explicit symptoms like cough, it will take more than screening in the central area to find missing patients. The most effective screening area is in the consulting room by nurse clinicians, due to the improved privacy and the skill they possess for history taking, probing and clinical assessment (WHO, 2013). Achieving this, however, requires ownership of TB case finding activities by professional nurses who attend to HIV patients.

1.3. Purpose

TB/HIV integration has been identified as one of the best ways to improve programme performance for both HIV and TB (Tamuzi et al, 2020). Policymakers have long advocated for integration and, despite low case detection, facilities often report they are integrating the services. This study sought to help the programme managers to understand why integration is difficult in daily practice, and how integration can be made more practically feasible to improve TB case finding in people living with HIV.

The focus of this study is on HIV services as an entry point and how TB services can be integrated to improve case finding among PLWHA attending HIV services in the District. Although HIV services are supposed to offer TB screening in consultation rooms, there is still suboptimal screening and low levels of follow-up investigation at these service points.

1.4.Research aim and objectives

The aim of this research was to explore the perceptions of professional nurses providing HIV care on barriers to improved TB screening and testing of people living with HIV.

Adopting the Health Belief Model of behaviour change as a conceptual framework (Glanz, 2008), the specific objectives were to explore:

- professional nurses' knowledge on the susceptibility to TB of people living with HIV and of health care workers who are in contact with undiagnosed TB cases.
- professional nurses' knowledge of the severity of the undiagnosed TB problem, specifically the impact of late diagnosis and missed diagnoses on the patient, society and health system.
- perceived factors that hinder the implementation of proper TB screening and TB diagnosis in HIV positive patients by professional nurses providing HIV care.
- cues to action that may prompt actions towards more engagement in active TB case finding.

1.5. Study setting

The study was conducted in Zululand, one of 11 Districts in Kwazulu-Natal (Figure 1). Zululand is a largely rural district, has an estimated population of 804 454, and is divided into five sub-districts (Figure 2). Traditional governance and healing systems prevail alongside a formal health system of five district hospitals and 66 primary health care facilities. The district is characterised by long distances between the district office and the subdistricts and poor road terrain between the subdistrict management offices and facilities. Travelling from one district to another takes anywhere between an hour to three hours.

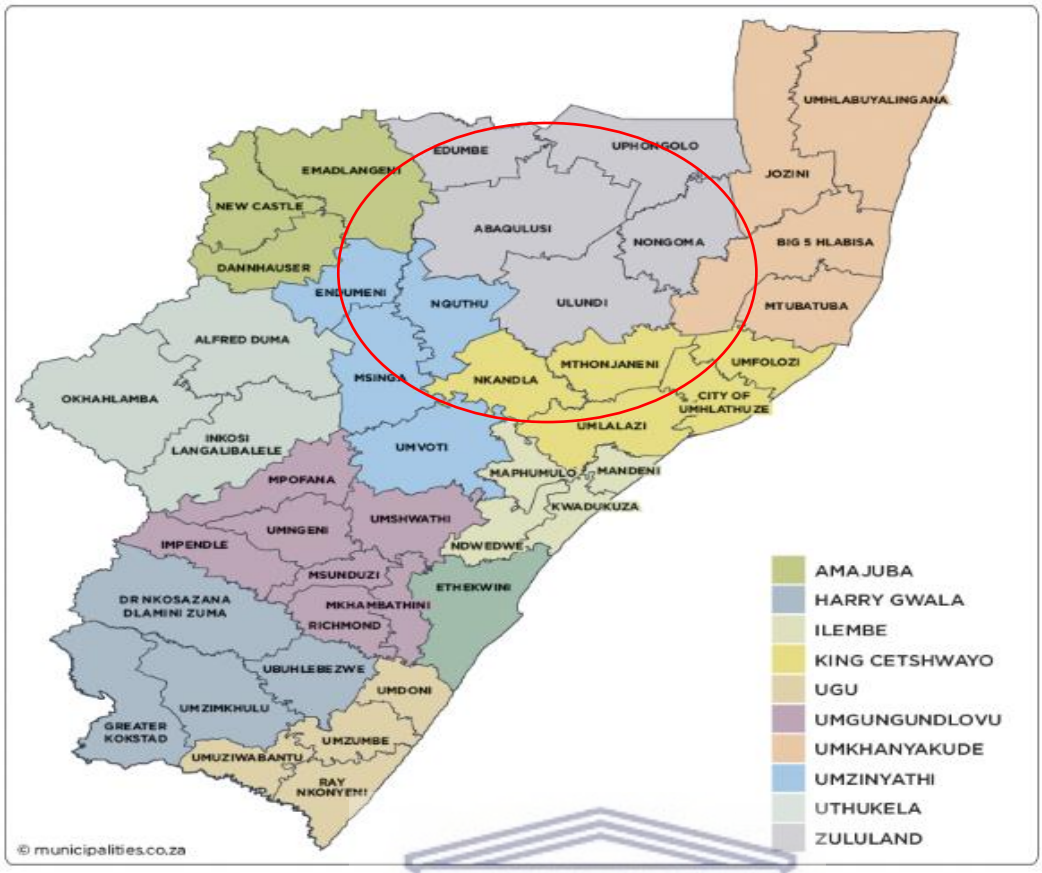

Figure 1. KwaZulu natal Province (indicating Zululand District)

Figure 2. Map of Zululand Sub-Districts

Profile of Primary Health care facilities

The professional nurses interviewed were working across four of five subdistricts, and in low to the high-volume primary healthcare facilities. All facilities are day clinics with operating hours from seven am to four pm for small to medium volume facilities and seven am to seven

pm for the larger volume facilities. The facilities with nurses' housing have an on-call system at night. Typical staffing includes a facility manager, PNs, enrolled nurses (ENs), enrolled nursing assistants (ENAs) and in some facilities TB assistant officers. The latter are a non-clinical category that was assigned to support the TB programme, assisting with sputum collection, results management and contact tracing. The facilities receive supportive supervision from the PHC as well as TB/HIV programme managers at least once a month. Blood and sputum specimens are transported to the subdistrict for laboratory analyses and X-ray services are available at the district hospital level. Some facilities have access to planned patient transport to the hospital once a week.

Two facilities were selected for the initial observations, one in AbaQulusi Subdistrict (Facility A) and one in Ulundi Subdistrict (Facility B). Facility A is the highest volume clinic in the whole Zululand District with an average of primary health care head count of 9,000 per month. The facility is in the central area of a small town and offers a 12-hour service (7am to 7pm), providing comprehensive PHC services including: HIV&TB, non-communicable disease, maternal and child, women and men's health services. The facility has the largest antiretroviral (ART) programme in the District and the largest number of total people remaining on ART (TROA) of 7,998. The clinic has visiting general practitioners, dentists and physiotherapists once a week.

The facility has one major entry point where registration is completed and one main vital signs area where TB screening is also done by enrolled nurses or nursing assistants. The facility has an allocated TB room run by a TB assistant officer. The activities of the TB room include collection of sputum from patients referred by PNs at the consultation room or patients identified at the vital signs area, sorting of TB specimen results, recalling patients with positive TB results and treatment initiation.

Facility B is a medium volume facility with an average monthly primary health care headcount of 3,200, serving a catchment population of around 10,000 and a TROA of 2,121. The clinic also offers a comprehensive PHC service package and operates from 7am to 4 pm with an on-call system in the evenings.

1.6.Structure of the report

Chapter two reviews the literature on the burden of TB, TB case finding and barriers to case finding. It also introduces the Health Belief Model. Chapter three describes the methodology used to conduct research. Study findings are reported in Chapter 4 and Chapter 5 discusses findings in relation to the study aim and current knowledge and proposes recommendations.

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

This chapter starts by reviewing the TB burden in South Africa, including how COVID 19 has affected this burden, and TB prevalence among people living with HIV and health workers. It then considers the evidence on improving TB case finding, including integrating TB and HIV services. Finally, the Health Belief Model of behavior change and influencing factors is presented, unpacking its key constructs and its application to the TB field and to studying health care provider behaviour.

2.2. TB burden in South Africa

Globally there are 30 countries with a high TB burden, eight of whom contribute two-thirds of the global TB burden. South Africa is among the eight highest burden countries, contributing a full 3.6% to the burden of the 8 countries (WHO, 2021).

National prevalence surveys, notification data and TB inventory studies are all used by WHO to estimate the TB burden. After a long period of advocacy by WHO, South Africa conducted its first national TB prevalence survey in 2016, with the results published in 2018 (Pillay et al., 2021). The survey found a very high TB prevalence, with an estimated 852 cases per 100 000 population. This TB prevalence rate is very high when compared to other low and middle income countries, even if, as (Chakaya et al., 2021) assert, it is common for the countries to report lower estimates than what is actually observed. The South African TB epidemic is driven by a parallel HIV epidemic, although a limitation of the national TB prevalence survey is that it could not define the co-infection rate as participants were not provided with HIV testing services on the spot (Ayles et al., 2022). This information would have been crucial in confirming the risk of TB in the HIV-infected group.

Although the prevalence of TB is very high in South Africa, many people with TB are still missed in health services, especially HIV positive people, men and children (Pillay et al., 2021). Zululand district is among the six districts in KZN with both high HIV and TB burdens (Massyn et al., 2020).

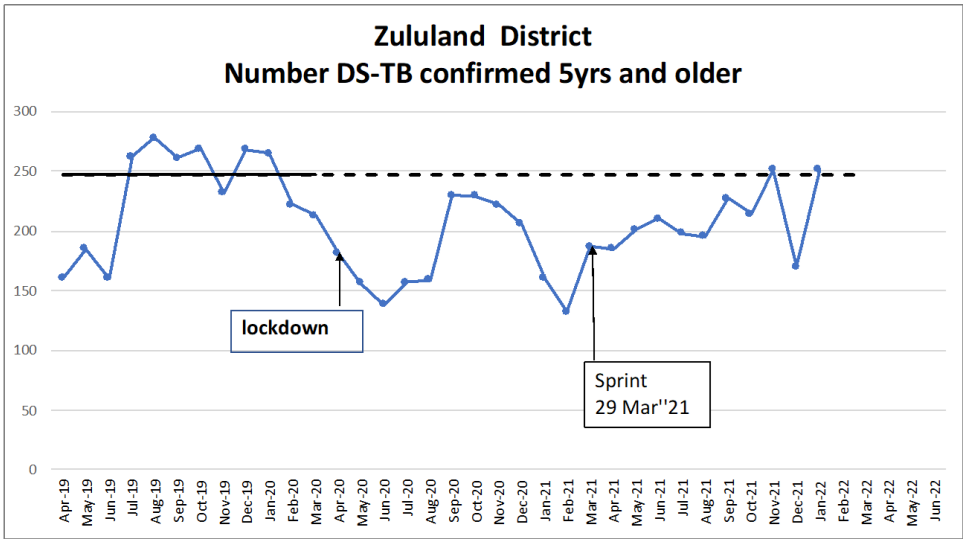

Figure 3. Zululand number DS-TB confirmed cases per month (Apr' 2019-Jan' 2022)

Figure 3 reports routine monthly data extracted from the District Health Information System (DHISv2). The graph shows median performance (black line) for a one-year period prior to COVID-19, and monthly trends in TB case finding in Zululand District for nearly three years (2019-'22). The beginning of COVID-19 lockdowns had a negative impact on TB case finding in the district, followed by a gradual improvement over the course of 2021, with support from partners (TB sprint project). However, these efforts were not adequate to fully restore the district to pre-covid levels.

2.3. The impact of COVID 19 on TB case finding

In 2020 the global community was hit by a COVID 19 pandemic which led to hard lockdowns to contain the pandemic, and major disruptions in the health system and the delivery of health services.

The most notable impact was a global drop of newly diagnosed TB cases, which went from 7.1 million in 2019 to 5.8 million cases in 2020 (an 18% decline), falling far short of the estimated 10 million people who developed TB in 2020 (WHO, 2021). South Africa was among the countries that showed a 50% reduction in their TB notifications in the period March to June 2020 (Pillay et al., 2021). TB testing and diagnosis also declined by 50% and 33%, respectively (Loveday et al., 2020). The delay in diagnosis increases infectiousness and opportunities for spread of TB transmission, over and above the case finding challenges that existed before COVID. Using routine primary health care data, another study revealed that HIV and TB case finding services were severely affected during the COVID-19 lockdowns. HIV

testing declined by 22% between 2019 and 2020 with a likely knock on effect on the TB programme as HIV is the driver of the TB epidemic (Ayele et al., 2021).

A study conducted in 2021 in India, Kenya and Ukraine estimated the long term impact of COVID-19 disruptions on the health system. Using adapted mathematical models of transmission TB, the study revealed that a three month disruption, followed by a 10 months restoration period of TB services, would result in an estimated additional 1-19 million cases of TB in India (Cilloni et al., 2020). South Africa is likely to follow a similar pattern. In the coming years, South Africa will in all likelihood experience more TB infections and require the health system to be more robust in dealing with TB case finding activities (Loveday et al., 2020).

2.4. TB susceptibility and prevalence in people living with HIV

The 2020 WHO TB report identified five factors that place individuals at a higher risk of getting a TB infection: 1) HIV infection 2) smoking 3) undernutrition 4) excessive alcohol use and 5) diabetes (WHO, 2020).

People living with HIV have a 15-22 times higher chance of developing TB than people who are HIV negative, with the risk increasing as CD 4 count declines (WHO, 2020). In 2019 TB contributed two thirds of deaths in HIV-infected people globally (WHO, 2020). A systematic review of autopsies in resource limited settings found that 45,8% (almost half) of people dying with HIV had undiagnosed TB (Gupta et al., 2015). A retrospective cohort study in Nigeria identified a high incidence of TB in PLWA who were newly initiated on anti-retroviral treatment (ART). This incidence was driven by patients who already had suspected TB but were undiagnosed during ART initiation or those with a history of previous PTB (Pathmanathan et al., 2017).

South Africa has the highest number of people living with HIV globally, with women and adolescent girls proportionally more affected than men. In South Africa, TB prevalence is estimated at 1,734 cases per 100 000 population, and each year an estimated 320,000 people living with HIV fall ill with TB (Bulled & Singer, 2020). The prevalence of TB in people living with HIV infection is double than the prevalence of the HIV negative population (Ayles et al., 2022).

2.5. TB susceptibility among health care providers

A 2015 study among 5,050 health care workers in South Africa found a high prevalence of latent TB, ranging from 62-84% using different tests. When tested again a year later, between 13-38% had converted from latent to active TB, using three different tests (Adams et al., 2015).

Rates of latent TB were higher amongst health workers than a non-health care worker group in the same community and were thus attributed to occupational exposure.

In another study in South Africa, 138 hospital healthcare workers were monitored for TB infection incidence. Over a 12 months period there was a 34% incidence of TB infection, associated with poor ventilation and/or crowding (measured through carbon dioxide levels). This study provides compelling evidence that healthcare workers are more susceptible to TB infections than the general population (Nathavitharana et al., 2022). A study in Indonesia similarly found a prevalence of 24% of latent TB infection among healthcare workers, who were asymptomatic but had a positive Mantoux test. The major risk factor for infection was the presence of other morbidities (Erawati & Andriany, 2020).

A qualitative case study conducted in a metropolitan District in South Africa looking at infection spread among healthcare workers concluded that, among other factors, de-stigmatization of TB among health care workers would contribute to infection prevention (Zinatsa et al., 2018). Another study found that health care providers who believe they are more at risk of contracting TB will engage more in TB prevention and case finding activities (van Rensburg et al., 2018).

2.6. Improving TB case detection

High TB mortality rates can be averted by identifying TB early. The goal of ending TB by 2030 will require that people living with TB be found timeously and linked to care as early as possible. Case detection is one of the important pillars of the TB programme. Chen et al (2019) in their study on point of TB care diagnosis assert that all activities that may be done in the quest to reduce TB transmission and provide timely treatment cannot be commenced without accurate diagnosis.

Mortality reduction depends on the strength of the diagnostic cascade of the TB programme. Although there are still notable gaps in TB case detection, some progress has been made. Between 2000 and 2017, TB diagnosis and treatment saved an estimated 54 million lives globally (WHO, 2017).

The benefits of early detection also include breaking the chain of transmission between patient to patient. If the facilities exclude TB early enough the patient will not come back numerous times with undetected TB and in the process infect other patients in the health facilities as well as health care providers and ultimately spreading it in the community (Paudel et al., 2021).

2.7. Barriers to TB case finding

2.7.1. Suboptimal use and limitations of the TB screening tool

Systematic screening is fundamental to finding missing TB cases. To date, the only recommended screening tool for adults and adolescents living with HIV is a four-symptom questionnaire by WHO, which screens for cough, nights sweats, fever or weight loss. Any one of these symptoms warrants a further TB investigation. The tool was designed to be used at every patient encounter at a health facility (WHO, 2021).

An exit interview study conducted in a high TB burden municipality in South Africa, estimated the number of patients that had a consultation but were missed for screening and testing. The findings revealed that screening was not systematically done. Only 79% of patients who came for TB related symptoms were screened, and in those who were attending for other reasons a screening rate of 21,9% was reported. TB investigations on all the patients with TB symptoms but who were not tested found an alarming 5% TB positivity rate (Kweza et al., 2018). The study estimated that a TB diagnosis was missed in 62.9-78.5% of people presenting at clinics with TB-related symptoms, and in nearly all (89.5-100%) other patients. In as much as the screening tool has shortcomings on sensitivity, this study revealed that if used correctly and consistently at least 40% more TB missing patients could have been found.

Sub-optimal implementation of TB screening is not only limited to primary health care facilities. A study of TB screening done in Lesotho hospital and a health care centre revealed that only 22% of hospital and 48% of health centre attenders were screened for TB. The presumptive rate in both these facilities was at 2%. The study revealed issues of trust between patients and those who were providing screening as well as a shortage and low level of expertise of staff providing the screening (Andom et al., 2022).

Different studies suggest that the symptom screening tool has a lower sensitivity compared to routine (biological) testing, particularly among people living with HIV (Hamada, Lujan & Schenkel, 2018). A systematic review aimed at assessing the screening tool performance on people living with HIV also concluded that there is suboptimal accuracy in detecting presumptive patients among this population when using the WHO four symptom screening tool. This finding prompted the recent recommendation from WHO for molecular rapid diagnostic testing for all HIV positive patients especially in inpatient settings and in settings where the TB prevalence is above 10% (Dhana et al., 2022),

The evidence also suggests that the sensitivity of symptom screening decreases in people with HIV infection, especially after initiation of ART. One systematic review found that the symptom screening tool sensitivity is almost double for HIV negative people as compared to those on ART (WHO, 2021).

The Department of Health has since recommended universal testing for TB using GeneXpert technology in HIV positive patients even if they do not present with symptoms of TB (NDoH, 2019). This is an important intervention that has been supported by evidence from the latest TB prevalence survey that showed that around 60% of patients that have TB do not have symptoms, particularly in the HIV positive population (NDoH, 2018).

2.7.2. Health care provider knowledge and attitude

One study examining barriers to case finding found that healthcare providers sought to distance themselves from TB activities, voicing views that "it was not their job" and therefore "extra work", while others indicated that they "just forgot to ask" patients for symptoms (Der et al., 2022). There were also clashing responses regarding the use of the screening tool, some saying they were not trained and did not know how to use it, and others stating that it was primarily a matter of attitude rather than training (Der et al., 2022). A study in the Western Cape found that only 25% of health care workers perceived themselves as having knowledge to provide integrated TB/HIV care, and 50% reported that they felt unequipped to manage both TB and HIV (Phetlhu et al., 2018)

In one Ghanaian study of nurses' attitudes to sputum handling, 71% of providers expressed fear of contracting TB during the sputum collection process (Tenna et al., 2013). Eight percent (8%) of nurses indicated a shortage of protective equipment, particularly masks, to aid in sputum collection, although this may have changed in the era of COVID-19 were facilities are better equipped with protective equipment.

2.7.3. Patient reluctance

Although not extensively studied, lack of knowledge about TB symptoms may result in patients seeking alternative help in places like spiritual or traditional healers or to self-medicate with herbal medicines. Stigma and the fear of being diagnosed with TB may prevent patients from reporting symptoms of TB when attending facilities (Der et al., 2022).

2.8. Models and impact of TB/HIV integration

The South African HIV/TB Strategic Plan has endorsed service integration and has called for all HIV patients to be screened for TB and TB patients to be tested for HIV infection (SANAC, 2015). (Uyei et al., 2014) identified three forms of TB/HIV integration in operation: functional, organizational, and clinical integration. Functional integration refers to the integration that occurs at the level of budgeting and planning; organizational integration is where HIV and TB care would be offered in one facility but in different areas; and clinical integration where services are offered by the same provider in a facility. Further elaborating the organizational

and clinical domains, one systematic review identified five specific models of TB HIV integration: (1) TB service used as an entry point and patients referred for HIV testing and care, (2) TB service as an entry point with onsite testing and patient referred to HIV point for further HIV care, (3) HIV service as an entry point where patients are referred for TB screening and treatment, (4) HIV service as an entry point where TB screening is done on site and patients referred for TB diagnosis and further care, (5) TB and HIV service are provided on one point (Legido-Quigley et al., 2013).

Several authors have found that integration of care improves health outcomes of patients, and the diagnosis of TB in HIV positive patients can increase when TB screening is integrated into routine HIV care, such as monthly or periodic treatment collection, routine HIV investigations and initial HIV treatment initiation. A systematic literature review by Uyei, et al (2011) revealed that when TB patients were offered an HIV test during their routine TB care, test uptake and diagnosis improved. The limitation of this study is that it did not look at HIV routine care to assess if TB testing was offered. Another Cape Town study that looked at integration of TB/HIV services across 33 facilities found that clinics where HIV/TB services were offered in one room received more complete HIV/TB care compared to clinics that offered a parallel programme in separate areas. The study showed that TB patients received improved HIV care like HIV testing. However, it did not report whether patients who came for HIV care received TB screening and testing (Uyei. et al, 2014). Similarly, a Ugandan study looked at HIV/TB integration and how it improves TB outcomes (loss to follow ups and treatment completion) but did not consider those who were undiagnosed (Musaazi, et al. 2019). It is therefore not known whether integration improves TB case finding.

2.9. The Health Belief Model

The Health Belief Model (HBM or model) originated in the 1950s, developed in the field of health promotion to explain the motivations for people to adhere to certain disease treatments or to participate in prevention and case detection programmes. Behavioral scientists sought to understand the reasons for observed low participation in health prevention and promotion programs (even when offered for free) and the conditions that would trigger people to take certain actions(Mikhail, 1981). The model has since continuously evolved and has been used in research to understand and to explain a wide range of health behaviour (Glanz et al., 2008), including provider behaviour (Tsai et al., 2021).

The model provides a framework that can be used to understand perceptions, motives, drivers to behavior, intentions and facilitators to change (Yoshitake et al., 2019). It is made up of different constructs that provide an assumption as to what influences action or behavior, and

what would facilitate prevention, screening or controlling of an illness. These constructs include susceptibility, severity (seriousness), benefits, barriers and cues to action (Glanz et al., 2008). Severity pertains to beliefs about the perceived risk and how serious the illness or condition is. It also evaluates the seriousness or complications of the untreated condition or disease (Glanz et al., 2008).

Even though susceptibility and severity may be acknowledged, this does not guarantee behavioural change, until there is internalisation of the benefits of change or of a proposed intervention. The acknowledgement of the benefits serves as a precursor to motivate change in behaviour (Glanz et al., 2008). Cues to action are actions, people or events that trigger one to act or to change behaviour, they can be internal or external. It is a stimulus that triggers one to decide on behaviour (Der et al., 2022).

2.9.1. Application of the Health Belief Model to TB related behaviour in patients

Researchers have used the model in the TB field to understand and explain certain behaviours and beliefs related to the uptake of TB interventions. Several studies have applied the HBM to TB treatment adherence. One used the model to identify factors associated with TB treatment adherence in Iran (Azizi et al., 2018), while in Indonesia a randomized controlled trial assessed the efficacy of hypnosis in improving TB treatment adherence using the constructs of the HBM (Prasetya et al., 2018).

Others have used the HBM in studies of TB prevention. An Ethiopian study assessed the risk perceptions and protective behaviours related to Bovine TB and identified the determinants of the high-risk behaviour among abattoir employees and butchers using the HBM (Fekadu et al., 2018). Another study used the HBM in health prevention to ascertain of health beliefs, personality characteristics and interpersonal concerns predicted TB prevention behaviour among adults in Japan. Interestingly, study found that participants with a higher level of education had almost the same level of low perception of risk and susceptibility than participants of lower education level (Yoshitake et al., 2019).

2.9.2. Application of the Health Belief Model to health care provider behaviour

Although the HBM has not been applied to the TB related actions of health care providers, there is literature on provider action related to COVID-19 risks. A study of student nurses in Taiwan used the constructs of the HBM to explore the relationship between COVID-19 knowledge, health beliefs, cues to action, and behavioural intention in Taiwan (Tsai et al., 2021). Another study at a Najran University, Kingdom of Saudi Arabia, sought to ascertain the

impact of an educational intervention based on the HBM on nursing students' awareness and health beliefs during the COVID 19 outbreak (Elgzar et al., 2020)

Other studies have used constructs similar to that in the HBM, such as that by (van Rensburg et al., 2018) cited earlier, who found that health care provider beliefs of TB risks shaped their TB prevention and case finding activities.

2.10. Conclusion

From the literature reviewed, factors that undermine case finding include health care provider knowledge and attitudes, TB screening practices, healthcare provider perceptions of TB risk, patient's health seeking behaviours and lack of awareness of TB infection risks.

The studies have shown that healthcare workers particularly nurses have a higher susceptibility to latent TB, which may convert to active TB. The gap between healthcare worker susceptibility to TB versus their own perceived susceptibility may be a major factor that explains certain behaviours among healthcare workers. If workers do not acknowledge that they are susceptible to TB they may be passive in their approach in excluding TB from patients who visit their facilities because of the assumption that it does not also affect them.

Studies on TB and HBM are mainly around TB prevention and treatment and there is limited information on TB case finding or on provider behaviour in South Africa and elsewhere. Finally, currently available studies on the application of the HBM to TB are mainly quantitative in design and do not provide further information on the depth of beliefs and perceptions and what drives those beliefs and perceptions.

CHAPTER 3: METHODOLOGY

3.1. Introduction

This chapter outlines the research design adopted to explore barriers to TB case finding, the study population, sampling, data collection and procedures used, data analysis conducted and limitations of the study.

3.2. Study design

The study adopted a qualitative descriptive research design, seeking an in-depth understanding of the context and the perspectives and actions of health care workers in an environment that is complex (Pope & Mays, 1995) (Brink et al., 2006). Data collection included health care provider interviews, key informant interviews as well as two field observations to obtain an in-depth understanding from different angles and data sources. The study methodology conforms to the COREQ guidelines.

3. 3. Conceptual framework

The Health Belief Model (HBM) was adopted as the conceptual framework to explore the factors influencing TB case finding by professional nurses among people living with HIV. The HBM is a health promotion model that was traditionally used to explore and address behaviour change in health care users, by examining their perceived risk of a health condition, attitude towards a health problem and belief in the proposed intervention to curb that health problem.

Researchers have applied the HBM model to various cultural and topical contexts (Scarinci et al., 2012). In this study, the model was adapted to explore and influence changes in nursing practice rather than in health behaviours. The use of the model had a dual role of enabling the participants to reflect on their attitude towards TB, perceptions of risk to themselves and to patients, and to consider actions that will reduce or eliminate the risk, while providing information.

Although motivational theories would also be appropriate for the research, the researcher considered the HBM as a framework that would best explain the phenomena under study.

Motivational theories like the theory of planned behavior (Bosnjak, Ajzen, & Schmidt, 2020), the Herzberg's two factor theory (Osemeke & Adegboyega, 2017), the Maslow's hierarchy of needs (Fallatah et al, 2018), the Mc Gregor's theory X and theory Y (Brdulak, Senkus, & Senkus 2017), to name a few, were among the theories that the researcher considered. However, the researcher felt that they lacked the advantage of the HBM in eliciting reflection about the participants beliefs about their own health, vulnerability and susceptibly.

The researcher explored the providers perceptions using the five key constructs contained in the HBM, with some adaptation.

- Susceptibility referred to their knowledge on the susceptibility of those who are in contact with undiagnosed TB positive people, including the susceptibility of health workers from the TB infection. It also explored their perceptions on the susceptibility of the HIV positive population to the TB infection.
- Severity referred to the providers' knowledge on the extent of seriousness of the TB infection at a personal and population level, the impact of late diagnosis and missed diagnoses on the patient, society and the health system.
- The benefit construct referred to the providers understanding of the particular role and benefits of improved case finding of TB in HIV services to the health worker, patient, health system and society.
- The barriers construct referred to the perceived factors that hinder the implementation of proper TB screening and TB testing of people living with HIV.
- Cues to action referred to enablers, the prompts that encourage the provider to take certain action towards the desired behavior.

3.4. Study population, sample and sampling procedure

The study population included professional nurses working in HIV services (a total of ten) and their immediate sub-district programme managers (total two) in Zululand District. A purposeful selection of ten sites and professional nurse participants was done, using the criteria of balancing subdistricts and facilities. (Creswell, 2014) The study sample was recruited during the researcher's site support visits to their facilities. As data saturation was reached with the first ten participants, upon consultation with the study supervisor, no further interviews were done (Robson & Mc Cartan, 2016). Of the ten facilities visited, two sites were selected as observation sites, one a high volume and one a medium volume site, where one day long field observations were conducted by taking notes on processes and the behaviour of participants (Creswell, 2014). Purposive sampling was used to select an additional two key informants with knowledge and experience (i.e. information rich) at managerial level, one a HAST coordinator and another, a Monitoring and Evaluation manager at subdistrict level.

The inclusion criteria was professional nurses who have some HIV training and who have worked in the HIV services for at least one year.

3.5. Data collection

Data collection was conducted over three months, between May and July 2022, and began with two 6-7-hour long field observations in the two facilities (A & B). The observation took 6 hours in facility A (due to the distance to the observed facility) and 7 hours in facility B.

The observations firstly followed the patient pathway from the registration desk to consultation, until the patients exited the facility. The second part involved observing two professional nurses as they consulted with patients. An observation sheet was used to collect data and guide the researcher on important aspects of the observation (Annexure 4), and additional field notes were recorded as observations were in progress. At the registration desk the researcher observed if the filing clerk could identify patients who routinely needed a sputum collection and those who presented with obvious cough for triage. However, this was done in passing and not a focal point of the observation. During the observations the researcher sought to establish an empathetic rapport with the PN, which encouraged the observed nurse to continue with their daily consultations without feeling uneasy (Polit & Beck, 2008). The seating arrangement promoted an unobtrusive researcher presence: she sat at a desk in the corner of the room, with a laptop and diary to give an impression that the researcher was not focusing solely on the consultation.

After the observations were complete, ten semi-structured interviews were conducted using an interview guide (Annexure 3). Six face-to-face and four virtual (via zoom) interviews, lasting between 30 and 55 minutes were conducted. Four participants requested late afternoon virtual interviews due to staff shortage in the facility during the day. A pilot interview was conducted as a trial run before the actual planned interviews (Brink et al., 2006).

The researcher obtained permission to conduct interviews from the district manager and the participants at the facility. Upon the start of data collection, the facility management was again informed of the research and informed consent obtained from the participant before the interview. Since the participants were all highly qualified health care professionals, interviews were conducted in English. However, they were encouraged to respond in isiZulu whenever they needed to, in order to obtain rich information unhindered by language. All interviews were audiotaped. A research diary was kept by the researcher, noting the whole data collection process and key points during the interview (Creswell, 2014)

3.6 Data Analysis

Thematic analysis of data was conducted in an iterative manner throughout the data collection and write up process. The interviews were transcribed by professional transcribers, and

checked line by line by the researcher to ensure the transcription was correct and to translate Isizulu responses. The researcher prepared for the analysis by scanning through the data and sorting it according to different modes of collection (interviews and observations)(Creswell, 2014). Content was read and re-read until the researcher was completely immersed (Ehrlich & Joubert, 2014). The researcher then started identifying patterns in the data (Brink et al., 2006) and categorized data into segments or codes, drawing on the conceptual framework. The process was done manually in an excel spread sheet. The codes were grouped to identify themes that were used to interpret data, and draw explanations to the phenomenon being investigated (Creswell, 2014).

3.7. Rigour

The rigour of the research was ensured by employing the following strategies to facilitate trustworthiness, authenticity and credibility (Creswell, 2014)

- Data on the barriers to improved case finding was gathered from different sources - in-depth interviews with professional nurses, the key informants and observations, which were triangulated to enhance credibility (Brink et al., 2006).
- Prolonged engagement with the setting was achieved by spending the whole day in one consultation room, long enough for the participant to carry out their daily activities as naturally as possible.
- Member checking was performed at the time of interviews, when the researcher would ask the participant to review and validate the key information recorded in the interview notes to ensure that the information carried the participants voice and not the interpretations of the researcher in as much as possible (Polit & Beck, 2008).
- The researcher kept field notes and tracked the whole process thus ensuring that an audit trail was kept.
- Peer debriefing was enabled through meetings with the supervisor as an independent reviewer of the processes followed, who also asked questions about the study.

Reflexivity seeks to clarify how the biases and background of the researcher may influence the study (Creswell, 2014). The researcher was already providing external support to the TB programme and had formulated beliefs about the phenomena under study which may have influenced the data collection and analyses process. To this end, the researcher kept a diary that has recorded reflections of the possible preconceived ideas, beliefs and biases.

3.8. Ethical consideration

Ethical clearance was granted by the University of Western Cape's Biomedical Research Ethics Committee (Annexure 1). Permission to conduct research was obtained from the Provincial Health Department and the Zululand District Manager (Annexure 2), and at the facility, permission was sought directly from the participants and received through individual consent forms.

Written informed consent was sought from all participants prior to face to face interviews and verbal consent was obtained from participants who were interviewed via zoom. All participants were made aware that the participation was voluntary, with the right to refuse participation and withdraw from the study anytime without explanation or without fear of repercussions from the researcher. The reasons and benefits of the research were also explained to participants, and that the research did not pose any significant risk or harm.

The information sheet was provided to participants, detailing the study purpose and participant and researcher role (Annexure 3). The personal identifiers of participants were interview numbers and not their names (Brink et al., 2006).The information was kept confidential with interview recordings stored on a device that requires a password. The transcripts were also saved on a computer with a password.

CHAPTER 4: RESULTS

This chapter reports on the results of the semi structured interviews of professional nurses working in HIV services on their TB screening practices and beliefs, and using the constructs of the Health Belief Model. This is prefaced by a profile of study participants and the findings from the two days of facility observation.

4.1. Profile of the study participants

Table 1 summarises the profile of participants relevant to the study. There were three male and nine female participants, reflecting the unequal gender distribution across all health facilities. The age of participants ranged from 20-59 years, and experience varied widely, from 2-36 years. Training coverage was better for HIV (NIMART) than for TB: only one, newly appointed professional nurse (PN) did not have training on HIV management. Conversely, four PNs had not had training in TB, one of whom had been working for 18 years. Respondents reported relying on occasional in-service trainings, guidelines and consultation for their TB management work.

Ten of the participants were PNS in facilities and two PNS were key informants(KI) and managers at a subdistrict level. One was an HIV, AIDS, STI & TB (HAST) coordinator, and one was a female, working as a Monitoring and Evaluation (M&E) coordinator.

Table 1: Participants' profiles (n=12)

PN	Gender	Age	Years as PN*	HIV trained (NIMART)**	TB trained
P1	F	40-49	6	yes	no
P2	F	20-29	3	yes	no
P3	M	20-29	3	yes	yes
P4	F	50-59	36	yes	yes
P5	F	30-39	2	no	yes
P6	F	50-59	18	yes	no
P7	F	30-39	12	yes	yes
P8	F	40-49	15	yes	no
P9	F	30-39	12	yes	yes
P10	M	40-49	16	yes	yes
P11 KI	F	40-49	13	yes	yes
P12 KI	M	30-39	10	yes	yes

* PN: professional nurse; ** NIMART: Nurse Initiated Management of Antiretroviral Therapy

KI-Key informant

4.2. Observations of patient flow and potential barriers to TB case finding

Two facilities – one with high (facility A) and one with medium patient volumes (facility B) - were selected for observation of patient flow, and one professional nurse in each facility observed while conducting their HIV consultations (20 in total).

The following observations were made on barriers to the TB screening in the care cascade:

- Screening at a central area was done by an enrolled nurse (EN) or enrolled nursing assistant who was observed asking patients the four TB screening questions (cough for two weeks or more, drenching night sweats, unexplained loss of weight, fever). However, there was no privacy as the area was also used by the nurse taking vital signs and there were always two patients in the area at any given time.

- In the consultation rooms, verbal screening was rarely observed (Figure 3). Out of the 20 patients that were seen on both days only two were screened: one was asked the four screening questions and one other was asked whether they *"have a person with TB at home"*. However, in all instances the patients were recorded as screened in the consultation register.
- Out of four patients who displayed signs of TB, only one was referred for TB sputum testing and the other three given antibiotics and requested to return if they did not feel better. The nurse was observed saying to one patient *"Make warm water with lemon for the cough at home"*, and did not ask if they had other accompanying signs and symptoms.
- Patients who were identified as suspects were given treatment first and then referred to the testing point, potentially encouraging them to leave without testing for TB because they already had what they mainly came to the clinic for.

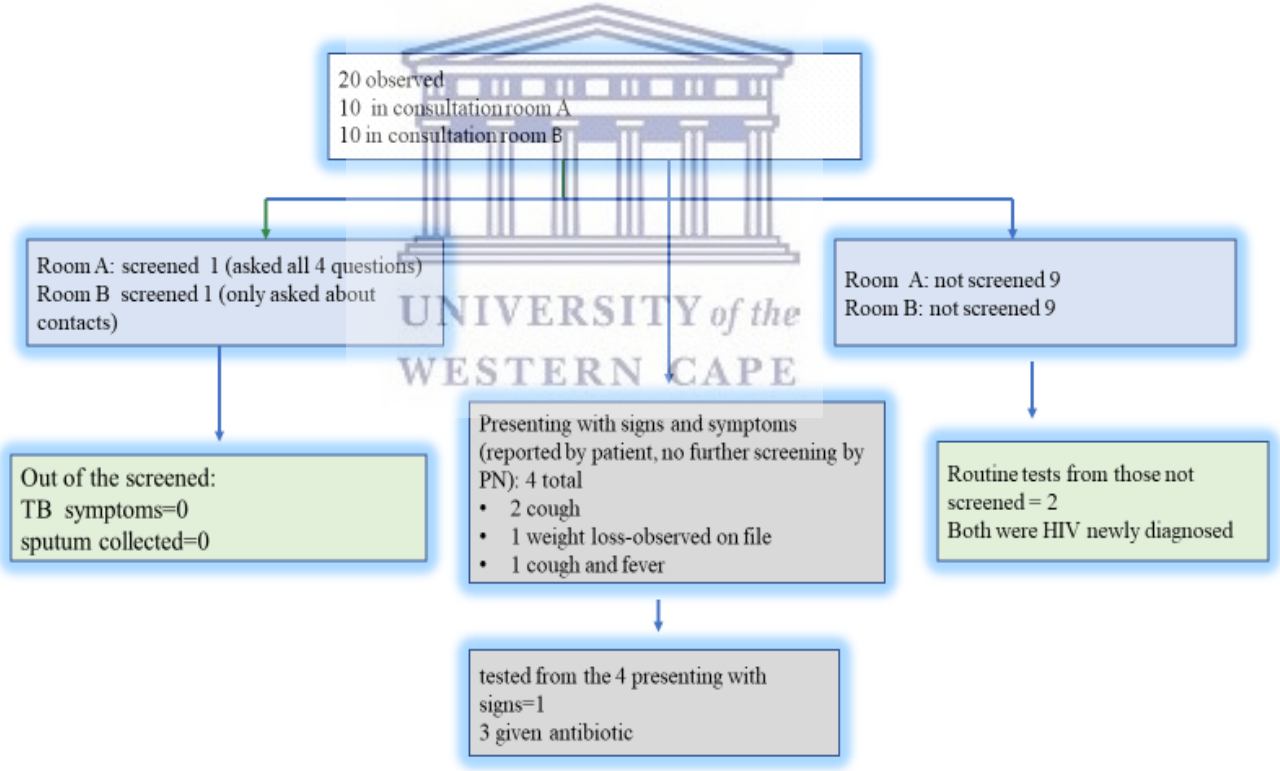

Figure 3. Observed TB screening cascade in consultation rooms

Figure 4 is a process map of TB screening and testing, indicating where these were done (red dots) and summarising possible barriers to case finding. In conversations with facility staff, it appeared that there was no clear agreement on where screening should be done. The EN assumed the screening was done at the consultation room, while the PN assumed screening was done at the central area by ENs. There was no consistent recording of the screening done at the

central area as the facility did not have screening tools that would be attached to the patient's files.

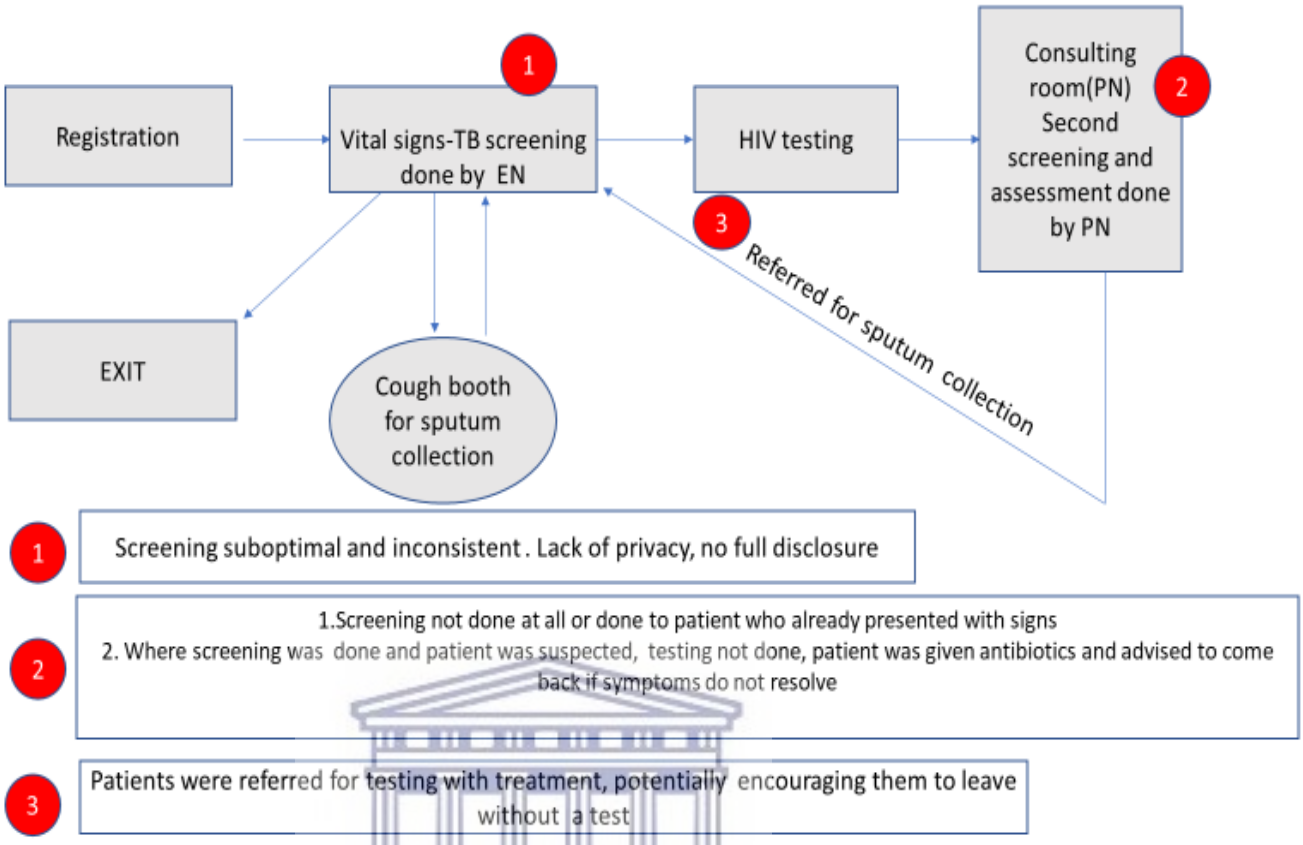

Figure 4: Process map of TB screening and testing from clinic observations

4.3. Reported case finding practices

When participants were asked about the model of TB screening in their facility, they described two models, (i) screening done at the central area by enrolled nurses (ii) TB screening done at the consultation room by professional nurses. The 'central model' being the one most widely reported.

However, participants also indicated that due to staff shortages, patients did not always get screened at the dedicated central area and ended up being screened in the consultation room.

"*Due to the shortage here of staff we end up screening them there [consultation room]* " (P4).

In other instances the patients skipped the vital signs area and joined queues directly to the PNs consultation rooms, especially those who came for collection of their chronic medication:

"*And also the professional nurses they do it in the consultation room, if the patient was not screened there. Because there are those who will skip there and then they'll take the card and then go straight to the sister*". (P4)

Even if screening was done at the central area, PNs reported that they felt a need to repeat the screening in the consultation room, because it was a requirement and because they were skilled to conduct further clinical assessment beyond the screening questions.

"*We do TB screening because it's required. Sometimes they come in from the point of care having filled the TB screening form if it's available, but we also do TB screening" (P3)*

"As PNs we also do screening, but doing more of clinical assessment" (P6)

When asked about their views on which screening model could improve case finding, responses differed among participants.

Some felt that patients were more at liberty to disclose symptoms to PNs due to their clinical seniority:

"*Screening is best when done correctly by PNs, patients disclose better to them as they are senior*" (P1).

Another believed that the central screening was the best model, especially when well supervised and if there was continuous training.

"Central screening is optimal, as all patients pass there, you will see it for a month or so after a certain training or after a visit by the supervisors, you will see things, picking patients up and then it dies down along the way and then it's gone"(P10)

Although there was a consensus that screening done in consulting rooms had the potential to improve case finding, the challenge was that it was often done for compliance as opposed to patient management purposes, or overlooked altogether.

"*Screening by PNs is just for compliance, ticking without actual screening, just to impress the operational manager that, yes I did do a TB screening. Tick, tick, tick. Sometimes they [even] forgot to tick"* (P7).

"*sometimes you find out that the patient was never screened, it does not appear on their notes that the patient was screened" (P10)*

When asked about action to improve TB case finding, the participants pointed out that they have interventions in place to complement the routine TB screening, which are: the routine testing of certain high risk groups like HIV newly diagnosed patients, antenatal patients who are HIV positive, HIV positive patients who come for their annual viral loads, and sputum culture in those HIV positive TB symptomatic patients who have a negative GeneXpert result.

Routine testing of all COVID suspects for TB was also reported as one intervention aimed at improved case finding.

"*if we check them COVID we are checking TB here. So we are taking the sputum. If we check COVID we check the sputum also"* (P4).

4.4. Provider perceptions of TB case finding

The different themes identified in the interview transcripts were grouped into the five main categories of the Health Belief Model, namely, perceived susceptibility and perceived severity of TB, benefits and barriers to improved TB case finding and cues to action.

These themes are summarized in their categories in Table 2 below and are explored further in the remainder of this chapter.

Table 2. Emerging themes from provider interviews

Perceived susceptibly	HIV positive population and other immunocompromised groups Health care providers
Perceived severity	Health care costs Community health Health care provider health Patients' health and related complications
Benefits of improved case finding	Health care system benefits Community health Health care provider wellness Patients' health
Barriers to improved case finding	Health system barriers Patient related barriers Healthcare provider barriers Programme management and policies
Cues to action	Setting of daily targets for nurses

	Training on TB management for professional nurses

4.4.1. Perceived Susceptibility

This refers to the individual's perceived likelihood of acquiring a certain illness or disease, and which influences behaviour towards that health problem. The more individuals perceive themselves as susceptible to a disease, the higher the probability of behavioural measures to prevent the disease (Tsai,2021).

When interviewees were asked who they considered as more susceptible to TB infection, they identified HIV positive people, children, patients with chronic diseases and males as more susceptible.

" HIV positives are more susceptible to TB because of the immune suppression" (P6)

"The people who used to get TB are those who are HIV positive with viral unsuppressed and low CD4, but in our days from childbearing age to elderly they are testing positive for TB" (P7)

"People who are immune compromised, people who are HIV positive mostly, children, pregnant women, those are the main groups that are most susceptible to TB." (P9)

"It is males, males are the higher in this group cause each time I analyse clients, the number of clients which have more TB is males" (P10)

Health care workers were not identified as a group that was more susceptible to TB; six participants reported that they had not seen TB infected colleagues. Low perceived susceptibility was attributed to preventive behaviours such as wearing masks and a good diet.

"the healthcare workers are at high risk, but not that much because we have been told, the patient must sit looking at the side and you mustn't have close contact, eye contact, but the window must be open so that you mustn't get infected"(P6).

"And they must just eat in the morning"(P6).

"We are safe because of the masks" (P7)

Alternatively, self-testing and self-treating practices may have hidden the true extent of TB amongst health workers. When participants were asked what they would do in if they developed signs of TB, one reported that:

"Maybe if I suspect myself I just test, take the specimen to the lab". (P5)

4.4.2 Perceived severity

This refers to how individuals classify the level of seriousness or severity of a disease, which may be as a result of someone's experiences of consequences or what they believe the complications could be like death, disability, etc (Tsai,2021).

In response to a question on the perceived severity of low TB case finding, participants focused on the costs to the health system, clinical consequences for HIV infected patients and community transmission.

With respect to the health system, poor screening, testing and diagnosis of TB had severe effects on admission costs, which would have been averted had the case finding activities been done timeously.

"If it was treated earlier, they would have been treated at a local clinic taking treatment at his or her home. So once admitted the health system is compromised there because that person is taking a bed that should have been used by other people." (P10).

Poor case finding practices led to late or missed diagnoses of patients, who came to facilities very sick and needed to be transported to hospital.

"they may need to be transported to hospital via ambulance when very sick." (P3)

When patients were missed, they were treated for irrelevant conditions, resulting in increased costs of return visits.

"Yes. if it is a misdiagnosis it's gonna to cost us a lot because we are not treating the right thing. The patient can come back again with another complaint and then you treat it, will come back again with another complaint then you treat the complaint it's a loss of resources in respect your budget you will be affected surely". (P9)

In addition to the costs of care, participants pointed to impacts on workload if health care providers become infected with TB and booked off for long periods of treatment.

"I think it would impact on the human resources, when we are sick there will be shortage, and then with TB you are on treatment for a long time". (P3)

With respect to patient health, participants raised the risk of Immune Reconstitution Inflammatory Syndrome (IRIS) on those co-infected with HIV. IRIS occurs where the patient initiated on HIV treatment with undetected underlying TB develops severe illness as the immune system picks up and starts fighting the hidden TB bacteria.

"On the patients side. especially the new patient, if you missed TB, you could initiate the patient on ARV's of which that could cause IRIS on the patient." (P9)

HIV/TB co-infected patients with untreated or delayed TB treatment could take longer to respond to HIV treatment, with poor HIV outcomes.

"They do survive but when they come back it takes longer for them to respond even to ARV's." (P2)

"the longer he is not diagnosed the longer the patient is deteriorating" (P9)

"She won't be suppressed because of the TB. You can take your ARV's on time every day, but if you have TB it's like you are just wasting time."(P7)"

Late TB diagnoses exposed the patients to severe side effects due to compromised immunity and to drug resistance, and ultimately, higher death rates.

"*Exaggerated side effects, more deteriorated patients and they experiencing most side effects" (P6).*

"if not diagnosed early, MDR obviously."(P7)

" The impact of TB is very bad because the patient he or she may end up losing his or her life. "(P 7).

Finally, undetected TB had wider community impacts.

"*Infection spread, patient will spread all over where he is going he is going to spread it and more or most of the people become more infected "(P8).*

4.4.3. Benefits of early TB detection

This construct refers to an individual's belief, knowledge or opinion of the effectiveness of a certain behaviour is in reducing the effect of the disease or the disease itself, and that changing behaviour will yield positive results (Mikhail,1981).

When asked about the benefits of early TB case detection, participants restated the points reported in the previous section on severity, but with different emphases.
With regards to the health system benefits participants reiterated the cost effectiveness, less resource wastage and decreased strain on the hospitals.

"Also, admissions are less. So I think it's somehow also cost-friendly to early detect TB because there won't be any admission or management of other complications". (P3)

"You can imagine if she/he come to the clinic for Amoxilin, after some days she come back again, you have to treat that client." (P7)

"And in the Health Department, the strainers for having a lot of TB, it will decrease" (P8)

When reflecting on healthcare provider benefits, participants also pointed out safety concerns

"Even us, we are safe. Because if this client is not treated he'll come next visit to collect medication and spread the TB."

When asked about the benefits to the patients' health. Participants referred to faster healing, and improved chances of survival.

"Patient can be cured in just 6 months" (Participant 4)

"When you get them early we are almost certain that the patient is going to survive." (P10)

A holistic view on patients' mental health and financial stability were also mentioned as a benefit.

"Financial stability, contributing to mental health and improved productivity(P4)

"They continue working, they continue providing for their families". (P6)

"They can even go back to work they can have the brighter future" (P8)

On the benefits to the community, the relationship between the facility and the community came out strongly as a factor.

"the DOH will be appreciable to the community, after all if they see that to come to the clinic to check and take treatment and diagnosed early, life is going on". (P8)

"They take the facility as their right-hand man when it comes to issues of life." (P 8)

"And if communication is good between the staff facility and the community, it makes it easier because even at home if the patient notice that there is someone at home who is sick but does not want to come to the clinic, she or he come to the clinic and report I have someone at home I try to bring her to the clinic but she denied, can you please help us". (P8)

Participants also reiterated the benefit of reduced risk of infection spread particularly through timely contact tracing and management

"when you're home you're not wearing a mask. When you're going around to your neighbour you're not going to put on a mask. So, for them it's also the thing of get better so that you cannot infect other people". (P1).

"Contacts get their treatment like INH so that they can be protected so that they might not get the TB." (P6)

4.4.4 Barriers to improved TB case finding

Barriers refer to factors that hinder behavioural change and adherence to a recommended health behaviour (Mikhail,1981).

Sputum collection processes emerged as a key facility level barrier to TB case finding. This included the time it takes to collect sputum, and availability of collecting jars and coughing booths.

"Specimen collection take up more time, TB screening is not a lot. Maybe it comes to the sputum part" (P1)

"It is a long process. Because you don't give just the bottle. You must explain to the patient how to cough, how to do, how to hold the bottle. It takes a long time. You come to the filling of the forms, there are many forms which you fill. It takes a long time." (P6)

"sometimes the sputum bottles, we will find that there are no sputum bottles, although it's not usually". (P10)

"Stationery shortage causing lack of continuity in care, the patient will not come with the card which was even used last time and the whole information will be missing". (P8)

Fear also appeared to be an underlying factor that hindered sputum collection. In the facilities where there was no coughing booth, providers felt that they and other patients could easily be exposed to TB, and hence were reluctant to collect sputum.

"there is no proper cough booth, only one coughing area" (P3)

At the programme level, the prioritizing of certain programmes more than others was a reported barrier.

"I think also the challenge comes from the pressure that we get with the patient that have tested HIV positive and we've not initiated them on ARVS the same day. Because later on every day of the week they will ask, sister, where's the patient that tested positive for HIV" (P1)

"First of all, I would say, TB is not getting much attention as it should" (P12)

Participants also drew attention to the allocation of staff to the TB programme at facility level, and the prioritization of ENs rather than PNs for TB training.

"the champions for TB they are ENs of which sometimes I feel sad for the programme because those people have got limited knowledge with regards to the scope of practice. Yes, as much as they get the trainings, they do know a lot of nitty gritties about the programme, but the supervision over the patients, they might not know some other complications because of the limited kind of knowledge" (P12)

"…and then you come to me and you say you are giving a whole, a very important programme to a person who has undergone a two-year training, and it becomes a problem, that is why even nowadays it is a problem" (P2)

"They use to take the enrolled nurses most of the time and train them with TB which in the long run results in the professional nurses they come to be outside of the programme and it ends up being run by the enrolled nurses." (P12)

" I said most of the time most of people other they know about TB is the EN, we are professional but we are not skilled like them". (P 8)

Due to poor ventilation, providers wanted to spend as little time with each patient as possible, leading to compromised screening.

"The space, everything is not well ventilated." (Participant 5)

When asked about perceived healthcare provider barriers, one that came out strongly among participants was the issue of workload.

" I don't think I can decide if it's a lot or it's a priority. I think it's a bit of both. It's taking a bit of both because sometimes, now that I've learnt it's a priority I can do it for the first week or two weeks. The third week I'll be going back, , I have a lot to do" (P1)

And for us as professional nurses it's not that we don't know , but sometimes it's just a matter of I have so many people to see and if I have to fill in an N1 form for your viral load and then I have to fill in another form to check for TB sputum, it's a lot of work for one person."(P2)

"Lots of forms, there's a blood form, sputum form, N4, you are supposed to write on the bottle…there's too much paperwork."(P4)

"Sometimes we collect but it takes a long time. it's just that there are lots of things to write." (P5)

If providers spent too much time on one patient, they received complaints from others waiting in the queue

"you are working and thinking of the number of people that are outside of your door and the complaints that you're getting" (P2)

"People they are complaining that they have waited for so long, they don't want to wait." (P4)

Some participants argued that as much as there was a lot of work to do, TB should also be prioritized and made part of that load if it is really a priority. They believed that poor attitudes had a big effect on how patients responded.

"If your attitude is not good it affects them. It's the way you talk to them. They end up not disclosing everything and we will miss TB." (P4)

"That is why I say it's the attitude if someone talks about workload, TB should also form that part of it you know" (P2)

On patient related barriers to TB screening and testing, interviewees reported failure to produce sputum as a factor.

"But sometimes they come, you see that clinically she is having TB, but she'll tell you that sister, I don't have sputum. I am unable to cough, I don't have sputum" (P4)

Patients did not want to be asked to produce sputum if they attended for an unrelated problem.

"many say "I don't have sputum. I did not come for TB, I was coming just for STI". That's in her mind she is having that, that I was coming for this…and then she'll hide to say I don't have sputum" (P4)

Patients fear of stigma around HIV was also believed to discourage patients to test for TB. Patients understood that HIV is closely linked to TB, so when they test for TB, they would also need to have an HIV test.

". If the patient is having the denial stage they don't want to accept, let's say the patient come you test you found out that this patient is HIV positive". (P8)

The issue of patients who "shop around" was also raised as a barrier for continuity of care and proper disease identification

"Or sometimes they give facility sputum [patient produces sputum, and] on the following day does not come to the same facility they go to another facility [to start all over again]". (P8)

4.4.5 Cues to action

Cues to action are triggers of behavioural change and can be events, certain things or people (Tsai, 2021).

When asked about cues to action, participants voiced that having targets for TB testing and number identified with TB per PN would encourage participation in case finding activities.

"We once had targets, It worked for me because that is when I started seeing more and more patients coming back with TB sputum that is positive. Because every time I had to…the page that time was like 10 people. So every ten patients I see, one patient must be collected sputum" (P2)

I think it's possible, if each PN can have targets" (P9)

Participants felt that equipping professional nurses with skills as well as observational supervision would encourage participation in case finding.

"*Equipping -Not just trainings, sometimes it has to be an assessment. Can you really manage this patient? So, when I've closed the door and we are sitting and talking that is when you can actually screen someone properly*". (P2)

"*I have to say it's education. We must stress in-service education. And then people must be sent to other training and they must be sent to other TB training so that they can have a tangible knowledge. If you know, you've been taught you'll know how to do it. But if I tell you go and do a TB, you don't have any knowledge of doing TB, you have no interest. As I said, you must be trained so that you can have the interest*" (P4).

4.5. Conclusion

In this chapter we reflected on TB screening practices and the themes and derived meanings that emerged under the main five categories of the HBM: susceptibility, perceived severity, benefits, barriers and cues to actions.

Low or sporadic/selective screening was observed, and also confirmed in interviews, which was at odds with the high recorded percentages of screening in the routine data.

Providers appeared to know the theory and were conversant with the implications of TB infection for patients, communities and the health system (severity). However, the PNs did not necessarily perceive themselves to be at risk of acquiring TB from patients (susceptibility). They recognised the need and value of TB screening for patients (benefits) in interviews, even if the observations did not reflect this.

The interviewees cited numerous barriers to screening, including:

- Material factors such as supplies (e.g. sputum jars) and space (coughing booths)
- Patient reluctance

- Systems constraints such as complexity of sputum testing, staffing and waiting times

The pragmatic responses of providers to these barriers were to indicate compliance to universal TB screening while being selective about who they would test (such as patients with newly diagnosed HIV).

In addition, the observations highlighted the barriers posed by the organisation of services and division of labour between TB and HIV nurses and along hierarchical lines. TB was also seen as being low in priority (including training) and not supported by managers, and PNs also felt less confident in TB management. Some cues to action were offered including being allocated individual targets and better training on the TB programme.

CHAPTER 5: DISCUSSION

5.1. Introduction

The aim of the study was to explore the barriers to TB case finding in people living with HIV attending HIV services in a rural district in KZN, South Africa. Ten professional nurses providing HIV care from different primary health care facilities and two subdistrict TB supervisors were interviewed. These interviews were preceded by two days of field observation of HIV services in two high burden facilities.

This chapter discusses the key findings summarised at the end of the last chapter in relation to the research aim and the literature reviewed. Study limitations are discussed and recommendations for policy/practice and further research proposed.

5.2. Disconnect between theory and practice in TB screening and testing

The study found a disconnect between what the nurses reported in interviews and what the researcher observed as practice in the facilities. The participants displayed high levels of knowledge on why and how screening and testing should be done and implied they were taking an active part in these practices. However, this was not the case in live observations, where only 1 in 10 of the patients seen in the consultation rooms were screened. This confirms findings of other studies, notably by (Kweza et al., 2018) on implementation of universal TB screening, which found a screening rate of 21% for patients who were attending services for reasons other than a direct report of TB symptoms.

If basic knowledge is not a barrier, the question is why this disconnect exists. The rest of this chapter discusses other possible factors from the reported and observed barriers to TB case finding in the participating facilities.

5.3 The best screening model

The study also found a lack of consensus on the most feasible and effective model of screening. The participants differed with regards to which model of screening facilitates more case finding: between screening at a central point by the enrolled nurses or nurse assistants and screening in the consulting room by the professional nurses.

The majority who supported screening at the consultation room believed that professional nurses are well trained to provide a clinical assessment, over and above the probing skills that they have during history taking. This confirmed a study which found that patients had more confidence in the professional nurses compared to other nurse categories because of their training level and experience (Lukewich et al., 2022). Furthermore, screening by professional

nurses was considered more effective due to the consultation room's privacy which facilitates disclosure of symptoms A Ghanaian study on TB screening guidelines implementation also found that health care providers with tertiary education and those who are clinicians had a higher likelihood of adhering to the TB screening guidelines than their counterparts (Narh-Bana et al., 2021). Other interviewees believed that central screening achieved better coverage even if at a lower skill level, also pointing to non-commitment to screening by professional nurses as a factor.

5.4 Perceptions about susceptibility

There is now substantial evidence that TB is indeed prevalent among both patients and healthcare providers. (WHO,2020) (Adams et al., 2015), (Nathavitharana et al., 2022) However, it was interesting that health care providers interviewed in this study did not appear to think of themselves as susceptible to TB or believed it constituted an urgent factor, even though they were in daily contact with TB patients. This may explain their behaviour of not taking an active role in TB case finding activities. This lack of awareness of susceptibility was also fuelled by the fact that they were not aware of other health care providers who had contracted TB, possibly because health workers engaged in self-testing and self-treating behaviour. Health care providers who perceive that they are more at risk of contracting TB will engage more in TB prevention and case finding activities (van Rensburg et al., 2018). A qualitative case study of TB infection spread in healthcare settings conducted in another South African district pointed to the lack of visibility and stigmatization of TB among health care workers as a barrier to prevention (Zinatsa et al., 2018).

This lower risk perception could also be linked to unconscious stereotypes of what it means to be TB positive, as TB is usually associated with HIV, poor living conditions, and health care workers could possibly mentally disassociate themselves with these conditions.

5.5 Prioritization of health programmes

The study findings also pointed to the issue of programme prioritization, where other programmes and targets, notably for HIV, were perceived to be a greater priority than TB by higher levels of the system. There were instances where the participants had to choose between meeting the HIV programme or the TB programme targets. For instance, TB screening was compromised in favour of starting HIV treatment on the same day as per Universal Test and Treat (UTT) mandate (DOH,2019). Although the UTT guideline makes allowance for initiation

within 7 days, professional nurses were under pressure from the HIV programme managers to reach ‘same day’ initiation targets.

Case finding activities constitute a lot of work, from screening, filling forms and bottles and registers. From the observations it was evident that there are numerous screening activities required at PHC level, including HIV, family planning, cervical cancer, diabetes, mental health, and TB screening among others. In this context, providers make choices on how best to use their scarce time, and it was observed that PNs tended to focus more on screening activities deemed a priority by the facility like HIV screening and cervical screening.

These priorities were often established at a higher level. The facilities have platforms where they report on the key programme indicators on a weekly basis. TB screening, and presumptive and positive cases are among the reported indicators but there is usually no emphasis on the TB indicators. In addition, any issue that gets prioritised during a supervision visit and especially where individualised targets are set and monitored, is also considered as a priority by the implementors in the facility.

Supervision and target setting was also revealed by the study as factors that influenced programme prioritisation. The findings revealed that PNs performed well in screening for other conditions because of the presence of individual nurse targets that are monitored on a daily or weekly basis. The absence of individualised nurse targets contributed to poor programme prioritisation. The supervision provided did not have a focus on the finding missing cases performance, until a partner led project supported the managers with tools to monitor the facility performance with regards to TB case finding.

5.6. Health care provider attitudes and fears

PNs reported that a large workload and fears of complaints from patients in long queues prevented them from spending time on screening and testing of patients. However, on observation revealed that PNs have sufficient time with each patient and could include TB screening and testing. Each PN was observed for 6 hours during which they managed to have 10 consultations, making an average consultation time of 36 minutes per patient. The PNs themselves indicated that screening using the four questions would take less than five minutes, including assessment and referral to the investigation area. From the researcher’s observations it seemed PNs were reluctant to screen to avoid having to take the next step of investigation. Even those patients who came presenting with symptoms were given antibiotics and told to return if not feeling better. Reluctance to collect and handle sputum specimens was also revealed as a factor in a Ghanaian study which found that 71% of health care providers expressed fear of contracting TB during the sputum collection process (Tenna et al., 2013)

A systematic review in India found that 50% of TB related deaths occurred despite the patient efforts to seek medical care, with all screening and testing policies in place. After having consulted with health providers patients experienced an average delay of 55 days before obtaining their diagnosis (Pai & Temesgen, 2019).

It also seemed that the professional nurses had informally developed a mental image of certain patients as being of higher risk, that is, they classified patients into those more likely and those less likely to have TB and developed screening practices aligned to these. This practise could have resulted in missing TB infected patients, especially those who did not represent with visible symptoms like cough.

5.7. TB knowledge gaps among professional nurses

Despite a general appreciation of TB screening, findings reveal that professional nurses felt less equipped to manage the TB programme compared to enrolled nurses. This confirms (Phetlhu et al., 2018) findings that only 25% of health care workers perceived themselves as having the knowledge to provide integrated TB/HIV care, and 50% reported that they felt unequipped to manage both TB and HIV. Another study also documented the knowledge gaps of PNs regarding TB management including treatment regimens and duration of treatment phases. (Noé et al., 2017).

ENs in this study were more likely to receive training in TB management than PNs, but the transfer of knowledge from ENs to PNs is rendered difficult by the status hierarchies within nursing, characterized by a high regard for seniority and ranks within the profession. The Ideal Clinic model for the primary health care system has sought to integrate the TB service within the chronic stream and do away with the so called “TB rooms” mainly managed by ENs.(Egbujie et al., 2018; Hunter et al., 2017) This would promote TB knowledge among professional nurses and better knowledge of patient clinical management would facilitate buy in to the screening cascade. However, efforts to achieve this milestone are still in progress.

The approach to TB training appears to vary between provinces. While in KZN, ENs were privileged for training, a study conducted in Cape town found the opposite, where training was directed to the facility managers who were not hands on in the programme and neglecting the enrolled nurses who provided the TB care (Zinatsa et al., 2018).

5.8. Resources

Findings revealed that the occasional shortage of supplies for testing like sputum jars and laboratory forms contributed to reduced TB case finding. Patients would be missed for testing

even if symptomatic and there were no mechanisms in place to follow up on those patients who had missed tests due to the shortage of sputum jars.

The infrastructure also contributed to poor case finding. The absence of cough booths discouraged PNs to send patients for a TB test, because areas that are used as cough zones are open and can expose other patients to the infection. (Zinatsa et al., 2018) also found that shortage of cough areas contributed to low case identification.

5.9. Limitations

This research explored the perceptions of professional nurses working in the HIV services but did not include other nurses working in other units, and in particular the enrolled nurses providing TB care.

The researcher occupied a role of being a mentor to the clinic teams and the participants may have received direct mentorship from her previously or seen her at the facility. This could have changed the power dynamics and resulted in the participant providing information that they judged to be acceptable to the researcher, or created expectations that the researcher could resolve the challenges raised. To address this, the researcher spent time clarifying the role she was taking as a researcher versus mentor.

The study was using the Health Belief Model as a framework to guide the research, during the interviews participants voiced out how the questions using the constructs of the model itself raised their awareness about the TB epidemic and case finding. There prompted self-introspection and willingness to change behaviour. Whilst this was positive, a limitation of the study was that it did not do any follow up assessments of any behavioural changes post interviews.

5.10. Conclusions and Recommendations

South Africa's response to the call for finding TB missing cases is in progress. Plans have been put in place, provincial and district targets are now clearly communicated and monitoring platforms have been established. While the quest for finding missing TB cases is in progress in the country, the hard lockdowns of COVID-19 setback case finding. There is ground work in facilities and communities to restore districts to pre-COVID performance levels and ultimately find the missing cases.

The quest to find missing cases is vast, and requires the involvement of many players including non-governmental partner support to districts and multisectoral collaboration. This research focused case finding at the facility level, and in particular the HIV infected users as a known driver of the TB epidemic. Providers working in these services could play a key role in

identifying TB patients early. However, gaps in implementation still exist and there is considerable room for improvement.

Based on the study findings, the researcher recommends the following measures to strengthen routine TB testing so that HIV patients are not missed through sub optimal screening practices:

- integrating professional nurses into the TB programme, starting with those working in HIV services where there is a high yield of TB patients. This can be achieved by allocating professional nurses to be TB champions rather than enrolled nurses.
- Professional nurses working in HIV services should be prioritised for TB training so that they better understand the condition from identification to management of TB cases.
- Sustainable models for capacity development for both professional nurses at implementation level and leadership at supervision level.
- Allocating targets for each professional nurse on TB cases could promote participation and prioritisation of TB case identification, as facilities already have individual PN targets for PNS for the HIV case finding, closely monitored targets could make TB screening a TB default function in all health care services , especially the HIV services.
- TB case finding indicators, particularly TB positives identified, should be integrated into reporting platforms, from facility to provincial level.
- Strengthening implementation of occupational health policies including periodic TB testing for staff to eliminate TB stigma and self-testing and treating tendencies.
- Proper allocation of testing stations and clear referral pathways for testing within the facility.

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UNIVERSITY of the WESTERN CAPE

60 YEARS of hope, action & knowledge

5 November 2021

Mrs NP Zulu
School of Public Health
Faculty of Community and Health Sciences

Ethics Reference Number: BM21/9/17

Project Title: Perceived provider barriers to Tuberculosis case finding in people attending HIV services at Primary health care clinics in a rural KwaZulu Natal District

Approval Period: **4 November 2021 – 4 November 2024**

I hereby certify that the Biomedical Science Research Ethics Committee of the University of the Western Cape approved the scientific methodology and ethics of the above mentioned research project and the requested amendment to the project.

Any further amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

Please remember to submit a progress report annually by 30 November for the duration of the project.

For permission to conduct research using student and/or staff data or to distribute research surveys/questionnaires please apply via:
https://sites.google.com/uwc.ac.za/permissionresearch/home

The permission letter must then be submitted to BMREC for record keeping purposes.

The Committee must be informed of any serious adverse event and/or termination of the study.

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

NHREC Registration Number: BMREC-130416-050

KWAZULU-NATAL PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

ZULULAND HEALTH DISTRICT CARE
OFFICE OF THE DISTRICT DIRECTOR
30 AUG 2021
DIRECTORATE:

Postal Address : PRIVATE BAG X81 ULUNDI 3838
Physical Address: L A BUILDING,KING DINIZULU HIGHWAY
Tel: 035 874 0600 x 606 Fax : 0864742523
Email address: Vilakazi.Vusi@kznhealth.gov.za

DISTRICT DIRECTOR
ZULULAND HEALTH DISTRICT OFFICE

Enquires: Ms. L Dlamini
Tel: 035 874 0600
Ref No: NPZ0812021

Re: PERMISSION TO CONDUCT RESEARCH IN ZULULAND DISTRICT

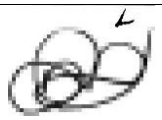
This letter refers to your application to conduct a research study titled:
PERCEIVED PROVIDER BARRIERS TO TUBERCULOSIS CASE FINDING IN PEOPLE ATTENDING HIV SERVICES AT PRIMARY HEALTH CARE FACILITIES IN A RURAL KWAZULU NATAL DISTRICT).

Ms N.P Zulu (PROTOCOLE REF:)

This approval is provided under the following terms and conditions:

1. The research team will adhere to all the policies, procedures, protocols and guidelines of the
   Department of Health with regards to research.
2. All research activities will be conducted in a manner that does not interrupt clinical care at health care facilities or the work of department's respondents.
3. The District Office will be informed at each stage of the research before any work commences on the ground.
4. The District Office will not be asked to provide any resources for this research.
5. The research team will provide feedback on findings to the District Office as available.
6. Research work to only commence once ethical clearance by the academic institution is received.

Name and Surname	Mr. S.V Vilakazi

Position	District Director
Email	Vilakazi.Vusi@kznhealth.gov.za
Tel no:	035 8740600
Cell no:	060 501 7914
Date	30 August 2021
Signature	

GROWING MAZULU-NATAL TOGETHER

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21 959 2809 Fax: 27 21 959 2872

E-mail: soph-comm@uwc.ac.za

INFORMATION SHEET

Project Title: *Perceived provider barriers to tuberculosis case finding in people attending HIV services at Primary health care facilities in a rural KwaZulu Natal District*

What is this study about?

This research aims to understand your perceptions on the barriers to TB screening and testing in people living with HIV as a group that is at high risk of TB infection. We hope that by understanding the health providers perspectives of barriers, we will obtain rich information to support policy developers and program managers on how best to improve TB case finding in HIV services and how best to support the health facilities.

What will I be asked to do if I agree to participate?

I will conduct an interview with you, which will take approximately one hour. During this time, I will be noting important points as we engage, and will also request your permission to record the interview so that valuable information is not lost. The interview will be in a quiet, private area. I will ask you what you think are the barriers to TB screening in HIV services, and your perceptions on the dangers of TB, to you, to your patients and to the community.

Would my participation in this study be kept confidential?

I will ensure your confidentiality by replacing your name with a study identification number. As a person who interviewed you, I will be the only one who is able to link your identity to the research

number allocated. The recorded information will be kept safely under lock and key and the transcripts will be stored safely and will not contain your name. If we write a report or article about this research project, your identity will be protected.

What are the risks of this research?

There is no known or perceived harm that may arise from this interview, however, human interactions and talking about self or others carry some amount of risks. We will nevertheless minimise such risks and act promptly to assist you if you experience any discomfort, psychological or otherwise during the process of your participation in this study. Where necessary, an appropriate referral will be made to a suitable professional for further assistance or intervention.

What are the benefits of this research?

This research can benefit the other health care providers in your position, should the information we obtain result in any change of policy or workflow that improves service provision.

Do I have to be in this research, and may I stop participating at any time?

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you are free to stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify

What if I have questions?

This research is being conducted by me ***Nokuthula Portia Zulu*** at the University of the Western Cape. If you have any questions about the research study itself, please contact me at: 28 Oortlepp Street, Melmoth,3835, ***telephone number, -076 545 1644***

e-mail address 4001429@uec.ac.za

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

Prof Uta Lehmann

Head of Department: School of Public Health

University of the Western Cape

Private Bag X17

Bellville 7535

ulehmann@uwc.ac.za

Prof Anthea Rhoda

Dean: Faculty of Community and Health Sciences

University of the Western Cape

Private Bag X17

Bellville 7535

chs-deansoffice@uwc.ac.za

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

Biomedical Research Ethics Committee

University of the Western Cape

Private Bag X17

Bellville

7535

Tel: 021 959 4111 e-mail: research-ethics@uwc.ac.za

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-959 2809, Fax: 27 21-959 2872

E-mail: soph-comm@uwc.ac.za

CONSENT FORM

Title of Research Project: Perceived provider barriers to tuberculosis case finding in people attending HIV services at Primary health care facilities in a rural KwaZulu Natal District

The study has been described to me in language that I understand. My questions about the study have been answered. I understand what my participation will involve, and I agree to participate of my own choice and free will. I understand that my identity will not be disclosed to anyone. I understand that I may withdraw from the study at any time without giving a reason and without fear of negative consequences or loss of benefits.

I agree to be audiotaped during my participation in this study.

I agree to be interviewed but do not agree to be audiotaped during my participation in this study.

Participant's name……..

Participant's signature…….

Date……

APPENDIX 4 : Interview guide for Professional nurses

INTERVIEW GUIDE FOR PROFESSIONAL NURSES

Interview date: _____

Interview Duration: _____

Participant study identifier number: _____

Participant's age: _____

Health care facility : _____

1. How long have you been working as a professional nurse
2. Please share any qualifications or courses after being a professional nurse
3. Describe your role in the clinic
4. Please share your experience with managing people living with HIV

-share any certificates or education on HIV care

-Share any areas of interest

-Areas you are struggling with or that you feel you need to improve on

5. Please share your experiences in managing people living with TB

-Do you have any extra training in TB management

Please share your strengths with regards to TB management

-Please share your perceived areas of lack as far as TB management is concerned

6. Please share your experiences with working with people infected with both HIV/TB

7 What are your thoughts on TB susceptibility?

-Who is more likely to contract TB

-What is your perceived susceptibility to you as a healthcare worker contracting TB infection

-What is your perceived susceptibility for a person living with HIV to contract TB

-What knowledge do you have on the measures to identify TB infection early.

8. What are your thoughts on the severity of TB infection

-What are the complications of TB infection

-What are the dangers of having TB undiagnosed

-As an individual

-for the health care system

-As a community

9. What are your perceived benefits of identifying TB early

-For the sick person

For the community

-For the health care system

10.What are your perceived barriers to TB screening and testing

-Health care provider related

-Patient related

-Health system related

APPENDIX 4 : Interview guide for Key informants: Managers

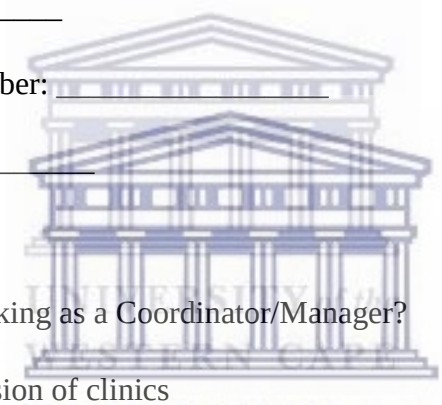
INTERVIEW GUIDE FOR KEY INFORMANTS: HEALTH CARE MANAGERS

Interview date: _____

Interview Duration: _____

Participant study identifier number: _____

Participants Age: _____



1.How long have you been working as a Coordinator/Manager?

2.Describe your role in supervision of clinics

3.Please share your experience with managing people living with HIV

-share any certificates or education on HIV care

4.Please share your experiences in managing people living with TB

-Do you have any extra training in TB management

-Please share your strengths with regards to TB management

-Please share your perceived areas that you need to improve in as far as TB management is concerned

5. Please share your experiences with working with HIV/TB coinfected people.

6.What do you perceive as barriers that hinder professional nurses to screen and test for TB.

-Health care provider barriers

-Health systems provider barrier

-Patients related barriers.

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21 959 2809 Fax: 27 21 959 2872

E-mail: soph-comm@uwc.ac.za

OBSERVATION SHEET

Project Title: *Perceived provider barriers to tuberculosis case finding in people attending HIV services at Primary health care facilities in a rural KwaZulu Natal District*

Facility: ***Subdistrict:***

1. Clinic organisation

-Clinic management

-Physical layout, Ventilation

-infrastructure-Cough areas

2. Patient flow

-TB screening points, flow for people living with HIV in the facility

3. Supply chain management

-Sputum bottles available

-Testing kits for other TB tests available.

-Laboratory forms and recording tools.

4.Consultation room/observing the health care providers

-Interaction with patients

-Recording

-TB Screening and testing practices