

Barriers to the Implementation of Tuberculosis Infection Control among South African Healthcare Workers

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EMERGING PUBLIC HEALTH PRACTITIONER AWARD

This chapter provides an overview of health system factors that influence health worker performance in implementing TB infection control (TBIC) in primary care clinics at district level. Research in the form of a case study was conducted among professional and lay healthcare workers (HCWs) to assess barriers to implementation of TBIC in two South African primary care clinics with high TB prevalence.

Barriers and enablers to TBIC implementation were linked with health systems and HCW motivation. Some of the barriers identified were inadequate HCW training on TBIC, a non-responsive compensation policy and the perception that a busy clinic schedule leaves no time for TBIC implementation. Resource availability, adequate human resources, supervision and leadership characterised by delegation enabled HCWs to implement TBIC.

Lessons drawn from this chapter could influence health policy reform and inform managers about how to improve health worker performance as regards safety in high-risk settings.

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Introduction

Healthcare workers (HCWs) and patients are at risk of acquiring tuberculosis (TB) infection in healthcare facilities.¹ Such risk characterises TB as a dual public health threat – first, as a communicable disease and, second, as an occupational health hazard. Overall TB prevalence among HCWs in South Africa (SA) was 5% in 2009 while HIV prevalence was approximately 16% in 2002.^{2,3} HIV co-infection and TB drug resistance (DR-TB) worsen the overall problem of TB in South Africa.⁴ The burden of TB disease driven by a high HIV prevalence and increased vulnerability to TB increases the likelihood and significance of healthcare-associated TB transmission.⁵⁻⁷ “Healthcare-associated infections” refers to infections that are acquired by staff or users of health services within healthcare facilities.⁸ The risk of healthcare-associated TB has been recognised in healthcare settings worldwide.^{9,10} In SA, healthcare-associated infection is particularly an issue in communities with both a high drug-resistant TB prevalence and HIV prevalence.¹¹⁻¹³

Khayelitsha is a poor urban township located 40 kilometres from Cape Town, and has an estimated population of 500 000.¹⁴ Within the South African health system, the district or sub-district level, such as Khayelitsha, is the primary level of care and first point of call for health service utilisation. There are ten primary care clinics in Khayelitsha and each of these clinics has been sensitised to TB Infection Control (TBIC) and have commenced implementation of such an initiative.¹⁵ As the largest township in the Western Cape, Khayelitsha has one of the highest TB and HIV co-infection rates in SA and globally, with a TB case notification rate of 1 158 per 100 000 per year.¹⁶ About 70% of all TB patients are also HIV-infected.¹⁷ One of the strategies aimed at reducing the TB burden in Khayelitsha is to prioritise TBIC in health facilities to limit nosocomial transmission. Although measures of TBIC have been implemented in all Khayelitsha clinics, such measures are difficult for HCWs to maintain.¹⁸ This study explores barriers to TBIC implementation among HCWs in two primary care clinics in Khayelitsha.

TBIC is part of a broad range of Infection Prevention and Control (IPC) measures recommended by the World Health Organization (WHO) and adopted locally in SA.¹⁹⁻²¹ Provisions for IPC in SA are documented in the Occupational Safety and Health Act (Act 85 of 1993)²² and Compensation for Occupational Injuries and Diseases Act (Act 130 of 1993).²³ The WHO recommends TBIC as one of the three strategies for reducing the burden of TB in HIV-prevalent settings.²⁴ These strategies are: isoniazid preventive treatment, intensified case finding and infection control.²⁵

TBIC is a combination of measures used as part of a holistic approach to effectively reduce the risk of TB transmission within crowded settings, including healthcare facilities. TBIC comprises three categories of measures that are hierarchical but usually implemented simultaneously to reduce the risk of healthcare associated TB. These measures are administrative controls, environmental controls and the use of personal protective equipment (PPE). Administrative controls are the most prioritised of the three, described as the “first line of defence” against TB transmission in healthcare facilities because of their potential for removing infectious risk through prompt diagnosis and treatment.²⁶ They include prompt identification of clients with TB symptoms, placing them on treatment and minimising time spent in a health facility. Other components of administrative controls include staff training,

establishing infection control committees, cough etiquette, health education and the use of paper masks by patients. Environmental control helps to reduce the number of infectious droplets in the air through controlling the direction of airflow and natural ventilation (i.e. keeping windows open) or mechanical ventilation (i.e. installation of vents and wind-driven air extractor turbines). The third measure of TBIC is the correct and consistent use of PPE (e.g. N95 respirators, which contain filters that prevent wearers from inhaling the TB bacilli).²⁷ Implementing PPE for TBIC is ranked third because it is regarded as a last resort that complements administrative and environmental control measures. Whereas other measures prevent more than one person from becoming infected with TB, PPE protects only the wearer. Although there is little direct evidence, theory and mathematical modelling suggest that the consistent implementation of the trio of TBIC measures can significantly reduce TB transmission within healthcare facilities.^{7,10,13} HCWs are seen as the front-line implementers of TBIC in healthcare facilities and therefore play a vital role in the effective and consistent implementation process.

Since HCWs are an essential part of the health system that implement health policies within healthcare facilities, understanding what motivates them to implement TBIC is crucial for identifying barriers to implementation.

This chapter reports on a study conducted with healthcare workers from two clinics in Khayelitsha (Clinic A and Clinic B). Data was collected by direct observation of HCWs implementing TBIC in the clinics and key informant interviews among facility managers and a sub-district health representative (n=3), semi-structured interviews among professional HCWs (n=7) and focus group discussions among lay healthcare workers (n=3). An observational grid and interview guidelines were developed as data collection instruments.

Enablers of TBIC implementation among HCWs

This section outlines factors that enhanced TBIC implementation among HCWs in the two clinics surveyed.

Resource availability

Professional and lay HCWs are more likely to implement TBIC when resources are provided in the form of infrastructure, human resources and consumables (e.g. N95 and paper mask). Professional HCWs mentioned the crucial role of human resource availability in TBIC practice, especially with regard to reduced workload per staff member, which left more time to implement TBIC.

Last year, we asked for more staff. We are happy because they have recruited more people, now we can listen to TBIC. We have more people and more time to implement.

(Key informant one – Professional HCW)

In terms of resources provided by the health system (potentially enabling factors), both professional and lay HCWs in both clinics described respirators and paper masks as “generally available”. Health system support characterised by leadership, resource availability and operational policies enabled HCWs to implement TBIC. This finding is in line with previous research that has shown how organisational support and commitment to health workers’ safety strongly motivates HCWs to implement TBIC.²⁸

Leadership by delegation

As a further administrative control measure, a facility manager assigned responsibility for infection control (IC) to a professional HCW. Such delegation, combined with ongoing supervision, seemed to have underlined TBIC as a priority in Clinic B compared to Clinic A where an infection control committee is yet to be functional.

There is someone I have given the portfolio to who is championing IC. He is the one doing an IC audit on a monthly basis and then we discuss it with the general assistants.

(Key informant two – Professional HCW)

Supervision

It was observed that HCWs in Clinic B used respirators more consistently compared to those in Clinic A. A key informant interview revealed that in Clinic B, the facility manager who had earlier observed the inconsistent use of respirators among HCWs organised a fit test of N95 respirators to encourage sustained use of respirators among staff. The fit test enabled HCWs to use respirators:

Last year, we had fit testing sessions. I asked the TB/HIV coordinator to come and do a fit test for all the staff working in the TB room. So now it fits them properly.

(Key informant three – Professional HCW)

Although HCWs' discomfort while they are using respirators is something the health system may not be able to address, fit tests can minimise the discomfort by helping HCWs to identify the most suitable respirators.

After the fit tests, one of the HCWs working in the TB unit was seen not wearing a respirator. The manager then requested a signed document stating the HCW was not willing to use the PPE provided by the clinic. This HCW was seen wearing a respirator during later observations. HCWs need to be supervised and constantly reminded about maintaining TBIC practices in clinics. Evidence suggests that if each clinic had a dedicated infection control officer, daily TBIC implementation would be likely to be more effective. However, a setback in hiring an infection control officer is the over-reliance of HCWs on the individual, whereas TBIC should be the collective responsibility of professional and lay HCWs. The experience of the head of the infection control committee in one of the clinics referred to the tendency of HCWs to avoid taking responsibility for infection control once a person has been assigned to champion the implementation process in clinics.

Collective practice

HCWs tend to be influenced by the social norm when colleagues wear PPE. One HCW declared:

In this particular clinic, I see that everybody wears a mask more than in other clinics which is encouraging....I think when you are working with people who are conscious of IC [infection control], it makes you more conscious of IC.

(Key informant four – Professional HCW)

Similar to our findings, another recent South African study associated support from colleagues with the implementation of TBIC among HCWs.²⁹ In-service training could be a potential platform to garner support for implementing TBIC in clinics. After in-service training HCWs are more likely to remind each other about sustaining the TBIC practice they have learnt. Implementation challenges can be shared and resolved through active infection control within clinics.

Screening for TB

On HCW screening for TB, the health system makes diagnostic services readily available to staff. TB screening is voluntary and usually initiated by HCWs. When asked if TB screening is available to HCWs, one of the interviewees responded:

We are allowed to whenever you feel like. If I feel like I have a cough and want to have an x-ray because maybe I am suspecting TB, that is in place at work.

(Key informant five – Professional HCW)

Such provision of TB screening services to HCWs is an enabling factor for TBIC practice. If HCWs are provided with needed services that enhance their health such as screening for TB, they are more likely to feel supported by the health system and implement TBIC. If screening services are unavailable, HCWs are likely to feel demotivated.

Barriers to TBIC implementation among HCWs

Identified obstacles to implementing TBIC among healthcare workers are summarised in this section.

Uncomfortable respirators

Despite the fear and high risk attributed to TB, HCWs admitted they were not inclined to comply with PPE requirements due to the discomfort and suffocating nature of the respirators provided. They mentioned difficulty in breathing aggravated by personal health challenges, pregnancy or other conditions.

The challenge and demotivator is difficulty in breathing using the N95.

(Key informant six – Professional HCW)

Non-proactive use of respirators

An important finding is the reactive manner in which HCWs use respirators by only wearing them after they know the TB status of a patient.

I only wear mask when I know a patient has been diagnosed. It is suffocating, a communication barrier and feels hot.

(Key informant seven – Professional HCW)

This non-proactive use of respirators reflects a lack of understanding as to who is more likely to be infectious. Undiagnosed and untreated TB cases that will be infectious are mostly found in the waiting areas of clinics. Wearing respirators for known TB cases only is therefore a hindrance to consistent TBIC implementation among HCWs.

HCW perception of TB concentration in certain clinic sections

Lay HCWs not working in the area of TB did not see a need to use PPE because they did not perceive themselves at high risk of acquiring TB. In Clinic A, lay HCWs (assisting the TB team) did not use respirators while attending to patients because of their perceived low risk of contracting TB. Further probing on the possible reasons for this perceived low risk, revealed that HCWs associate consistent use of respirators with HCWs working in TB sections or working with diagnosed TB patients. As far as they are concerned, TB is concentrated in one section of the clinic – the TB section.

Therefore, the perception is that spending a few minutes in the TB room does not predispose HCWs to TB infection as stated by these respondents:

I don't work in TB room full-time, just helping out so I don't need to wear a mask.

(Key informant eight – Lay HCW)

When I was working in TB room, I used to wear a respirator but it choked me. I feel very uncomfortable, but now I no longer work there so I don't have to use it.

(Key informant nine – Professional HCW)

The perception that an airborne infection such as TB is restricted to the TB section of the clinic is a barrier to TBIC implementation among HCWs that needs to be addressed during staff meetings. Information, Education and Communication posters should be displayed in all sections of the clinic. For example, a poster that reads: "TB somewhere in the clinic is TB everywhere in the clinic. Are you protecting yourself?" could be posted in each section of the clinic to inform HCWs and clients.

Non-responsive compensation policy

Another issue raised by HCWs was the non-responsive compensation policy, should they ever get active TB. Compensation for active TB disease is a regulatory factor that can motivate HCWs to sustain TBIC practices by being financially responsible for their TB disease. TB is a compensable disease, though, according to the Compensation for Occupational Injuries and Diseases Act (COIDA) (Act 130 of 1993). One HCW commented:

The thing is with TB and being a health worker, should I get it, I know it's going to be my problem. I won't be able to prove that I got it here. There is nothing in place that says if you are working in the TB department, you will be compensated. So I guess if you work here, it is at your own risk. That's how I feel.

(Key informant three – Professional HCW)

A finding from a key informant interview revealed that HCWs are not required to prove the infection was healthcare associated. Further probing on the nature of compensation HCWs expect from the health system revealed both financial and non-financial incentives:

It could come in many different ways, remuneration is always a good thing, give me more money, sometimes recognition, even if it's not in form of money.

(Key informant three – Professional HCW)

The COIDA policy serves as a regulatory document that supports reimbursement of HCWs who develop TB. However, because of bureaucratic processes and delays, HCWs see TB as a 'personal problem' and not an institutional problem. Previous research suggests that such lack of trust in the system can be a barrier to motivation of HCWs who implement TBIC.³⁰

Patients' non-compliant attitudes

One other demotivating factor mentioned by lay HCWs in both clinics was the disrespectful and non-compliant attitudes of patients. This finding is in line with that of an earlier study that recognised the contributing role of patients to effective TBIC practice.³¹ Patients sometimes rebel against the use of masks by wearing them inappropriately or not wearing masks at all, as illustrated by this respondent:

They are so rude...sometimes you talk to them nicely. You say "sisi, others are wearing masks, please you must," but they say they can't because they have rights. I usually tell them "yes, you have rights but before you use your rights, you must know others have rights too."

(Key informant ten – Lay HCW)

No time for TBIC

Both professional and lay HCWs perceive TBIC as a separate item from their routine tasks. Although HCWs perceive they are at risk of getting TB and particularly dread being infected with DR-TB, they feel they are too busy to adhere fully to TBIC measures. It appears as though professional and lay HCWs are initially motivated by fear to implement TBIC but become so familiar with the working environment that the perceived risk of acquiring TB wanes over time. This perception suggests that TBIC is yet to be prioritised and integrated into service delivery procedures in clinics, as illustrated by this respondent:

I used to be scared when I started but I have gone past that now...like yesterday we were so busy here, there is no time to get paranoid.

(Key informant eleven – Professional HCW)

Training deficit

According to facility-specific policies on TBIC, in-service training is an administrative control measure. Other than professional training in medical and nursing schools, most (professional) HCWs had not received further training in TBIC. However, two professional HCWs had attended one-day training on TBIC organised by a non-governmental organisation. Although a prior needs-assessment report in both clinics has identified refresher training as integral to improved infection control, in-service training is yet to be implemented in these clinics. Two predisposing factors that determine sustained TBIC practice are HCWs' perception of risk and the training they have received on TBIC. If HCWs perceive they are at risk, they are more likely to participate in training and implement TBIC in a consistent manner. Research suggests that improvements recorded in the "work and systematic training" of health workers at primary health care level contribute to successful TB control.³² Studies have also shown the benefit of in-service training to improved TB care in resource-constrained settings within South Africa.³³ Sustained TBIC implementation requires training focused on behaviour change communication, rather than

knowledge acquisition.³⁴ In-service training can easily bridge the gap between knowledge and practice identified as a barrier to TBIC practice in previous studies.^{29,33,35}

Inadequate ventilation

Inadequate ventilation was cited as a barrier to effective TBIC in clinics. Most professional HCWs in both clinics complained about inadequate ventilation in consulting rooms and TB treatment rooms. While some HCWs generally request that vents be installed in consulting rooms and TB rooms, some HCWs who have attended dissemination meetings on infection control are specifically requesting for the installation of wind-driven roof turbines – ‘whirly birds’ – which may contribute to improved ventilation in rooms.³⁵

I don't see anything like an air vent here...that's bad. I think it will be great if they can improve ventilation. Can they put whirly birds? After that study, I think it made an impact.

(Key informant twelve – Professional HCW)

One of the study clinics is an older-style building and does not conform to current policy recommendations, which results in poor ventilation in some waiting areas.¹⁹ In this situation, while opening windows may assist with ventilation, issues of clinic design are, perhaps, more relevant. The health system needs to improve on physical infrastructure that supports natural ventilation in all sections of the clinic, otherwise HCWs will continue to experience challenges in implementing environmental controls.

Lack of shared responsibility among HCWs

Although all interviewed HCWs in one of the clinics knew there was an infection control committee, they seemed to be detached and unaware of the actual committee activities. The head of the infection control committee works in another section of the clinic, rather than in the TB section itself. When interviewed, the head of the infection control committee stated that one barrier to effective TBIC was the over reliance on the head of the infection control committee and a lack of shared responsibility among other HCWs:

The barrier is that they tend to rely on one person....it should be done by everybody. It should start with me and extend to everybody. It should be everybody's responsibility.

(Key informant thirteen – Professional HCW)

There is a need to re-sensitise HCWs to their contribution to effective TBIC practices in clinics. The leadership of infection control committees could be rotated across various departments to encourage HCWs to develop a sense of responsibility for infection control.

Conclusion

Self-reported and directly observed barriers to the implementation of TBIC were limited time owing to heavy workload, uncomfortable N95 respirators, poor ventilation due to over-crowding in some waiting areas and patients' non-compliance with the use of masks. Specific barriers related to the health system are a non-responsive compensation policy and inadequate training of HCWs on TBIC.

Bureaucratic delay in compensating HCWs (with active TB disease) is a major barrier to building trust in the health system. Such mistrust is an obstacle to sustained TBIC implementation among HCWs. Professional and lay HCWs are not implementing TBIC according to facility-specific policy. The last line of defence, PPE, was mostly prioritised by HCWs instead of administrative and environmental measures. TBIC is not likely to be effective in clinics where HCWs continue to prioritise PPE.

Protecting HCWs and patients from healthcare-associated infections is the responsibility of the health system. Professional and lay HCWs need to be trained (in service) on TB transmission risk and how to implement TBIC to ensure effective implementation in clinics. Sub-district health systems should prioritise TBIC by training HCWs and continue to provide resources needed to implement TBIC. In terms of HCWs, who are an integral part of the health system, there is a need to maximise resources provided and develop the motivation needed to maintain TBIC implementation. Further research should focus on identifying behavioural models that further explain barriers to TBIC implementation among HCWs and how to address these barriers despite patient workload, insufficient numbers of HCWs and other resource constraints that characterise poor urban townships.

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