

FACILITATORS FOR AND BARRIERS TO THE IMPLEMENTATION OF NATIONAL TUBERCULOSIS MANAGEMENT GUIDELINES

Lucretia V. Dlwati, DLitt et Phil

<https://orcid.org/0000-0002-3925-0926>
Walter Sisulu University,
School of Nursing Sciences

Thandisizwe R. Mavundla, DCur

<https://orcid.org/0000-0002-4673-9388>
University of South Africa,
Department of Health Studies

Fungai Mbengo, MPH

<https://orcid.org/0000-0001-9056-1896>
University of South Africa,
Department of Health Studies

ABSTRACT

The South African government developed the National Tuberculosis Management Guidelines (NTBMGs) to provide guidance to professional healthcare workers on the management of people with TB and also those co-infected with HIV. However, little is known about primary healthcare (PHC) nurses' perceptions of the implementation of the NTBMGs, despite their critical role in TB management. The purpose of this study was to explore PHC nurses' perception of the implementation of the NTBMGs in order to identify factors influencing the implementation of the NTBMGs and to make recommendations to improve the implementation of the NTBMGs. The study was conducted in the Eastern Cape, South Africa. The Normalization Process Model (NPM) was used as a theoretical framework to understand the factors influencing the implementation of the NTBMGs. A qualitative, explorative, descriptive and contextual research design was utilised. Data were collected using individual semi-structured interviews on a purposive sample of 10 PHC nurses working in rural clinics. Data were analysed following a descriptive method of Tesch. The study revealed several facilitators for and barriers to the implementation of the NTBMGs based on the NPM. The facilitators included the PHC nurses' satisfaction with the Directly Observed Treatment, Short Course (DOTS) strategy in rendering health services to TB patients, and the PHC nurses' perception of TB meetings as an appropriate platform for problem-solving, of the NTBMGs to be consistent with TB management, and of job satisfaction in relation to

patient improvement. The barriers included poverty, inadequate training, shortage of staff, and a lack of material resources, a proper infection control policy, and space. There is a need for the provision of adequate human, material and infrastructural resources in order to eliminate the barriers to the implementation of the NTBMGs.

Keywords: barriers; facilitators; implementation; National Tuberculosis Management Guidelines; Normalization Process Model; perception; primary healthcare nurse; TB management; tuberculosis

INTRODUCTION

TB is an infectious disease, and is the second greatest killer worldwide after HIV and AIDS (Carlsson et al. 2014, 1). The disease is caused by the bacillus *Mycobacterium tuberculosis* (Hemlata, Narang, and Saini 2011, 34). It is spread through the air, when an infected individual coughs, sneezes or speaks releasing minute droplet nuclei each containing between 1–5 TB bacilli, which are able to remain airborne in any indoor space for up to four hours (Soul City Institute of Health and Development Communication and Department of Health 2015, 16). When left untreated, a person with active TB can infect an average of 10 to 15 people each year (ibid.). According to the World Health Organization (2013), 8.9 million people had TB in 2012 and 1.3 million died from the disease. Over 95 per cent of the people that succumb to the disease are from low- and middle-income countries in Asia and Africa mainly due to a poor standard of living, overcrowding, poorly ventilated living conditions, poor access to quality healthcare, and high prevalence of HIV and ADS in these areas (Carlsson et al. 2014, 1; Soul City Institute of Health and Development Communication and Department of Health 2015, 23). TB accounts for 25 per cent of the avoidable deaths in developing countries (World Health Organization 2014).

TB is also a major public health problem and remains the leading cause of death in South Africa (Statistics South Africa 2014, 21). Among the 22 countries with the highest burden of TB, South Africa has the highest estimated incidence and prevalence of TB and the largest number of HIV-associated TB cases (Churchyard et al. 2014, 244). The country had an estimated incidence of 450 000 cases of active TB in 2013, an increase of 400 per cent over the last 15 years (World Health Organization 2014).

The high incidence of TB can partly be attributed to poor TB control in primary healthcare (PHC) facilities (Sissolak, Marais, and Mehtar 2011, 262). The growing number of undiagnosed and untreated TB suspects and immune suppressed patients, notably people with HIV who present together at PHC facilities, increases the likelihood of infection with TB (ibid.). This situation is aggravated by the increasing incidence of drug-resistant TB in South Africa (O'Donnell et al. 2010, 516). The growing burden of multiple-drug resistant tuberculosis (MDR-TB) and the emergence of extensively drug-resistant tuberculosis (XDR-TB) in 2006 added a further burden to overstretched health services in South Africa (Churchyard et al. 2014, 244). According to the Department

of Health (2014), South Africa has the second highest number of reported MDR-TB cases globally. Studies have shown that patients with active, untreated MDR-TB can infect large numbers of HIV-positive individuals, leading to significant outbreaks of MDR-TB with high case-fatality rates (Soul City Institute of Health and Development Communication and Department of Health 2015, 11). XDR-TB is extremely difficult and expensive to treat and has a very high mortality, with rates of over 90 per cent recorded among HIV co-infected XDR-TB patients in the Tugela Ferry, KwaZulu-Natal (Department of Health 2014, 78). The contributing factor to drug-resistant TB is human error in the management of drug supply, patient management and patient adherence (Soul City Institute of Health and Development Communication and Department of Health 2015, 11). It is therefore important that TB be successfully treated in order to prevent TB-related morbidity and mortality.

In addition, the high prevalence of HIV and AIDS in South Africa is fuelling the TB epidemic (Department of Health 2010, 14). People with reduced immune systems like HIV and AIDS patients are more sensitive to the bacteria and suffer a greater risk of developing an active TB, compared to people without HIV and AIDS (Carlsson et al. 2014, 2). HIV-positive individuals have a higher risk of developing TB than those individuals that are HIV-negative (Soul City Institute of Health and Development Communication and Department of Health 2015, 16). Additionally, TB is the leading cause of death among HIV-infected patients (ibid.). Appropriate case management of TB including the provision of comprehensive HIV care to the co-infected patient is therefore important in order to prolong the lives of people living with HIV and AIDS, to minimise the negative effects of TB on the course of HIV, and to interrupt the transmission of TB.

In responding to the dual epidemics of TB and HIV, the South African government developed the NTBMGs (Department of Health 2014, 3). These guidelines are meant to provide guidance to professional healthcare workers, including nurses, on the management of TB and HIV co-infection (ibid.). According to the Department of Health (2014, 3) the aims of the NTBMGs include the following:

- the reduction of the transmission of infection in communities by targeted screening interventions to increase detection;
- the early diagnosis of drug-sensitive tuberculosis (DS-TB) and drug-resistant tuberculosis (DR-TB) by the use of Xpert MTB/RIF in the diagnosis of pulmonary and extra pulmonary TB;
- the early initiation of treatment in all patients diagnosed with TB;
- the retention of patients in treatment and care until completion of the treatment by including management of adverse drug events; and
- the prevention of TB in people living with HIV by initiating all eligible HIV-positive people on antiretroviral therapy (ART) and isoniazid preventive therapy (IPT), and by following up of patients on both ART and TB medicines.

STATEMENT OF THE RESEARCH PROBLEM

PHC in South Africa is mainly provided by nurses at community health centres and clinics in the public health sector (Reagon, Irlam, and Levin 2004). The role of the PHC nurses is therefore critical as they are the TB patients' first point of contact with the primary healthcare system. The NTBMGs were developed by the South African government in order to provide guidance to healthcare professionals on the management of TB (Department of Health 2014). However, there is limited research concerning the realities faced by nurses in implementing the NTBMGs. Previous studies in Jamaica and Botswana reported healthcare workers' lack of knowledge about TB policy and guidelines (Tlale et al. 2015, 12; White 2011). There is limited evidence regarding nurses' perception of the implementation of TB guidelines in PHC facilities within the South African context. The absence of nurses' voices towards the implementation of the NTBMGs in PHC settings constrains their success (Ghebrehiwet 2006, 239). This study was therefore conducted in order to explore PHC nurses' perception of the implementation of the NTBMGs in PHC clinics. The study sought to identify the factors influencing the implementation of the NTBMGs in PHC clinics and to make recommendations to improve the NTBMGs.

PURPOSE OF THE STUDY

The purpose of the study was to explore PHC nurses' perception of the implementation of the NTBMGs in PHC clinics with the intention of identifying factors influencing the implementation of such guidelines and making recommendations to improve the implementation of the NTBMGs.

Definitions of Key Concepts

Barriers refer to the factors that hinder the implementation of the NTBMGs.

Facilitators refer to the factors that promote the implementation of the NTBMGs.

Implementation is defined as the utilisation of the NTBMGs by PHC nurses to manage TB.

National tuberculosis management guidelines (NTBMGs) refer to guidelines used by the PHC nurses to manage TB.

Normalization Process Model (NPM) refers to the theoretical framework used in this study to understand the factors that influence the implementation of the NTBMGs.

Perception refers to the way the PHC nurses view the implementation of the NTBMGs for the purpose of this study.

Primary healthcare (PHC) nurse, for the purpose of this study, refers to a registered professional nurse who works in a rural clinic in the Eastern Cape province, South Africa, and who renders TB management services.

TB management refers to the various roles played by PHC nurses such as the diagnosis, treatment and referral of TB patients.

Tuberculosis (TB) refers to any form of TB including pulmonary TB, MDR-TB and XDR-TB for the purpose of this study.

THEORETICAL FRAMEWORK

The Normalization Process Model (NPM) was used as a theoretical framework to understand the factors influencing the implementation of the NTBMGs. The model is defined by the following four constructs:

- interactional workability which seeks to examine whether the complex intervention promotes ease and efficiency of interaction between people and practice;
- relational integration which seeks to investigate the extent to which the complex intervention can be integrated with existing knowledge, practices and relationships;
- skill-set workability which is concerned with how the current division of labour is affected by the intervention, the capacity of participants to deploy the required tasks and how the quality of the work is monitored; and
- contextual integration which focuses on how the organisation uses its capacity and resources in the normalisation of the complex intervention (Leon, Lewin, and Mathews 2013, 97; May 2006, 86).

The NPM was appropriate for this study as it offered the framework to understand the factors that influence the implementation of the NTBMGs (*ibid.*). The model has been used elsewhere to understand the processes and factors influencing the implementation of complex healthcare provider change interventions in a range of clinical contexts (Atkins et al. 2011, 275; Rogers et al. 2011, 1077).

RESEARCH METHODOLOGY

Research Design

A qualitative, explorative, descriptive and contextual research design was utilised. The qualitative method was chosen in order to develop a rich understanding of the phenomenon (Terre Blanche, Durrheim, and Painter 2007, 47). The study was exploratory since not much research has been done regarding the PHC nurses' perception of the implementation of the NTBMGs. According to Burns and Grove (2009, 359), exploratory studies are useful when little is known about the topic and not much research has been done on the topic.

Research Setting

The Eastern Cape is one of South Africa's nine provinces and is located in the south-eastern part of the country. The population of the Eastern Cape is estimated at seven million people, which represents 12.6 per cent of the South African population (Statistics South Africa 2015, 15). The Eastern Cape is home to some of the poorest and most vulnerable communities in South Africa, many of which exist in extremely rural and remote areas (Public Health Association of South Africa 2014). Access to employment opportunities and basic services such as education, housing, piped water and sanitation remains limited, making the provision of healthcare difficult (Eastern Cape Department of Health 2016, 26). Recent data show that TB and HIV are the leading causes of mortality in the province, accounting for 9.8 per cent and 5.4 per cent respectively (ibid.). The TB incidence in the province is estimated at 782 cases per 100 000 of the population (Soul City Institute of Health and Development Communication and Department of Health 2015, 20). At 41 per cent, the TB curer rate remains well below the 85 per cent rate recommended by the World Health Organization (Public Health Association of South Africa 2014). The TB defaulter rate of 8.5 per cent is well above the national target of less than 5 per cent set by the South African National TB Control Programme (Soul City Institute of Health and Development Communication and Department of Health 2015, 20).

The Province has a total of 31 492 healthcare workers, and out of these 10 258 are professional nurses, 3 256 are enrolled nurses, 5 581 are enrolled nursing auxiliaries, and 103 are student nurses (Eastern Cape Department of Health 2016, 38). In terms of public health facilities, the province has 92 hospitals, 28 community health centres and 711 clinics (Eastern Cape Department of Health 2003, 3). These clinics provide comprehensive primary healthcare services, and the management of TB in the province has been decentralised to PHC facilities in accordance with the National TB Control Programme (Soul City Institute of Health and Development Communication and Department of Health 2015, 23).

Research Population and Sample

The research population for this study consisted of nurses working in TB management in rural PHC clinics of the Eastern Cape, South Africa. Purposive sampling of nurses from 11 different rural PHC clinics (one nurse from each clinic) that provide TB management and that are situated in the King Sabata Dalindyebo local municipality was conducted. The 11 clinics were contacted to see if there were any nurses who were interested in participating in the study. In order to be selected, one needed to be a qualified professional nurse, registered with the South African Nursing Council and must have been working with TB treatment issues for at least two years, including the year before the study.

Data Collection Instrument

Data were collected using individual semi-structured interviews. The purpose of these types of interviews was to obtain complex answers with a lot of information (Trost 2010). An interview guide was used to conduct the interviews. The main research question was structured as follows: “The NTBMGs have been developed by government to provide guidance to healthcare professionals on managing TB, please tell me how you perceive the implementation of the NTBMGs?” This was followed by a list of probing questions based on each participant’s responses in relation to the research purpose (Flick 2009, 171). The interview guide was pretested on three nurses who were not part of the study in order to check its content relevance, applicability and feasibility (Sampson 2004, 397).

Data Collection Procedure

Data were collected during a four-week period between January and February 2015. The individual semi-structured interviews, undertaken in private rooms offering strict confidentiality, were conducted in English by the principal investigator. The interviews were held in each of the 11 clinics and lasted approximately 45 minutes each. A guide with questions was used and the interviews were recorded. The principal investigator also took field notes of what was happening during the interviews. To start the interview, the nurses were asked general questions in order to build rapport and make them comfortable. Probing and follow-up questions were used to clarify the participants’ responses. The interview was ended when the participant had no further information to share. At the end of the interview, the principal investigator summarised what was discussed, clarified uncertainties and thanked the participant. The principal investigator felt that data saturation was reached during the 10th interview. It was realised that the participants repeatedly gave more or less the same information and no new information emerged. The 11th interview was conducted to see if any new insights could emerge, but this was not the case. It was then concluded that data saturation had been reached. Follow-up interviews were also done in order to clarify participants’ responses and to determine the contextual appropriateness of the coding and emerging themes during data analysis.

Data Analysis

The recorded interviews were transcribed verbatim by the principal investigator. Data were analysed following a descriptive method of Tesch as cited in Creswell (2009, 186). This method involved identifying, coding, analysing and clustering recurring data into overarching themes with respective key and sub-themes. The identified themes were presented together with quotes from participants in order to add depth and richness to

the findings. The themes were constantly checked against the aim of the study to make sure that they answered the study's purpose.

Trustworthiness of the Study

The trustworthiness of the data was assured by testing the interview guide for content relevance and ease of application before data collection. The interview guide was adjusted to eliminate ambiguous formulations. The use of the interview guide was done to make sure that no important topic is forgotten during the interviewing process. Data were collected during a four-week period between January and February 2015, and this prolonged engagement with participants enabled a deeper understanding of their working contexts. Follow-up interviews with the participants were done in order to clarify their responses and to determine the contextual appropriateness of the coding and emerging themes during data analysis. During the data analysis, two coders, namely the principal investigator and the independent coder, were responsible for coding and developing the themes. Two district managers and three nurse specialists served as peer reviewers to verify the thematic analysis, and disagreements were debated to reach general agreement. The use of the two district managers and three nurse specialists to review the analysis enhanced the credibility of the study's findings.

ETHICAL CONSIDERATIONS

Ethical approval for the study was obtained from the Research Ethics Committees of the Walter Sisulu University and the University of South Africa, reference number HSHDC/334/2014. Permission was also sought from the Eastern Cape Department of Health, TB district managers and the individual clinics that participated in the study. Participation was voluntary and informed consent was obtained from all the participants. The purpose, procedure, risks and benefits of the study, and participants' ethical rights were explained to the participants. Privacy was ensured as the individual interviews were held in private and secured rooms. All information was handled with confidentiality and the participating nurses have been unidentified in the results. The nurses were informed that they could stop their participation at any time without any consequences. Consent was sought and obtained from the nurses to record the interviews with a voice recorder. Only the principal investigator had access to the recorded information. The recorded interviews were deleted once they had been transcribed. The participants were also given information about where the study's findings were going to be published and how they would be able to access the findings.

RESEARCH FINDINGS

A total of 11 nurses participated in the study. The participating nurses were between 30 and 50 years old, they were all females, 10 were married and one was single, four had a

university degree in nursing and seven had a diploma in nursing, and had been working in TB management between two and seven years. This period of work experience in TB management allowed sufficient time for these nurses to develop the necessary experience for providing rich data for the study.

Themes

Two major themes emerged during data analysis based on the NPM, namely (1) facilitators for the implementation of the NTBMGs, and (2) barriers to the implementation of the NTBMGs. The themes and sub-themes are summarised in Table 1.

Table 1: Themes and sub-themes

Themes	Sub-themes
Facilitators for the implementation of the NTBMGs	<ul style="list-style-type: none"> • PHC nurses’ satisfaction with the DOTS strategy in rendering services to TB patients • TB meetings an appropriate platform for problem-solving • Consistency of the NTBMGs with TB management • Patient improvement associated with job satisfaction
Barriers to the implementation of the NTBMGs	<ul style="list-style-type: none"> • Poverty • Inadequate training • Shortage of staff • Lack of material resources • Lack of a proper infection policy • Lack of space

Facilitators for the Implementation of the NTBMGs

The four sub-themes related to the facilitators for the implementation of the NTBMGs are discussed below.

PHC Nurses' Satisfaction with the DOTS Strategy in Rendering Services to TB Patients

The findings revealed that participants were satisfied with the DOTS strategy in rendering services to TB patients. The participants revealed that the DOTS supporters show enthusiasm and dedication to the TB programme because they come to the clinic on a weekly basis to have feedback meetings with nurses. This is what the participants had to say about the DOTS:

Our context has a high risk of TB, mostly they (our patients) are coming from remote rural areas. We have got a problem of defaulters and MDRs. We are being assisted by community health workers who can be able to give DOTS.

TB Meetings an Appropriate Platform for Problem-solving

In addition to their satisfaction with the DOTS strategy in the management of TB, the participants revealed that they perceived the meetings as being supportive to staff working in the TB control programme. The participants indicated that these meetings are held with all the TB nurses and the TB programme coordinators and managers. These meetings were an appropriate platform for nurses to get clarity on any problems that they encountered while managing the TB programme at the clinics. The participants indicated that the meetings were useful for decision-making, coordination of information, sharing and morale building. This is what one of the participants had to say about the importance of the TB meetings:

... one is attending ... meeting which is for problem-solving.

Consistency of the NTBMGs with the TB Management

Apart from satisfaction with TB meetings, professional nurses felt that guidelines are appropriate and are meant to provide guidance to healthcare workers on the management of TB as well as those who are co-infected with HIV. This is what one of the PHC nurses had to say about the consistency of guidelines:

What is good is that you have ... your national guidelines next to you that guide ... it is a very positive thing to have something available for you that you refer to it when you are not sure what you should do.

Patient Improvement Associated with Job Satisfaction

The nurses expressed job satisfaction and feelings of fulfilment in managing TB health services especially when the TB patients expressed gratitude towards them for healing

and when they observed the patient's condition improving from being extremely ill to being cured. The following direct quote illustrates this:

Just to see your patients at the end of the day being cured of TB healed completely at the end of the day that's positive for me.

Barriers to the Implementation of the NTBMGs

There were six sub-themes that emerged from the interviews that are related to the barriers to the implementation of the NTBMGs. They are discussed below.

Poverty

The research participants indicated high levels of poverty in the communities they serve. Poverty, particularly the shortage of money for food and transport, was perceived as the principal cause of non-adherence to treatment. This is what research participants had to say about the effect of poverty on TB management:

... here in the Eastern Cape province there are no food parcels only MDR patients are getting grant ... Patients told us are not ready to take TB treatment because they have nothing to eat at home except for DIVA nutritional porridge in the clinic ...

Patients travel long distances to collect their treatment. Their treatment is for six months to eight months. Every month they are coming to the clinic. It's costly for them ...

Inadequate Training

The nurses perceived themselves to be inadequately trained to manage TB. They identified gaps in their knowledge in terms of TB and HIV co-treatment. As a result, the participants who have not undergone TB management training perceived themselves to be inadequate in assessing and diagnosing patients that are suffering from TB. The participants identified a need for more training on TB. They felt that there are few nurses who are trained on TB management, especially with regard to TB and HIV co-infection. The participants also felt that there was a lack of training regarding infection control measures. This is what they had to say about inadequate training to manage TB:

We need training on the relationship between TB and HIV on co-treatment of TB/HIV ...

Shortage of Staff

The participants perceived the shortage of staff as a major hindrance in the execution of their daily tasks in managing the health services for TB patients. The participants indicated that the shortage of staff resulted in increased workloads, rapid staff turnover,

workplace stress and burnout which had detrimental effects on service delivery. The participants said that the situation was made worse by the fact that they were faced with other responsibilities in addition to their core responsibility of managing TB patients. The participants also indicated that the shortage of staff was compromising the quality of services that they render to TB patients. This situation was being made worse owing to the increased number of TB patients being seen at the clinics. The participants expressed the problem of staff shortage as follows:

Nursing staff are having low morale because they are working so hard doing the work of two people. Workload we have got more than 300 patients a day here in our clinic. It is demotivating and demoralising the staff.

Lack of Material Resources

The management of TB needs material resources such as masks, gloves and respirators in order to assess, diagnose and treat the clients effectively. Therefore, without the necessary resources, it is difficult for PHC nurses to manage TB. The participants felt that they were at increased risk of contracting TB due to the shortage of material resources. This is what one participant had to say regarding the lack of material resources:

The disadvantage here is the cross infection. For instance here we don't have masks N95, the type of masks that we are supposed to wear and for the patients.

Lack of Proper Infection Control Policy

In addition to the lack of material resources, the participants were concerned about the increasing number of patients contracting TB due to a lack of a proper infection control policy. The participants felt that there was no proper infection control policy in place to assist them with preventing the spread of TB in the clinic. The following quotation supports this sub-theme:

Infection control is poor ... Cleaning material most of the time is not there ... and the protective clothing that is worn by the nurses and the general workers.

Lack of Space

A sufficient number of consulting rooms at the clinics are needed for the rendering of TB services. PHC nurses indicated that there were not enough consulting rooms allocated for attending to TB patients. The participants also indicated that the rooms did not allow for privacy when consulting with the patients. This sub-theme is supported by the following quote from a participant:

Clinic lack[s] separate rooms for counselling of patients. This situation makes it difficult to assess or counsel a patient in privacy.

DISCUSSION

The purpose of the study was to explore primary healthcare nurses' perception of the implementation of the NTBMGs in order to identify the factors influencing the implementation the NTBMGs and to make recommendations to improve the implementation of the NTBMGs. The NPM was used as a theoretical framework to understand the factors influencing the implementation of the NTBMGs. The study identified several facilitators for and barriers to the implementation of the NTBMGs. The study revealed that the implementation of the NTBMGs was facilitated by the PHC nurses' satisfaction with the DOTS strategy in rendering services to TB patients, the TB meetings as an appropriate platform for problem-solving, and consistency of TB guidelines with the disease management and patient improvement associated with job satisfaction. The "fit" or "congruence" of the NTBMGs with existing clinical practice was identified as a key factor in this study promoting the implementation of the NTBMGs. The study revealed that the implementation of the NTBMGs was constrained by poverty, inadequate training, the shortage of staff, and the lack of material resources. These findings are similar to another NPM study by Leon, Lewin, and Mathews (2013, 97).

The DOTS strategy is a crucial strategy to treat TB and was implemented by the World Health Organization (2013, 24). South Africa also adopted and implemented the strategy in order to treat TB. The DOTS strategy involves observing patients during their intake of medication in order to enhance treatment adherence and prevent the development of DR-TB. In the present study, PHC nurses' satisfaction with the DOTS strategy in rendering services to TB patients was an important facilitator of the implementation of the NTBMG. Scheineder and Barron (2008, 1) are of the opinion that the DOTS strategy is an important mechanism for monitoring treatment adherence by the use of community volunteers to monitor and trace TB patients. Lehman and Sanders (2007, 26) concur with the above authors and argue that community volunteers can improve access to health services in poor communities where access to health services is constrained due to the shortage of healthcare workers. Given the important role played by the DOTS strategy in facilitating the implementation of the NTBMGs, there is a need to strengthen the existing DOTS strategy in order to improve the implementation of the NTBMGs.

The participants viewed the TB meetings as platforms for problem-solving, information sharing and morale building. According to Janse van Rensburg-Bonthuyzen (2005, 214) meetings are one of the communication platforms used in the nursing profession for participative problem-solving, decision-making, coordination of information, sharing and morale building. It is also advisable to hold meetings at

least once a month to discuss general matters in the clinic to maintain cohesion, and communication between personnel and TB programme manager should take place on a regular basis to improve the consultation process (*ibid.*). This, in turn, improves the quality of service delivery. Based on the findings of the study, there is a need for regular meetings in PHC clinics in order to facilitate the implementation of the NTBMGs.

The implementation of a healthcare intervention is more likely to be successful if the healthcare intervention is integrated with existing knowledge, practices and relationships (Leon, Lewin, and Mathews 2013, 97). TB and HIV co-infection is a serious public health challenge in South Africa (Churchyard et al. 2014, 247; Soul City Institute of Health and Development Communication and Department of Health 2015, 3). The government should be commended for developing the NTBMGs and the National Strategic Plan for HIV, STIs and TB 2017–2022 in order to respond to the dual epidemics of TB and HIV, the major public health challenge in South Africa (Department of Health 2014; Department of Health and South African National Aids Council 2017). The NTBMGs were being viewed by the participants as consistent with TB management, probably because the guidelines offered practical guidance on the management of TB and HIV co-infection.

Poverty was identified as a barrier to the implementation of the NTBMGs. Similar to the study by Sissolak, Marais, and Mehtar (2011, 262), the findings revealed that poverty, particularly the shortage of money for food and transport, was perceived as the principal cause of non-adherence to treatment. The findings are congruent to the socio-economic conditions of the province where the study was undertaken. According to the Public Health Association of South Africa (2014), the Eastern Cape province is home to some of the poorest and most vulnerable communities in South Africa, many of which exist in extremely rural and remote areas, with limited access to basic services, making the provision of healthcare difficult. The provision of social grants to poor families can be used to enhance compliance, thereby improving the implementation of the NTBMGs. A study by Mudzingiri, Moyana and Mbengo (2016, 11) found that social grants are beneficial as a subsistence support mechanism and play a buffering role in poor families.

According to the NPM, the implementation of an intervention is more likely to be successful if the intervention has a good fit with the actual or realisable division of labour (Leon, Lewin, and Mathews 2013, 97). The model further proposes that the implementation of an intervention is more likely to be successful if the organisation effectively and efficiently uses its capacity and resources in the implementation of the intervention (*ibid.*). The shortage of staff was also perceived as a barrier to the implementation of the NTBMGs. The participants felt that the shortage of staff resulted in increased workloads, rapid staff turnover, workplace stress and burnout, which had detrimental effects on service delivery. The findings are similar to the study by Kiekkas et al. (2007, 34) which revealed that the inadequate supply of nursing staff results in an increase in workload and leads to compromised quality patient care. According to the

Tuberculosis Strategic Plan for South Africa (Department of Health 2007, 75), at least at clinic level, there should be at least one person responsible for the coordination of the TB programme if the case load is less than 200 patients. This ideal situation is limited in South Africa due to the increasing number of patients and the exiting of skilled health workers from the public health system (Day and Gray 2010, 319). Based on the findings of this study and the propositions of the NPM, there is a need for increased funding for the TB control programme to employ additional nursing staff in order to improve the implementation of the NTBMGs. The provision of financial incentives like rural and scarce skills allowances can also be used to retain nurses in PHC clinics (World Health Organization 2009, 20).

All healthcare professionals, including support staff, must receive training in infection control (Mehtar 2008, 321). Through ongoing training and continual professional development, PHC nurses could develop the skills and enhance their confidence and competence in TB and HIV management. The participants perceived themselves to be inadequately trained to manage TB, and they identified the need for more training on infection control measures and TB management, especially with regard to TB and HIV co-infection. More training on infection control measures and TB management should urgently be offered to PHC nurses and other healthcare workers in order to improve knowledge, clinical competency and quality of care. This will result in far-reaching benefits towards the implementation of the NTBMGs. In-depth training regarding the NTBMGs should be a priority to all nurses (World Health Organization 2009, 15).

Patients and healthcare workers are at high risk of exposure to TB (Churchyard et al. 2014, 246). A healthcare facility without an infection control policy, combined with the high TB and HIV infection prevalence among patients and visitors, could provide a prime setting for the rapid spread of TB. The lack of proper infection control in PHC facilities in South Africa has fuelled increasing numbers of MDR-TB as well as outbreaks of XDR-TB (Padayatchi et al. 2010). This highlights the importance of stringent implementation of infection control policies in PHC facilities. Infection control measures are the first line of defence against the transmission of TB in PHC facilities (Bock et al. 2007). Muller, Bezuidenhout and Jooste (2011, 108) state that the goal of the infection control programme is to control the transmitting of infections among patients and all health workers. However, the participants in this study were concerned about the lack of a proper infection control policy to assist them with preventing the spread of TB in the PHC clinics.

According to the South African Constitution (South Africa 1996), the National Health Act (South Africa 2003), and the Occupational Health and Safety Act (South Africa 1993), the infection control policy should be developed and implemented. The purpose of the infection control policy is to set national minimum standards for the effective management and prevention of infection in PHC facilities. Therefore, the infection control programme will be underpinned by the principle of quality improvement

with the quality assurance framework ensuring that the PHC facilities comply with the infection control policy. The findings of the study calls for the establishment of proper infection control policy in PHC facilities to facilitate the implementation of the NTBMGs. Furthermore as suggested by Churchyard et al. (2014, 246), the PHC facilities should be monitored regularly to ensure consistent implementation of infection control guidelines.

In addition to the establishment of an infection control policy, PHC facilities should be adequately resourced with infrastructural and material resources such as consulting rooms, isolation rooms, respirators, curtains around beds, and cough hygiene material in order to improve the implementation of the NTBMGs (Sissolak, Marais, and Mehtar 2011, 262). Engelbrecht and Van Rensburg (2013, 224) also indicate that the availability of personal protective equipment, that is N95 respirators, surgical masks, disposable gloves and soap for hand washing, is essential for the improvement of the facilitation of TB management in primary healthcare clinics.

The study has certain limitations. Owing to the small sample size used in the study, the generalisability of its findings is limited. The other limitation is that the study was only conducted on PHC nurses. The purposive sampling method was used to select the sample and did not give participants equal chance to be included in the study which might have made the study susceptible to bias. However, despite these setbacks, the study has some merits. The findings have transferrable relevance to similar study settings and they open up new avenues for future researchers to explore and test. The study has methodological implications too. It helps to obtain an in-depth understanding of the factors influencing the implementation of the NTBMGs using the NPM as a theoretical framework.

There are aspects of the study design that could have been done to improve the study. The inclusion of other healthcare workers involved in TB management and TB patients in order to obtain their perceptions on the implementation of the NTBMGs could have provided a holistic understanding of the factors influencing the implementation of the NTBMGs. In future, qualitative studies involving other healthcare workers involved in TB management and TB patients should be conducted in order to obtain a holistic understanding of the factors influencing the implementation of the NTBMGs. Quantitative studies involving larger samples and more settings should also be conducted in order to generalise the findings to other settings.

CONCLUSION

Based on the NPM, the study revealed the following factors that influence the implementation of the NTBMGs:

1. facilitators for the implementation of the NTBMGs that included PHC nurses' satisfaction with DOTS strategy in rendering health services to TB patients, the perception of the PHC nurses of the TB meetings as an appropriate platform for

- problem-solving, the perception of the PHC nurses that NTBMGs are consistent with the management of the disease, and the perception of the PHC nurses of job satisfaction in relation to patient improvement; and
2. barriers to the implementation of the NTBMGs that included poverty, inadequate training, shortage of staff, lack of material resources, lack of a proper infection control policy, and the lack of space. There is a need for the provision of adequate human, material and infrastructural resources in PHC clinics in order to eliminate barriers to the implementation of the NTBMGs.

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