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Tuberculosis infection control policy implementation among healthcare workers in secondary health facilities in Ibadan, Nigeria

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Abstract

Introduction: Tuberculosis infection is a leading cause of death with huge public health importance globally and responsible for about nine million new cases reported in 2013. Hospitals with inadequate infection control facilities are likely to record an increase in transmission of tuberculosis (TB). This study assessed the TB infection control (TBIC) measures in place to address the transmission of TB in secondary health centres in Ibadan, Southwest Nigeria.

Method: This was a descriptive cross-sectional study conducted in purposively-selected secondary health facilities in Ibadan. Key informant and in-depth interviews were used to obtain information from health facility managers and healthcare workers (HCWs) on compliance and challenges with implementation of TBIC policies. An observational checklist was used to assess facility control measures.

Result: Perceived capacity of facilities to implement TBIC policies varied considerably among respondents. Major challenges to implementation included: inadequate funding, absence of TBIC-specific training and understaffing. Separation and triaging were the most common TBIC method. There was little to no provision of TB treatment and prevention packages for HCWs.

Conclusion: The capacity of assessed secondary health facilities to implement Tuberculosis Infection Control policy is generally low due to funding and human resource challenges. In addition, weak infrastructures and poor environmental design impeded the ability of health facilities to implement TBIC guidelines.

Keywords: *Nosocomial infection, Tuberculosis, Infection control, Policy implementation*

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Résumé

Contexte: : L'infection tuberculeuse est une cause majeure de décès avec une importance considérable pour la santé publique dans le monde et responsable d'environ neuf millions de nouveaux cas signalés en 2013. Les hôpitaux dont les installations de contrôle des infections sont insuffisantes sont susceptibles d'enregistrer une augmentation de la transmission de la tuberculose (TB). Cette étude a évalué les mesures de contrôle de l'infection tuberculeuse (TBIC) en place pour lutter contre la transmission de la tuberculose dans les centres de santé secondaires à Ibadan, dans le sud-ouest du Nigéria.

Méthode: Il s'agissait d'une étude transversale descriptive menée dans des établissements de santé secondaires sélectionnés à dessein à Ibadan. Des informateurs clés et des entretiens approfondis ont été utilisés pour obtenir des informations auprès des gestionnaires des établissements de santé et des agents de santé (TS) sur la conformité et les défis liés à la mise en œuvre des politiques du TBIC. Une liste de contrôle d'observation a été utilisée pour évaluer les mesures de contrôle des installations.

Résultat: la capacité perçue des établissements à mettre en œuvre les politiques TBIC variait considérablement selon les répondants. Les principaux défis à la mise en œuvre comprenaient: un financement insuffisant, une absence de formation spécifique au TBIC et un manque de personnel. La séparation et le tri étaient la méthode TBIC la plus courante. Il y avait peu ou pas de programmes de traitement et de prévention de la tuberculose pour les travailleurs de la santé.

Conclusion: La capacité des établissements de santé secondaires évalués à mettre en œuvre la politique de lutte contre l'infection tuberculeuse est généralement faible en raison des problèmes de financement et de ressources humaines. En outre, la faiblesse des infrastructures et la mauvaise conception de l'environnement ont entravé la capacité des établissements de santé à mettre en œuvre les directives TBIC.

Mots clés: *infection nosocomiale, tuberculose, contrôle des infections, mise en œuvre de la politique*

Introduction

Tuberculosis (TB) is a global emergency - one third of the world is infected with TB, 8.6 million TB cases and 1.3 million deaths were estimated in 2012 globally [1]. According to the World Health Organization 2013 report [1], vast majority of cases and deaths were in developing countries. Tuberculosis spreads from person-to-person through the air by droplet nuclei and over 50% of TB cases in Sub-Saharan Africa are co-infected with HIV [2]. According to USAID, TB accounts for about 3 to 4 months of lost work, 30% of yearly household income in lost renumerations and is highly disadvantageous economically resulting in some families losing 100% of their income [3].

In sub-Saharan Africa, TB accounts for about a quarter of avoidable adult deaths and the transmission of multi-drug resistant TB (MDR-TB) among HIV-infected individuals in hospitals have been documented with high case-fatality rates [4, 5]. In Nigeria, TB is also a major public health problem; the country ranked third in 2013 and is among the 22 high burden countries of the world [1, 6]. In addition, Nigeria is one of the 27 high burden multidrug resistant TB (MDR-TB) countries [1, 6]. In a 2014 survey, Nigeria recorded over 600,000 new cases with over 91,000 cases under treatment [7]. The TB burden is further worsened by the high HIV prevalence of 2.9% and the emergence of MDR-TB in the country [8].

Tuberculosis infection control (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 [9]. TBIC comprise of three categories of measures that are hierarchical but usually implemented simultaneously to reduce the risk of healthcare associated infections (HAI) [9]. These measures are administrative controls, environmental controls and the use of personal protective equipment, which when well applied have been found to be effective in the control of nosocomial transmission of multidrug resistant tuberculosis or minimize TB transmission in health facilities [10].

Healthcare workers (HCWs) are frontline personnel as well as TBIC policy implementers in health facilities. In low income countries, HCWs are about 6 times more likely to develop TB than the general population [3]. Undiagnosed and untreated TB cases are frequently found in waiting rooms of health facilities [3] thereby intensifying the likelihood of nosocomial TB infection.

Nosocomial TB infection has worsened the human resources crisis in global health and in HIV and TB services [11,12]. The spread of drug-resistant TB to patients and HCWs has been attributed to poor infection control practice in health facilities [10]. Regardless of the knowledge of health workers, there is poor practice on TB infection control in the health facilities [13,14].

Studies conducted on the extent of implementation of TB control measures among secondary healthcare workers in Ibadan Nigeria are scarce and have not been extensively evaluated. Therefore, this study assessed the healthcare worker's compliance and challenges faced with the implementation of TBIC policies.

Method

Study design and setting

This qualitative study was cross-sectional in design. The study was carried out in Ibadan, the capital of Oyo State, one of the most populous city in Nigeria (over 3 million) [20]. Study population included respondents from the five purposively selected secondary health facilities of the metropolis: Adeoyo Maternity Yemetu, Adeoyo Hospital Ring Road, St Marys Catholic Hospital Eleta, Ring Road State Hospital and Government Chest Hospital. These facilities represent the major private and public secondary healthcare centres providing standard TB care in Ibadan metropolis.

Data collection and analysis

Qualitative instruments used in data collection include key informant interview guide for health facility manager, in-depth interview guide for health workers providing TB care (Table 1), and an observational checklist. All study instruments were adapted from the WHO guidelines and policy prescriptions for TBIC [3] and previously validated.

Ethical authorization was obtained from ethical committee of the Ministry of Health, Oyo State. Signed informed consent was obtained from the respondents before the interviews. Data were collected on observed facility control measures, healthcare workers' experiences on implementation, and perceived challenges with implementing TBIC measures. Interviews were transcribed and analysed thematically. Additional themes which emerged during the process of analysis were indexed and compared with original themes till data were saturated, when new information was not being obtained.

Results

A total of 19 healthcare workers were interviewed across the five selected health centres and the Ministry of Health. The interviewed workers cut across all cadres of TB care providers. The mean

age of workers was 41.8 ± 8.1 years with 12.1± 8.4 years as the mean number of years working as a TB care provider. Other sociodemographic characteristics of the respondents are presented in Table 1.

Table 1: Socio-demographic characteristics of respondents (N=19)

Variable	n	%
Facility		
Adeoyo Hospital (Ring road)	3	15.8
Adeoyo Hospital (Yemetu)	4	21.1
Chestnut Hospital	4	21.1
Saint Mary Hospital Eleta	4	21.1
Oluyoro Hospital	3	15.8
Ministry of Health, Oyo State	1	5.3
Gender		
Male	8	42.1
Female	11	57.9
Age group (years)		
30-39	7	36.8
40-49	8	42.1
50-59	4	21.1
Mean age	41.8±8.1	
Years of experience		
<10	8	42.1
10-19	8	42.1
≥20	3	15.8
Mean year of experience	12.1±8.4	
*Highest professional/educational qualification**		
MBBS	2	10.5
RN/RM	3	15.8
BMLS	4	21.1
BSc 3	15.8	
NCE/OND/PGD	7	36.8
Occupation		
Medical doctor	2	10.5
Nurse	5	26.3
Laboratory scientist	6	31.6
Social worker and others	6	31.6
Type of interview		
KII	6	31.6
IDI	13	68.4

**MBBS – Bachelor of Medicine, Bachelor of Medicine; RN/RM – Registered Nurse, Registered Midwife; BMLS – Bachelor of Medical Laboratory Science; BSc – Bachelor of Science; NCE – National Certificate in Education; OND – Ordinary National Diploma; PGD – Postgraduate Diploma*

Challenges with implementation of TBIC national guidelines

Existing capacity for TBIC implementation

Responses regarding the capacities of secondary health facilities to implement the TBIC policy varied. Overall, according to the respondents, major challenges hampering the implementation of TBIC in the health facilities include inadequate funding, absence of training opportunities and understaffing. Some respondents believed they had enough capacity, while others complained of lacking capacity. For example, with regards to funding, half of the healthcare workers interviewed complained of insufficient funding while the other half were satisfied with the level of funding.

> *"They are not funding it well at all. Government is not helping the masses. Look at our environment for instance, it is so pathetic especially when you go to the interior parts in Ibadan. For example, I've worked at Aremo too. If you go there and*

bring out 10 patient samples, at least 7 will be 3+'s that are Tb positive. I can say it anywhere and I've done it before. In fact, looking at their environment it's like a confirmation. And looking at workers; they are not paid well. God have mercy..."- IDI 1 Female

"*Funding is essential to get tools and resources. For example, here we are given one bottle of morning fresh (liquid detergent) for a whole year and some in other units add water to the detergent. Can you imagine*?"-KII 2 Female
"We are well funded"-IDI 10 Male.

Some respondents also mentioned the crucial support provided by non-governmental organizations like Damien Foundation. One of the key informants said;

"*Yes, the State can't fund it. The NGOs are the ones helping. Most of the buildings here were built by them i.e. Damien Foundation"*-IDI 4 Male

Also, the responses with regards to staffing were similar - on one hand some workers felt health facilities were short-staffed and on the other hand, several others felt the facilities were adequately staffed. Some respondents said:

"More staff should be employed because we're short of staff that is why I'm on leave and still coming to work."- IDI 4 Male

"This place is a government owned hospital; they should also contribute and support us in this facility. There should also be periodic check-up. And this environment is not safe by night, because we don't have fence. We're also short-staffed, people retire and government did not employ. "- IDI 6 Female
"*There is no training*."- KII 1 Female

"We're short of staff here. We're supposed to have 20 nurses. We have 5; cleaners, security personnel and so on and so forth. People are retiring and government is not employing."-KII 3 Male
"*For Tuberculosis we have enough staffs*." IDI 1 Female

With regards to training, most of the health workers had undergone some form of training on TB management but none of the respondents had received TBIC specific training.

"*No, I haven't been trained on TB outbreak response. I don't know if there is any Tuberculosis Infection Control Committee*."-IDI 19 Female
"*We have not received any special training*."-IDI 17 Female

Concerning the presence of a TBIC committee in the secondary healthcare facilities, only 60% of the facilities had one while the others didn't have any standing committee. Despite the fact that a few facilities had TBIC team, none of them could clearly explain the TBIC implementation plan in their facility. Some responses included;

"*No, there is no infection control team or committee in this facility*."-KII 1 Female
"*I don't know if there is any Tuberculosis Infection Control Committee*."-IDI 19 Female

"Yes. There is a TB committee. They meet every two weeks."- IDI 5 Female

With regards to the provision of healthcare packages for the healthcare workers, a breakdown of the various components of the available prevention and care packages showed that little to no attention was given to the periodic screening of healthcare workers. One respondent opined:

"*It is quite unusual. Only if a staff is coming (new arrival).* IDI 8 Male.

Another respondent said:

"*It is not done. It is done personally*."-IDI 6 Female.

Compliance with WHO TBIC policy and national guidelines

Compliance was considered based on responses from the interviews of respondents concerning the practices of TBIC in health facilities, availability and use of personal protective equipment, and the environmental design. Also, the observational checklists were used to check for compliance with managerial, administrative, use of personal protective equipment and environmental standards.

Practices of TBIC in health facilities

Separation was the most common TBIC practice in place in all the health facilities as confirmed by 60% of the total health workers interviewed, followed by triage. On separation, a respondent volunteered that:

"*If a patient comes in and we notice any of them coughing and it's alarming, we separate such ones*.**"-** IDI 8 Male

Due to a variety of reasons given especially stigma concerns, cough etiquette was the hardest control method to implement.

*"We don't embarrass them but ask them for their handkerchief and if they don't have, we tell them to get it so as not to transfer Tb.**" -** IDI 7 Female*

In order to improve cough etiquette among the patients, the respondents mentioned several solutions they adopted. These range from health education to providing cross-ventilation. Complicating the challenge of cough etiquette at the facilities was the lack of masks or tissue paper as claimed by the respondents.

With respect to handling of HIV patients, the majority of respondents said that they did not separate patients that were known to be HIV positive from those who had been confirmed to have tuberculosis. Most of them simply answered saying "No". A few of the respondents spoke of a form of priority system in place to attend to the TB patients first. For some, this involved ensuring that the TB patients were attended to first by health workers. For others, the system involved waiting for a confirmation in a secluded area.

Another important TBIC control is the provision of Information, Education and Communication (IEC) materials at the facilities. While some facilities had and distributed various IEC materials, others complained of unavailability of IEC materials.

*"I know with that of HIV/AIDS we have stickers and posters around everywhere so much as it used to be then. But these days I don't see that of TB so much as it used to be then because even if you're the Lab scientist and you don't want to really cover your nose, by the time you see it everywhere your mind goes to it that you have to use your handkerchief, cough etiquette and everything.**" -** IDI 2 Male*

Personal protective equipment: availability and use

Information regarding the availability of prevention and treatment packages for staff working in TB centres was also sought. The general impression given was that there was little to no provision for healthcare workers. Sometimes, healthcare workers use their own resources to provide personal protective equipment. Below are some quotes from respondents:

"*There is no special package like that. You know that when you're examining patients, you should put on your protective material***s.**"- IDI 3 Female

"*I remember when I worked at Adeoyo hospital at Yemetu there was prevention package for HIV but for TB I don't think there was such.***"-** IDI 1 Male

*"Ah, what can we do? I've used my personal money to get face mask most times. In fact, I was told that face mask can't even prevent the spread of TB.**"- KII** 1 Female*

Periodic medical examination of HCWs

Generally, there is no system in place to periodically examine healthcare workers for early detection of infection with TB. When asked if staffs were periodically screened in the health facilities, responses included:

"It is based on personal decision, not by the hospital. **"-** IDI 19 Female

Environmental design

Poor infrastructural and environmental design, which further hampered the ability of the health facilities to properly implement the TBIC guidelines was noted. A respondent from Adeoyo Hospital Yemetu stated:

"*When we're trained on how to use some equipment, on getting to our clinic we don't find it there and that can make it challenging. Following the standard, this building is not supposed to be here, it should be in a separate place. Again, look at our lab, we even find it hard to differentiate between TB lab and other labs*."- IDI 5 Male

Observational checklist

Implementation of managerial standards

Below were the findings from the observational checklist with regards to the implementation of managerial standards (Table 2):

1. All health facilities in this study had a written facility-specific infection control plan that includes TB infection control (TBIC). Similarly, this document was seen at all the facilities (100%).

Table 2: Facility observational checklist

Variable	Present n	Present %
Part 1: Managerial Standards		
1a. Written facility-specific infection control plan (that includes TB infection control (TBIC)	5	100
1b. A copy of the TB national guidelines available	2	40
2. Budget allocated for TB infection control activities	5	100
3. Designated person for implementing TBIC practices in the facility	3	60
4. A committee responsible for implementing TBIC practices in the facility	3	60
5. Training document sighted for clinical staff have received documented TBIC training or refresher training within the past 2 years	1	20
6. TB symptoms occurring among staff if diagnosed, is treated, registeredand reported in the confidential occupational health records or in the TB register.	5	100
Part 2: Administrative Standards		
7. Patients with a cough are given guidance on cough etiquette	5	100
8. Patients with a cough are separated from other patients and fast-tracked through all waiting areas, including consultation, investigations and drug collection	2	40
9. All information and education material is systematically checked to prevent inclusion of stigmatizing or discriminatory language.	5	100
10. TB information for patients is readily available and offered by staff.	4	80
11. Supplies are readily available for coughing patients (tissues, surgical masks, cloths) and are being used.	1	20
12. Medical waste bins for safe disposal.	4	80
13. A package of HIV and HIV-associated TB prevention and care is available for facility staff on site including confidential HIV testing and post-exposure prophylaxis for all staff	1	20
14. A tracking mechanism (e.g. register)	3	60
15. A person responsible for monitoring turn-around time from TB screening to diagnosis, and from TB diagnosis to treatment initiation	3	60
16. The median time between actual diagnosis and treatment initiation is no more than one day	1	20
17. The median time between screening positive for TB symptoms and actual diagnosis is not more than one day.	1	20
18. WHO recommended rapid diagnostics, e.g. Xpert MTB/RIF is the first TB diagnostic test for people living with HIV.	4	80
19. HIV testing is offered to all patients with presumptive	4	80
20. Evaluation for time to start ART is carried out if found HIV-positive.	4	80
Part 3: Environmental Standards		
21. The facility design, patient flow and triage system comply with what is outlined in the infection control plan and/or national infection control policy.	3	60
22. Waiting area is well ventilated (i.e. windows and doors open when feasible)	5	100
23. There is clear display of messages on cough hygiene in all areas frequented bypatients.	5	100
24. Sputum samples are collected in a well-ventilated, clearly designated area away from others, preferably outdoors.	4	80
25. Diagnosed TB cases, who are hospitalized, are isolated or grouped according to drug sensitivity status in rooms with adequate natural ventilation or negative pressure	1	20
Part 4:Personal Protective Equipment		
26. N 95 Respirators are readily available for and being used by staff for providing care to patients with diagnosed or suspected infectious MDR-TB and XDR-TB.	1	20
27. Staff have been trained in the proper fit and use of N 95 respirators.	1	20

** MDR-TB- Multi Drug Resistant Tuberculosis, XDR-TB- Drug Resistant Tuberculosis, ART- Anti retroviral therapy, HIV- Human Immunodeficiency virus, Xpert MTB/RIF- Mycobacterium tuberculosis/ Resistance to rifampicin*
Adapted from Implementing the WHO policy on Tuberculosis Infection Control (2009)

2. All the facilities (100%) in the study were found to have a budget allocated for TB infection control activities as well.
3. However, only 3 (60%) facilities out of 5 facilities had a designated person or committee responsible for implementing TBIC practices. Of these, it was only in one facility that this person could be identified. The clinical staff in all the facilities received documented TBIC training or refresher training within the past 2 years. However, a training document was sighted in only one of the facilities (20%).
4. Similarly, in all facilities (100%), if TB was diagnosed, it was treated, registered and reported as seen in the confidential occupational health records or in the TB register.

Implementation of Administration standards

Table 2 also presents a few findings concerning implementation of administrative standards:

1. Separation of TB patients from other patients was seen in only 40% of the facilities visited.
2. IEC materials found in most facilities (4 out of 5) were seen to be free of stigmatizing or discriminatory language. One of the facilities (20%) did not have any TB information.
3. Medical waste bins for safe disposal of wastes was seen in 4 out of the 5 facilities (80%). A tracking mechanism for patients was found in just 3 facilities (60%). Only 4 (80%) facilities of the 5 offered HIV testing to all patients with presumptive TB.

Implementation of Environmental standards

Environmental standards implementation at these secondary health facilities are presented below (see Table 2).

1. The facility design, patient flow and triage system complied with what is outlined in the infection control plan and/or national infection control policy in 3 facilities (60%) of the 5 facilities visited.
2. Similarly, 80% of the facilities collected sputum in well-ventilated, clearly designated areas away from others. All facilities had a clear display of messages on cough hygiene. Diagnosed TB cases, who were hospitalized were isolated or grouped according to drug sensitivity status in rooms with adequate natural ventilation or negative pressure in just one facility (20%).

Personal protective equipment

Only 1(20%) facility was seen to have supplies readily available which included gloves, face masks, protective clothing and tissue. Similarly, only 1(20%) of the facilities had N95 respirators (Table 2).

Discussion

In this study, majority of the interviewees agreed that health workers who manage patients with TB are at higher risk of contracting the disease than others especially due to their interactions with these patients. This is similar to the finding by Tenna and colleagues [14] in Ethiopia, where almost three-quarters of health workers who treat TB patients agreed that they were more prone to occupational acquisition of TB. This awareness is the first step in the continuum that facilitates adherence to regulatory guidelines and in effect, reduced health worker disease transmission risks. Furthermore, when asked about the contents of the guidelines, majority of the respondents who claimed to know the contents of the guidelines were able to cite only areas that related to their personal practices. The situation is similar to what happened in other countries with similar context [21].

The level of compliance with the national guidelines in the facilities visited was low. For example, one of the basic elements of the guideline is that there should be a copy of the guideline available in all TB treatment centres. Less than half of the facilities in this study had a copy of the guidelines present. This is similar to the 22% of facilities in another resource-poor setting that had a copy of the guideline available [18]. In addition, many of the respondents agreed that there was no TBIC person or committee in their facility. In slight contrast, in rural South Africa, health facilities have an infection control officer without TB Infection Control policy or monitoring in the health facilities [18].

The WHO TBIC policy states that the composition of the TBIC team should be multi-disciplinary. Among the few facilities with TBIC teams, adherence to this recommendation was found to be very high. Many of the committees had members from management, laboratory and administration on them. An advantage of the multi-disciplinary approach to the composition of the TBIC team is that it allows the continuum of care for TB patients, from arrival to treatment, to be expedited as quickly as possible and in a manner that reduces exposure of uninfected people to TB. Unfortunately, despite the multi-disciplinary approach to the composition of the TBIC teams, many of the respondents reported that the teams had not come up with specific approach to expedite the treatment of TB patients.

One aspect of the national guidelines stipulates that "the door and windows of a room should be open whenever TB suspected or confirmed patient is in the room" [6], a fact that was attested to

by most of the respondents. However, due to several barriers, only one facility out of five was able to abide by this guideline. The gap between knowledge and practice of guidelines in the health sector has been a recurring problem observed among other studies in resource-poor settings. For example, in Ethiopia, while 96.4% knew that the doors and windows should be kept open when a suspected TB patient is around, only 61.5% adhered to that guideline [4]. This study observed that the median time between screening positive for TB symptoms and actual diagnosis was more than one day in most of the facilities unlike the standard stipulated in the guidelines.

Major barriers to the implementation of the guidelines identified in our study include understaffing, infrastructural, logistics and poor staff welfare. Simple interventions like use of PPE varied with many of the facilities. In many cases, the unavailability of these materials forces the HCWs or the patient family to provide this in a very inconsistent manner (Authors observation). Such low hanging fruits should be prioritized in these settings for TBIC. All of these constraints contributed to the poor implementation of the TBIC guidelines. As previously documented in similar settings within and outside Nigeria, our study settings have had perennial issues dealing with resource mobilization and its efficient utilization for TBIC [16, 19]. These systems are also often plagued by inefficiencies which means that provision of required materials for end-user benefit is usually poor [22]. Addressing TB challenge will require not only upscaling resources devoted to control TB through increased local political commitment but also capacity building and strict enforcement of resource utilization.

Similar to findings from previous studies focused on LMICs, the welfare of TB healthcare workers was observed to be poor [23, 24]. For example, this study noted that there was hardly any provision for prevention and treatment packages for staff, neither was any arrangement made for periodic screening of health workers. This situation is similar to what was reported from Nepal where healthcare workers did not receive adequate welfare packages, leading to poor motivation and performance among volunteers [25]. Poor health worker welfare has been associated with decreased work motivation, increased job stress and mass health worker migration [25, 26]. To what extent this has contributed to the burden of TB transmission in regions like Nigeria remains unclear.

Limitations

A major limitation of our study is the small sample size and the non-representativeness of our respondents. Like any qualitative study, representativenes is not the goal in sampling. Therefore the generalizability of our findings is limited to similar contexts. However the methods described in this study are transferrable to other contexts. Also, our findings give a baseline picture of TB infection control implementation that can guide further research into specific issues, and TB prevention and control interventions.

Conclusion

The capacity of assessed secondary health facilities to implement Tuberculosis Infection Control policy was generally low due to funding and human resource challenges. In addition, weak infrastructures and poor environmental design impeded the ability of health facilities to implement TBIC guidelines. Overall, there is need for enhanced training on Tuberculosis Infection Control policy implementation, improved welfare packages, other necessary organisational support, improved funding and infrastructural development as well as political commitment.

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