Contextual Factors Affecting Implementation and Uptake of Preventive Treatment in Urban Settings: A Qualitative Study

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Abbreviations

CIPRB	Center for Injury Prevention and Research, Bangladesh
DOTS	directly observed treatment, short course
DSCC	Dhaka South City Corporation
FGD	focus group discussion
HH	household
IDI	in-depth interview
IPT	isoniazid preventive therapy
KII	key informant interview
MDR-TB	multidrug-resistant TB
NGO	nongovernmental organization
NSP	National Strategic Plan
NTP	National Tuberculosis Program
PT	preventive treatment
SDG	Sustainable Development Goal
TB	tuberculosis
USAID	US Agency for International Development
WHO	World Health Organization

Executive Summary

Tuberculosis (TB) is a major public health concern in Bangladesh. It remains the deadliest infectious killer. Bangladesh National TB Prevalence Survey data indicate that TB is higher in urban areas, which have increasing population density, poor living and working conditions, and a lack of knowledge and awareness of TB, which leads to rapid transmission in urban settings. To reduce the transmission of and eliminate TB, the Government of Bangladesh is closely working with donor agencies and national, international, and nongovernmental organizations (NGOs). The government has developed facilities to provide the World Health Organization's (WHO) recommended directly observed treatment, short course (DOTS); the government has also initiated isoniazid preventive therapy (IPT) for children under five who are close contacts of bacteriologically positive TB patients. However, to reduce TB incidence further in Bangladesh, it is essential that preventive treatment (PT) is available for all close household (HH) contacts. This study aims to understand the facilitators and barriers to providing PT to close HH contacts of index TB patients.

The aim of this research is to:

1. Explore barriers and factors that facilitate implementation and uptake PT among HH contacts of index TB patients
2. Understand perceptions of key stakeholders on the use of different PT regimens and their preferences
3. Build an evidence base to further contextualize and generate policy responses toward better implementation and improved uptake of PT

Qualitative methods based on the principles of phenomenological research were used in this study. To supplement this, a systematic literature review to understand TB in the national and urban slum contexts of Bangladesh was conducted. The study was carried out in Dhaka between February and April 2018 with specific focus on South City Corporation (DSCC). A total of 125 participants were selected through purposive sampling. We conducted 43 in-depth interviews (IDIs); 9 focus group discussions (FGDs) with index TB patients, HH contacts, service providers, and community members; and 10 key informant interviews (KIIs) with policy makers, program managers, and TB experts. We used current IPT intervention of the National Tuberculosis Control Program (NTP) as a proxy measure of preventing treatment. In addition, two case studies were conducted to capture patients' and providers' experiences with current IPT intervention. Trained anthropologists conducted IDIs and facilitated FGDs. Data was transcribed, coded, and thematically analyzed.

Members of the community, providers, and policy makers have indicated that those in urban areas have limited access to TB information and services. The data revealed the coexistence of conflicting social stigma and discrimination; patients, community members, and providers' own personal beliefs; community members and providers' lack of knowledge about TB treatment and prevention; and suboptimal training have influenced care-seeking behavior and providers' attitudes and abilities to offer TB care in general and PT specifically. A clear understanding about PT is lacking among TB patients, community members, and providers.

The study revealed that community members in urban areas of Dhaka are not unaware of TB (because of different awareness campaigns or their personal experience with TB), but their knowledge about TB is ambiguous in general. Pervasive stigma and discrimination faced by TB patients in Bangladesh creates fear and shame for the affected family and leads to social isolation. As a result, TB remains a disease hidden in the community, making early diagnosis difficult. People with early symptoms of cough usually seek treatment from local medicine shops or other untrained

providers. Patients often seek care from qualified providers at a late stage of the disease. Interactions with providers and counseling efforts helped change the knowledge and perception of TB patients and their family members. As a result, they try to properly complete the treatment and take preventive measures, such as staying at home during the infectious period, covering their mouth and nose with a clean cloth while coughing, using a facemask in public places, etc., to limit spreading TB to others. Apparently, a large number of index TB patients discontinued their treatment and were unwilling to use preventive measures because of the lack of interest and awareness about TB and the prolonged treatment process.

Although TB patients and their family members have some knowledge about TB and its treatment, they have limited knowledge of PT. Even some service providers are unfamiliar with the preventive approach and lack up-to-date knowledge about PT. However, policy makers, program managers, and TB experts highlighted the critical need of PT for HH contacts of TB patients in Bangladesh. Although community members have no knowledge of PT, the majority of them would be interested if their doctors recommend that the treatment is essential for them. However, a few patients, community members, and providers were not sure whether PT is necessary for HH members of TB patients. Although most respondents appreciated the idea of PT, they were also concerned about some issues related to the treatment process, e.g., duration and number of doses, cost of the treatment, side effects, etc. Both community members and providers indicated that they preferred a shorter regimen for PT. Most service providers also welcomed the idea of PT, but at the same time, they were worried that it would impose an additional workload on them. Policy makers, TB experts, and program managers mentioned that further reduction of TB from its current level is a priority health agenda of the Government of Bangladesh. They acknowledged the importance and need of a PT initiative at scale as way to eliminate TB in Bangladesh. They have suggested increasing counseling at every level, modifying the awareness program, collaborating with all types of stakeholders, and generating an integrated plan.

Despite the NTP’s continuous push for comprehensive TB care for urban communities, this study clearly demonstrated that PT is not widely available in urban settings through the existing NTP. Mobilizing the community, creating awareness, early detection and initiation of treatment, HH contact tracing, and an effective mechanism for initiating appropriate PT are crucially important in accelerating progress toward comprehensive TB service delivery in urban settings. To that end, PT that is of short duration and is suitable for the socio-cultural context of Bangladesh could be a feasible option for the community and providers.

Introduction

TB, caused by *Mycobacterium tuberculosis,* is a major public health concern in Bangladesh. Despite the availability of effective treatment options, a new case of TB develops every 2 minutes and approximately 210 people die every day from TB in Bangladesh (1, 2). Bangladesh ranks eighth globally among the 30 highest TB-burdened countries (2, 3). According to the World Health Organization (WHO), approximately 66,000 people die from TB and about 360,000 new cases occur each year (2). Although absolute numbers of incident cases and deaths remain high in Bangladesh, rates per 100,000 population reveal a more nuanced situation—the best estimated TB incidence rate for Bangladesh is 221/100,000 population. Bangladesh has made remarkable progress in the TB case detection and treatment success rates over the last few decades. Annual case notifications stood at 223,921 in 2017 and the high treatment success rate of greater than 90% of diagnosed cases was maintained from 2005 to 2016 (2). The TB incidence rate, by contrast, has remained flat between 225/100,000 and 221/100,000 from 2001 to 2016; therefore, despite progress, the NTP continues to miss 38% of drug-sensitive TB cases (all forms) and only an estimated 20% of drug-resistant TB cases are enrolled in the national program (4).

The problem is aggravated by increasing population density, rapid urbanization, and poor living and working conditions, all of which facilitate the spread of TB (1). More than one-third of Bangladesh's population (34.3%) lives in urban areas, and the average urban annual population growth rate for 2010-2015 was 3.6%, three times the national rate. Approximately one-third of the urban population live in slums in conditions that create high transmission (5). In such a situation, the NTP, under the Directorate General of Health Services, is closely working with development and implementing partners to reduce the burden of TB, focusing on urban TB management (6, 7).

In 2016, the WHO declared the End TB Strategy in the context of the United Nations' Sustainable Development Goals (SDGs) agenda to raise awareness of TB worldwide and the status of prevention and care (2, 7). The newly adopted SDG target is to end the TB epidemic by 2030 with a special focus on uniting efforts to "Leave No One Behind" (7). In light of the End TB Strategy, Bangladesh's 2018-2022 National Strategic Plan (NSP) for TB identified ambitious epidemiological milestones and targets from the 2015 baseline: A 75% reduction in TB deaths and a 50% reduction in the TB incidence rate by 2025, and a 95% reduction in TB deaths and a 90% reduction in the TB incidence rate by 2035 (7). The NSP proposed a set of activities and targets to increase annual TB case detection, increase treatment success rates, ensure quality-controlled treatment services at all implementation sites, and prevent infection among HH contacts of index TB patients, specifically among children (3, 7).

Young children (age <6 years) in contact with smear-positive TB adults often become infected with TB; once infected, they are at higher risk of progressing to TB disease than adults (8, 9). Evidence suggests that the source of infection for most children is an infectious adult living in close proximity, usually in the same HH (10, 11). It is also documented that providing PT to children with active TB contacts significantly reduces the burden of childhood TB (12). Detection of latent TB infection among children provides an accurate measure of on-going transmission within communities, which is a key indicator of epidemic control. However, the childhood TB control program is not yet well designed, so incidence and prevalence are underreported. Primary health care centers can implement contact screening, which is an effective and simple approach for early identification of children eligible for appropriate PT and preventing susceptible children from developing the disease after infection from smear-positive TB patient in the same HH (13, 14).

A good number of studies have demonstrated the importance of PT and the efficacy of IPT to prevent TB disease in children who live with active TB patients (15-18). A meta-analysis shows that IPT reduces the risk by 59% among children age <15 years (19). The NSP recommends that all HH contacts of smear-positive patients age <5 years be investigated for TB and those without TB be provided with IPT for six months. However, there is no strategy for PT in children beyond five years or in adults (7).

Globally, implementation of PT has been a challenge, including in Bangladesh. At present, there is no nationwide data in Bangladesh on the screening, initiation, and completion of IPT for child contacts and the feasibility of PT for other HH contacts. However, various studies from Southeast Asia (20-23) indicate that implementation of IPT is deficient. Information about the reasons for non-initiation and non-completion of IPT in urban settings in Bangladesh from the perspective of the community and health care providers is limited. Understanding these is crucial to addressing implementation challenges, and this warrants a comprehensive assessment using a rigorous study design.

This qualitative research assessed the barriers to initiation and subsequent completion of PT in urban settings in Dhaka, Bangladesh and explored the reasons for non-initiation of IPT from the perspectives of health care policy makers, providers, community members, and parents. This study also investigated a feasible PT option and identified possible programmatic solutions for increasing the uptake of PT in Bangladesh.

Objectives

1. Explore barriers to and facilitating factors for implementation and uptake of PT among HH contacts of index TB patients in Dhaka
2. Understand perceptions of patients, community members, providers, and key stakeholders on the use of different PT regimens and their preferences
3. Build an evidence base to further contextualize and generate policy responses for better implementation and improved uptake of PT

Methodology

Study Design

The study employed a descriptive qualitative approach, based on the principles of phenomenological research, which is considered appropriate when the features of a particular phenomenon are not well understood (24). Semi-structured interviews and FGDs were used to give primacy to participants' own perspectives and to the uniqueness of their individual experiences. This paradigm pays attention to "live experiences of the phenomenon" and subjective meanings and experiences of individuals and groups; it also recognizes how these meanings and experiences influence people's behaviors. Guided by this paradigm, participants' perspectives during care seeking and delivery are best described and interpreted by themselves through interaction with researchers. Phenomenological research is now increasingly used in health care research when people's behavior has strong social and cultural dimensions (25). Desk reviews were also used (26, 27). Overall, this research adopted a constructivist methodological approach (28) recognizing that patients' and providers' accounts of their experiences are socially constructed, reflecting their own unique lives and backgrounds and reinterpreted for a researcher during the interview process.

Study Location

The research was conducted in different parts of Dhaka between February 2018 and April 2018 with specific focus on DSCC. The areas selected are mainly urban slum areas, crowded with high concentrations of poor population.

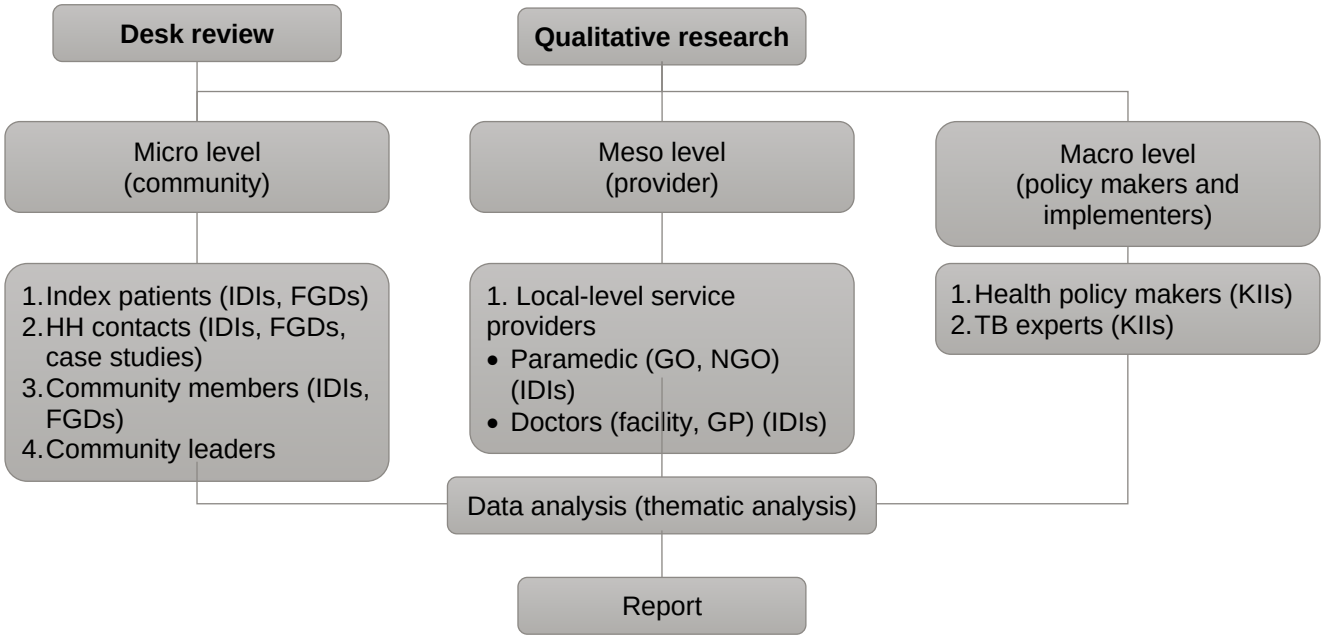
Sampling Procedures

A purposive sampling technique was applied to recruit study respondents at three different levels of involvement (figure 1):

- Micro level: Index TB patients, HH contacts, and community members and leaders
- Meso level: Health service providers, e.g., doctors, paramedics, community health workers
- Macro level: Health policy makers, program managers, TB experts)

Data collectors visited different DOTS centers in the DSCC to collect lists of TB patients (until December 2017). Initially, a short list of TB patients and their HH contacts was developed based on gender, age, duration of treatment, etc. The research assistants then contacted by phone; most agreed to participate in the study. Those who refused did so because they went back to their village, were not interested, or did not want to reveal their identity. Separate lists were also developed for health service providers and community members and leaders. The research assistants approached them directly or scheduled an interview over the phone. For KIIs, 10 respondents were listed who have been working in the TB field for years. The research team faced some challenges recruiting participants for FGDs and IDIs, especially to ensure participation of both genders from the community and capture their views about PT. Despite several attempts, the research team failed to organize and conduct FGDs with female participants in the community. However, to capture female respondents' views about PT, a few female participants were approached and interviewed individually.

Figure 1. Methodological framework



Study Participants

Respondents from different categories were selected (table 1) to reach the study's objectives.

Index TB patients: 37 index TB patients (23 male and 14 female) were selected randomly from the list of TB patients collected from different DOTS centers who were registered for treatment for at least two months preceding the study; the team members interviewed patients over the phone that agreed to participate. Patients who declined to participate were replaced with alternates.

HH contacts: 39 HH contacts (15 male and 24 female) of index TB patients who acted as caregivers were selected; the participants in this category were selected and approached the same way as the index TB patients.

Community members: 11 individuals (8 male and 3 female) who live in the same community as the index TB patients, but never had a TB patient in their HH, were selected; the research team members approached them directly for an interview. If they were not interested, alternates were selected.

Community leaders: 14 community leaders (12 male and 2 female), such as school teachers, religious leaders, local government officials, and political leaders, were recruited using the snowballing technique in which community members were polled on who was influential in the community.

Health service providers: 10 service providers (7 male and 3 female) were approached directly at facilities or by phone for interviews.

Health policy makers and TB experts: 10 health policy makers, program managers, and TB experts (9 male and 1 female) who have a wealth of knowledge about TB and years of experience in TB programming in Bangladesh were interviewed; these individuals were found through the network of Challenge TB's team members.

Table 1. Study Participant Characteristics

Research technique and number	Respondent category	Number of			Age range	Resident status
		Respondents	Males	Females		
IDI (15)	Index patient	15	9	6	15-66	Peri-urban, slum
IDI (15)	HH contact	15	7	8	20-50	
IDI (3)	Community member	3	0	3	25-40	
IDI (10)	Service provider	10	7	3	28-48	Urban
FGD (3)	Index patient	22	14	8	15-70	Peri-urban, slum
FGD (3)	HH contact	24	8	16	19-50	
FGD (2)	Community leaders	14	12	2	28-65	
FGD (1)	Community people	8	8	0	30-60	
KII (10)	Health policy makers and TB experts	10	9	1	40-65	Urban
Case study	2 cases					Peri-urban, slum

Data Collection

The topic guides for IDIs and FGDs were developed through a consultative process among the research team members. Individual interview guides were developed for each type of participant (annex 1). The guides were written in English, translated into Bengali, and field-tested prior to collecting the data. Four anthropologists with previous qualitative research experience were recruited as research assistants to collect data. The research team members received a seven-day training on the research topics, objectives, ethics, guidelines, research process, and data collection.

Data Collection Techniques

IDIs: Forty-three semi-structured IDIs were carried out with various stakeholders to understand participants' experience with and perceptions about the disease. IDIs also explored participants' understanding about the existing TB program and preventive intervention and identified the barriers and facilitating factors of those interventions. Interviews lasted 40 to 60 minutes.

KIIs: Ten semi-structured KIIs were carried out to explore their views about TB, the barriers and facilitating factors of existing TB programs, and insight on PT in Bangladesh. The participants in KIIs included health policy makers, program managers, and TB experts. Interviews lasted 50 to 70 minutes.

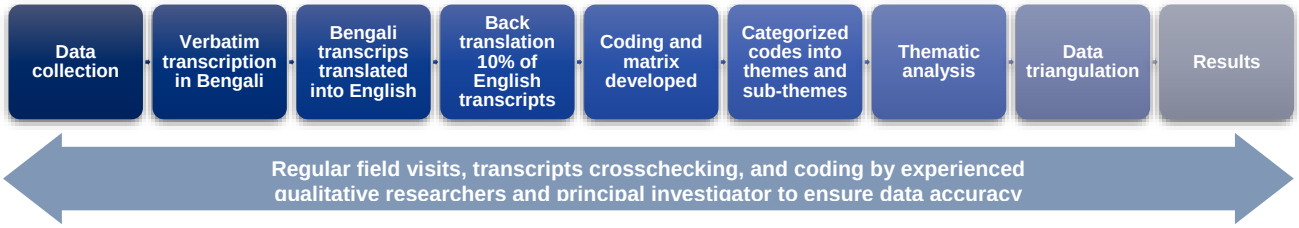
FGDs: We conducted 9 FGDs with 68 participants to explore their views on practices, perceptions, and knowledge of TB infection and treatment and their understanding and preferences on preventive measures. Each FGD included 8-12 homogenous participants from group of index TB patients, their HH contacts, community leaders, and non-TB community members. The discussion session lasted 70 to 90 minutes.

Case study: Two case studies were conducted on unsuccessful IPTs to explore patients' and providers' experiences and to capture more in-depth context of the barriers and facilitators specifically related to IPT.

Data Analysis

Data analysis of this study was an on-going, iterative process (figure 2). All interviews were digitally recorded, transcribed, and checked for accuracy. The interviews were conducted in Bengali, transcribed verbatim, and translated into English. To check the accuracy and quality of the translations, 10% of all transcripts were randomly selected and translated back into Bengali.

Figure 2. Data analysis flow diagram



The FGDs and IDIs transcripts were analyzed thematically to gain a clear, logical understanding of the participants' thoughts and to convey their experience (29). To assist in data accuracy, researchers visited the field several times; field supervisors and researchers listened to the recorded interviews and randomly cross-checked transcription and coding. Further, to enhance reliability, all interviews were monitored and discussions were held on a regular basis among the research team members to ensure data quality and consistency within the interviewing process. The research team members jointly performed analysis and developed an agreed coding matrix.

The coded similar segments were categorized into themes and sub-themes. The results were then compared and discrepancies discussed with the wider group, and the concepts were further refined. The triangulation of data is crucial to increasing the credibility and validity of the results (30). In general, the study highlighted a number of recurring and interlinked sub-themes related to TB service provision and PT in urban settings. Although different perspectives were shared during the FGDs, there was overall group consensus on various issues. The emerging sub-themes are grouped under five broad headings: knowledge of TB and care-seeking pattern, social stigma and isolation, preventive practices and perception of risk, perception about and preferred method of PT, and facilitating factors and barriers to PT. Each area is influenced strongly by the respondents' category and to a lesser extent by their age, their own personal perceptions and beliefs, and social position. The central themes were constantly compared and combined with the results of multiple data sources and triangulated across three broad levels to see how the findings complemented each other. Finally, the key findings from the multiple data sets were analyzed in relation to the wider perspectives and practices regarding knowledge, service provision, preventing TB, and potential preferences of PT.

Ethical Considerations

Clearance for this study was obtained from the Ethical Review Committee (ERC) of the Center for Injury Prevention and Research, Bangladesh, which is an independent, registered ERC in Bangladesh. All participants provided written consent for their participation and for interviews to be audio-recorded.

Results

This study enrolled 125 participants age 15 to 70 years residing in different parts of Dhaka (table 1). Most of the respondents, particularly index patients and other community members, live in the slums with four to six people living in a single, very congested room. Most of these people are very poor with a low level of education; most of them are daylaborers, rickshaw pullers, drivers, carpenters, or masons. A few participants were also from middle-income families living in non-slum areas in independent houses with a good educational background.

In general, ambiguity about TB and transmission was common among the community—TB is a deadly disease, but it is curable because of treatment; TB is transmitted through cough, spitting, and even being intimate with your spouse; and TB is hereditary, which means that if your ancestors had the disease, then the new generation might suffer from it as well. It appears that the social stigma associated with TB is still very prominent in the community, which creates a high level of misconception about the disease.

TB patients, their family members, and community members perceived TB as a matter of shame and fear for the affected family and as such, it is a matter that is not to be disclosed to the community. However, because of media campaigns, understanding of the disease has changed to a certain extent, but misconceptions still prevail. The interactions of TB patients and their family members with TB care providers helped change knowledge and perceptions. The data also suggests that a number of TB index patients terminated their treatment without completing the full cycle, and a few did not follow the preventive measures properly for various reasons. A few patients with a history of incomplete TB treatment also reported reinfection with TB.

In general, information on TB knowledge and perceptions was gathered mainly from the community level (index TB patients, their HH contacts, and non-TB community members). However, perceptions and views related to PT were gathered from all categories of respondents. Community-level respondents have a certain degree of knowledge about TB and its treatment, but they have limited knowledge about preventive measures and treatment. Even service providers are unfamiliar with preventive approaches and they lack up-to-date knowledge about PT. However, policy makers, program managers, and TB experts highlighted the critical need of PT for HH contacts of TB patients in Bangladesh. Although community members have no knowledge about PT, the majority of them expressed interest in PT and appreciated the idea of prevention. The service providers also expressed almost similar views. Thus, people's willingness to take PT, health care providers' readiness to deliver services and counseling, and the government's interest in reducing the TB burden were identified as key facilitating factors for TB programming in urban settings.

On the other hand, long treatment regimens, unwillingness to pay for essential diagnostic tests, fear of extra workload among local service providers, and low programmatic coverage and stakeholder participation in urban settings are identified as key barriers to implementing urban TB interventions. However, respondents also highlighted a few solutions to overcoming these barriers. The respondents felt that, in addition to making TB treatment free of charge, counseling efforts should be increased at every level, and awareness programs and prevention interventions should be stepped up through an integrated and collaborative approach.

Knowledge of TB and Care Seeking Patterns

Knowledge of TB

Most respondents from all categories had some prior knowledge about TB. They knew a few symptoms and about the availability of free treatment from government-supported facility. Although most TB patients, community members, and providers knew that crowded conditions facilitate TB transmission and that pulmonary TB is contagious, they also incorrectly associated TB transmission with strangers rather than with family members. Their understanding of susceptibility to TB was poor with low perceived risk for TB among family members and health providers.

Community-level respondents (TB patients, HH contacts, and non-TB community members) and local service providers highlighted that the main sources of information about TB are interactions with health care providers, television, short dramas and public service messages (PSMs), newspaper advertisements, etc. Exposure to these awareness messages has corrected misperceptions related to TB to some extent. This also motivated a few respondents from the community to learn more about TB and helped improve treatment adherence in general. As one service provider stated,

“TV advertisement where X singer [referring to a popular Bangladeshi folk singer] said there is no point of saying now that TB is a non-curable disease, the advertisement really worked very well.” (IDI_female_service provider_age 41 years)

Participants who acquired information from different sources about the complexity of this illness particularly demonstrated mixed views about TB.

One of the prominent sub-themes that emerged from the study is the general perception that TB is a deadly disease that causes immense suffering for patients experiencing the signs and symptoms (prior to diagnosis).

“TB is a dangerous disease. It was really terrible feeling especially before I have been diagnosed as TB ….it makes me and my family scared while I was coughing badly.” (FGD_01_male_index patient)

TB experts pointed out that, despite significant efforts by the government, even many service providers, including doctors, are afraid that TB patients could infect them. A few providers emphasized that they are really scared of multidrug-resistant (MDR) TB, and are thus reluctant to provide services to MDR-TB patients. One female service provider working with MDR-TB patients expressed her worries about her own health.

“You know, I am not safe here…. dealing with MDR-TB patients every day in this ward. I am really scared of getting infected by MDR-TB.” (IDI_female_service provider_age 28 years)

Most TB patients and their HH members understand that although TB is a dangerous disease, it is curable now. The respondents also highlighted that previously people died from TB because their knowledge about treatment was poor or they were not serious enough about their disease and its treatment. But now, proper treatment is available for TB and it is free of charge. If a TB patient receives treatment and follows the provider’s advice, there is no risk of fatality anymore. One family member of a TB patient portrayed both death and survival in their family by saying,

“My youngest paternal aunt had TB a few years back. She died because she did not opt any treatment for that. I’ll say she died because of her carelessness. My paternal uncle also had TB

recently. But he did seek treatment on time, completed treatment, and now is fully cured." (IDI_female_HH contact_age 24 years)

TB patients and their family members expressed mixed perceptions regarding the transmission of TB. Although most respondents considered TB a transmittable disease, their perceptions regarding the mode of transmission varied according to their own personal experiences and beliefs. A few family members of TB patients perceived TB as communicable and that it can be transmitted from an infected person to his/her family members or from infected colleagues to other colleagues in the workplace; others perceived it as not too infectious. One respondent who had multiple TB patients in their family stated,

"We have three persons infected with TB in our family. I am sure I got that from any one of my family members." (IDI_male_HH contact_age 38 years)

Alternatively, misconceptions and myths around the spread of TB were also observed. A few respondents mentioned that TB could be spread through injection syringes and needles; excessive dust in the air; sharing common cloths, combs, medicines, and utensils with a TB patient; by touching an infected person, etc. However, respondents from the community perceived TB as not too infectious. As one of the HH contacts stated,

"If it is an infectious disease, why doctors who are dealing with TB patients every day are not suffering from TB." (FGD_04_female_HH contact_age 31 years)

Most TB patients, their family members, and members of the community believed that TB is inherited. They frequently linked TB with a previous family history. The myth about the hereditary nature of TB was prevalent and deeply rooted among many of our study participants. One HH contact of an index TB patient who was recently diagnosed with TB said,

"My brother is a TB patient and under treatment for the last five months. I am also diagnosed as TB recently and just started treatment. My bother believes that I got the infection through him … maybe from our parents…since we have a blood relation." (IDI_male_HH contact_21 years)

Care-Seeking Pattern

Respondents were asked to describe where a person with symptoms of TB would seek care. The patients described their own experiences, and community members described the experiences of family members, friends, or neighbors. Once they noticed symptoms of respiratory infections with prolonged coughing, people sought care from a diverse group of nonqualified and qualified providers based on their financial condition, ability to pay, and stage of the disease. TB patients sought care from formal health services, such as NGO facilities, private medical practitioners, private clinics/diagnostic facilities, and government health facilities before diagnosis.

Upon confirmation of TB, a patient was usually referred to a nearby DOTS center for registration and initiation of nationally recommended treatment.

"I cannot afford paying for long-term TB treatment. I am getting free medicines from the government DOTS center" (IDI_female_HH contact_42 years)

Although patients and the community perceive TB treatment as difficult and painful, most acknowledge the importance of completing treatment. The underlying belief is that if the disease is diagnosed early enough, treatment can begin quickly and cure is possible. Participants in FGDs often considered treatment and curability as synonymous.

It was noted that patients tend to consult the DOTS facility for any health problems during treatment, and they tried to adhere to the recommended treatment. In general, patients and community members demonstrated positive attitudes about the effectiveness of currently available treatment options for TB. It was apparent that providers' counseling efforts were instrumental in motivating patients and their families to start and complete treatment. As one TB patient from the urban slums highlighted:

"Doctor told to take medicine daily for six months without any gap; if there is a gap only for one day, then it will affect the overall treatment and then the medication period will be longer and chance of treatment failure will increase. I am taking medicine daily as doctor advises." (IDI_male_index patient_30 years)

The service providers emphasized the importance of completing treatment by highlighting their experiences with non-adherence cases. Providers reported that some TB patients stop treatment when they start feeling better after a few months of medication.

Social Stigma and Isolation

The social stigma associated with TB emerged as the key driver in shaping patients' and community members' views about the disease. Service providers' personal beliefs and their dislike and unwillingness to have close interactions with TB patients played critical roles in TB care delivery in urban settings. The community's perception of TB strongly influences the attitudes toward TB patients. Because TB is a very deadly and contagious disease, community members usually avoid contact with TB patients and, as a result, the patient and her/his family become isolated. Sometimes relatives even prevent children from having contact with their parents who have TB. Children are instructed how to avoid contact with TB patients.

"You know, when my relatives and neighbors came to know that I am suffering from TB…. they started avoiding me… even if I am visiting my relatives I noticed they are not treating me like other family members. This is really disappointing…. I stopped mixing with them now." (FGD_01_male_index patient_35 years)

TB patients and their family members highlighted that the social stigma associated with TB makes patients' lives miserable and isolates the whole family from the community. They also expressed their strong dislike about lengthy TB treatment, which is really hard to adhere to in the long term. Diagnosing with TB is a real shock for both the patient and their family members.

"I cried a lot when I heard from my doctor that I am TB positive. I thought I would die, I was so afraid…. why am I suffering from this bad disease?" (FGD_02_female_index patient)

Most TB patients and their family members maintained strict confidentiality regarding their disease since they were afraid of social isolation and loss of income. Most TB patients and their family members believe that their community would not accept them if their disease status is disclosed. A TB patient stated,

"I do not tell my neighbors about my disease… if they come to know they will avoid mixing with us… my kids will be stigmatized and cannot play and mix with other kids freely in the community and school."(IDI_female_index patient_29 years)

Similarly, due to the fear of social isolation, a TB patient who is also an imam of the local mosque said that he never disclosed his disease status to the community. Even he was concerned about

losing his status as a religious leader and that people might refuse to pray behind him. A few TB patients also highlighted the unbearable distress associated with stigmatization.

“I can’t express how painful that is when people surrounding me stigmatize me due to disease status….” (FGD_02_female_index patient)

The respondents also pointed out that unmarried girls face serious discrimination. Thus, the parents of unmarried girls feel uncomfortable disclosing their girls’ disease status because of the fear that their girls’ chances of marriage will be seriously affected as well as the embarrassment linked to the socially rooted notion that TB is a disease that should not be disclosed to anyone in the community, thus not with their neighbors at all.

“My daughter is a TB patient…. I really feel bad for her…. she is not married yet. I am worried about her marriage… if people know that she is suffering from TB… it will be difficult for me to marry her off. If my son suffers from TB, I’ll not worry too much about him.” (FGD_08_male_community leader_47 years)

However, a few TB patients also believed that there is no problem if other people know about their disease status. They never shared their disease status outside the family because they believed that it is not worth sharing. They only shared freely when someone wanted to know.

Preventive Practices and Perception of Risk

Although patients, providers, and community members were concerned about TB infection, they all underestimated the degree of risk. Patients and community members also lacked accurate knowledge of standard practices for preventing infection. Compliance with recommended infection control practices was poor among patients and health care providers.

Most TB patients and their families strongly agreed that TB is a deadly disease and that infection control at facilities and home was important. In general, TB patients and their family and community members were aware of and had positive attitudes toward TB infection control practices. While most TB patients, community members, and providers knew that TB transmission is facilitated by crowded conditions and that pulmonary TB is contagious, they also incorrectly associated these conditions with the risk of TB transmission process; in addition, family members’ understanding of susceptibility to TB was poor and perceived a low risk for contracting TB.

TB patients and their family members shared that the primary source of TB infection prevention measures are doctors and service providers at DOTS centers. The respondents appeared motivated to practice preventive measures as advised by doctors/providers. Wearing masks to prevent TB infection was widely practiced just after treatment initiation, when patients visit TB centers, or during hospital stays because of the perception that it can reduce TB infection transmission and protect other family members.

"My doctor advised me to use mask… I am wearing mask regularly even at home. I have a three-year-old daughter. I do not want to spread my disease to my child." (IDI_male_index patient_ 40 years)

However, a few TB patients stated that they discontinued using a mask after a few days because of discomfort while wearing it and to avoid public curiosity as people frequently asked them why they wore the mask. A few of them stopped using mask because they felt it was no longer necessary once treatment had started. Moreover, TB patients and family members also deemed infection control measures at TB facilities unacceptable. A few TB patients and family members revealed

that, although doctors and providers advised them to always use a mask, they never wore a mask, even when they were examining them.

“You know, my doctor always keeps advising me to wear mask, but I never see him wearing one. I get confused observing him…. if TB also discriminate and disproportionately infects only the general public like us but not the doctors… I think he is also at risk.” (IDI_male_TB patient_44 years)

Although most health care providers and physicians demonstrated positive attitudes toward TB infection control practices, they reported that they did not take any necessary preventative approaches while examining and counseling TB patients. However, a few providers stated that they did practice some sort of self-protective practices when dealing with TB patients. The most common practices were keeping their windows open, maintaining a safe distance from TB patients, and avoiding MDR-TB wards of hospitals. Although most providers considered that wearing masks was essential for TB patients, none felt that it was necessary for health care providers. In general, providers did not perceive themselves as a potential target for TB infection. The tendency to systematically underestimate personal risk was more prominent among physicians.

"TB patients must wear masks always. I do not use mask even when I am examining patients… I keep my consultation room’s windows open…. tell me, is it possible to always wear a mask in this hot weather? (IDI_female_provider_33 years)

“I am dealing with TB patients for over 15 years…. I try to keep safe distance from positive TB patients…. avoid visiting MDR-TB wards in this hospital. I think I am fine." (IDI_male_provider_ 42 years)

The understanding of TB risk and related preventive measures was low in general, but a few nurses and health care providers working in MDR-TB wards and DOTS centers expressed worries about their health and safety dealing with TB patients every day.

"I am working in MDR-TB ward… which is very dangerous… the overall working environment is so poor that I’m really worried about myself… I am not sure if I have TB… I had never been screened for TB… if I get infected with MDR… who will take that responsibility?” (IDI_female_ provider_46 years)

Perceptions and Preferred Method of PT

Perceptions of TB Patients, HH Contacts, and Community Members about PT

In regard to PT, TB patients, community members, and service providers had never heard of it. . They were uncertain whether vaccination prevents TB. However, a few providers were familiar with IPT. Only a few community members mentioned that they had family members below age five who were receiving drugs from DOTS centers although they were not TB patients. They heard from doctors that children under five have increased chance of TB infection, and they need to take special treatment to prevent developing TB in the future. Only TB experts, policy makers, and program managers had a clear understanding about the need and importance of PT for Bangladesh. However, most respondents from all categories welcomed the idea of PT considering its beneficial impact on community health in general and child health specifically. TB experts, policy makers, and program managers perceived PT as an effective method of stopping TB transmission and considered it critical to eliminating TB in Bangladesh.

Perceptions about PT

Although TB Patients, HH contacts, and community members had some knowledge about preventive measures, they had no idea of PT. However, a few of them mentioned that they often heard about TB germ prevention from TB facilities/DOTS centers during counseling sessions with doctors and providers and that TB could be transmitted from one infected person to another, especially to their close contacts in HHs. They perceived that there might be some relationship to TB prevention, and thus, PT might prevent infection. Despite having little knowledge about it, most TB patients, HH contacts, and community members demonstrated welcoming attitudes toward PT, assuming that it is beneficial for family members and the community. TB patients highlighted the importance of PT as a useful approach to protect their family from the suffering linked with TB. As one TB patient stated during IDI, his family members will appreciate the idea of prevention because they know the suffering of the disease very well.

“Due to my TB, my children and spouse suffered a lot. I was jobless for couple of months. I was real disaster for us. I want them to stay healthy. I am sure they will also prefer to accept preventive treatment.”(IDI_male_index patient_45 years)

However, a few TB patients noted that it would not be easy to motivate healthy persons without any symptoms to take TB medicines just to keep them healthy. As one TB patient mentioned,

“I think it is better ask healthy persons about this. Some of them might agree to take medicines, some might not. Do we usually take medicines without any health problems? I have valid reason to take. But what about a healthy person?” (FGD_03_male_index patient)

The HH contacts demonstrated positive attitudes toward the idea of such treatment. They appreciated that PT would help prevent TB infection, stop spreading the disease to others, and help them maintain healthy lives. As one HH contact who witnessed the suffering of a few TB patients in her family said,

“You know, healthy life is desirable to all of us. I have seen the sufferings of couple of TB patients in our family. If preventive TB drugs are useful, I’ll prefer to go for that option instead of experiencing such sufferings and causing problem to family members.” (IDI_female_HH contact_age 24 years)

A few HH contacts also thought that remaining healthy is much more important to them and preventive measures could help them stay TB-free.

“Staying healthy is much better than more days remaining sick with TB. I do not want to suffer from TB. I’ll better take medicines to be infection free.” (IDI_male_HH contact_32 years)

Similar positive attitudes toward prevention were also observed in HH contacts.

"If there are medicines that prevent TB infection, I think I would prefer to have it. Because it may spread to others if we don't take preventive measures." (FGD_05_male_HH contact)

Community members (and/or their family members) who never had TB also considered PT as useful to avoid unwanted suffering from TB. However, they also stated that they would accept PT if doctors think taking it is useful. As one community leader stated,

"TB is a problem for us. If taking medicines in advance is useful for people to avoid sufferings from TB, we should consider receiving protect us and community." (FGD_07_male_ community leader)

Alternatively, a few HH contacts and community members also demonstrated strong negative attitudes because they think that taking strong medicine without a good reason is not appropriate. They consider it a misuse of medicines, which should be used only if someone is infected with TB.

"Why being healthy I should take TB medicines? If I have disease, I would happily take medicines, even for 6-12 months, but I'd not have a single dose of medicine if there is no disease." (IDI_female_HH contact 35 years)

Like the respondents in other categories, most service providers from DOTS centers and doctors from TB treatment facilities had no clear idea about PT. Only a few received training on PT from the NTP. They heard that it is appropriate for sputum-positive TB patients' HH contacts because they are the most vulnerable to TB infection. They appreciated it because they think it will reduce the spread of TB infection. Alternatively, most respondents who did not know about it before also appreciated the idea with the thinking that it would help reach NTP's end TB goal by 2030. They also think that community members will receive PT once they were aware of its importance. They highlighted the importance of counselling to motivate people to get PT.

"I think it will be a good initiative to reduce TB burden in our country and people might take it after having proper information through awareness program and counseling." (IDI_female_service provider_40 years)

A few providers also demonstrated negative attitudes about PT, anticipating that it might increase their workload. Although they recognized it might help reduce TB in Bangladesh, they did not appreciate the idea of performing additional work as it would be difficult for them. As one provider at a DOTs center mentioned:

"We already have a lot of work to do. This will put extra burden to us. You know, our salary does not increase with increasing workload. Tell me, is it possible for a person to do too much work maintaining the quality?" (IDI_male_service provider_31 years)

TB experts, policy makers, and program managers considered PT essential for those who have been exposed to TB and to further reduce TB burden in Bangladesh. They revealed that, although IPT is available for children less than five years old with history of HH TB exposure, the uptake is not satisfactory. The PT for the high-risk population over 5 years is not yet available in Bangladesh.

The respondents also frequently highlighted vaccination, preventive awareness interventions, and early diagnosis as prerequisites for preventive measures in Bangladesh. As one TB expert stated,

"Prevention through medicine is one of the steps of the entire preventive practice. There are many other steps of this process like awareness campaign for behavioral change of the general people and TB index patient, and early detection and treatment of TB index patient because it prevents the spread of the germ to other people." (KII_O7_TB expert)

TB experts and managers frequently highlighted the treatment success of Bangladesh. Considering the high risk of spreading TB from every undetected TB patient, they also emphasized the importance of early detection of TB. Along with current preventive efforts, an extensive PT program might help the NTP achieve the End TB goals.

"PT is one of the most important ways forward for Bangladesh. Contact investigation and preventive treatment serve dual functions. In addition to treating for latent TB infection, it also helps early detection of active TB among household contacts of positive TB patients. If we really want to reduce TB incidence further, we must prevent it before an incidence occurs." (KII_02_policy maker)

Although TB experts and managers agreed on the importance of PT, they are worried about the feasibility at the national scale. A few also raised concerns about appropriate regimens, target groups, acceptance by the community, and stakeholders (e.g., NGO workers, public health care facilities, informal health care providers, etc.).

Preferred Method of PT

Most community-level respondents and service providers highlighted that a PT with a shorter duration is essential for better outcomes. They preferred a three-month PT regimen rather than a six-month regimen, and a door-to-door HH contact investigation was considered a more appropriate approach for better uptake and completion of PT.

The regimen most preferred by TB patients and all other stakeholders was a weekly dose for a maximum of three months. Most the TB patients demonstrated their preference for a three-month regimen. They highlighted that their family members would prefer a shorter treatment as they believed that it would be difficult to motivate healthy people to take medicine for a long period. As one index TB patient said:

“Once a week for three months is better; I am sure my family members will not have medicines daily for a long time. In in my case, they have witnessed that I don’t feel good having TB medicines daily.” (IDI_female_index patient_39 years)

However, a daily regimen for up to six months was also acceptable to a few TB patients and community members because they perceived that, with the daily dose, there is less chance of missing medication. On the other hand, they highlighted that, with a weekly regimen, there is more possibility of forgetting the time and date to take the medicine. One patient stated,

“I am on TB treatment and taking medicines daily; my three-year-old child is also taking medicines daily at the same time for TB prevention. If my other family members need to have preventive treatment, they can also have that daily one at the same time, it would not be difficult for us. But, with once weekly dose, there is a chance to forget.” (IDI_female_index patient_28 years)

Most of the HH contacts liked a three-month regimen. Similarly, the community members also preferred a shorter treatment course as better PT. One community member stated,

“I believe, it is more convenient to have a medicine one in a week and it will surely produce less side effects.” (FGD_09_community people)

But a few respondents also said that regardless of the number of doses, taking medicines without any disease for three months is also too long. They mentioned that it would be good if that could be completed in one month with six to ten doses. Some of the respondents also opined for a daily-dose treatment for just one month. A few even mentioned just a single dose of medicine or vaccine as the most preferred method of preventive measure. As one HH contact of an index TB patient highlighted,

“I hate taking medicines even for a single day. It would be better if you give me just an injection for it.” (IDI_HH contact_male_30 years)

Almost all of the service providers and TB experts/manager considered a shorter treatment regimen with minimum doses as the most feasible option for a community-based preventive program. They perceived that people would also prefer only a couple of doses for up to a couple of months

“I think 12 doses for 3 months is more appropriate, a 6-month daily regimen is too much for a person without TB.” (KII_O6_TB manager)

In general, most TB patients and community members preferred a door-to-door service for PT and perceived that their family members might not go to DOTS centers daily or weekly. Timely door-to-door delivery of preventive drug will help people complete the course. A few TB patients also highlighted that the DOTS center can follow the same path to provide PT as they do for TB treatment.

“I am already visiting and receiving my TB medicines from the DOTS center. I can get preventive medicine for my family members during that time.” (IDI_male_index patient_41 years)

The family members of TB patients and community people preferred to get their medicine delivered at home and perceived that this will ensure taking medicines properly. A few also suggested use of local medicine shops as an alternative place to obtain preventive drugs.

Similarly, service providers believed that people would prefer door-to-door service for PT and thought that this would help motivate people to take medicines and help ensure continuation of PT. Providers also expressed their worries about additional workload related to PT delivery, which they consider an extra burden. As one provider mentioned,

"I am giving TB medicines to a good number of TB patients now and observing their modifications directly. If I need to provide preventive medicines for 4-5 additional people in a family, it will be really difficult for me to maintain DOTs. I think, preventive treatment should be provided door-to-door by recruiting new field staffs." (IDI_female_service provider_41 years)

On the other hand, from a program perspective, policy makers, TB experts, and mangers thought delivering PT services through DOTS centers would be easier and cost-effective. However, they also highlighted the importance of considering the community and all stakeholders’ views and preference for PT. They also thought that there should be a service provider responsible for delivering medicines to homes and observe patients taking the medication in person.

“People might be less interested to take preventive treatment… even if interested they might forget to take medicines. A person should motivate people and ensure completion of treatment.” (KII_O3_TB policy maker)

Facilitating Factors and Barriers to PT

The respondents also identified facilitators, barriers, and challenges to implement PT in Bangladesh.

Facilitating Factors

Willingness to Accept Preventive Measures

Almost all TB patients thought that family members might not be interested in taking medicines without a good reason. However, they believed that their sufferings might motivate their family members to accept PT and that they will take that it if counseled properly. The positive views of family members regarding prevention could shape their wiliness to take PT and facilitate PT program implementation.

Compliance with Doctor's Advice

Community members revealed that people usually have a tendency to obey a doctor's advice to stay healthy. Counselling efforts and advice of doctors play an important role for treatment initiation and medication completion. Educated people also highlighted the importance of doctors' interactions and advice. One HH contact of a TB patient said,

"My father is an old person [75 years], he experienced many problems due to TB medicines. If we could meet a doctor, it would be a real help for us. You know, service providers up there at DOTs center are not doctors. They cannot heddle with complicated issues." (IDI_male_HH contact_28 years)

Counselling from DOTS Centers

Service providers at DOTS centers revealed that they counsel patients and their family members about TB treatment, medications, and preventive measures. They observed that people generally follow their instructions. They believed that if counselled properly about the importance of PT, family members might be interested in the idea of PT, which could facilitate implementation of PT.

Mass Media Campaign

Service providers highlighted the role of mass media, such as TV, radio, and print media in successful polio eradication and other vaccination programs. They believed that a similar mass media campaign on PT, including social media, can facilitate implementation of PT as well.

Government's Commitment

Most TB experts and policy makers discussed NTP's End TB goals. They highlighted the high political commitment of the Government of Bangladesh in achieving the End TB goals by 2035. They mentioned that the government is already sensitized and advocating to mobilize resources for PT.

Barriers and Challenges

TB patients and their HH contacts (including non-TB members) identified the costs of services, including travel, diagnostic tests (blood tests, X-rays, etc.), and cost of treatment, as the major barrier to seeking care, including PT. Treatment schedules and lack of interest were also identified a challenges.

Cost of Treatment

The cost of medicines was identified as a key barrier that determined whether people would accept PT. Most respondents considered PT important and demonstrated their interest in taking preventive medicines if they are free of charge, like other TB medicines. One TB patient stated,

"We get free TB tests and medicines from the government, so we take it. If I have to pay for treatment, I cannot afford the cost of long-term medications. Like other TB drugs, preventive treatment should be free for us." (FGD_02_female_index patient)

Most of the service providers also raised the similar concern about the cost of PT. They perceived that the community might not be willing to take this treatment if they have to pay.

"Cost should be determined according to the economic burden of [each] person. If possible, it should be free of cost for poor." (IDI_female_service provider_32 years)

However, only one community leader expressed his eagerness to pay for preventive medicines, emphasizing that only if the cost of treatment is reasonable.

Lengthy Treatment

Most TB patients and community members highlighted their preference for a shorter PT option with minimum doses. Therefore, long duration of treatment might be a challenge for PT implementation.

Distance of the DOT Center

The distance of DOTS centers and costs associated with travel were identified as barriers to TB treatment. Similarly, respondents argued that it would shape uptake of PT as well. In case study 1, children's unwillingness to take IPT medicine, visiting relatives during treatment, the distance of DOTS centers, and the cost of transportation were depicted as barriers to continue taking IPT regularly (actual names have been changed in the text).

Case Study 1. Problems Getting and Taking TB Medicines

Akram is a 27-year-old CNG driver living in Jatrabari, Dhaka, with his wife and five-year-old son Khoka. They live in a 100 sq. ft. room in a tin shed house where they share a bathroom and kitchen with 14 other families living in other rooms of the house. In the first half of 2017, he was diagnosed with TB and started taking treatment from a DOTS center. At that time, he made a living painting walls and furniture. He quit this job because he thought this is how he caught TB. After only two months, when he started feeling better, he stopped taking the medicine. But after several months, in the middle of January 2018, he became sick again. He went to the doctor who recommended that he start TB treatment again.

At the DOTS center, a service provider told him that if he has any children under five, they should be given IPT, after explaining it to him. Khoka was 4 years and 11 months then, so Akram brought him to the DOTS center the following day. Service provider Hashem gave him medicine after measuring appropriate doses for Khoka. The DOTS center usually gives parents enough medicine for 5-10 days. Khoka started taking the medicine daily, but he did not like it and would sometimes vomit immediately after taking it. So his parents smashed the tablets and mixed them with Khoka's favorite foods so he can take it easily. Khoka took the medicine routinely apart from a few disruptions. Once he missed some doses because they went to a relative's house and stayed longer than planned; they did not bring enough medicine for the added days. One time, Akram was told that the medicine was out of stock at the DOTS center, and other times, they simply forgot to give him his medicine. At one point, they admitted to not giving medicine to Khoka for the past 10-12 days because the DOTS center is far from their home and the center does not provide medicine for more than 5-10 days. Although the medicine was free of charge, their travel cost around 120 taka. They are willing to pick up the medicine if it is nearby.

But Hashem said that Akram and Khoka were taking medicine regularly, and that he always had a full supply of medicines and was never stocked out. He also explained that if his stock is out, he looks for medicine at similar nearby centers and borrows for emergency situations. According to the register, there are 10 children receiving IPT from his center. Hashem admitted that there should be more under five children from TB patients' HHs, but because the service is new, there is not a lot of interest yet.

Side Effects

Most community-level respondents mentioned that they heard about the side effects of TB treatment. TB patients and HH contacts expressed their anxiousness about similar side effects that can be a concern for PT implementation. Case study 2 explains the situation in detail (all names have been changed).

Case Study 2. Consequences of Side Effects

Kakoli, a banker, lives in Jatrabari, Dhaka, with her two daughters, Jorna age 13 and Borna age 4. Jorna was diagnosed with TB several weeks ago. Kakoli took her to several hospitals and doctors' offices to confirm the diagnosis and discuss treatment options. Then she went to the local DOTS center for Jorna's medicine. The service provider counseled her about the risk of transmission to her younger daughter Borna and suggested IPT. Kakoli was convinced and took the medicine for Borna. On the second day of taking the medicine, Borna vomited a lot, so Kakoli took her to a private doctor. After the checkup, the doctor said that the dose was high for a child and suggested stopping the medicine, which she did. Kakoli believes that the dose was not right for her daughter because she was vomiting. The service provider explained to her that the dose was accurate and that the vomiting was a normal side effect. But Kakoli was not convinced. Kakoli stopped taking her daughter to the local DOTS center, but she is scared that Borna may get TB as well; she is thinking about taking her to other private doctors for treatment.

Social Stigma

Most respondents expressed that they might be stigmatized just like TB patients because it is hard to explain to people that taking preventive medicine regularly does mean that you have TB. Therefore, they perceived HH contacts will be concerned about the stigma associated with TB and might shape the uptake of PT.

Workload for Local-Level Providers

Although service providers thought PT would be helpful, they expressed their concern about the additional workload due to this new health service. They elaborated that the size of the workforce is not adequate; adding this new service will bring in more clients, but it would be difficult serving all of them properly unless additional manpower is added.

TB experts and policy makers identified challenges and barriers from the program perspective.

Case Detection and Technological Challenge

Most TB experts and policy makers identified case detection as one of the major problems of the TB program and they assumed it will be a major challenge for PT as well. If TB patients cannot be detected, then exposed people cannot be detected. They further highlighted the challenges associated with the expansion of modern technology-based molecular testing facilities across the country. One of the policy makers stated,

"To improve diagnostic accuracy, we need to expand GeneXpert network across the country. But it is not possible for us to set up all of them at a time due to shortage of fund." (KII_01_policy maker)

Financial Barrier

The policy makers and program managers argued that financial barriers would be the biggest challenge for PT. Procurement of new drugs like rifapentine for PT requires a huge amount of funds, for which we are not ready yet.

Lack of Human Resources

Policy makers, TB experts, and program managers also identified the lack of human resources as a major challenge because when HH contacts or other exposed people are included in the program, the number of recipients will increase substantially. It is not possible to provide services to them with the current level of human resources. As one TB expert said,

"Here, the target people will be huge; we don't have that much human resources to provide services to all of them." (KII_03_TB expert)

In addition, more human resources are needed to expand the network of GeneXpert machines.

Motivate Exposed People

Policy makers, TB experts, and program managers mentioned that convincing exposed people to take treatment would be a challenge. Non-TB patients and persons in contact with TB patients would be the target group of the PT program. It is difficult to make someone understand that they will have to take medicine for a long time for a disease that s/he is not affected with yet.

Mobility of Urban people and Treatment Adherence

Respondents also perceived that adherence to treatment would be a challenge because people in urban areas frequently move from place to place and tracking them would be a real challenge for the program.

Lack of Patient Friendly Service

The hours of a service center or doctor consultation might not be convenient for patients, so if they are interested in PT, they might decide against it if the service is not open when they are available. Some respondents identify this as a key barrier.

Convincing Stakeholders

Considering the cost and feasibility of providing treatment to all exposed HH contacts, a few respondents perceived it will be difficult to convince stakeholders to implement the program. As one of them said,

"It would add extra burden if the fund is not available. Also if the fund is available the it would be possible to convince stakeholders to implement the program." (KII_9_TB expert)

Discussion

This qualitative research has generated information on perceptions regarding TB, its infection process, and stigmatization and isolation surrounding a TB patient. The respondents, including index TB patients and their HH contacts in DSCC, expressed their views regarding the facilitating factors and barriers to successful implementation of post-exposure/infection treatment. This study also explored key stakeholders' views on the treatment itself. People involved with providing service and policy making suggested ways for better implementation and improved uptake of post-exposure/infection treatment.

The stakeholders in the study, including patients and their close contacts, are aware of the available treatment for TB. They are also aware of its infectious nature. As in the case of many other infectious diseases, stigmatization is a determining factor in terms of secluding TB patients, making it difficult for them to seek health care and socialize with their community. Stigmatization of people with infectious disease is a historical event by which humans tend to keep their community safe from eradication (31). However, in the modern age, stigmatization is ineffective because of fast and widespread communications and advanced scientific medications that can keep infectious diseases under control, which is manifested in the current study (31). Respondents are indeed afraid of the stigma, but in a supportive environment, they do not hesitate to disclose their disease as they are aware of and eager to receive treatment. However, treatment-seeking behavior of those who believe they might have TB is similar to the behavior found in studies exploring community-based treatment in Bangladesh (32, 33).

In the first stage, patients take medicine for coughing either on their own or consulting with a medicine shopkeeper; if the coughing persists, next they seek treatment from another treatment provider, be it a private practitioner or a primary health care facility, whichever is convenient in terms of cost and distance (32–35). Finally, when the coughing reaches the chronic stage, they seek treatment from a specialized health facility only to find that they have TB at an advanced stage. However, studies found that delay in seeking treatment occurs because of the failure to recognize symptoms and delay in the decision whether to seek treatment and from whom to seek it; delays usually occur in the case of women who often are not in a decision making capacity (36–38). The current study did not explore gender discrimination in terms of treatment, but did find that the fear of stigma, in both men and women, delays seeking treatment from a facility, which will expose them as TB patients.

Regarding prevention of TB, most respondents in the study listed modern treatment followed by covering the mouth when coughing and proper disposal of sputum. Many respondents stated more than one precaution. A few respondents also mentioned cough hygiene, early diagnosis and treatment, followed better nutrition. It was very alarming that, even today, there is a tendency to discriminate TB patients, which was quite evident from preventive aspects of our study as well as others. A good number of respondents talked about isolation of patients and avoiding sharing food; a few listed keeping utensils separate, not smoking, and a nutritious diet as preventive measures.

Respondents have clear ideas regarding the current treatment regimen for TB. Both patients and their caregivers are aware of maintaining safety while interacting with TB patients, completing the course of medication, and the facilities where TB treatment is provided. But when asked about PT, they were completely unaware of such a preventive measure, although once explained, they accepted the idea. However, the idea of taking medication without having any disease or illness did not seem plausible to some respondents because they relate taking medicine with being ill.

Moreover, they are concerned that having medicines to prevent TB at a health facility will falsely label them as TB patients in the community. In this regard, service providers, non-TB patients, and caregivers all agreed that door-to-door service by health workers would be a suitable solution to this dilemma. On the other hand, several respondents in the caregiver or close contact categories opined that the prevention course should be of short duration to make it easy to adhere to and for which they suggested a three-month course with once a week dosage. Service providers also expressed similar views that short duration of medication would increase adherence to PT.

However, service providers and policy makers are concerned with the fact that the medication service will require additional health human resources. The government health system of Bangladesh is going through an acute crisis in human resources (34, 39, 40), resulting in those of low socio-economic status seeking care from untrained treatment providers in villages, homeopaths, and shamans or magic healers (40). Such reliance often puts the health of the population at serious risk; for example, village treatment providers are giving antibiotics to TB patients who seek treatment from them as their first choice. Such untrained providers, although popular in rural areas, put lives in danger and hamper the TB control program in reaching universal coverage (40). In such a context, the PT of TB, a disease often associated with secrecy and ostracism, requires resources in terms of manpower and technology along with appropriate strategy to cope with the reality of the disease. Besides, evidence from the current study shows that the mass media can play a vital role in building awareness among intended groups of the population. For a successful implementation of preventive measures, opinions from both providers and those on the receiving end are needed, and this is where the current qualitative study sheds light.

Strength and Limitations of this Study

All interviewers were trained anthropologists who also did transcriptions and contributed to analyses and writing. It was important to consider not only what respondents said, but to bring the context into the analyses. Multiple qualitative tools were used to validate and triangulate answers provided by those interviewed. Representation for each category in terms of age, sex, education, profession, etc., was ensured when selecting respondents for each category.

There were few limitations identified in the implementation of this study that would open further opportunities for investigation in the future. As the study aimed to explore experience and practices of those living in Dhaka’s urban area, TB also exists in other parts of Bangladesh, including rural communities. Similar research in rural areas should help broaden the picture at the national level. Interviewers had to explain PT to respondents; because this intervention has not yet been put in place, respondents’ comments were hypothetical. Further research can be initiated after the intervention to explore the community's practice and experience.

There were some challenges in recruiting participants, especially to include the views of both genders. While it was identified that willingness to pay for PT in general exist it was also identified the need to conduct a more systematic assessment by applying specific survey tools in the future.

Conclusions and Recommendations

The study demonstrated the need for instituting a collaborative integrated PT program, providing awareness interventions, increasing human resources, training service providers, and providing free treatment.

Most respondents at the community level had no knowledge of PT. Service providers and experts' knowledge is not very clear about PT. Therefore, before implementation, it is important to make people familiar with PT. Arranging seminars, symposiums, and workshops with all levels of stakeholders and sharing knowledge on PT will be an effective way to familiarize stakeholders and make them understand the importance of this issue. Also, raising awareness among service providers on person-centered PT should be a priority item for effective implementation of the program.

Community awareness is not up to the mark. Awareness programs will be important to sensitize the community on this service. Mass media (TV and radio), social media (Facebook), billboards, posters, and leaflets can raise awareness. Making TV commercials with popular public figures can make PT more acceptable to people. Local awareness programs, such as community meetings, street drama shows, and local influential people, such as community leaders, religious leaders, local doctors, and health service providers can explain PT and its importance and will be an effective way to sensitize community members.

Local service providers agree on the importance of PT. However, they are anxious about the extra workload for them. They are already short on staff, and sometimes lack adequate training. Therefore, it is essential to recruit new staff, specify their work, and provide training for for building their capacity for successful PT programming.

Many people go to health facilities at different levels for treatment, such as government hospitals, private hospitals, health service centers, clinics, private practitioners, and medicine shops. Therefore, they need to be involved in the program from the beginning.

The government, NGOs, and private sector are already working together in different TB control programs to eradicate it. Without collaboration with them, it is not possible to start PT implementation. Collaboration between different stakeholders needs to occur for successful implementation.

To make PT more acceptable to providers and the community, it is important to include PT in the operational plan of the NTP and update necessary guidelines. There is a need for developing an integrated implementation plan involving the government, NGOs, development partners, professional bodies, and private and local bodies to have a clear understanding of what is going to happen next.

It might not be possible to provide treatment for all exposed people at the same time. Therefore, it is urgent to prioritize high-risk populations for PT intervention. In that case, select urban populations, especially slums, garment districts, and prisons, should be prioritized.

Instead of launching into large-scale implementation at the outset, a pilot program should be conducted and lessons learned incorporated into the design of a large-scale implementation.

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