sw&s | Social Work and Society International Online Journal

# Preventing and Controlling Tuberculosis through Village Adoption Model in Koppal District of Karnataka: A Case Study

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**Abstract & Keywords**: The Indian government aims to eliminate tuberculosis (TB) by 2025 due to its high morbidity and mortality. India has much to do to lower TB rates. This research examined Koppal district of Karnataka, South India's village adoption model for tuberculosis detection, treatment, and prevention. The authors used an exploratory research design. After a screening process, the participants comprised 8 TB patients and 13 healthcare workers were recruited from the Koppal district through purposive sampling technique. A total of 21 semi-structured interviews were conducted among these selected beneficiaries and health professionals. Conventional content analysis was used to analyse the data obtained from the interviews. From the analysis, seven themes emerged from the health care workers and eight themes emerged from the beneficiaries. The major themes from the beneficiaries included critical roles in project management, private practitioners' reactions, healthcare workers' implementation experiences, initiatives beyond project staff, execution challenges, strategies to overcome them, and reasons for non-use. From the health care professionals, main themes were their experiences, process insights, patient emotions, programme services, beneficiaries' dislikes, suggestions, satisfaction, and thoughts on expanding the initiative to other regions. The Koppal District village adoption model was helpful in understanding private-sector dynamics and patient preferences. The project helped health professionals and communities promote TB knowledge, treatment adherence, and the TB agenda. Finally, this technique made Koppal district in Karnataka, India, TB-free.

**Keywords**: Tuberculosis; Village Adoption Model; Prevention; Control

## INTRODUCTION

To date, one of the deadliest diseases in the world brought on by a single infectious agent is tuberculosis (TB) (Moualeu-Ngangue et al., 2015; WHO, 2018). Mycobacterium tuberculosis (MTB), the bacteria that causes tuberculosis (TB), can be expelled into the air when an infected person coughs, talks, sneezes, or sings (Centers for Disease Control and Prevention, 2016). MTB generally affects the lungs of infected individuals in most situations. Due to the extreme contagiousness of tuberculosis, individuals who are vulnerable may contract the disease even if they inhale tiny particles containing MTB. The immune system is an essential defense mechanism that limits the growth and spread of MTB. If the immune system cannot suppress their growth, they will most likely spread throughout the body (Castillo-Chavez & Song, 2004). In fact, not all people infected with TB will be sick at once. Some people's incubation period may last from 1 year to several years. Nowadays, reliable TB tests do not exist (WHO, 2018), which causes many undiagnosed infections and increases the difficulty in controlling TB.

Every year since 1997, the World Health Organization (WHO) has published a Global Tuberculosis (TB) report, which provides an up-to-date assessment of the Global TB

situation, and summarizes progress and efforts in prevention, diagnosis, and treatment of the disease, at country, regional and global levels (Chakaya et al., 2021). WHO's Global Tuberculosis Report 2022 showed that, an estimated 10·6 million people became ill with tuberculosis in 2021, compared with 10·1 million in 2020, and 1·6 million people died from tuberculosis in 2021 (including 187 000 individuals living with HIV), compared with 1·5 million in 2020 (including 214 000 individuals living with HIV). In addition, the incidence rate of tuberculosis increased by 3·6% in 2021 relative to 2020, suggesting a reversal from the trend of nearly 2% decrease per year during the past two decades (Bagcchi, 2023).

It was reported in the Global Tuberculosis Report 2018 that people may be infected with TB in all countries and age groups, but overall, 90% were adults (aged ≥15 years), 9% were people living with HIV (72% in Africa). Most cases happened in the following eight countries: India (27%), China (9%), Indonesia (8%), the Philippines (6%), Pakistan (5%), Bangladesh (4%), Nigeria (4%), South Africa (3%). WHO listed all of these countries and 22 other countries as the top 30 countries with the high burden of TB, which account for 87% of the world's cases. On the contrary, the global cases of the WHO European Region (3%) and the WHO American Region (3%) account for only 6% (WHO, 2018).

According to the reports in India, TB inflicted 2.64 million people in the year 2019 that had led to the demise of approximately 450,000 people (Shrinivasan, Rane & Pai, 2020). This indicates that there had been close to 1000 reported deaths each day. India has faced the highest cases of TB in the world, with the number of people affected being 10 million, and the death toll has correspondingly risen to a staggering 1.4 million every year (WHO, 2020). The Indian government wants to end TB by 2025 owing to its high mortality and morbidity (Singh and Kumar, 2019). Globally, extra Pulmonary TB (EPTB) accounts for approximately 15%–20% of all TB cases, though this proportion varies by region. India, with its high incidence of TB, shoulders a considerable burden of EPTB. The Nikshay platform reported over 2.4 million TB cases in India in 2022, with EPTB constituting 24% of these cases (India TB Report 2023).

The TB management plan of a high-incidence nation tries to minimise transmission. Understanding infection risk and disease progression helps reduce TB. Infection risk following TB exposure depends on baseline infectivity, proximity to contact, and social and behavioural risk factors such smoking, drinking, and indoor air pollution. Most individuals have diabetes, alcohol, malnutrition, smoking, and indoor air pollution, which exacerbate TB (Narasimhan et al., 2013).

The government regulated tuberculosis for about 50 years. Indian authorities established the National Tuberculosis Programme in 1962. Unfortunately, the desired impact failed. After assessment, a 1993 pilot plan created the Revised National Tuberculosis Control plan (RNTCP). Only 2% of the community knew about it by 1998. RNTCP blanketed the country by 2006. Despite challenges, RNTCP has made great strides in the last decade (Singh & Kumar, 2019). The 2012–2017 National Strategic Plan for Tuberculosis Control seeks "universal access to high-quality TB diagnosis and treatment for all TB patients in the community." The NSP 2012–2017 implemented mandatory TB case notification, programme integration with health care services (National Health Mission), diagnostic procedure development, PMDT service expansion, single-screen TB-HIV service, nationwide drug resistance surveillance, and revised partnership guidelines. Indian Health Portal (National Tuberculosis Elimination Programme).

Being the world's largest contributor to the burden of tuberculosis (TB) including drug-resistant TB (DR-TB), accounting for 27% of the global estimated people with TB, India is on a commitment to achieve the Sustainable Development Goal (SDG) targets for ending TB on an accelerated timeline by 2025 (WHO, 2023). The National TB Elimination Programme (NTEP) of India released a National Multi-sectoral Action Framework for TB-Free India 2019, which aims to achieve end TB goals by mounting an accelerated and comprehensive multi-sectoral response. This framework emphasized that ending the TB epidemic is a 'whole-of-society struggle' rather than a health sector struggle alone (Ministry of Health & Family Welfare, Government of India, 2019).

Indian authorities want to end TB. India still has a long way to go to eliminate TB (Thakur et al., 2021). While famous for its historical landmarks, the Koppal district in Karnataka has recently been gaining popularity for its efforts in eliminating tuberculosis. In 2018, 1200 missed cases were identified in this district. An important intervention that the Koppal District TB office implemented recently to reduce these figures and improve TB care in the district has been the TB free village adoption model. TB free village adoption model is an initiative to improve community participation by involving private practitioners. The main purpose of this initiative is to detect-treat-prevent TB with the aim to eliminate the disease in the respective villages. Community intervention includes patient follow-up, awareness, marginalised and remote group work, screening, detection, counselling, treatment, and recovery. This methodology uses clinic tuberculosis patients to involve the village in awareness, detection, treatment, care cascade completion, and private practitioner recruitment (How Koppal District in Karnataka Is Fighting TB Using the Village Adoption methodology, 2020). Hence, the present study tried to examine how Koppal, Karnataka, South India's village adoption model is helpful for TB diagnosis, treatment, and prevention by employing a case study approach. It also tried to explore from the perspectives of both beneficiaries (TB patients) and the health care providers involved in this model.

## METHOD

### Study design

This study utilized a case study methodology to explore the Village Adoption Model in detail within a real-life context. A case study is a research approach that involves an in-depth, detailed examination of a subject within its real-life context. It is particularly useful for exploring complex phenomena where multiple variables and their interactions are involved. The Village Adoption Model for TB prevention and control in the Koppal district involved multiple stakeholders like TB patients and health workers, diverse activities, and varying impacts. A case study allowed for a comprehensive understanding of these components and their interplay in a specific setting. By utilizing a case study methodology, this study was able to offer a rich, nuanced understanding of the Village Adoption Model's impact on TB prevention and control in the Koppal district, capturing the complexity and context-specific dynamics that influence its effectiveness. This study also utilized the Descriptive and Exploratory research design. Combined descriptive methods to illustrate the current situation and exploratory methods to understand the effectiveness and challenges of the model. Combining descriptive and exploratory methods allows for a thorough examination of both the current implementation and the deeper factors affecting the Village Adoption Model's effectiveness. Also, to examine how the village adoption model in Koppal district of Karnataka was useful for preventing and controlling tuberculosis. It was explored by studying the perspectives of both beneficiaries and health care providers related to this model or

project. Exploratory design along with case study methodology was well suited for this study because it is conducted to investigate Koppal village adoption model for elimination of tuberculosis which has been under-investigated, or is otherwise poorly understood.

**Participants**

TB patients and health care providers were selected from the Koppal district of Karnataka through purposive sampling. After screening, 21 participants who had given consent for participation and met the inclusion criteria were recruited for semi-structured interviews. Out of the 21 screened participants, eight were beneficiaries of the project and 13 were health care providers associated with the project.

Those diagnosed with tuberculosis and aged 18 or above and have received treatment and benefited from the village adoption model were selected as the respondents of the study. Health care workers participating in the village adoption model were also considered for the study. Health care workers included either Asha workers, doctors, treatment supervisor, tuberculosis health visitor, AHF, senior treatment supervisor, junior health assistant, ANM, private practitioners etc.

**Data collection tool and procedure**

The study was thoroughly explained to the chosen participants, and a convenient time for the interviews was decided. Interview schedule was prepared in advance. It consisted of socio-demographic information and 32 open-ended questions. Each interview lasted approximately 21 minutes. The entire data collection was conducted from June to September 2020.

Healthcare workers: The researcher alerted the district TB control officer of the study's goal and sought an interview. We contacted them after gathering healthcare worker information. After obtaining informed consent, the researcher briefly discussed the study and participant rights. Interview guide included questions on the concept of village adoption for TB elimination. With the permission of the participants, the researchers recorded the interviews and transcribed them for further analysis.

Beneficiaries: The investigator gathered TB patient data from healthcare workers. Semi-structured interviews were prepared for study. We obtained informed consent and advised individuals of their right to reject to answer questions or quit the study. Investigators recorded the interviews with the permission of the participants and transcribed interviews.

**Data analysis**

The data obtained from 21 semi-structured interviews were analysed using the conventional content analysis method (Hsieh, & Shannon, 2005). The audio recordings were transcribed and translated to English by the investigator. The following steps were taken to analyse the data using conventional content analysis: Carefully reading the transcripts to grasp all of the minute details, Identification of meaningful units from transcripts, Generation of primary codes, categorizing the primary codes into categories, Formation of sub-categories from categories, Writing the report clearly and convincingly, explaining the stories based on the data analysis. The following ethical considerations have been followed in the current study. Informed consent was obtained from the participants. The participants were educated about the purpose and importance of the research. The participants were informed about their rights and informed that their responses won’t be disclosed to anyone and complete confidentiality would be maintained. They were also assured that their identity would not be revealed and the

data collected would be used for the sole purpose of the study only. They were also informed about their right to express their discomfort whenever they feel and could withdraw from the study at any point of time.

**Results**

| **Participants** | **Categories** | **Sub-categories** |
|---|---|---|
| Healthcare workers | Critical roles in Project Management | ● Asha workers<br>● Treatment supervisor<br>● TB health visitor<br>● AKF<br>● Senior treatment supervisor<br>● Junior health assistant<br>● ANM<br>● Private practitioners |
| | Private practitioners response | ● Cooperation and support<br>● Referring cases<br>● Following the law<br>● Convincing tb patients |
| | Experience of healthcare workers in implementing the program | ● Happy about the program<br>● Model yields good result |
| | Initiatives apart from project staffs | ● Support from others |
| | Challenges faced in implementing the project | ● Preference for private hospital<br>● Difficulty in implementing the program<br>● Doing for Financial gain<br>● Stigma<br>● Lack of support<br>● Problems in urban areas as population is high |
| | Strategies used to overcome the difficulties | ● Induce threat<br>● Holding RMP doctors to refer patients |
| | Reason for people refusal to use program services | ● Patients believe Asha workers do it because they make money. |
| Beneficiaries | Experience of beneficiaries | ● Gained health benefits<br>● Saving expenses<br>● Good experiences and services |

| | | |
|---|---|---|
| | | ● Normal social interaction |
| | Insights during the process | ● Normal social interaction<br>● Helpful and good |
| | Emotional experiences of patients | ● Support from others<br>● Discrimination<br>● Feelings of patients and family members |
| | Services received through the program | ● Nutritious food<br>● Health check-up<br>● Awareness programs |
| | Beneficiaries dislikes about the program | ● No issues |
| | Recommendations by beneficiaries | ● Implementing the program nationwide |
| | Beneficiaries satisfaction | ● Feeling good and satisfied<br>● Helpful & good effort<br>● Provides necessary services |
| | Beneficiaries' opinion on implementing the project to other state/ country | ● Implement across states<br>● Awareness classes |

**Health Care Providers**

The analysis of the interviews presented 7 main themes:

- Critical roles in project management
- Private practitioners response
- Experience of health care workers in implementing the program
- Initiatives apart from project staff
- Challenges faced in implementing the project
- Strategies used to overcome the difficulties
- Reasons for people's refusal to use program services.

These themes demonstrate the process that has been involved in controlling TB and have been illustrated using direct quotes from the interviews.

**Theme 1 - Critical roles in project management**

Each health care professional had different project management duties. Subthemes include Asha worker, Doctor, Treatment supervisor, Tuberculosis Health visitor, AHF, Senior treatment supervisor, Junior health assistant, ANM, and Private practitioners.

**Asha workers**

ASHA workers, trained female community health advocates, will represent the community to the public health system. Monitoring symptoms and recommending patients were priorities for most participants.

> "...we have asked to observe symptoms like cold, cough, asthma, and fever, refer those patients to sputum tests, and give them tablets daily," stated participant CH.

Another participant, VL, stated as follows:

> "...We will provide TB tablets, care for their health, and force them to take tablets in front of us."

Both participants said ASHA workers' main job is to recognise symptoms, report them to higher authorities, make sure they take their pills, and attend higher health officials' awareness events.

**Doctor**

According to the responses, doctors' sole responsibility is to identify TB patients.

> "...My work is identifying TB patients....in a village there should be no TB cases and no side effects due to medication...that is the main goal...we sold catch TB cases is the main thing," said participant ND.

The main goal of the village adoption model was to reduce the number of missed TB cases and improve TB care in the district, as evidenced by the participant's response.

**Treatment supervisor**

Treatment supervisors are crucial to project management. An education, training, or experience-based treatment supervisor may examine a client's or patient's psychosocial history to identify the best treatment approach. A therapy programme will choose this individual. KBN member says treatment supervisors need to

> "...highlight the people in the society or community who require any health care, and we will arrange appropriate facilities for them."

Separating patients by financial stability and recommending them to private or government hospitals is the treatment supervisor's exclusive job since each patient's financial status is unique.

**Tuberculosis Health visitor**

Finding the greatest expert, Educating physicians on WHO-recommended TB therapy and side effects (CME), urging them to identify patients, TB health visitors helped administer the project by promoting the free treatment and recommending patients from private hospitals.

> "...In the hamlet, we picked the best doctor. We've urged others to refer patients and provide complimentary services. We held a hotel-based TB load and implications CME for private doctors. Many doctors make 50-60% prescribing drugs. Medication resistance and sensitivity determine TB medications. They will irresponsibly provide drug-sensitive drugs. A contract-based nucleic acid test detects primary TB and tablet efficacy in one shot.At roughly 4000/-, the government will handle everything. We will test and deliver WHO-recommended drugs, but the private sector will sell harmful steroids and irrational drugs. The prescribe a month's supply of treatment without alerting patients they have TB. Patient will assume they gave 1500/- for a month of medicine. The consumer won't return next month. He will consult and get the same drug when symptoms return, continuing the cycle. Private hospitals oppose drugs. Though we approached them earlier, they now provide us the most cases." participant MK

**AHF**

Non-profit AHF treats nearly 1,000,000 patients in 43 countries with cutting-edge medicine and advocacy. AHF supports its cure-AIDS aim via pharmacies, thrift stores, healthcare contracts, and other partnerships. Innovative treatment, prevention, and advocacy have made the foundation effective.

The participant MDC, stated the role of AHF as,

> "...We are conducting an AHF survey, checking sputum and blood, and we will survey the listed suspected patients prepared by Asha workers, we will refer them, we will notify the president of the women's association if anyone is not responding to us so that they can be educated, and we will raise awareness through campaigns."

This foundation's only job is to check the survey list of suspected patients, contact the women's association president if someone doesn't react to health care personnel, educate individuals who reject treatment, and test sputum and blood.

**Senior treatment supervisor (STS)**

Due to their education, training, or experience, senior treatment supervisors may evaluate a client/psychosocial patient's history to decide the best treatment strategy. A therapy programme will choose this individual.

From the perspective of the participant NG, the role of STS is mentioned as;

> "…Because there will be poor people who will not believe us, private doctors have adopted villages. People will believe them, and practitioners will persuade and motivate them. Practitioners will ask patients to be tested for free, and if there is an issue, we will treat them for 6-9 months or 18-22 months, depending on their health."

The participant said the senior treatment supervisor must call private physicians to refer to the programme, promote free services, and create patient-specific treatment plans.

**Junior health assistant**

Healthcare Assistants help patients in hospitals, nursing homes, and at home. They help patients with everyday tasks, check vital signs, and support nurses.

> "...We know patients and people, we have to motivate them about nutritious food and give them awareness about symptoms, we need to motivate them and educate the public."

Said participant YSD.

The participant said the junior health assistant's key duties include identifying patients, raising awareness of tuberculosis symptoms in the targeted community, conducting awareness programmes, motivating patients to eat healthy, and encouraging preventive measures.

**ANM**

In India, auxiliary nurse midwives are female local health workers who are the initial point of contact with health services. Their services ensure local populations get safe and effective treatment. The participant SV describes ANM's importance as,

> "…Detecting tuberculosis cases early, reporting and treating them immediately, and providing tablets to children. KSPTR has pledged to eradicate tuberculosis by 2025. There are two people in charge of this programme here, and we will give ECS twice a month, and we will have a preventive list and a suspected list, from which we will refer cases. We will refer sugar cases, children, and those who have had a cough, cold, or fever for a long time for a quantum test, and now they are direct x-ray, so we will educate their families about hygiene and motivate them to seek treatment."

Detecting-treating-preventing tuberculosis (TB) in communities is the goal. Community interventions promote awareness, outreach to poor or remote groups, screening, detection, counselling, treatment, and patient follow-up till cure.

**Private practitioners**

The private practitioner-led TB free village adoption model engages communities. Private practitioners tout their freedom. Private practitioners and local leaders adopted a hamlet, hosted TB awareness programmes, and provided health and tuberculosis screenings.

> ".... They must come here and adopt the village and persuade the people... They will be out of commission for two days. They must arrive a day in advance. They must inform leaders and remain on site the following day... They must raise public awareness... We will educate people about the disease... They will have a general check-up as well as TB testing."

The critical role of private practitioners is evident from the response of the participant NG.

**Theme 2 - Private practitioners' response**

The private practitioner-led TB free village adoption model engages communities. Private practitioners and the public sector in the TB programme interact poorly due to lack of coordination, preconceived assumptions, biases against the private sector, and creative methods. This adoption concept attempts to overcome these care cascade gaps and enhance

TB care for rural health seekers. Cooperation, aid, recommending cases, lawfulness, and TB patient persuasion are subthemes.

**Cooperation and support**

Although Asha workers and other authorities' services are limited, private practitioners have been helpful and supportive throughout the scheme, which has helped the adoption model succeed.

SHM, the participant, responded as follows:

> "... They are cooperative, and there is a private scanning hospital that is assisting us, maam."

The replies show that private practitioners were cooperative and supportive, which helps the model solve private practitioners' deficient public sector engagement.

**Referring cases**

The participant, KBN, stated that private practitioners are referring patients due to the gravity of the situation.

> "...After giving information about the requirements and effects of this disease and what kind of treatments should be given to them by doctors, private hospitals are referring patients to us, and they are responding well."

It is evident that the aim of the model, which is to reduce the number of TB cases and improve TB care in the district, is achieved through referring patients.

**Following the law**

MK described the private practitioners' response as follows:

> "...There is a notice from Central Government...on that order basis, we had sent them a letter...we did not request them... We said you had to come. We took the letter, and it is also their responsibility.... They will arrive. Nobody will come if there is no rule."

Developing certain rules and regulations is effective in the TB control model, visible from participant response.

**Convincing TB patients**

Private practitioners provided both negative and positive responses, as reported by PK.

> "… There will be two responses..... Few people speak positively, and even fewer speak negatively.... I approached 5-6 people.... In that two have helped me... Shivanagouda Patil has supported me because he has asked me how many villages he needs to take..... In the beginning, he had taken one village... I said there are ten villages there, and they will be happy to serve others.... He then took another one. He also provides nutritional support to another 9 villages... Others haven't said no, but they have said they will think about it and will avoid it."

The private practitioners had persuaded the patients to stick with the programme until the end.

VL, a participant, stated.

> "…Some outpatients will go to them without informing us and private hospitals will tell them and convince them that medicines will be costlier. It would be better if you are taking treatment in government hospitals and they refer those cases to us."

Participants said authorities tried to connect private and government practitioners. Private practitioners supported and contributed to the concept and persuaded patients throughout the initiative.

**Theme 3 - Experience of healthcare workers in implementing the program**

Participants' programme implementation experiences were mixed. This Koppal District practises has helped grasp private sector dynamics and patient preferences.

**Happy about the program**

The majority of health care workers were pleased with the model's operation and stated that it produces good results in the control of tuberculosis.

> "...I feel happy if we are helping others, and they said I would die, but you've protected me, and if they are happy because of me, then I'll feel happy. I'll be happy to be in this line of work and I believe that tuberculosis should be eradicated so that we do not have a single case in our area."

Participant LB stated

The health care workers expressed their happiness and satisfaction in implementing the program as the program was beneficial to TB patients greatly.

**Model yields good result**

The village adoption model yields good results than expected.

> "...In my opinion, this model will give good results, and I feel that we should form teams and provide information about this disease to the people because a single person cannot do all the work, so we should motivate people about it,"

SV said.

> "...Health care staff knew that if everyone helped patients, the town could eliminate TB. They were pleased that the model was helpful and that they could find a new meaning in their job."

**Theme 4 - Initiatives apart from project staffs**

**Support from others**

Aside from project staff, other initiatives include family support, higher-ranking officials, and others.

> "...Patient's mother and wife will support us ma'am; aside from them, nobody will support us ma'am."

CH said

The participant KBN responded as,

> "...there is a village called Alagundi, and in that village, we've received a positive response from all villagers, local leaders, Panchayath members, youth committed, organisations, and even from the swami of matha to fight TB at the village level, so we are planning to conduct a programme, and you can come and see ma'am, and you can take help from me through my mobile number."

VL said,

> "...Local leaders and youth are behind us, and we're bringing a counsellor to persuade them that we're doing this programme for the betterment of all."

Few participants, such as MDC, responded that they had received no support from anyone other than project staff;

> "...No one has come forward until now, ma'am." "Asha workers are working well, and we are doing our duty. We will have more work, and we can't focus solely on this project, so it would be better if they would give incentives of 5000 rupees, and we are getting a salary of 10,000 rupees, so it is less."

Participants said PPM coordinators, Asha workers, anganwadi instructors, health workers, NGO, village Panchayath members, authorities, and family members supported the 'END TB' approach. Everyone helped improve TB care.

**Theme 5 - Challenges faced in implementing the project**

Patient preference for private hospitals, difficulties in successfully implementing the programme- patients do not comply with medications, convincing patients to adhere to medications, people think health workers do this because they receive money rather than their own health benefits, the stigma makes them refuse to deliver tablets to their homes, lack of support, reluctance for consultation, rejection from people, problems in urban areas due to high population.

**Preference for private hospital**

The participant CH responded as,

> "...The problem is that, even if we motivate them, they will claim they would go to private hospitals and reject treatment at government hospitals, and they will take medicines for 2 or 3 months to look to take them, but they will lie and not take them. They should contact us if they have any symptoms so we can help them, and we will take their sputum with us even if we have to go to their house. Some will not respond, and some will ask what you will get for doing this work, failing to recognise that it benefits them. They will state that you come to our home everyday since you're making money and that you should take care of yourself and your family before departing."

The findings show individuals prefer private hospitals over public ones. Private hospitals are pricey, but their high-quality services, such as lower wait times and personalised care, have made them popular.

**Difficulty in implementing the program**

As patients don't comply with the program, healthcare workers find it difficult to implement the program. The participant CH responded as;

> "...It is too hard because even though you motivate them, they will say that they will approach private hospitals and won't take treatment in government hospitals. They will also take tablets for 2 or 3 months, so they will act like they are taking tablets, but they won't take tablets."

**Doing for Financial gain**

People think that health workers do this because they receive money than their health benefits.

> "…Some will say, what will you get for doing this work? And they won't understand that it is beneficial for them. They will say that you are getting income from this, so you are coming to our house daily, and they will say, take care of you and your family and leave us."

Mentioned CH.

**Stigma**

The participant YSD stated that the added stigma causes them to refuse to deliver tablets to their homes;

> "...Few patients will tell us that they are young and no one will marry them and they will say things like 'do not come near us and then we will give health education and contact them via phone call...."

**Lack of support**

One of the significant challenges encountered from LB's response was:

> "...some people will be telling us that we will get cough and cold regularly and don't check us, but now they've taken treatment and recovered, and they will suggest others if they are having cough and cold and they will give contact numbers with them."

**Problems in urban areas as the population is high**

The participant MDC responded as;

> "...We have problems in urban populations, and they will go to private hospitals, which are more numerous, so they will refer cases, but our higher authorities will say you are not doing your job well and we will not get sputum in time, so we have to collect it from the patient's home with one person and DG. We may recommend patients twice. Working in the countryside is better than working in the city because affluent people

> won't come to us; they'll visit private physicians and have symptoms but won't register their name in their pregnancy and seek private treatment for TB."

The initiative was tough, but health professionals informed TB patients from the clinic and conducted active campaigns in villages for awareness, case identification, and treatment adherence to complete the cascade of care.

**Theme 6 -Strategies used to overcome the difficulties**

Due to these issues, healthcare workers developed methods to treat everyone and overcome other obstacles. Instilling fear, asking RMP physicians to send patients, recruiting one person and the DG to collect sputum, training them to utilise services, awareness activities to convince, and alerting the Asha ward in charge are tactics.

**Induce threat**

Through instilling fear in people the health workers were able to overcome the challenges and achieve the aim of the model.

> "...When we tell them that if you take tablets, you will live, and if you aren't, who will take care of your family after your death, they will follow our instructions."

CH stated.

**Holding RMP doctors to refer patients**

Holding RMP doctors to refer patients is considered a way to deal with the challenges faced by the health workers. MK responded as;

> "...Our community will reject us. Happens everywhere. Just stating, "If you have these symptoms, come and get tested," won't help. Villagers will hear RMP. We must inform them that you are practising illegally and will be here if you refer patients, or we will contact the authorities."

**Taken help from one person and DG to collect sputum**

As people are reluctant to get treatment, the health workers collect sputum from patients' homes with the help of one person and DG. According to MDC;

> "...Our expanding urban population will go to private hospitals, which are more numerous, and refer patients, but our higher authorities will say you are not fulfilling your duties appropriately and we won't have sputum on time. We must collect sputum from the patient's residence with one person with DG's help. We can suggest folks twice a month."

**Educating them to avail services as a way to deal with the problem**

Educating patients and conducting awareness programmes to avail services were two of the strategies used, according to participants YSD and VL;

> "...Very few patients will tell us they are young and no one will marry them, and they will say, 'Do not come near us,' and we will notify authorities with their backing, and they will take the medications, and we will give health education and call them..."
>
> "...After this corona, they believe that if they give sputum, we will do corona tests and put them far from home, so they are not willing to undergo sputum tests, and we are not getting enough referrals, and if we refer sputum, we will get a salary, so our higher officers, such as area-wise counsellors, have called a meeting to arrange awareness."

According to the participants' responses, health workers are attempting to detect tuberculosis early, provide holistic treatment to those in need, and advocate for the prevention of infection spread.

**Theme 7 -Reason for people's refusal to use program services**

**Patients believe Asha workers do it because they make money.**

The main reason people refuse to use programme services is that they believe Asha workers do it for financial gain.

Participant CH responded as;

> "...Please contact us for help and sputum collection if they have any symptoms. They are unresponsive when we collect sputum at home. Some may wonder what you'll obtain and why this effort is important. They'll say you're making money, so you come to our house every day to take care of yourself and your family and leave us."

Participants said that a lack of understanding, education, and stigma around TB prevents individuals from obtaining treatment and that health care providers benefit by pressuring them to seek treatment.

**Beneficiaries**

The analysis of the interview presented 8 main themes.

- Experience of beneficiaries
- Insights during the process
- Emotional experiences of patients
- Services received through the program
- Beneficiaries dislikes about the program
- Recommendations by beneficiaries
- Beneficiaries satisfaction
- Beneficiaries' opinion on implementing the project in another state/ country.

**Theme 1 – Experience of Beneficiaries**

Village members benefit from the model's community-level awareness, outreach to marginalised or remote groups, screening, identification, counselling, treatment, and follow-up till patient recovery. Subthemes include health outcomes, savings, pleasant experiences, and social engagement.

**Gained Health Benefits**

Over a million individuals die from TB annually. Medical treatment cures TB. Village adoption aims to diagnose, treat, and prevent tuberculosis (TB) to eliminate it in communities. Participant RJ responded as;

> "...It is good ma'am because they are taking care of us and sometimes we had problems getting tablets because they were expensive, but now we are getting those tablets to our house, and Asha workers have done their job well... Our bodies will be weak until we are adjusted to tablets, and there will be some side effects, but I am now adjusted to medicines."

AN responded;

> "...As a TB patient, I feel better because we wouldn't get tablets properly, so now it is helpful because they are providing tablets to our place and they are concerned about our health, so I feel good."

From the participant responses, it is clear that the patients are getting health benefits from the village adoption model.

**Saving Expenses**

The participants could save money because the medicines were completely free and easily accessible.

> "...We are taking tablets, and we are healthy; they are giving tablets to our house, and it is beneficial and will save our expenses." said participant AY.

**Good services and experiences.**

The village adoption model is meant to provide people in need with good services and care.

> "...They are taking care of us, and sometimes we had problems of getting tablets as they were costly, but now we are getting those tablets to our house, and Asha workers have done their job well."

Responded RJ.

The participant AN said;

> "… It is helpful because they provide the tablets to our place and are concerned about our health. So, we will feel good."

The response from the participant shows that the health workers were able to provide good services to people.

**Normal Social Interaction**

Healthy social interaction aided the participant's recovery and improved their mental health. According to participant AY,

> "...it is good, and it is helping, and our neighbours have begun to talk to me after taking tablets."

Participants reported greater health after taking medicine on time, and when health staff raised awareness and educated society about the disorder, individuals were more receptive to patients, making them more resilient. Patients feel relieved since the therapy is free and accessible.

**Theme 2 – Insights during the process**

The intervention had greatly aided the participants in various ways, including restoring normal social interaction and providing tablets to their location.

**Normal Social Interaction**

The participant AY stated as;

> "…It is good and helping, and our neighbours started to talk with me after taking tablets."

**Helpful and Good**

Participant SH responded,

> "...It's helping us, and they're doing a good job with the patients. They are providing free medications. They come here and provide medicines, and they set up meetings once a month."

The village adoption practise contributes to universal access to TB care and prevention, and as participants suggested, it is more beneficial to the villagers in many ways.

**Theme 3 – Emotional Experience of Patients**

The stigma of TB prevents individuals from getting treatment, and others ignore and isolate them, scarring their hearts. Patients need family and friend support, especially emotional support, to heal and thrive.

**Support from others**

The community's and families' sympathetic, understanding approach aids individuals in accepting and dealing with their difficulties or illness. Participant AY responded as;

> "...I am not ashamed of my condition. My family members were so supportive that they suggested I take tablets."

The results show that TB stigma is caused by ignorance. The patient needs community and family support to stay emotionally stable.

**Feelings of patients and Family**

Due to illness ignorance, others stigmatise and discriminate against the sufferer, making them an emotional danger. The participant MJ responded as;

> "...When I am at home, I feel lonely, which makes me uncomfortable, but when I am outside, I am OK."

Participant RJ responded as;

> "...We shouldn't bother about others and our lives will be affected by thinking about others. I was scared at first, and my family members cried and were sad about it, but they have now given me hope that the disease is curable."

The comments show that knowing about TB provides patients confidence and realism. Patients' family support bolstered their bravery.

**Discrimination**

The TB patients had to face a lot of discrimination, not only from the community but also from their own families. AN responded as;

> "...The comments show that knowing about TB provides patients confidence and realism. Patients' family support bolstered their bravery."

SH mentioned that;

> "...People who are unaware of the disease are more likely to discriminate against it, whereas those who are aware will not."

MT said that;

> "...Many things have happened to me. At home, not outdoors."Early on, I suffered. My wife told me not to eat around the kids, etc. I told health authorities my wife's opinion about this ailment. They also taught her. Though not explicitly, they have discussed everyone at the meeting. External factors are also hurting me."

The comments indicate that TB ignorance stigmatises individuals. Awareness activities and local education helped remove stigma.

**Theme 4 – Services Received Through the Program**

Patients benefit from the village adoption model by receiving nutritious food, receiving free tablets, participating in training and awareness programmes, attending meetings, etc.

**Nutritious food**

Proper diet and healthy food are helpful for the cure of TB. The participant PB stated as;

> "...We are getting fruits, vegetables, and protein-rich foods. They will check our health and provide service by coming to each patient's house."

According to RJ;

> "...They will provide food kits because we will be weak, which will help us be strong. They will do meetings and inform us about how to behave when we talk with others, take food, and other things."

The village adoption model provides services like detecting, treating, and preventing TB. They also offer healthy and nutritious food to each patient to improve their immunity.

**Health check up**

The adoption model ensures the provision of free TB services and the management of TB following the Standards for TB Care.

The participant SK responded as;

> "...They will be given training. They will check our health and provide tablets. I have been taking tablets for 6 months. They will provide nutritious food. Everything is good."
>
> They gave me medication, as well as information and nutritious food. They will conduct meetings every month.

Stated SH.

"...From the responses, it is evident that giving health check-ups and timely medications to patients seems to be effective."

**Awareness Programs**

To reach the goal, the adoption model conducted various awareness sessions, counseling and training sessions for the community and patients as well.

AN stated as;

> "...They have tested sputum and they have given a food kit. It is a protein-rich diet, ma'am, and they will give you tablets. They will tell you about the disease and inform you about it."

According to RJ,

> "...They will do meetings and inform us about how to behave when we talk with others, take food, and other things. They've told us to take medicines, and I've been taking medicines for the last 4 months."

The village adoption approach involves the community. The results show that the services offered to elevate patients and their families were completely useful and accomplished the adoption model's purpose.

**Theme 5 – Beneficiaries Dislikes about the Program**

**No issues**

When asked about their dislikes or any discomforts, the participants responded as follows:

> "...First and foremost, we must be cured of the disease, and we will work with them." If they do not come forward, we will not be cured of the disease. "Who will look after our family if I'm not well?" AN stated

SH responded as;

> "...I feel that the health workers are taking care of me well. I didn't find any issues."

According to the responses, people are completely satisfied and benefited from the project.

**Theme 6 - Recommendations by Beneficiaries**

**Implementing the program nationwide.**

Following their experience with the village adoption model, the participants made recommendations.

The participant AN responded as;

> "...we will get all facilities and services at district hospitals, but when you go to primary health care centres, they will be negligent, so it would be better if they provide services to the villages; we have this centre in Koppal, so it would be better if they provide programmes at the ground level."

The participants PB and RJ responded as;

> "...They must go to all villages and carry out this plan and provide more services to them."

> "...Not only in this village, but there will be many cases in other villages where people will refuse to undergo tests because they believe they will be separated from their families, and so they should spread this model to all villages."

Living examples helped people understand TB prevention; it was eye-opening. They suggest implementing this village adoption strategy in all districts and villages.

**Theme 7 - Beneficiaries Satisfaction**

A few participants like the village adoption approach. Participants believed others should because they benefitted from the programme. Participants were pleased and thanked health care staff and authorities.

**Feeling Good & Satisfied**

Patient satisfaction is critical to treatment success. Patients satisfied with their healthcare professionals are more likely to use health services, comply with medical treatment, and stick with them.

The participant MJ responded as;

> "...I am feeling better and satisfied with this service."

According to PB;

> "...I feel good about the services provided by the project."

The responses from participants have depicted that they are satisfied and benefitted from the village adoption model.

**Helpful & Good Effort**

The participant SK stated as;

> "...This model is good, and it is a good effort."

While the participant SH responded as;

> "...It has aided us, and I am grateful. They did an excellent job."

The effort put in by each health worker and other members were worth mentioning. From the responses, it is clear the participant had received good care, and it was helpful for their overall wellbeing.

**Provides Necessary Services**

The participant MT responded as;

> "...I got benefited from this project, and so others also should."

> "...The project is going well, and I'm pleased, and they've provided all of the necessary resources." Said AN

The majority of participants stated that they were satisfied and happy with the project's services. They also recommend that the services be extended to other villages and districts.

**Theme 8 - Beneficiaries Opinion on Implementing the Project to Other State/ Country**

Participants favoured expanding the concept to other countries. Participants agreed that the strategy should target the poor, educate and refer people for testing, offer hierarchical treatment across states, eliminate TB, and have adoption centres in each hobli.

**Implement across states**

The participant AY responded as;

> "...I would like to say that it would be better if they check other people who are having financial and other problems so it should give service to those in need."

The participant RJ commented that;

> "...It is good because if a family got treatment and gradually if a taluka, district and states are free, it will be beneficial to our country."

AN mentioned,

> "...I feel that it would be better if there is adoption centres in each taluks and each hobli (sub division of taluk) so that we will get benefit out of it because some people won't have money to travel and get treatment and if they implement this model in large scale then , it will be helpful."

Participants were pleased and benefitted from the village adoption model and offered their thoughts on its expansion positively and wisely.

**Awareness Classes**

Raising community knowledge about tuberculosis (TB) may enable people to seek early and appropriate care. The participant MT responded as;

> "…In the Koppal district, health workers and other officials are implementing a program. They will adopt the village, and Asha workers will provide the necessary services. They will do the sputum test and give the results. Now I am also educating people—especially the elderly—to go and get tested."

Responses show that training, counselling, and broad implementation may work. To boost TB awareness and mobilise teenagers to eradicate TB, the action and promotion approach was crucial. The village adoption approach has done well here.

**Discussion**

The TB-free village adoption model effort detects, treats, and prevents tuberculosis (TB) to eliminate it in communities. Community interventions involve awareness, outreach to marginalised or isolated communities, screening, detecting, counselling, treating, and following up with patients until they are cured. This model's unique feature is local private physicians' involvement in clinic tuberculosis cases and active village awareness, case detection, and compliance campaigns to complete the care cascade (How Koppal District in Karnataka is Fighting TB through the Village Adoption Model, 2020).

The research includes healthcare staff and beneficiaries. As a doctor, nurse, aide, assistance, laboratory technician, or medical waste handler, a healthcare professional helps the ill and wounded (Joseph & Joseph, 2016). They are vital to worldwide tuberculosis eradication. This research included an Asha worker, a doctor, a treatment supervisor, a TB health visitor, an AHF, a senior treatment supervisor, a junior health assistant, an ANM, and private practitioners. The research found that healthcare staff helped the initiative succeed. Primary health care (PHC) practitioners are the forefront of patient care and may reduce TB burdens via early identification and treatment referral. Delays in recognising infected TB patients endanger the community and health care professionals.

Research shows the private sector treats 40% of Indian TB cases. Drug sales indicate 2–3 times more private sector TB patients than previously thought. TB prevention and care depend on business, making their cooperation the most crucial step towards universal access (Anand et al., 2017). Private practitioners promote community participation via TB free village adoption. Private practitioners are underrepresented in the TB programme due to lack of coordination, preconceived assumptions, biases against the private sector, and creative methods. This adoption concept attempts to overcome these care cascade gaps and enhance TB care for rural health seekers. Private practitioners helped the model and persuaded patients, according to the statistics.

For more than 50 years, India has been involved in tuberculosis (TB control activities). TB, however, continues to be India's most serious public health crisis. Every year, approximately 480,000 Indians are killed by tuberculosis, with more than 1,400 dying daily. Every year, over a million “missing persons” cases go unreported in India, with the vast majority remaining undiagnosed, underdiagnosed, and undertreated in the private sector (National Strategic Plan (NSP) draft, 2017). Clients’ preference for private hospitals, difficulties in successfully implementing the program-patients do not comply with medications, people believe health workers do this because they receive more money than their own health benefits, the added stigma causes them to refuse to deliver tablets to their homes, lack of support, reluctance for consultation, rejection from people, problems in urban areas with a high population, were the major challenges faced during implementation of the project.

Despite project issues, healthcare workers employed numerous methods. Fear, mandating RMP physicians to send patients, recruiting one person and the DG to collect sputum, training them to utilise services, awareness activities to convince, and alerting the Asha ward in-charge are some measures. Experts advise everyone in the country should know about TB (Thakur et al., 2021).

India needs better public and basic healthcare to reduce TB risk. Universal healthcare and effective MDR-TB treatment might dramatically reduce tuberculosis. Better health facilities, living conditions, and diet may help battle this terrible sickness. Free or low-cost drugs and treatment, faster and more accurate diagnostics, and private sector TB Programme management will improve infrastructure and healthcare. These methods will fight TB long-term (Thakur et al., 2021).

Researchers used the Koppal District village adoption model to analyse private sector dynamics and patient preferences (How Koppal District in Karnataka Is Fighting TB Using the Village Adoption Model, 2020). Beneficiaries said that training and engagement of front-line health professionals and community organisations and provision of community-based tools raised TB knowledge and comprehension in targeted locations. The initiative assisted health professionals and communities improve TB awareness and treatment. Successful patients' participation decreased community stigma and prejudice (Kamineni et al., 2011).

Treatment stigmatises TB. Clinical symptoms, societal prejudice, poverty, and self-discrimination make TB patients struggle (Dias et al., 2013). The study found that TB stigma harms customers' mental health owing to a lack of knowledge or awareness. Healthcare practitioners must understand how TB treatment affects patients' psychosocial lives and identify strategies to lessen these effects while allowing patients to express their anxiety, anguish, and bio-psychosocial changes. Healthcare practitioners should educate and empower TB patients and their families to break the cycle of misinformation and prejudice (Dias et al., 2013).

A 2018 Koppal research discovered 1,200 missing instances. To reduce these rates and improve TB treatment, the Koppal District TB office launched the TB-free village adoption initiative. The programme provides free screening and rehabilitation to needy areas. Recent study suggests the poorest do not utilise free services (Verma et al., 2013). The community adoption approach provides patients with nutritious meals, free medications, training and awareness, meetings, etc., according to study. A cheap strategy to keep families out of poverty and maintain communities' health and economy is TB prevention. New, better drugs

and dropping prices will make it cost-effective to save millions of lives (New WHO Recommendations to Prevent Tuberculosis, n.d.).

Project recipients also learned about TB treatment and other services from past patients and community members. Learn TB symptoms. Still trusted, public sector services were improving in remote locations (Kamineni et al., 2011). Participants chose a system that targeted everyone in financial difficulty, educated and recommended people for testing, hierarchically provided treatment across states, eradicated TB, and built adoption centres in every hobli.

**Implications**

Social workers can play a crucial role in building the capacity of local communities to manage TB prevention and control. This involves training local health workers, educating community leaders, and facilitating community-based health initiatives. Encouraging and promoting active participation of community members in TB control activities, ensuring they have a voice in decision-making processes. This empowerment leads to increased ownership and sustainability of health interventions. This study will be helpful to develop and implement health education programs that are culturally sensitive and tailored to the specific needs and beliefs of the Koppal district communities. This can help dispel myths and stigma associated with TB. Social workers can help reduce the stigma associated with TB by promoting open discussions, support groups, and public awareness campaigns. Reducing stigma is critical for encouraging individuals to seek diagnosis and treatment without fear of social ostracism. Along with this, establishing peer support groups for TB patients and their families to provide emotional support and share experiences, which can help in coping with the disease and adhering to treatment. Social workers can contribute to the ongoing monitoring and evaluation of the Village Adoption Model to identify what works and what needs improvement. This involves collecting feedback from community members and healthcare providers and using this data to refine interventions. Equipping social workers with the necessary skills and knowledge to effectively engage in TB control efforts. This includes training on TB epidemiology, community engagement techniques, and advocacy strategies. By integrating these social work implications into the TB control efforts in the Koppal district, the Village Adoption Model can become more comprehensive, inclusive, and effective in addressing the multifaceted challenges of TB prevention and control. Social workers, with their expertise in community engagement, advocacy, and support, are pivotal to the success and sustainability of such public health interventions.

**Limitations & future directions**

The exploratory approach of this investigation limited generalisation. The current research did not assess health care providers' and recipients' TB knowledge. Targeted evaluational investigations would give more direct and practical evidence, limiting our research. Future applications of this approach to other state and national locations should be examined using numerous methodologies.

**Conclusion**

According to this research, community adoption has helped TB patients. Health care personnel helped the initiative succeed. The Koppal District village adoption model has helped understand private sector dynamics and patient preferences. The project helped health professionals and communities promote TB knowledge, treatment adherence, and the TB agenda. Beneficiaries of the Project reported improved knowledge of TB treatment and other services offered by former patients and community members, which prevented and controlled

TB. Social work intervention required to eradicate TB in villages nationwide to fulfil sustainable objectives.

## Funding

This study was not funded by any funding agency.

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