

## ORIGINAL ARTICLE

# From Myths to Facts: Predictors of Knowledge about Tuberculosis in Rural Bareilly

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**Background:** Tuberculosis (TB) remains a major global health challenge, with India having the highest burden of cases. Public awareness is crucial for controlling TB, as it aids in reducing mortality and morbidity through early detection and accurate information. Stigma often surrounds TB, leading to social rejection, but basic knowledge and access to free treatment can help support patients within their communities. Addressing misconceptions is particularly important in remote and underserved areas with limited health-care access. This study aimed to assess knowledge, attitudes, and behaviors regarding TB in the rural areas of Bareilly district. **Materials and Methods:** A community-based cross-sectional study was conducted in the rural areas of Bareilly district. A pre-designed, pre-validated, semi-structured questionnaire, translated into the local language, was used for data collection, which was analyzed statistically. **Results:** The study included 100 patients, among whom males and literates showed higher awareness of TB symptoms. Of the participants, 96% believed in taking precautions; 20% approved of separating utensils and food; 25% endorsed covering the mouth during coughing; 29% practiced proper sputum disposal; 17% emphasized a good diet and a clean environment, and 9% advocated for staying separately. Vaccination awareness was noted in 9% of participants, while 32% were knowledgeable about the treatment regimen. In addition, 73% were aware of the availability of free anti-tubercular aid provided by the government. **Conclusion:** The study revealed that females and illiterate patients had significantly less knowledge about TB symptoms, transmission, and etiology. Although the overall knowledge regarding these aspects was satisfactory among the majority of the population, there remains a critical need to prioritize educational efforts for females and illiterate individuals. In addition, misconceptions, such as the belief that TB can be transmitted through food and utensils, must be addressed and corrected.

**KEY WORDS:** Tuberculosis, awareness, misconceptions

## INTRODUCTION

TB is an infectious disease caused by the bacterium *Mycobacterium tuberculosis*. It remains one of the most

prevalent infectious diseases globally, posing a significant public health challenge, especially among low and middle socioeconomic populations. Tuberculosis (TB) primarily affects the lungs but can involve other organs as well. Approximately 10% of latent TB infections progress to active disease, which, if untreated, can be fatal. The disease spreads through the air when individuals with active TB cough, sneeze, or expel respiratory droplets.<sup>[1]</sup> In contrast, individuals with latent TB do not transmit the disease.<sup>[1,2]</sup>

TB is more prevalent among immunocompromised individuals, including those with HIV/AIDS and smokers.<sup>[1]</sup> Diagnosis of

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active TB involves a combination of methods, including the tuberculin skin test, chest X-rays, and microscopic examination and culture of affected samples/fluids.<sup>[3,4]</sup> Preventive measures include screening high-risk populations, early detection and treatment of active cases, and vaccination with the Bacillus Calmette-Guerin (BCG) vaccine.<sup>[5,6]</sup>

### Disease Dynamics

The symptoms of active pulmonary TB include coughing, which may be accompanied by blood or blood-tinged sputum, chills, fatigue, fever, weight loss, decreased appetite, and night sweats. When TB affects extrapulmonary tissues, symptoms are specific to the affected organ or tissue. For instance, when TB spreads to bones, it can cause spinal or lower back pain and joint destruction. TB affecting the brain can result in meningitis, while renal involvement can impair kidney function, leading to oliguria, hematuria, and potentially renal failure.<sup>[7]</sup>

The World Health Organization (WHO) has continued to implement and refine effective strategies to prevent and control TB, including the Directly Observed Treatment Short-course and the End TB Strategy, which builds on the successes of the Stop TB Strategy. The Sustainable Development Goals (SDGs) aim to end the global TB epidemic by 2030, with significant milestones already achieved, such as an almost 9% reduction in

global TB incidence since 2015 and a 19% reduction in the death rate between 2015 and 2022.<sup>[8]</sup> Despite these achievements, TB remains a serious issue. Many people lack awareness about the disease's etiology, transmission, and symptoms, often delaying medical consultation and inadvertently spreading the infection. The stigma associated with TB exacerbates the problem, and the prolonged treatment duration for antitubercular drugs frequently leads to incomplete courses and advanced disease stages. Increased awareness and access to proper medical advice are crucial.

Health education and awareness programs are essential for informing the public about disease management, enabling timely and appropriate treatment.<sup>[9]</sup> This study aims to evaluate the knowledge of the general population regarding TB diagnosis, prevention, and treatment and to assess their overall attitudes and behaviors toward the disease.

## REVIEW OF LITERATURE

According to the WHO, TB remains a significant global health challenge, with an estimated 4000 people dying from TB every day and approximately 29,000 new infections occurring daily. Despite progress over the years, the global burden of TB is still high. The incidence rate of TB has been declining at an average rate of 2% per year since 2015. The prevalence of TB cases has continued to decrease, and with sustained efforts, the targets set by the SDGs aim to end the global TB epidemic by 2030. However, achieving a 50% reduction in TB incidence and a 75% reduction in TB deaths compared to 2015 levels by 2025 remains a challenging goal, as emphasized by the WHO End TB Strategy.<sup>[10]</sup>

Public awareness is crucial for reducing both the mortality and morbidity associated with TB. Increased awareness strongly correlates with early disease detection, influencing individual behaviors and practices. Effective prevention, early detection, and timely diagnosis are critical factors in reducing TB morbidity and incidence.

TB is often stigmatized, leading to social rejection. Ensuring that individuals in the community have accurate knowledge about the disease and access to free treatment is essential. In addition, it is crucial to identify and address any incorrect practices related to TB, especially in remote and underserved areas where health-care access is limited.

### Aim

The study aimed to assess knowledge, attitude, and behavior about TB in the rural areas of Bareilly district.

### Objectives

The objectives of the study are as follows:

1. To assess the knowledge regarding investigations, prevention, and treatment of TB.
2. To assess correct knowledge regarding symptoms, mode of transmission, and cause of TB.

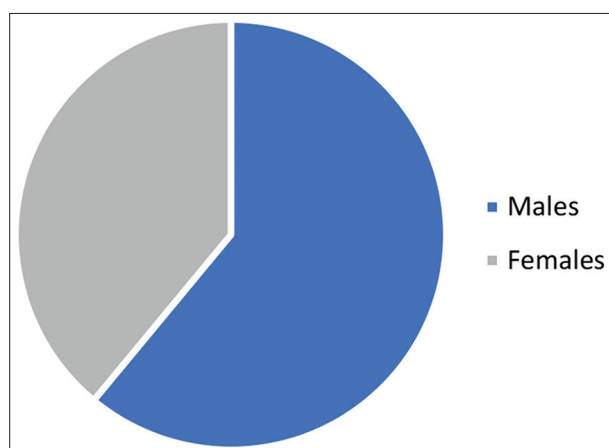


Figure 1: Gender distribution

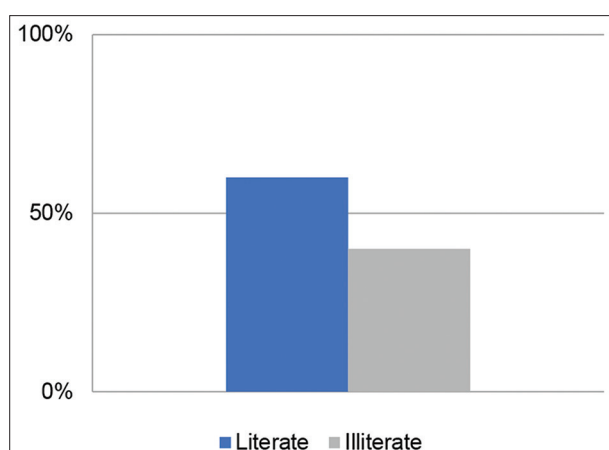


Figure 2: Literacy status

**Table 1: Knowledge of the mode of transmission**

Mode of transmission	Observation (%)
Cough	47
Sharing same utensils	20
Contaminated food and water	05
Overcrowded area	17
Sexual contact	02
Not aware	09
Total	100

**Table 2: Knowledge of the cause of disease**

Cause of TB	Observation (%)
Germs	47
Malnutrition	17
Tension	08
Evil's eye	05
Not aware	23
Total	100

- To discuss overall information resources through which people seek information about TB in rural areas.

## MATERIALS AND METHODS

A community-based cross-sectional study was conducted over 3 months from February 2023 to April 2023 in a randomly selected village associated with the Rohilkhand Medical College and Hospital in Bareilly district. The study subjects included villagers aged 18 years or older of both genders who had lived in the rural area for at least 10–15 years and consented to participate. It excluded those who were moribund or severely ill, had a history of TB, or did not consent to participate.

The required sample size was determined using the formula  $n = 4pq/d^2$ , where  $p$  was estimated at 0.22 based on previous studies,  $q$  was calculated as 0.772, and the desired precision ( $d$ ) was set at 0.08. This calculation resulted in a sample size of 106.15, rounded to 100 participants. Consequently, data were collected from a random sample of 100 individuals in the village, selected through a household-based random sampling approach. In each selected household, the youngest eligible participant was recruited for the study.

A pre-designed, pre-validated, semi-structured questionnaire was utilized to gather data. A pilot study was conducted with 50 rural individuals to test the questionnaire, which was then translated into Hindi (the local language) for standardization. The questionnaire addressed knowledge related to the diagnosis, prevention, infection, transmission, and treatment of TB. Data were recorded in Microsoft Excel spreadsheets and analyzed using Statistical Package for the Social Sciences (SPSS) software.

## Ethical Considerations

Ethical clearance was obtained from the Institutional Ethics Committee. The study participants were explained the purpose and nature of the study, and informed consent was obtained. Strict confidentiality was maintained.

## RESULTS

Of the 100 individuals from rural areas interviewed for the study, 61% were males, and 39% were females (Figure 1). 40% of the participants were illiterate (Figure 2). Most females (88%) were housewives, while most males (70%) were farmers.

The key observations from the collected data are as follows:

- Awareness of TB Symptoms:** The majority of villagers were aware of the symptoms of TB, with males being more informed than females. In addition, literate individuals had greater awareness of symptoms than their illiterate counterparts.
- Precautionary Measures:** A significant number (96%) of participants believed that precautions should be taken if diagnosed with TB. Among them, 20% cited using separate utensils and food as the most common precaution. Other precautions mentioned included covering the mouth during coughing (25%), proper sputum disposal (29%), maintaining a good diet and a clean environment (17%), and staying separately (9%).
- BCG Vaccination:** Only 9% of participants were aware of the BCG vaccine, even though 94% of infants in the area had received it.
- Belief in TB Cure:** The majority (95%) of participants believed TB is curable. However, only 32% correctly knew the duration of treatment (6–9 months). Awareness about the availability of free anti-tubercular drugs at government health centers was known to 73% of the participants, while 4% believed the treatment was not free, and 23% were unaware of the cost status.

## DISCUSSION

The current study, which investigated TB awareness among villagers in the Bareilly district, offers valuable insights into public knowledge, attitudes, and practices concerning TB. When compared with findings from other studies, several parallels and disparities emerge, shedding light on the critical areas needing attention.

**Demographics and Education:** In our study conducted in the Bareilly district, 61% of participants were male, and 40% were illiterate. This demographic contrasts with the reference study by Dumpeti *et al.*,<sup>[11]</sup> where 57.7% of participants were female, and 47.3% were college-going, indicating a higher education level in that cohort. Education significantly influenced TB awareness across studies. In the Dumpeti *et al.*<sup>[11]</sup> study, 79.6% of participants knew that bacteria cause TB, compared to only 47.7% in our study. Similarly, Nautiyal *et al.*<sup>[12]</sup> showed that

literacy status played a crucial role in understanding TB, with literate individuals demonstrating better knowledge of the disease. These findings underscore the importance of education in shaping public awareness about TB.

**Awareness of TB Etiology and Transmission:** As seen in table 1 and 2, our... study found that 47.7% of participants were aware that TB is caused by bacteria. This figure aligns closely with the Nautiyal *et al.*<sup>[12]</sup> study (43.2%) but is lower than the 79.6% reported by Dumpeti *et al.*<sup>[11]</sup> and the 95% awareness level by Samal.<sup>[13]</sup> Conversely, Pramanik and Ghosh<sup>[14]</sup> found that many participants attributed TB to smoking and chewing tobacco, indicating significant regional variations in understanding TB etiology.

Regarding transmission, 96.3% of our participants correctly identified cough droplets as the primary mode, which is higher than the 78.3% reported in Luba *et al.*<sup>[15]</sup> and the 21% in Pramanik and Ghosh.<sup>[14]</sup> who mistakenly believed TB spread through unclean food and water. Nautiyal *et al.*<sup>[12]</sup> reported that 78.4% of patients understood TB's communicability, while Samal.<sup>[13]</sup> reported 82% awareness of TB being transmissible. Despite the high awareness in our study, misconceptions persisted, with 67.6% believing TB could be transmitted through dishes, highlighting the need for focused public health education.

**Misconceptions About TB:** Misconceptions about TB being hereditary were prevalent in both our study and the Dumpeti *et al.*<sup>[11]</sup> study, where 31.6% and 36.5% of participants, respectively, believed TB to be hereditary. This aligns with findings from San Lin *et al.*<sup>[16]</sup> and indicates a persistent misunderstanding that could delay treatment-seeking behavior, emphasizing the need for targeted educational interventions to correct such myths.

**Knowledge of TB Symptoms and Treatment:** In our study, 96.3% identified a persistent cough as a symptom of TB, closely aligning with the 97% reported by Samal.<sup>[13]</sup> However, awareness of the treatment duration was notably lower in our study (32%) compared to the Nautiyal *et al.*<sup>[12]</sup> study (82.9%) and Pramanik and Ghosh.<sup>[14]</sup> (66%). This suggests that while awareness of TB symptoms is high, knowledge about treatment protocols is lacking, potentially impacting treatment adherence.

Regarding the curability of TB, 95% of participants in our study believed TB was curable, consistent with findings from Samal.<sup>[13]</sup> (76%), Ali *et al.*<sup>[17]</sup> (87%), and Luba *et al.*<sup>[15]</sup> (80.5%). However, Pramanik and Ghosh<sup>[14]</sup> reported that 60% of participants were unsure about the curability of TB, highlighting regional differences in public health messaging and its impact.

**Vaccination and Preventive Measures:** Awareness of the BCG vaccine was low in our study, with only 9% of participants aware of it, despite 94% coverage in the area. This contrasts with the Dumpeti *et al.*<sup>[11]</sup> study, where 43.6% of participants knew about the vaccine, although only 12.9% could name it. Similarly, the Nautiyal *et al.*<sup>[12]</sup> study reported a slightly higher awareness (13.5%) than our findings. Samal *et al.*<sup>[13]</sup> found that

68% of participants knew TB was preventable, and 91% could identify various preventive measures, underscoring the success of targeted health campaigns in some regions. The overall low awareness of vaccination highlights a significant gap that public health campaigns need to address, emphasizing the availability of vaccines and their importance.

**Addressing Misconceptions and Information, Education, and Communication (IEC) Challenges:** Misconceptions about TB transmission were prevalent across studies. In our study, 67.6% believed TB could be transmitted through shared dishes, similar to the 10.8% in Nautiyal *et al.*<sup>[12]</sup> and the findings from Pramanik *et al.*,<sup>[14]</sup> where many participants were unaware that TB transmission is preventable. The wide variability in knowledge observed across different studies, including ours, could be due to the diverse study settings and the effectiveness of local IEC systems. As the Nautiyal *et al.*<sup>[12]</sup> study suggests that a culturally sensitive IEC system that goes beyond a purely biomedical framework could help address these knowledge gaps more effectively, particularly in rural and less educated populations.

## CONCLUSIONS

Our study, in conjunction with findings from other research, underscores both the progress and persistent challenges in TB awareness and knowledge, particularly in rural areas with lower education levels. Although general knowledge about TB symptoms, transmission, and etiology was found to be satisfactory, our findings reveal a critical need to focus on educating females and illiterate individuals. Persistent misconceptions, such as the belief that TB can be transmitted through food and utensils, must be actively addressed and corrected. The impact of education, literacy, and regional differences on public understanding of TB is, thus, evident, highlighting the need for targeted interventions.

To address these gaps, it is crucial to implement sustained and culturally sensitive public health campaigns emphasizing accurate information about TB transmission, symptoms, treatment, and prevention. These efforts should prioritize reaching underprivileged and less educated populations.

Furthermore, mass media and Information, Education, and Communication (IEC) activities should continue to promote the importance of BCG vaccination and other preventive measures to enhance public health outcomes. These efforts are essential for achieving a more informed and proactive approach to TB prevention and control in diverse populations.

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