Section: Respiratory Medicine

Original Research Article

DETERMINANTS OF AWARENESS AND ADHERENCE AMONG TUBERCULOSIS PATIENTS: A TERIATORY CARE HOSPITAL EXPERIENCE FROM NORTHERN INDIA

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ABSTRACT

Background: Tuberculosis (TB) remains one of the most significant global public health threats, particularly in low- and middle-income countries. Despite available treatments, poor awareness and non-adherence continue to undermine TB control efforts. **Objective:** This study aimed to assess the determinants of awareness and treatment adherence among TB patients and to identify patient-related factors affecting TB management.

Materials and Methods: A cross-sectional study was conducted over one year (August 2023 – July 2024) in the Department of Respiratory Medicine at Rohilkhand Medical College and Hospital, Bareilly, Uttar Pradesh. A total of 194 confirmed TB patients were enrolled. Awareness was assessed using a structured questionnaire and TB knowledge score, while adherence was evaluated using the Morisky Medication Adherence Scale (MMAS-8). Data were analyzed using SPSS version 23, and statistical significance was set at $p < 0.05$.

Results: Awareness about TB was found to be poor in 81.4% of patients. Awareness levels significantly correlated with literacy ($p < 0.001$), socioeconomic status ($p < 0.005$), and geographic location ($p = 0.018$), with urban, educated, and higher socioeconomic groups showing better awareness. Adherence to TB treatment was observed in 71.7% of patients, while 28.3% were non-adherent. Adherence rates were significantly higher among DOTS-treated patients (83.8%) compared to non-DOTS (53.2%) ($p < 0.001$), and among highly educated individuals. No significant differences in adherence were observed across gender or urban/rural settings.

Conclusion: Poor awareness and non-adherence remain significant challenges in TB control. Literacy, treatment mode (DOTS), and socioeconomic status are key factors influencing both awareness and adherence. Strengthening health education, expanding DOTS coverage, and improving patient support through government and community collaboration are essential to improve TB outcomes and prevent drug resistance.

Keywords: Tuberculosis, Awareness, Adherence, DOTS, Socioeconomic Status, Literacy, Morisky Scale, Public Health.

INTRODUCTION

Tuberculosis (TB) remains a major public health challenge, rivaling the human immunodeficiency virus (HIV) as a leading cause of death from infectious diseases worldwide. Despite a decline in TB incidence, prevalence, and mortality over the past decade, the global elimination of the disease

remains unattainable, requiring substantial resource investment. TB is closely linked to poverty, disproportionately affecting the poorest, most vulnerable, and marginalized populations. Ensuring access to diagnosis and care, fundamental in the fight against TB, is particularly difficult for these groups

Globally incidence cases of T.B were 10.8 million in 2023, slight increase from 2022. The TB incidence rate in 2023 was 134 new cases per 1,00,000 population reflecting a minimal 0.2% rise compared to 2022. Globally, an estimated 4, 10,000 people developed multi drug resistant or rifampicin resistant TB (MDR/RR-TB) in 2022. 1

A deficiency in public awareness may contribute to the deterioration of the epidemiological landscape by facilitating the development of drug-resistant infections, which subsequently increases the likelihood of transmission of resistant bacillary strains.2

Health education plays a vital role in the control of all diseases, including tuberculosis. Its primary objective is to influence and modify patients' health behaviors by providing them with information that motivates adherence to the prescribed treatment regimen.3

Adherence to TB treatment is essential to ensure complete cure, prevent the development of drug-resistant TB, reduce the spread of infection, and avoid complications or death. Incomplete or irregular treatment allows TB bacteria to survive, making the disease harder to treat and more dangerous to public health.

Therefore, our study aimed to investigate and identify the factors that contribute to poor awareness and non-adherence to treatment in TB care. It also sought to design user-centric strategies to enhance diagnosis rates, healthcare quality, treatment adherence, and TB outcomes.

Aim and Objectives

Aim

To study the determinants of awareness and adherence among tuberculosis patients

Objective

1. To access the awareness of tuberculosis among patients.
2. To analyse the adherence of tuberculosis treatment among patients.
3. To investigate the patient related factor affecting the tuberculosis management.

MATERIALS AND METHODS

Study Design: Cross – sectional Study.

Study Setting: Department of Respiratory Medicine in Rohilkhand Medical College & Hospital, Bareilly, and Uttar Pradesh.

Study Duration: One year (1st August 2023 to 31st July 2024)

Study Participants:194 patient admitted and presented in OPD in the department of Respiratory Medicine, Rohilkhand Medical College and Hospital, Bareilly, U.P

Inclusion Criteria

1. Patients diagnosed with pulmonary tuberculosis, confirmed through microbiological, radiological, or clinical evaluation
2. Patients currently receiving TB treatment
3. Participants must be willing to respond to interviews or questionnaires related to awareness and adherence.
4. Patients who provide informed written consent to participate in the study.

Exclusion Criteria

1. Not willing to participate in study.

Methodology

- After taking informed and written consent all the patients confirmed case were included in study.
- Detailed clinical history, physical examination was done.
- All the details about general awareness and adherence of tuberculosis treatment were taken from patient.
- All the patient who does not have confirmed diagnosis were further evaluated, to confirm the diagnosis of tuberculosis by relevant radiological and microbiological investigation.

Awarness

A cross-sectional survey was conducted, with the questionnaire thoughtfully designed by the researchers to ensure comprehensive coverage of key topics. Participants' literacy was evaluated using the TB knowledge score[4], which was calculated by dividing the number of correct responses by the total number of questions and converting this into a percentage. Based on the percentage of correct answers, knowledge levels were categorized as follows:

- Poor Knowledge: ≤ 70%
- Fair Knowledge: 70–79%
- Good Knowledge: 80–89%
- Excellent Knowledge: 90–100%

Adherence

Adherence was assessed using the 8-item Morisky Medication Adherence Scale (MMAS-8)[5], a self-reported tool designed to evaluate medication-taking behaviors. The MMAS-8 consists of 8questions, each with a "Yes" or "No" response. For questions 1 to 7, a "Yes" answer is scored 0 points, while a "No" answer is scored1 point. Item 8, however, employs a 5-point Likert scale to measure adherence, with responses ranging from 1 (never) to 5 (always).

Scoring System:

- High adherence (8 points): Patient is consistent with medication.
- Medium adherence (6–7 points): Some inconsistencies but generally follows treatment.
- Low adherence (<6 points): Patient frequently misses doses or does not follow the regimen properly.

- Patients with medium and low adherence were classified as NON-ADHERENT GROUP
- While patients with high adherence classified as ADHERENT GROUP

Statistical Analysis

- All the data will be compiled in excel sheet. The Data will be entered in SPSS (Statistical Package for Social Sciences) licensed version 23.0. Descriptive analysis will be done by calculating proportions, means and standard deviation.
- Appropriate statistical tests will be applied depending on the type and distribution of data.
- p value if < 0.05 will be considered statistically significant.

RESULTS

Table 1: Responses to Awareness Questionnaire (Result was Analyzed Using TB Knowledge Score),[4]

PATIENTS AWARENESS		N	%
1. WHAT IS THE CAUSE OF TB? (BACTERIA/POLLUTED AIR/DON'T KNOW)	BACTERIA	26	13.4%
	DON'T KNOW	168	86.6%
2. TB IS A HEREDITARY DISEASE?	NO	2	1.0%
	YES	6	3.1%
	DON'T KNOW	186	95.9%
3. TB AFFECTS ALL AGES?	NO	5	2.6%
	YES	62	32.0%
	DON'T KNOW	127	65.5%
4. MALNUTRITION PREDISPOSE TO TB?	NO	4	2.1%
	YES	59	30.4%
	DON'T KNOW	131	67.5%
5. DIABETES AND SMOKING INCREASE THE RISK TO DEVELOP TB DISEASE?	NO	4	2.1%
	YES	51	26.3%
	DON'T KNOW	139	71.6%
6. TB CAN AFFECT ANY ORGAN IN THE BODY?	NO	6	3.1%
	YES	72	37.1%
	DON'T KNOW	116	59.8%
7. LUNGS ARE MOST COMMONLY AFFECTED BY TUBERCULOSIS?	FALSE	6	3.1%
	TRUE	139	71.6%
	DON'T KNOW	49	25.3%
8. IS TB CURABLE?	NO	2	1.0%
	YES	133	68.6%
	DON'T KNOW	59	30.4%
9. DURATION OF PULMONARY TUBERCULOSIS TREATMENT IS 6 TO 9 MONTHS?	FALSE	7	3.6%
	TRUE	135	69.6%
	DON'T KNOW	52	26.8%
10. IS TB PREVENTABLE?	NO	2	1.0%
	YES	84	43.3%
	DON'T KNOW	108	55.7%
11. IS THERE ANY VACCINE RELATED TO TB?	NO	7	3.6%
	YES	30	15.5%
	DON'T KNOW	157	80.9%
12. HAVE YOU HEARD/SEEN DOTS CENTRE?	YES	138	71.1%
	DON'T KNOW	56	28.9%
13. ARE YOU AWARE OF FREE TB DIAGNOSTIC SERVICES AVAILABLE FOR TB PATIENTS?	YES	154	79.4%
	DON'T KNOW	40	20.6%
14. ARE YOU AWARE OF FREE TB TREATMENT SERVICES AVAILABLE FOR TB PATIENTS?	YES	155	79.9%
	DON'T KNOW	39	20.1%
15. ARE YOU AWARE THAT DURING TREATMENT PERIOD, RS. 500/1000 WILL BE GIVEN EVERY MONTH FOR TB PATIENTS REGARDING NUTRITION?	YES	141	72.7%
	DON'T KNOW	53	27.3%

Table 2: Patients Awareness Statistics

AWARNESS	N	%
<70% POOR	158	81.4%
70-79 FAIR	6	3.1%
80-89 GOOD	23	11.9%
90-100 EXCELLENT	7	3.6%

Table 3: Awareness About Tuberculosis Across Different Literacy Groups

		AWARNESS								P-VALUE
		<70% POOR		70%-79% FAIR		80%-89% GOOD		90%-100% EXCELLENT		
		N	%	N	%	N	%	N	%	
LITERACY	PRIMARY	5	3.2%	0	0.0%	0	0.0%	0	0.0%	<0.001
	UPPER PRIMARY	24	15.2%	0	0.0%	0	0.0%	0	0.0%	
	SECONDARY	45	28.5%	0	0.0%	5	21.7%	0	0.0%	

	SENIOR SECONDARY	62	39.2%	5	83.3%	5	21.7%	3	42.9%	
	UNDER GRADUATE	21	13.3%	1	16.7%	10	43.5%	4	57.1%	
	POST GRADUATE	1	0.6%	0	0.0%	3	13.0%	0	0.0%	

- 39.2% of Senior Secondary, 28.5% of Secondary, and 15.2% of Upper Primary individuals have poor awareness. This shows that individuals with lower education levels lack sufficient knowledge about TB. 57.1% of undergraduates have excellent awareness, the highest among all groups. Since $p < 0.05$, the difference in awareness among literacy groups is statistically significant. This confirms that education directly impacts TB awareness.
- The highest percentage of excellent awareness is seen in the 21-30 year age group (57.1%) and 31-40(28.6%) year age group while older age group shows a poor and fair awareness (13.9%& 16.7% respectively).
- There is no statistically significant difference between male and female awareness levels. This implies that gender does not play a major role in TB awareness in this population.
- Poor awareness dominates both treatment groups(dots and non dots), with over 79% having low knowledge about TB. DOTS patients show slightly better awareness than Non-DOTS patients, with higher percentages in Good (12.8%) and Excellent (4.3%) categories. However, the p-value (0.84) suggests no significant difference in awareness levels between the two treatment groups.
- 88.5% of rural respondents have poor awareness compared to 74.5% in urban areas.15.3% of urban respondents fall in the good category, compared to only 8.3% in rural areas. Since $p < 0.05$, the difference in TB awareness between rural and urban populations is statistically significant. This confirms that geographical location has a real impact on TB awareness.
- A large proportion of individuals in lower, upper lower and lower middle have poor awareness (<70%). Upper class patients (50%) have excellent awareness. Hence p value <0.005 signifies that higher socioeconomic status is strongly correlated with better tuberculosis awareness.

Table 4: Response To Adherence Questionnaire (Morisky Medication Adherence Scale 8 MMAS 8),[5]

ADHERENCE		N=194	%
Q1. DO YOU FORGET TO TAKE YOUR TUBERCULOSIS MEDICATION?	YES	54	27.8%
	NO	140	72.2%
Q2. PEOPLE SOMETIMES MISS TAKING THEIR MEDICATIONS FOR REASON OTHER THAN FORGETTING. THINKING OVER THE PAST 2 WEEKS, WERE THERE ANY DAYS WHEN YOU DID NOT TAKE YOUR MEDICATIONS?	YES	8	4%
	NO	186	96%
Q3. HAVE YOU EVER CUT BACK OR STOPPED TAKING YOUR MEDICATION WITHOUT TELLING YOUR DOCTOR BECAUSE YOU FELT WORSE WHEN YOU TOOK IT?	YES	16	8.2%
	NO	178	91.8%
Q4. WHEN YOU TRAVEL OR LEAVE HOME, DO YOU SOMETIMES FORGET TO BRING ALONG OR TAKE YOUR TUBERCULOSIS MEDICATIONS?	YES	9	4.6%
	NO	185	95.4%
Q5. DID YOU TAKE ALL YOUR MEDICATIONS YESTERDAY?	YES	194	100%
	NO	0	0%
Q6. WHEN YOU FEEL YOUR CONDITION IS FAIR, DO YOU SOMETIMES STOP TAKING YOUR MEDICINE?	YES	10	5.2%
	NO	184	94.8%
Q7. DO YOU OFTEN FEEL HASSLED ABOUT STICKING TO YOUR TREATMENT PLAN?	YES	20	10.3%
	NO	174	89.7%
Q8. HOW OFTEN DO YOU HAVE DIFFICULTY REMEMBERING TO TAKE ALL YOUR MEDICATIONS?	NEVER	140	72.2%
	RARELY	20	10.3%
	SOMETIMES	15	7.8%
	USUALLY,	11	5.7%
	ALL THE TIME	8	4%

Table 5: Patients Adherence Statistics

ADHERENCE	N	%
ADHERENT	139	71.7%
NON-ADHERENT	55	28.3%

Table 6: Adherence to Tuberculosis Treatment Across Different Literacy Groups

		ADHERENCE				P-VALUE
		NON-ADHERENT		ADHERENT		
		N	%	N	%	
LITREACY	UPPER PRIMARY	21	87.5%	3	12.5%	<0.001
	PRIMARY	4	80.0%	1	20.0%	
	SECONDARY	13	26%	37	74.0%	
	SENIOR SECONDARY	16	21.3%	59	78.7%	

	UNDER GRADUATE	1	2.78%	35	97.22%	
	POST GRADUATE	0	00.0%	4	100.0%	

- Lower literacy groups (Upper Primary and Primary) have the worst adherence, with adherence rates below 25%. Higher literacy groups (Undergraduate and Postgraduate) have nearly perfect adherence (97–100%). This significant correlation suggests that education plays a crucial role in health compliance.
- There is some variation in adherence across age groups, with younger adults (21-40 years) showing better adherence. However, since the P-value is not significant, age does not appear to have a major influence on TB treatment adherence in this sample. Other factors (e.g., socioeconomic status, health education, or support systems) may play a more critical role.
- Since the p-value is greater than 0.05, meaning gender does not play a statistically significant role in treatment adherence.
- There is no significant difference in adherence rates between rural and urban areas. Rural areas show slightly better adherence (74.0%) than urban areas (69.4%), but the difference is not statistically meaningful.
- Patients on DOTS treatment adhere much better (83.8%) than those on Non-DOTS treatment (53.2%). Non-DOTS treatment is associated with a much higher non-adherence rate (46.8%). The p-value (<0.001) confirms that this difference is statistically significant, making DOTS a strongly preferable approach for improving adherence to tuberculosis treatment.

DISCUSSION

With aim to evaluate the determinants of awareness and adherence among tuberculosis patients the need for this study relates to the unawareness about tuberculosis in society, and to access the factors contributing to non-adherence towards tuberculosis treatment. A total of 194 tuberculosis patients were enrolled in our study among which 57.2% were male and 42.8% were female respondents.

In the age-wise distribution of the patients, majority of the patients belonged to the age group between 21-30 years (25.8%), followed by the age groups of 31-40 years (20.1%), 51-60 years (15.5%), 41-50 years (13.9%), >60 years (12.9%) and 10-20 years (11.9%). However, the findings by Agazhu et al.6 reported that nearly half of the cases 168 (48.4%) were within the age group of 21–40 years. In NorteyAN et al,[7] the age-wise distribution of the study subjects showed that the majority (36.1%) of the patients were between the age group of 29 to 38 years. The high prevalence of tuberculosis cases in the 21-30 age group suggests that young adults are at a greater risk of tuberculosis disease, possibly due to increased social interactions, occupational exposure, or weakened immunity. This highlights the need for targeted awareness, early diagnosis, and preventive measures in this age category.

With respect to the literacy status, more than 38.7% of the patients had senior secondary level education followed by secondary level of education (25.8%) and primary level of education (2.6%). While only 18.6% were undergraduates and 2.1% had post graduate level of education. The findings by Nortey AN et al,[7] recorded that the educational status of majority of the study subjects was secondary level (51.3%) followed by 30% of the respondents with basic level of education. Good awareness of tuberculosis was found to be directly related to the level of education.

The study revealed poor tuberculosis (TB) awareness in 81.4% of patients, with only a small fraction demonstrating good (11.9%), excellent (3.6%), or fair (3.1%) knowledge. A significant majority (86.6%) were unaware that TB is caused by bacteria, and 71.6% did not associate smoking with increased TB risk. While 71.6% correctly identified the lungs as the primary organ affected, only 68.6% knew TB is curable, and 69.6% were aware of the 6–9 month treatment duration. Over half (55.7%) lacked knowledge about TB prevention, and 80.9% were unaware of the TB vaccine. Despite these gaps, 71.1% were aware of DOTS centres, and over 70% knew about free TB services. Similar studies like Pramanik et al,[2] and Jangid et al,[3] also reported widespread misconceptions and low awareness, highlighting the need for stronger health education and IEC efforts under NTEP. In our study, 72.7% of participants were aware of the monthly nutritional support (Rs. 500/1000) provided to TB patients, while 27.3% were not. This level of awareness is encouraging and suggests that public health communication strategies regarding the Nikshay Poshan Yojana are reaching a considerable portion of the affected population. Nonetheless, the fact that over one-fourth of patients remain uninformed highlights a critical gap in outreach efforts. Ensuring complete awareness is essential, as proper nutrition plays a vital role in treatment adherence, recovery, and overall health outcomes in TB patients.

Awareness was significantly associated with education and socioeconomic status—undergraduates (43.5%) showed better knowledge, while those with lower education levels had poorer awareness. These findings align with previous research indicating a statistically significant correlation between education level and TB knowledge.

Literacy plays a crucial role in enhancing awareness and understanding of tuberculosis (TB), as demonstrated in our study. To improve TB awareness among patients and the general population, coordinated efforts by both the

government and healthcare professionals are essential. The government should launch widespread public awareness campaigns using TV, radio, newspapers, and social media, while promoting educational activities around World TB Day (March 24). Visual aids like posters and billboards in public spaces—such as hospitals, schools, and transport hubs—can further enhance visibility. Regular free screening camps should be conducted, especially in high-risk areas like slums and prisons, alongside strengthened active case-finding strategies. Integrating TB education into school curricula up to the senior secondary level is critical, given the strong link between literacy and TB awareness. Training primary school teachers can be a sustainable and impactful strategy. Teachers, as trusted figures in the community, can effectively pass on basic knowledge about TB symptoms, prevention, and the importance of treatment to young students. This early education not only helps reduce stigma but also encourages children to share information within their families, thereby extending awareness to the wider community. Training teachers to deliver age-appropriate TB information can thus serve as a long-term investment in public health education and early intervention.

Community involvement, particularly through religious and local leaders, can help spread accurate information at the grassroots level. Local leaders /politicians/gram panchayats can significantly influence public perception and awareness. When TB is mentioned in their speeches, it helps destigmatize the disease and brings it into mainstream conversations. People often connect more with community leaders than with medical professionals, proving to be a valuable approach to enhance public awareness encouraging treatment-seeking behavior, and reinforcing the importance of government initiatives like the Nikshay Poshan Yojana. Strengthening relevant health policies is also vital. On the clinical front, doctors and healthcare workers must prioritize patient education, ensuring that patients and their families understand TB symptoms, the importance of treatment adherence, and preventive measures. They should also actively screen high-risk populations, including individuals with diabetes, malnutrition, or those living in overcrowded conditions. By aligning government initiatives with proactive medical engagement, TB awareness, early detection, and treatment adherence can be significantly improved, ultimately helping to reduce the disease burden.

Adherence: In our study of 194 tuberculosis patients, 71.7% were adherent to treatment, while 28.3% were non-adherent—findings consistent with Nortey et al.7, who reported 69.7% adherence. Younger patients (ages 10–40) showed higher adherence (73.9%–79.5%), while older patients, especially those aged 41–50 (59.3%), had lower adherence, likely due to factors like comorbidities or cognitive decline. Adherence did not differ significantly between genders.

High adherence was observed in behaviors such as not forgetting doses (72.2%), continuing treatment despite side effects (91.8%), and staying consistent during travel or symptom relief. Most patients (89.7%) did not feel alienated from healthcare workers, and 72.2% did not struggle to remember their medications.

Educational level strongly influenced adherence: postgraduates (100%) and undergraduates (97.2%) were significantly more adherent than those with only primary or upper primary education (non-adherence of 80% and 87.5%, respectively). These findings align with previous studies in Yemen, Turkey, and India, all linking illiteracy with poor treatment compliance.

A notable finding was the strong association between adherence and treatment mode. Patients on DOTS (Directly Observed Treatment, Short-course) had an adherence rate of 83.8%, compared to 53.2% for non-DOTS patients. DOTS was more effective due to its free services, accurate diagnosis, weight-based dosing, local accessibility, and supportive care, including nutritional and financial aid. Similar results were reported by Nyi Nyi Naing et al.8 who found that non-DOTS patients were three times more likely to be non-adherent.

Improving adherence to tuberculosis (TB) treatment is essential for ensuring successful recovery and preventing the development of drug resistance. Several strategies can support better adherence. Patient-centered care is crucial—patients should be clearly informed about the importance of completing treatment, potential side effects, and the consequences of non-compliance. Communication should be adapted to suit each patient's language, literacy level, and personal beliefs. Addressing the psychosocial aspects of TB, including stigma and fear, is also important. Involving family members and community health workers can provide ongoing support and help monitor adherence. Making treatment more convenient—through flexible scheduling, home visits, or outreach to remote areas—can reduce barriers to access. Providing counseling and appropriate management for side effects encourages patients to stay on treatment. Technological tools, such as automated text message reminders, along with regular check-ins by healthcare providers, help maintain engagement. Publicly recognizing and rewarding patients who complete their treatment can further motivate adherence. Lastly, a strong referral system ensures that patients can access additional resources and support when needed. Together, these approaches create a supportive and responsive healthcare environment that encourages patients to complete their TB treatment effectively.

CONCLUSION

The study highlights a balanced distribution across demographics, mostly from the middle

socioeconomic class with at least secondary education. However, health concerns persist, as many individuals are underweight, indicating nutritional deficiencies. Tuberculosis awareness is generally low, with limited knowledge Factors like literacy and socioeconomic status of patients significantly contributes toward awareness and knowledge of tuberculosis. Literacy and mode of treatment shows significant association toward adherence to treatment. Treatment adherence is higher among DOTS patients, demonstrating its effectiveness in ensuring adherence and accurate documentation.

A functional collaboration needs to be established between private medical practitioners and the NTEP to provide quality Tuberculosis care services. Mass public awareness should be raised to identify the main symptoms of pulmonary tuberculosis. Involving the private sector in providing standardized tuberculosis care can benefit both program managers and private providers, as well as patients, helping achieve universal access to care. Given the large number and diverse backgrounds of tuberculosis patients, it would be challenging for the National Tuberculosis Elimination Program (NTEP) to individually support and monitor each case effectively. To address this, NTEP must adopt a combination of strategies aimed at strengthening patient support. These include partnering with intermediary organizations such as NGOs and community-based groups, promoting collaborative care models, and implementing structured systems to ensure that patients receive standardized and uninterrupted treatment. Such measures will help ensure consistent care, improve treatment adherence, and ultimately contribute to better health outcomes for TB patients across the country.

The Government of India has undertaken several important and commendable initiatives toward the elimination of tuberculosis, including financial support schemes like the Nikshay Poshan Yojana and enhanced access to free diagnosis and treatment. These steps reflect a strong commitment to tackling TB at a national level. However, findings from this study indicate that challenges such as limited awareness and poor treatment adherence still persist at the community level. This suggests that while national policies are moving in the right direction, their impact can be further strengthened through improved grassroots-level implementation, sustained community engagement, and targeted awareness campaigns. Bridging these gaps with the support of local leaders, educators, and healthcare workers will be essential to fully realize the goal of a TB-free India and END TB by 2030 by WHO.

REFERENCES

1. World Health Organization. Global Tuberculosis Report 2024 [Internet]. Geneva: World Health Organization; 2024.
2. Pramanik D, Ghosh J. Knowledge and awareness of tuberculosis among pulmonary tuberculosis patients in a rural area of West Bengal. SAARC J Tuberc Lung Dis HIV/AIDS [Internet]. 2016 Oct 25;12(2):13–9.
3. Jangid V, Agrawal N, Yadav G, Pandey S, Mathur B. Health-seeking behavior and social stigma for tuberculosis in tuberculosis patients at a tertiary-care center in North West India. Int J Med Sci Public Health [Internet]. 2016;5(9):1893.
4. Zhang L, Ma X, Liu M, Wu S, Li Z, Liu Y. Evaluating tuberculosis knowledge and awareness of effective control practices among health care workers in primary-and secondary-level medical institutions in Beijing, China. BMC Infectious Diseases. 2024 Aug 2;24(1):774.
5. Kishor R, Kumari S, Prakash R, Chaudhary N, Shyama S, Ahmad S, et al. An assessment of treatment compliance using the Morisky scale-8 tool in adult hypertensive patients of Eastern India. J Family Med Prim Care [Internet]. 2024 Mar;13(3):924–31.
6. Agazhu HW, Assefa ZM, Beshir MT, Tadesse H, Mengstie AS. Treatment outcomes and associated factors among tuberculosis patients attending Gurage Zone Public Hospital, Southern Nations, Nationalities, and People's Region, Ethiopia: an institution-based cross-sectional study. Front Med (Lausanne) [Internet]. 2023; 10:1191.
7. Nortey AN, Adjoda A, Alhassan A, Scott GY. Adherence patterns, risk factors, and complications among patients with tuberculosis: A cross-sectional study at Nsawam Government Hospital. BMJ Public Health [Internet]. 2024 Apr;2(1):e000618.
8. Naing NN, D'Este C, Isa AR, Salleh R, Bakar N, Mahmod MR. Factors contributing to poor compliance with anti-TB treatment among tuberculosis patients. Southeast Asian J Trop Med Public Health [Internet]. 2001 Jun;32(2):369–82.