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ASSESSMENT OF HEALTH-SEEKING BEHAVIOR IN TUBERCULOSIS PATIENTS DIAGNOSED AT NITRD-OPD – A QUESTIONNAIRE-BASED STUDY

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ABSTRACT

Background: Tuberculosis remains a significant public health challenge in India. Effective management relies on patients exhibiting positive health-seeking behavior. This study assessed health-seeking behavior among tuberculosis patients attending the outpatient department of the National Institute of Tuberculosis and Respiratory Diseases in New Delhi, India.

Methods: A cross-sectional study recruited 100 consenting adult tuberculosis patients. Data was collected through similar pre- and post-education questionnaires exploring demographics, general health-seeking behavior, and tuberculosis-specific knowledge. Descriptive analysis evaluated the impact of educational interventions delivered by healthcare professionals.

Results: A substantial portion of participants displayed limited knowledge about tuberculosis. The patient interview showed that not more than 50% of the participant patients showed appropriate general health-seeking behavior. The intervention in the form of health education significantly improved the health-seeking behavior. Appropriate knowledge about Tuberculosis, which was exhibited by only 35.1% of participants, rose to 80.3% after the health education.

Conclusion: This study highlights the need for enhanced patient education on tuberculosis. Addressing socioeconomic disparities and tuberculosis-related stigma is also crucial. Effective communication between healthcare providers and patients can empower individuals to make informed treatment decisions, ultimately leading to improved TB management. There was a significant difference in patient responses after the education of the participants.

KEYWORDS: Tuberculosis, Health-seeking behavior, National Institute of Tuberculosis and Respiratory Diseases.

INTRODUCTION

India accounts for approximately 25% of the global tuberculosis (TB) burden, with an estimated 2.77 million cases recorded[1]. The detection and management of TB cases in India are primarily governed by the National Tuberculosis Elimination Programme (NTEP)[2]. The key objectives of NTEP include early case detection through active screening, enhanced diagnostic services, and effective treatment

via standardized regimens. Despite having a robust TB treatment framework, the disease remains a significant public health concern, particularly in low- and middle-income countries (LMICs)[3].

In India, various cultural, economic, social, and healthcare factors shape the perception of TB, often leading to stigma and discrimination. Persistent misconceptions regarding TB transmission further exacerbate fear and ignorance. Additionally, limited access to healthcare and economic hardships hinders patient adherence to treatment, necessitating comprehensive patient support programs. Addressing these disparities is crucial, as they contribute to the continued prevalence of TB. Given the multifaceted influences on TB perception, a comprehensive approach is essential for effective disease control.[4]

According to the World Health Organization (WHO), health-seeking behavior (HSB) encompasses any action or inaction taken by individuals who believe they have a health issue to seek an appropriate remedy. HSB activities may include visiting healthcare facilities in the public or private sectors, self-medication, reliance on home remedies, or engagement in general health-promoting behaviors. Positive HSB is critical in disease prevention, early diagnosis, and effective management[5].

To better understand the determinants of HSB, two prominent theoretical models are considered: the Health Belief Model (HBM) and the Theory of Planned Behaviour (TPB)[6]. The HBM suggests that health-related behavior is influenced by perceived threat severity, perceived benefits, barriers to change, self-efficacy, and external cues to action. The TPB posits a causal link between individual beliefs and behaviors, mediated by attitude, subjective norms, and perceived behavioral control[7]. These models provide a structured framework for analyzing the factors influencing TB-related HSB in affected individuals.

This study assesses HSB among TB patients attending the outpatient department (OPD) at the National Institute of Tuberculosis and Respiratory Diseases (NITRD). Patients diagnosed clinically or via laboratory tests at NITRD-OPD are directed to the health education section for counseling by a professional health educator. The study evaluates patient knowledge, attitudes, and behaviors related to TB through structured questionnaires.

METHODOLOGY

This empirical study was conducted at NITRD, New Delhi, within the health education section. The study design received approval from the Institutional Research Committee (NITRD/RC/2548) and the Postgraduate Ethics Committee (NITRD/PGEC/2024/1476).

The intervention by health educators aimed to influence patients' knowledge and behavior regarding TB treatment and prevention. To measure changes in patient responses post-intervention, a pretested structured questionnaire was administered twice—once before the health education session (pre-education) and again afterward (post-education). The questionnaire was meticulously designed in both Hindi and English, drawing on previous studies evaluating HSB. It included:

1. Demographic Information: Name, age, sex, residence, marital status, and socioeconomic status (assessed using the modified Kuppuswamy scale).[8,9]

2. Knowledge of TB: Causes, complications, transmission modes, and prognosis.

3. Awareness of Government Services: Knowledge of TB treatment programs and patient support initiatives.

4. Health Belief Model Considerations: Perceived threats, perceived benefits, and barriers to treatment.

The participants were randomly selected from the patients attending NITRD-OPD. All participants provided signed informed consent before enrollment.

The sample size of 100 participants was determined using the formula: $n \geq \frac{z_{\alpha}^2 P(100-P)}{L^2}$;

where prevalence (P) of respiratory diseases in Delhi and its surrounding regions was estimated at 18.8%.[10] Taking Zα=1.96Z_\alpha = 1.96 (for α=0.05\alpha = 0.05) and a minimum absolute error (L) of 8%, the calculated sample size was 91.6, rounded up to 100.

Descriptive statistics (frequency counts and percentages) were used to summarize questionnaire responses. Responses to general HSB-related questions were presented as percentages, while changes in TB-specific HSB following the health education session were analyzed by comparing pre- and post-education responses. The summarized data were depicted in graphical format using Microsoft Excel.

RESULTS

Demographic Characteristics of the Study Population

The study population consisted of 100 patients diagnosed with tuberculosis (TB) at the National Institute of Tuberculosis and Respiratory Diseases (NITRD), New Delhi. The demographic distribution of participants was analyzed across multiple socioeconomic factors, including occupation, education level, family income, and overall socioeconomic status, using the modified Kuppuswamy scale.

1. Occupational Distribution

Figure 1 presents the distribution of participants based on their occupation. The majority of the study participants were employed in low-income jobs or informal labor sectors, including daily wage earners, household workers, and small-scale vendors. A significant proportion of patients (approximately 15%) were unemployed at the time of the study, which may have contributed to financial constraints affecting their access to healthcare services. The limited availability of stable employment was a crucial factor influencing their health-seeking behavior (HSB), as financial dependency often deterred individuals from seeking timely medical care.

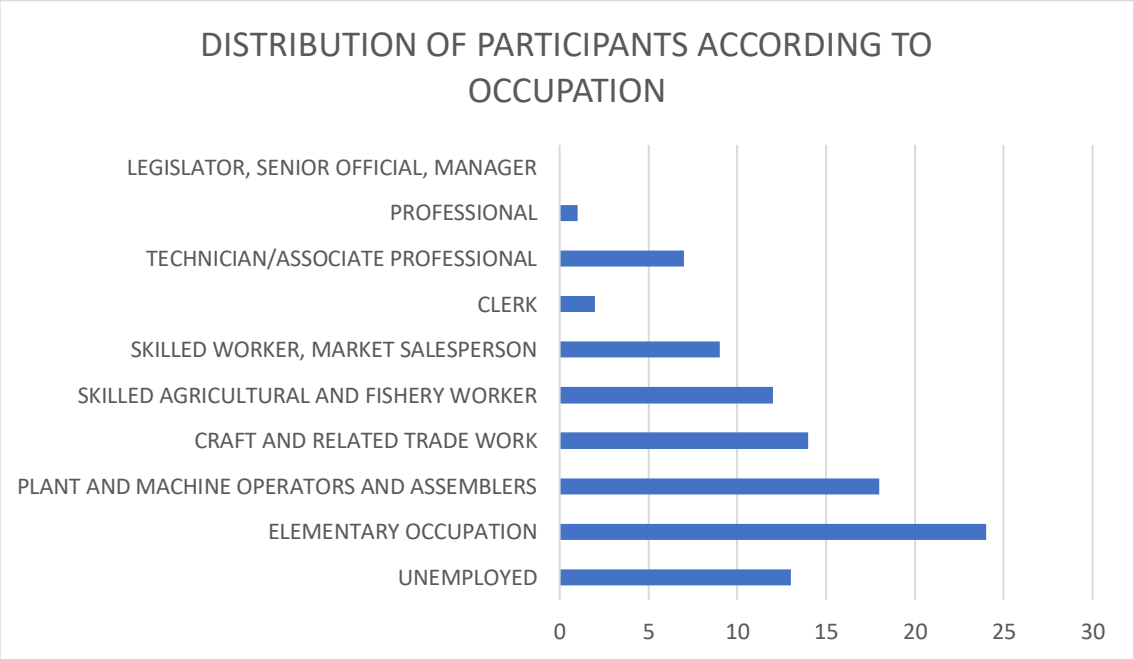

FIG 1: PARTICIPANT DISTRIBUTION ACCORDING TO OCCUPATION

2. Education Profile

Figure 2 illustrates the educational background of the study population. A substantial proportion of participants were either illiterate or had only received primary-level education. The highest percentage of participants (about 30%) were illiterate, followed by those with college education (approximately 25%) and middle school education (approximately 15%). Low literacy levels likely played a significant role in misinformation, misconceptions, and poor adherence to treatment regimens, reinforcing the need for targeted educational interventions.

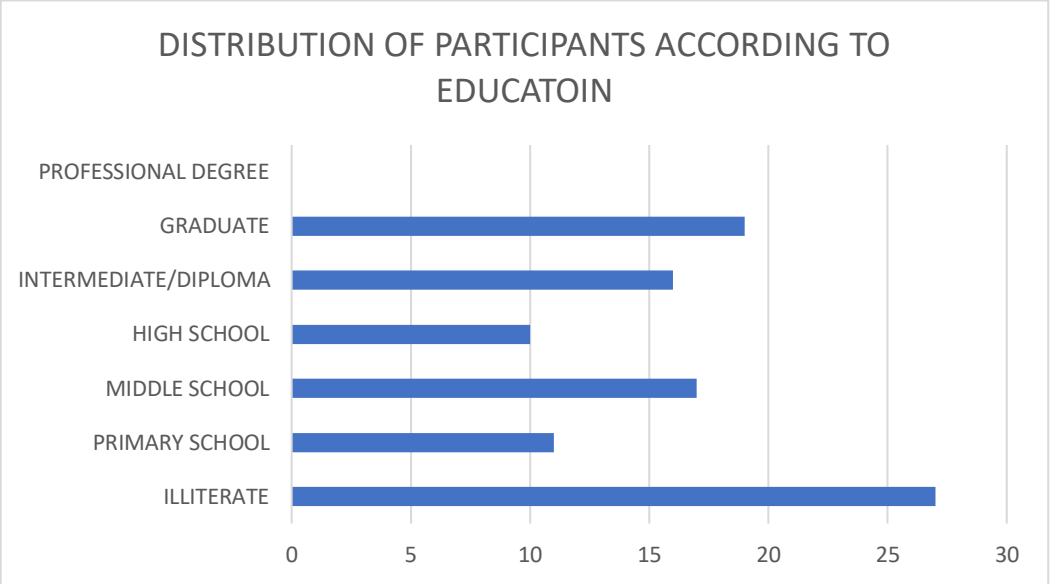

FIG 2: PARTICIPANT DISTRIBUTION ACCORDING TO EDUCATION

3. Monthly Income Distribution

Figure 3 provides insights into the participants' family income distribution. About one-fourth of the participants belonged to the lowest income bracket, earning less than ₹7,315 per month. A further 30% earned less than ₹20,000, while less than half (44%) of the participants had a monthly income exceeding ₹20,000. This skewed income distribution underscores the economic vulnerability of TB patients, as financial constraints often determine their ability to access healthcare, purchase medications, and adhere to treatment.

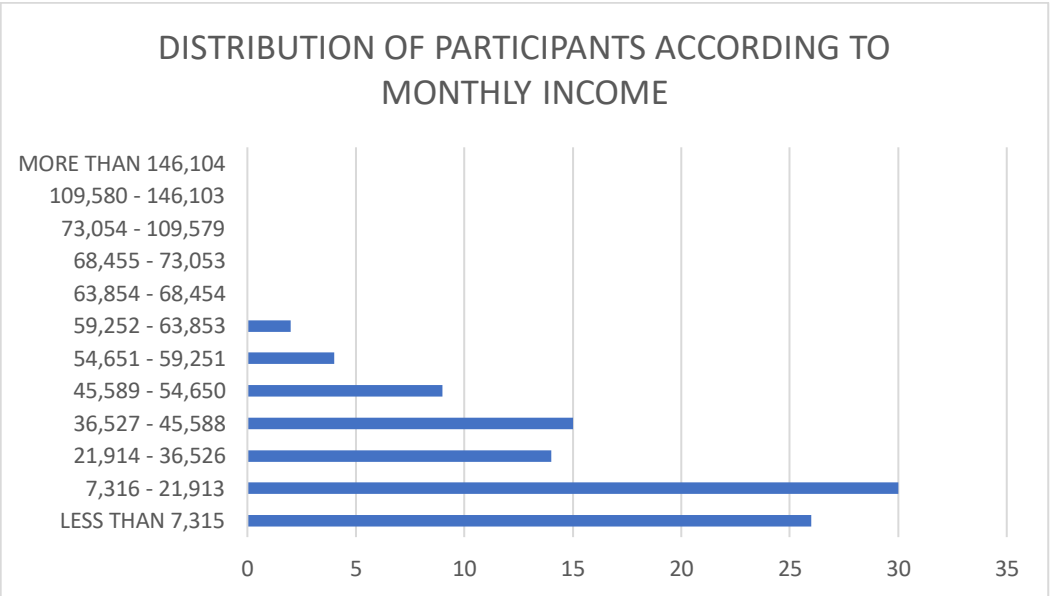

FIG 3: PARTICIPANT DISTRIBUTION ACCORDING TO MONTHLY INCOME

4. Socioeconomic Status

The socioeconomic status (SES) of the participants, calculated using the modified Kuppuswamy scale, is shown in Figure 4. The majority of the participants (about 65%) were from lower socioeconomic backgrounds, with a significant proportion also falling under the "lower-middle" category. The low SES of the study population directly impacts their health-seeking behavior, with financial barriers, lack of health insurance, and limited awareness about free government-provided TB treatment services being major obstacles.

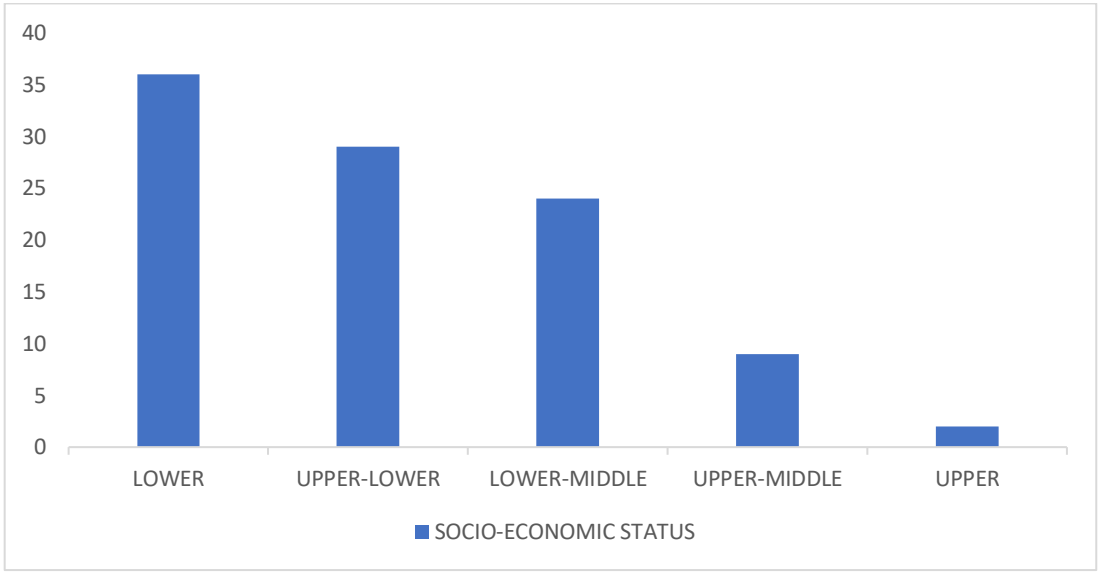

FIG 4: SOCIO-ECONOMIC STATUS OF PARTICIPANTS

Assessment of Health-Seeking Behavior (HSB)

The responses to the structured questionnaire were analyzed in two key domains: (1) general health-seeking behavior and (2) TB-specific health-seeking behavior. The results highlight critical gaps in knowledge, misconceptions about TB, and variations in attitudes toward seeking healthcare services.

1. General Health-Seeking Behavior (HSB) Responses

Figure 5 presents the responses to questions assessing general HSB among participants. Only about 50% of the participants demonstrated appropriate health-seeking behavior for common illnesses, indicating a significant gap in healthcare awareness. Despite the availability of free healthcare services, a notable proportion of participants (15%) still relied on home remedies or traditional healing methods, while 10% practiced self-medication, highlighting the need for stronger health education programs. These results indicate a tendency toward reactive rather than proactive healthcare-seeking behavior, emphasizing the need for behavioral change strategies.

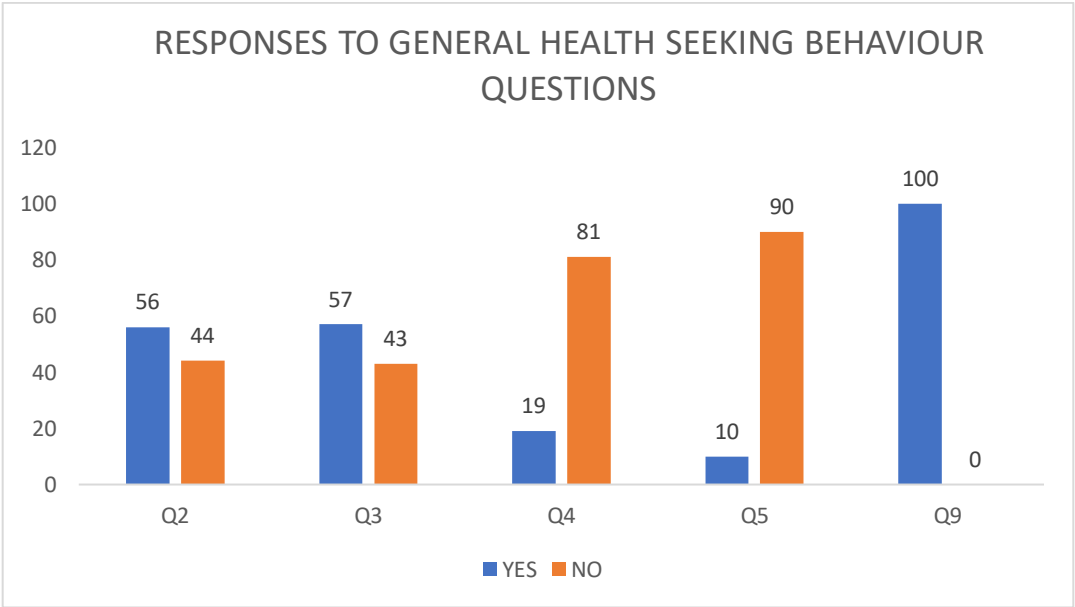

FIG 5: RESPONSES TO GENERAL HSB QUESTIONS

2. TB-Specific Health-Seeking Behavior Responses

Figure 6 presents the responses to TB-related HSB questions. The findings reveal that misconceptions, stigma, and lack of awareness were major barriers to early diagnosis and treatment adherence.

- **Knowledge of TB Causes and Transmission:**
  - **Accurate understanding (bacterial infection, airborne transmission):** 40%
  - **Misconceptions (hereditary, curse, poor diet):** 35%
  - **Unaware or uncertain:** 25%

These findings highlight the urgent need to correct misinformation regarding TB causation and transmission.

- **Awareness of Government-Supported TB Treatment Programs:**
  - **Fully aware:** 30%
  - **Partially aware:** 45%
  - **Unaware:** 25%

Although India has well-established TB control programs, a significant proportion of patients were either unaware or only partially aware of the free treatment services available under the National Tuberculosis Elimination Programme (NTEP).

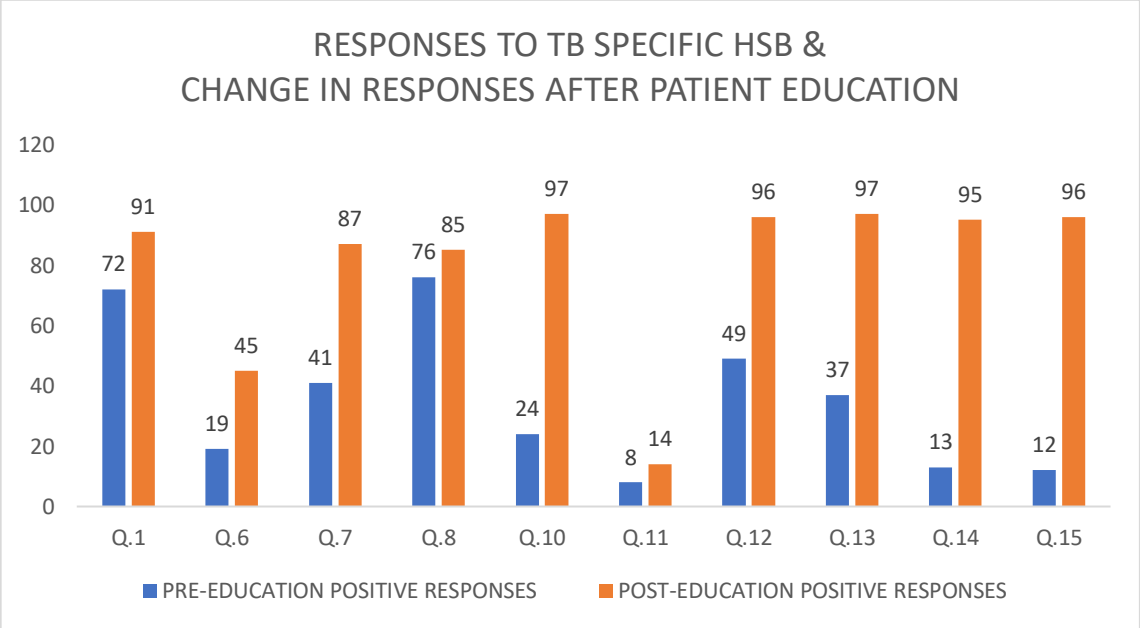

FIG 6: RESPONSES AND CHANGES TO TB HSB QUESTIONS

Impact of Health Education Intervention

TABLE 1: CHANGE IN RESPONSE AFTER EDUCATION

	PERCENTAGE CHANGE IN RESPONSE
Q. 1	19
Q. 6	26
Q. 7	41
Q. 8	9
Q. 10	73
Q. 11	6
Q. 12	47
Q. 13	60
Q. 14	82
Q. 15	84
Average of cumulative change	44.7

To assess the effectiveness of health education, a comparison of pre- and post-intervention responses was conducted. Table 1 presents the percentage change in responses after patients received education from a health educator. The pre-education and post-education responses revealed a significant positive shift in knowledge and attitudes toward TB treatment.

Key Findings from the Post-Education Questionnaire:

- Awareness about TB causes and symptoms improved significantly, rising from 40% pre-education to 80% post-education.
- The proportion of patients who recognized TB as a bacterial disease and an airborne infection increased by nearly 60%.
- More than 70% of the participants exhibited a change in their attitude towards early diagnosis and timely treatment.
- 84% of patients demonstrated an improved understanding of the importance of completing the full TB treatment course, reducing the risk of drug-resistant TB.

These results highlight the effectiveness of direct patient education in improving TB knowledge and modifying health-seeking behavior.

DISCUSSION

This study was conducted to assess the knowledge, attitude, and treatment perception of TB patients, specifically examining their health-seeking behavior (HSB) at the National Institute of Tuberculosis and Respiratory Diseases (NITRD) in New Delhi. The research explored various factors influencing HSB, including socioeconomic status, stigma, healthcare access, and the effectiveness of patient education interventions in improving disease management. HSB is a critical determinant of disease outcomes and plays a key role in TB management. It encompasses actions taken by individuals in response to perceived health issues, including seeking medical care, self-medicating, or completely neglecting symptoms. The study found that before health education interventions, a significant portion of TB patients lacked adequate knowledge regarding TB symptoms, treatment adherence, and the benefits of early intervention.

Several factors shaped the health-seeking behavior of TB patients. Health literacy emerged as a major determinant, as patients with low literacy levels often failed to recognize TB symptoms early, leading to delays in seeking appropriate treatment. Stigma and discrimination further discouraged patients from disclosing their illness or seeking help, often resulting in advanced disease stages before medical intervention. Economic constraints played a crucial role, as many TB patients in India belong to lower socioeconomic strata where healthcare expenses, transportation costs, and loss of daily wages deter them from seeking timely care. Additionally, healthcare accessibility issues, including inadequate access to well-equipped health centers and reliance on unregulated private healthcare providers, led to delays or improper treatments. These factors highlight the need for targeted public health interventions focusing on education, stigma reduction, and improved accessibility to TB care.[11]

The findings of this study align with research conducted in other developing regions. For instance, a study in Assam by Baruha et al.[12] (2017) revealed that only 51.6% of elderly participants exhibited appropriate HSB. Similarly, in sub-Saharan Africa, TB awareness campaigns improved HSB by nearly 50%, demonstrating the importance of structured health education interventions.[13] Despite Delhi being a metropolitan city with better healthcare infrastructure than rural areas, the findings suggest that even in urban settings, socioeconomic and cultural factors heavily influence HSB. The comparison with Assam highlights that the mere presence of healthcare facilities does not guarantee their utilization—awareness and affordability remain key determinants.[14]

One of the most significant outcomes of this study was the positive change in patient responses after health education interventions. The intervention led to an average improvement of 44.7% in knowledge and attitudes toward TB treatment. Patients who were previously unaware of free TB treatment programs became more likely to seek proper care. Many misconceptions about TB

transmission, such as believing it to be hereditary or caused by supernatural factors, were corrected. A higher number of patients also reported increased confidence in completing their full treatment regimen, which is crucial for preventing drug-resistant TB (DR-TB). This supports the theory that short, structured interventions by trained health educators can effectively alter patient behavior and lead to better health outcomes.[15]

Despite these improvements, several barriers to effective TB management remain. Non-adherence to treatment continues to be a significant challenge, as TB requires long-term treatment (a minimum of six months), and dropout rates remain high. Many patients discontinue medications prematurely due to perceived recovery, side effects, or financial constraints. Misinformation and cultural beliefs also persist, with some patients relying on traditional healers or home remedies rather than seeking medical intervention. This issue has been observed in studies from Ethiopia and Nigeria, where traditional beliefs often delay proper TB diagnosis and treatment. Gender disparities further complicate TB management, as women in many households face greater barriers to accessing healthcare due to social restrictions and financial dependency. In patriarchal societies, women with TB symptoms may delay seeking care due to fear of social consequences, including marital abandonment.[16]

Addressing these barriers requires a multifaceted approach. Strengthening community outreach programs can help dispel TB-related myths, while encouraging family-based counseling can support patient adherence. Introducing financial incentives, such as India's Nikshay Poshan Yojana, which provides ₹500 per month to TB patients for nutritional support, can help mitigate economic constraints. India’s National Tuberculosis Elimination Programme (NTEP) plays a crucial role in TB detection and treatment. However, awareness about government services was found to be low among participants, with only a small percentage of patients knowing about financial aid schemes or directly observed treatment short-course (DOTS) centers in their vicinity. To enhance the impact of NTEP, policymakers should increase grassroots awareness campaigns in low-literacy communities, strengthen the role of community healthcare workers in monitoring patient adherence, and improve digital tracking systems for real-time monitoring of treatment progress and dropout rates.[17]

The study highlights the necessity of integrating health education into routine TB care. Engaging TB patients in interactive counseling sessions leads to better knowledge retention and treatment adherence. While hospitals and TB clinics are available, they must be financially and geographically accessible to patients from all backgrounds. Community involvement is also crucial—engaging local influencers, religious leaders, and grassroots organizations can help break stigma and encourage early diagnosis. Health education programs should be tailored to different patient groups. Illiterate populations may benefit from visual aids and community radio broadcasts, while women may require separate awareness programs to ensure the social acceptability of seeking treatment. Working-class individuals may need evening TB clinics to accommodate their work schedules.[18]

While the study provides valuable insights, certain limitations must be acknowledged. The sample size was relatively small, including only 100 participants, which limits the generalizability of findings to the wider TB population in India. The short follow-up duration prevented an assessment of long-term behavioral changes in TB patients, and future studies should track whether patients continue to exhibit improved HSB over time. Additionally, responses were based on self-reported questionnaires, making them subject to recall bias and social desirability bias. Future research should employ larger samples, longer follow-up durations, and qualitative interviews to better capture behavioral patterns and ensure a more comprehensive understanding of TB patients' health-seeking behavior.[19,20]

Conclusion

In summary, the study demonstrates that targeted health education interventions significantly enhance TB-related knowledge and health-seeking behaviors. However, socioeconomic constraints, stigma, and misinformation remain significant barriers to optimal TB care. Policymakers and healthcare providers must adopt a holistic approach, combining awareness campaigns, financial support, and community engagement strategies to improve TB management in India. By addressing these challenges, India can move closer to its goal of TB elimination, ensuring that every patient has the

knowledge, support, and resources necessary for effective treatment adherence and improved health outcomes.

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