



IMPACT OF PATIENT SUPPORT SYSTEMS ON TREATMENT OUTCOMES AMONG TUBERCULOSIS PATIENTS IN BELAGAVI, KARNATAKA

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ABSTRACT Tuberculosis (TB) remains a major public health challenge in India, with successful treatment outcomes often influenced by multiple socio-economic factors. Patient Support Systems (PSS), such as the Nikshay Poshan Yojana (NPY), have been introduced under the National Tuberculosis Elimination Programme (NTEP) to address treatment adherence by offering nutritional and financial aid to TB patients. However, the actual impact of these support systems on treatment outcomes is not fully understood. This study was conducted among TB patients registered under the Urban TB Unit in Belagavi, Karnataka, to assess the association between awareness and utilisation of PSS and their treatment outcomes. Awareness and utilisation were measured using structured questionnaires and categorized into poor, average, and good levels based on scoring. The findings showed that while awareness alone was not significantly associated with treatment outcomes, higher utilisation of support systems was linked to better treatment completion rates. This highlights the importance of strengthening the implementation and accessibility of PSS to improve TB treatment success and move towards India's goal of TB elimination.

KEYWORDS : Tuberculosis, Patient Support Systems, NTEP, Nikshay Poshan Yojana, Treatment Outcomes

INTRODUCTION

India accounts for the highest global burden of tuberculosis, with an estimated 27% of the world's TB cases and 36% of TB-related deaths.¹ The country's progress in combating tuberculosis is crucial to meeting the global target of ending TB by 2030. As outlined in the National Strategic Plan for Tuberculosis 2017–2025, India aims to achieve treatment success rates of 92% for drug-sensitive TB and 75% for drug-resistant TB by the year 2025.² The overall treatment success rate for drug-sensitive tuberculosis (DS-TB) was 86.9% in 2023.³ These figures underscore the urgent need for highly effective and rapidly scalable interventions such as Nikshay Poshan Yojana to improve tuberculosis treatment outcomes and accelerate progress toward higher success rates.²

One of the biggest challenges for TB patients is staying on treatment for the full course, especially when faced with poor nutrition, stigma, and financial difficulties. To help reduce these barriers, the Government of India launched the Nikshay Poshan Yojana (NPY) in April 2018. This scheme provides INR 500 per month (now, INR 1000, since October 2024) to TB patients to support their nutritional needs and to ease some of their financial burden during treatment. By focusing on the patient's overall well-being, the initiative aims to improve adherence to treatment and ultimately lead to better outcomes.⁴

While NPY has reached many patients across the country, there is still limited information about how well people understand and use the scheme. Most available data show how much money has been disbursed, but they don't tell us whether patients know about the support, how easily they can access it, or whether it helps them complete their treatment.

This study explores whether there is any link between using the patient support system and their treatment outcome. By understanding this connection, we hope to provide insights that can strengthen patient support systems and help India move closer to its goal of eliminating TB.

MATERIALS AND METHODS

A facility-based descriptive study was conducted at the Urban Tuberculosis Unit in Belagavi, Karnataka. A total of 400 adult TB patients registered under the National Tuberculosis Elimination Program (NTEP) between January 2021 and December 2023 were selected using systematic random sampling. Data was collected using a pre-tested and structured questionnaire, administered through face-to-face interviews. Prior to the main study, a pilot study was conducted among 40 TB patients outside the selected TB unit to assess the

feasibility and clarity of the questionnaire, and necessary modifications were made based on the acquired findings.

Written informed consent was obtained from all participants after explaining the purpose of the study, assuring confidentiality, and addressing any concerns. Ethical clearance was obtained from the Institutional Ethics Committee (IEC) for Human Subjects Research of the Medical College. Approval was also taken from the District Tuberculosis Office, Belagavi and the Principal of the Medical College.

The inclusion criteria were: (1) TB patients aged 18 years or older, (2) registered for treatment under NTEP at the urban TB unit of Belagavi between 2021 and 2023, and (3) able and willing to provide informed consent. The exclusion criteria included: (1) patients with severe cognitive impairment or mental illness affecting their ability to participate, and (2) those who were critically ill or hospitalized at the time of data collection.

Data on awareness and utilization of Patient Support Systems (PSS), particularly the Nikshay Poshan Yojana, were collected, and treatment outcomes were recorded from TB registers. Awareness and utilization of the Nikshay Poshan Yojana (NPY) were each assessed using 12 structured questions. Correct or affirmative responses were scored as 1, and incorrect, negative, or 'Not Applicable' responses were scored as 0. The total score for both awareness and utilization ranged from 0 to 12 and was categorized as poor (0–4), average (5–8), and good (9–12). Data was entered in Microsoft Excel and analyzed using SPSS version 20. Chi-square tests were used to assess associations between awareness/utilization of PSS and treatment outcomes, along with socio-demographic variables.

RESULTS

Table 1: TB Treatment Outcomes Among Patients (N=400)

TB treatment outcome	Frequency	Percentage (%)
Cured	99	24.8
Treatment completed	259	64.8
Died	0	0
Lost to follow up	0	0
Treatment failure	42	10.4
Transferred out	0	0
TOTAL	400	100

Among the 400 study participants included in the study, 99 (24.8%) participants were cured, 259 (64.8%) participants completed treatment, and 42 (10.4%) participants experienced treatment failure after the end of DOTS treatment. None of the participants died, were

lost to follow up or transferred out during the study.

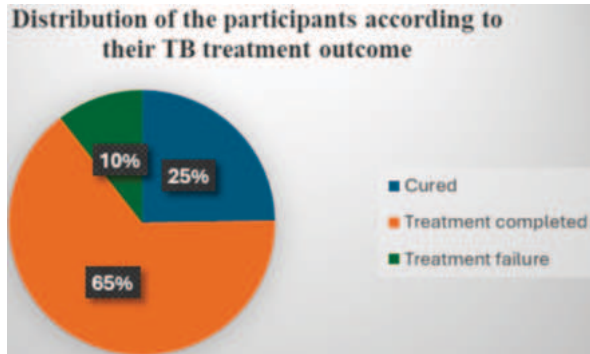


Figure 1: TB Treatment Outcomes Among Registered Patients (N=400)

Table 2: Association Of Awareness Scores Of Patient Support System And TB Treatment Outcomes Among Patients (N=400)

	TB Treatment Outcome							
	Cured		Treatment completed		Treatment failure (%)			
Awareness level	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Chi-square value	p value
Poor Awareness	93	26.6	223	63.9	33	9.5	8.012	0.091
Average Awareness	5	12.2	28	68.3	8	19.5		
Good Awareness	1	10.0	8	80.0	1	10.0		

Among 400 study participants, 93 (26.6%) with poor awareness were cured, 223 (63.9%) completed treatment, and 33 (9.5%) experienced treatment failure. Among those with average awareness, 5 (12.2%) were cured, 28 (68.3%) completed treatment, and 8 (19.5%) had treatment failure. In the good awareness group, 1 (10%) participant was cured, 8 (80%) completed treatment, and 1 (10%) experienced treatment failure. The chi-square value for this association was 8.012, with a p-value of 0.091, indicating no statistically significant relationship between awareness levels and TB treatment outcomes.

Table 3: Association Of Utilization Levels Of Patient Support System And Tb Treatment Outcomes Among Registered Patients (N=400)

	TB Treatment Outcomes							
	Cured		Treatment completed		Treatment failure (%)			
Utilization level	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Chi-square value	p value
Poor Utilization	74	28.9	160	62.5	22	8.6	15.24	.004*
Average Utilization	10	14.7	53	77.9	5	7.4		
Good Utilization	15	19.7	46	60.5	15	19.7		

Among 400 study participants, 74 (28.9%) with poor utilization were cured, 160 (62.5%) completed treatment, and 22 (8.6%) experienced treatment failure. Among those with average utilization, 10 (14.7%) were cured, 53 (77.9%) completed treatment, and 5 (7.4%) had treatment failure. In the good utilization group, 15 (19.7%) participants were cured, 46 (60.5%) completed treatment, and 15 (19.7%) experienced treatment failure. The chi-square value for this association was 15.24, with a p-value of 0.004, indicating a statistically significant relationship between utilization levels and TB treatment outcomes.

DISCUSSION

In the present study, out of 400 tuberculosis (TB) patients, we observed

a cure rate of 24.8%, with 64.8% completing treatment, and a treatment failure rate of 10.4%. There were no reported cases of mortality, loss to follow-up, or patient transfers during the study period because these patients were not included in the study.

Similarly, a multicentric prospective cohort study done in India in 2024 involving 2,006 individuals with drug-susceptible TB found that 18% experienced unfavorable treatment outcomes, including treatment failure (4.7%), recurrent infection (2.5%), death (4.1%), and loss to follow-up (6.8%).⁵ (Table 1)

Association of awareness scores and TB treatment outcomes among patients (n=400)

In the present study, the association between awareness levels and TB treatment outcomes among 400 participants was analyzed. Among those with poor awareness, 93 (26.6%) were cured, 223 (63.9%) completed treatment, and 33 (9.5%) experienced treatment failure. In contrast, the average awareness group showed a lower cure rate (12.2%) and a higher treatment failure rate (19.5%), while the good awareness group had 10% cure and 80% of the participants completed treatment. Despite these variations, the association between awareness and treatment outcome was not statistically significant (Chi-square = 8.012, p = 0.091). (Table No. 2)

Association of utilization scores and TB treatment outcomes among patients (n=400)

In the current study, the analysis of utilization levels of Patient Support Systems revealed a statistically significant association with TB treatment outcomes (Chi-square = 15.24, p = 0.004). Participants with poor utilization had a cure rate of 28.9%, treatment completion rate of 62.5%, and treatment failure rate of 8.6%. The average utilization group demonstrated the highest treatment completion rate (77.9%) and the lowest failure rate (7.4%), while the good utilization group had a comparatively higher treatment failure rate (19.7%), despite also showing a higher cure rate (19.7%). (Table No. 3)

CONCLUSION

TB Patient Support Systems (PSS), particularly the Nikshay Poshan Yojana (NPY), play a significant role in shaping treatment outcomes among tuberculosis patients. While awareness of support schemes alone did not show a statistically significant association with treatment success, the actual utilization of these systems was strongly associated with improved outcomes. Patients who effectively accessed support had higher rates of treatment completion, suggesting that financial and systemic support mechanisms can positively influence adherence and recovery.

The unexpectedly high failure rate among those with good utilisation highlights the complex interplay of social, economic, and clinical factors, suggesting that patients who rely more heavily on support systems may also represent a more vulnerable population. These findings highlight the need not only to expand awareness and access to PSS, but also to provide targeted follow-up and support for patients with higher dependency on these schemes.

For India to move closer to its goal of TB elimination, strengthening the implementation and equitable utilisation of patient support initiatives is critical. Ensuring timely disbursement, simplifying access processes, and integrating socio-economic vulnerability assessments into routine care may further enhance the effectiveness of interventions like NPY. Future studies should also explore the quality, timeliness, and patient satisfaction with support schemes to fully understand their impact on treatment outcomes.

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