

Original Research Article

EVALUATION OF COMMUNITY SUPPORT (NIKSHAY MITRA) FOR TUBERCULOSIS PATIENTS IN SURENDRANAGAR DISTRICT, GUJARAT

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ABSTRACT

Background: Tuberculosis elimination in India requires addressing social determinants. Recognizing these multifaceted challenges, the Government of India launched the PMTB MBA in 2022, which introduced the Nikshay Mitra initiative. This study aims to assess the availability and utilization of community support (Nikshay Mitra), explore challenges faced by stakeholders, and identify opportunities to strengthen the program in Surendranagar District.

Materials and Methods: A mixed-methods study was conducted in Surendranagar district. A total of 120 TB patients registered during the third quarter of 2023 were selected using systematic random sampling and interviewed using a validated, pre-tested, semi-structured questionnaire. For the qualitative component, Medical Officer, Taluka Health Officer and District Tuberculosis Officer were interviewed. To assess the independent effect of nutritional kit provision on BMI ANCOVA was performed.

Results: Among 120 participants (mean age 43.3 years), 73.33% had pulmonary TB. While 64.17% consented to community support, only 33.33% received assistance, predominantly nutritional support (85%). No statistically significant association was observed between receipt of community support and treatment outcome or end-of-treatment BMI after adjustment for baseline BMI. Health workers perceived that nutritional and supportive care facilitated adherence; however, irregular distribution, weak monitoring, and lack of standardization were identified as key implementation gaps.

Conclusion: Despite high consent for community support under the Nikshay Mitra initiative, only one-third of patients received assistance, indicating an implementation gap. Nutritional kit provision showed no independent association with end-of-treatment BMI. Health workers perceived supportive benefits but reported irregular distribution and weak monitoring. Strengthening implementation and oversight is necessary to improve program effectiveness.

Keywords: Nikshay Mitra, Nutrition kit, PMTB MBA, Tuberculosis.

INTRODUCTION

Tuberculosis (TB) remains a significant public health challenge globally, reclaiming its status as the leading cause of death from a single infectious agent in 2023, with an estimated 1.25 million deaths and

10.8 million new cases worldwide.^[1] India accounts for nearly one-fourth of the global tuberculosis (TB) burden, with an incidence rate of 199 cases per lakh population in 2023.^[2]

TB elimination requires not only medical interventions but also a comprehensive approach to

tackle its social determinants, such as undernutrition, economic insecurities, and the stigma surrounding the disease.^[3] Recognizing these challenges, the Government of India launched the Pradhan Mantri TB Mukta Bharat Abhiyan (PMTBMBA) in 2022, which introduced the Nikshay Mitra initiative.^[4] This program mobilizes community support to complement government efforts in TB elimination. The entire program operates through the Ni-kshay 2.0 portal, serving as a centralized platform where donors, known as Ni-kshay Mitras, provide support to TB patients who have consented (via OTP) to be included in the initiative. The assistance offered through this program encompasses three key areas: nutritional support, additional diagnostic aid for diagnosed TB patients, and vocational support.^[5] Ni-kshay Mitra include elected representatives, political parties, corporates, NGOs, and individuals. This initiative not only aims to improve treatment adherence but also fosters a compassionate connection between patients and their supporters, helping to reduce stigma and empower communities to participate actively in TB control.^[5] By January 2025, 1.91 lakh Nikshay Mitras and 14,50 lakh TB patients were registered on the Nikshay portal, reflecting the scheme's reach.⁶ However, the scientific literature on its implementation, utilization, and challenges remains limited.^[7,8] This study aims to bridge this knowledge gap by evaluating the implementation of the Nikshay Mitra scheme in Surendranagar District. It will assess the availability and utilization of community support, explore challenges faced by stakeholders, and identify opportunities to strengthen the program. The findings will provide valuable insights to optimize the scheme and contribute to the broader goal of TB elimination in India.

MATERIALS AND METHODS

A mixed-methods study was conducted in Surendranagar district, Gujarat, to evaluate the implementation of the Nikshay Mitra initiative under the Pradhan Mantri TB Mukta Bharat Abhiyaan during April 2024 to March 2025. The study included both quantitative and qualitative components to assess coverage, utilization, nutritional outcomes, and stakeholder perspectives. The study Population consisted of TB patients registered during the third quarter (July–September) of 2023. The sample size was calculated assuming that 77.5% of registered TB patients receive community support in Surendranagar district.⁶ With 10% relative precision and 95% confidence level, the required sample size was estimated using the formula $n = Z^2pq/d^2$, where $p = 0.775$ and $d = 10\%$ of p . The minimum required sample size was 111. A total of 120 participants were included in the study. The total sample was allocated proportionately across the 10 talukas based on the number of TB patients notified in each taluka during the 3rd quarter of 2023. Within each taluka, participants were selected using systematic random sampling from the Nikshay line

list. Transferred-out and deceased patients were excluded.

Data were collected through face-to-face interviews using a validated and pre-tested semi-structured questionnaire. Information was obtained on socio-demographic characteristics, clinical profile, consent status for community support, receipt and utilization of nutritional kits, and treatment outcomes. For paediatric patients, caregivers were interviewed. Body Mass Index (BMI) was calculated at treatment completion and categorized according to WHO Asian BMI cut-offs.

For the qualitative component, purposive sampling was used to obtain stakeholder perspectives. In-depth interviews were conducted with one Medical Officer from each Primary Health Centre involved in TB management, along with key district-level officials including the District Tuberculosis Officer (DTO) and Taluka Health Officers (THO).

In-depth Interviews were conducted using a semi-structured guide focusing on strengths, operational challenges, monitoring mechanisms, and suggestions for improvement. Thematic analysis was performed manually through coding and categorization of recurring themes.

Quantitative data were entered in Microsoft Excel and analysed using SPSS version 26. Descriptive statistics were computed as frequencies, percentages, means, and standard deviations. To assess the independent effect of nutritional kit provision on BMI at treatment completion, analysis of covariance (ANCOVA) was performed with end-of-treatment BMI as the dependent variable and baseline BMI as a covariate. A p -value <0.05 was considered statistically significant.

Ethical approval was obtained from the Institutional Ethics Committee. Written informed consent was obtained from all participants or caregivers. Confidentiality and anonymity were maintained throughout the study.

Artificial intelligence (AI) assistance was used solely for language refinement, structural editing, and improvement of clarity in manuscript drafting. ChatGPT (OpenAI, GPT-4 model, 2026 version) was used to assist in improving grammar, organization of sections, and presentation of statistical interpretation. No AI tools were used for data collection, data analysis, data generation, or interpretation of primary findings. All statistical analyses were performed by the authors using SPSS (Version 26), and all outputs were independently verified by the authors. The authors take full responsibility for the integrity and accuracy of the study.

RESULTS

A total of 120 TB patients were included in the study, with a mean age of 43.3 ± 17.9 years. The majority were male (74.17%) and belonged to lower socio-economic classes (IV–V). Most participants accessed government healthcare facilities (95.83%), with over half residing within 1–5 km of the facility. [Table 1]

Table 1: Distribution of Participants Based on Socio-Demographic Characteristics (n=120)

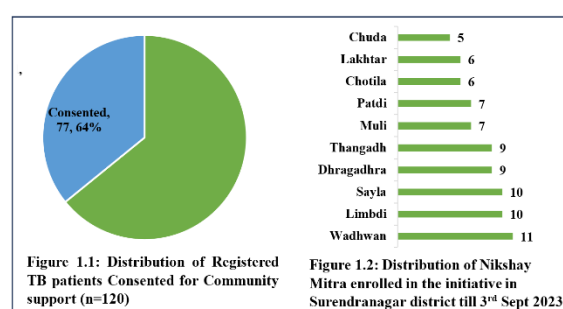
Socio-demographic characteristics	No.	Percentage
<i>Age (In years)</i>		
1-15	5	4.17
16-30	28	23.33
31-45	32	26.67
46-60	27	22.50
61-75	27	22.50
≥76	1	0.83
<i>Gender</i>		
Male	89	74.17
Female	31	25.83
<i>Educational Status</i>		
Illiterate	45	37.50
Primary	39	32.50
Secondary	24	20.00
Higher Secondary	11	9.17
Graduate	1	0.83
Post Graduate	0	0.00
<i>Occupation</i>		
Labourer	30	25.00
Farmer	26	21.67
Housewife	18	15.00
Unemployed or retired	19	15.83
Student	10	8.33
Business	7	5.83
Job (Govt./Private)	6	5.00
Self Employed	4	3.33
<i>Type of Family</i>		
Joint	59	49.17
Nuclear	61	50.83
<i>Socio-Economic Class</i>		
I	0	0.00
II	5	4.17
III	19	15.83
IV	65	54.17
V	31	25.83
<i>Nearby health care facility</i>		
Govt.	115	95.83
Private	5	4.17
<i>Distance from nearby health care facility</i>		
<1 Km	19	15.83
1-5 Km	70	58.33
>5 Km	31	25.83
Grand Total	120	100.00

Table 2: Clinical and Behavioural Characteristics of Tuberculosis Patients (n=120)

Clinical / Behavioural Characteristics	No.	Percentage
<i>Type of Tuberculosis</i>		
Extra Pulmonary	32	26.67
Pulmonary	88	73.33
<i>DOTS treatment category</i>		
DS-TB	116	96.67
DR-TB	4	3.33
<i>Previous History of TB</i>		
Yes	3	2.50
No	117	97.50
<i>Family History of TB</i>		
Yes	7	5.83
No	113	94.17
<i>Chronic illness</i>		
No chronic illness	111	92.50
COPD	4	3.33
DM	3	2.50
Chronic Kidney disease	1	0.83
Hypertension & Diabetes	1	0.83
<i>Habit of Smoking</i>		
Current	10	8.33
Former	21	17.50
Never	89	74.17
<i>Habit of Alcohol consumption</i>		
Current	4	3.33

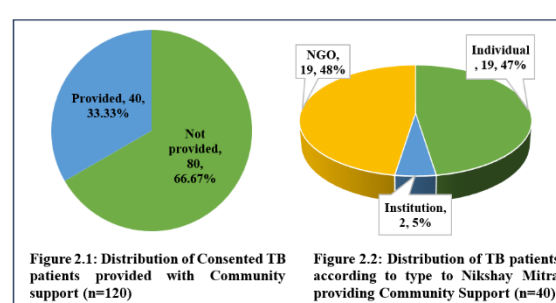
Former	13	10.83
Never	103	85.83
Outcome of TB treatment		
Cured	85	70.83
Treatment completed	17	14.17
Treatment Failure	9	7.50
Loss to follow up	9	7.50
Grand Total	120	100.00

Pulmonary TB accounted for 73.33% of cases, and 96.67% were diagnosed with drug-sensitive TB. A successful treatment outcome (cured or treatment completed) was observed in 85% of patients, while 7.5% experienced treatment failure and another 7.5% were lost to follow-up. No statistically significant association was observed between receipt of nutritional support and treatment outcome ($p > 0.05$). [Table 2]



Out of a total of 120 participants, 77 patients (64.17%) consented to community support, while 43 patients (35.83%) did not provide consent. [Figure 1.1]

As of 3rd September 2023, a total of 43 Nikshay Mitras were enrolled in the initiative across Surendranagar district. The highest number of Nikshay Mitras was reported in Wadhwan taluka (11), followed by Limbdi and Sayla, each with Ten. Dhragadhra and Thangadh both had Nine Nikshay Mitras, while Muli and Patdi had Seven each. Chotila and Lakhtar recorded Six Nikshay Mitras each, and Chuda had the fewest, with Five. [Figure 1.2]



Among all participants, 40 (33.33%) were reported receiving some form of community support. Most TB patients received this support either from NGOs (19, 47.5%) or individual (19, 47.5%) Nikshay Mitras. [Figure 2.1 & 2.2].

Table 3: Distribution of TB patients according to type of Community support received & utilization of Nutritional kit

Type of Community Support Provided (n=40)	No.	Percentage
Nutritional support	34	85
Additional investigations for the diagnosed TB patients	25	62.5
Vocational support	25	62.5
Additional nutritional supplements	17	42.5
Utilization of Nutrition Kit (n=34)		
Patient	21	61.76
Family	13	38.24
Content of Nutrition Kit (n=34)		
Cereals & millets	31	91.18
Pulses	30	88.24
Cooking oil	22	64.71
Milk powder	18	52.94
Milk	20	58.82
Other	6	17.65
Content provided in Nutrition Kit felt (n=34)		
Adequate	30	88.24
Inadequate	4	11.76

[Table 3] summarizes the distribution of TB patients based on the type of community support received and the utilization of nutritional kits. Among the 40 patients who received support, 85% (34) benefited from nutritional support, 62.5% (25) received additional investigations and vocational support, and 42.5% (17) were provided with additional nutritional supplements. Regarding the utilization of the nutritional kits among the 34 patients who received them, 61.76% (21) used the kits themselves, while

38.24% (13) shared them with their families. For the items available in the nutritional kit, 91.18% (31) received cereals and millets, 88.24% (30) received pulses, 64.71% (22) received cooking oil, and 52.94% (18) received milk powder. Out of the 34 TB patients who received nutritional kits, the majority, 88.24% (30), reported that the contents of the kits were adequate to meet their needs. However, 11.76% (4) found the contents to be inadequate.

Table 4: Nutritional status at completion of anti-tuberculosis therapy and effect of nutritional kit provision on end-of-treatment BMI (n = 120)

<i>A. Distribution of nutritional status at treatment completion</i>		
Nutritional Status (BMI)	No.	Percentage
Underweight (<18.5) *	38	31.67
Normal (18.5- 22.9)	55	45.83
Overweight (23- 26.9)	23	19.17
Obesity (≥27)	4	3.33
Total	120	100
<i>B. Analysis of covariance (ANCOVA) for end-of-treatment BMI†</i>		
Variable	F	p
Nutritional kit (adjusted)	0.67	0.415
Baseline BMI	86.05	0.001
*WHO Asian Parameters BMI = Body Mass Index. Underweight includes extremely underweight (<14 kg/m ²), Grade III (14–16 kg/m ²), Grade II (16–16.9 kg/m ²), and Grade I (17–18.4 kg/m ²). †ANCOVA performed with end-of-treatment BMI as dependent variable and baseline BMI as covariate. p < 0.05 considered statistically significant.		

At the completion of anti-tuberculosis therapy, 45.83% of patients had a normal BMI (18.5–22.9 kg/m²). To evaluate whether provision of nutritional kit support independently influenced BMI outcomes, an analysis of covariance (ANCOVA) was performed with end-of-treatment BMI as the dependent variable and baseline BMI as a covariate. Baseline BMI emerged as a significant predictor of BMI at treatment completion ($F = 86.05$, $p = 0.001$). In contrast, nutritional kit provision did not demonstrate a statistically significant independent effect after adjustment ($F = 0.67$, $p = 0.415$). [Table 4]

Strengths and Weaknesses of the Nikshay Mitra Initiative (Health Worker Perspective)

In-depth interviews with health workers revealed two major themes: perceived benefits and operational challenges of the Nikshay Mitra initiative. Health workers reported that the initiative provided support to socio-economically vulnerable TB patients and was perceived to facilitate treatment adherence. The provision of nutritional, diagnostic, and vocational assistance was considered beneficial, and involvement of patients in care planning was believed to foster a sense of ownership toward treatment completion.

Operational challenges were also highlighted. Respondents reported irregular distribution of support, absence of standardized nutritional kits as per government guidelines, inadequate communication channels, and weak monitoring mechanisms. Some health workers expressed concerns that financial assistance in place of structured nutritional support may not ensure appropriate dietary intake. The absence of incentives for staff coordinating with Nikshay Mitra and limited institutional participation were also noted as constraints.

DISCUSSION

A mixed-methods study was conducted in Surendranagar district, Gujarat, to evaluate the implementation of the Nikshay Mitra initiative. A total of 120 patients were studied, with a mean age of 43.3 years, predominantly males (74.2%), and largely belonging to low socio-economic strata (classes IV and V). Nearly half were labourers or farmers,

highlighting their economic vulnerability. These findings are consistent with the demographic profile observed in Mandya district, where most patients were male (72.9%) and primarily labourers or farmers.^[7] Similar socio-demographic trends have also been reported from Kollam, Kerala, where 70.4% of TB patients were male with a mean age of 49.7 years,^[9] and from Pokhara, Nepal, where 60.9% were males with a mean age of 35.2 years.^[10] Although 64.17% of patients consented to community support, only one-third reported receiving assistance, indicating a substantial implementation gap. Similar discrepancies between consent and actual delivery have been reported in Meghalaya and other districts, suggesting systemic operational constraints rather than lack of patient willingness.^[7,12] While patient engagement appears promising, programmatic bottlenecks limit effective coverage.

Among those receiving nutritional kits, approximately two-thirds utilized them exclusively for personal consumption, while a considerable proportion shared them within the household. Compared to the IIPH Gandhinagar assessment,^[11] which reported higher intra-household sharing, this variation may reflect differences in household food security, counselling practices.

At the End of Anti TB- Treatment, 45.83% of participants had normal BMI, but undernutrition remained significant (31.7%). This aligns with observations from Nepal, where 21.8% of TB patients were underweight and 17.3% overweight.¹⁰ Globally, a study from Burkina Faso reported an undernutrition prevalence of 35.8%, with 7.3% severely thin and 8.9% moderately thin.^[14] Our undernutrition prevalence mirrors these international findings, underscoring TB's consistent link with poor nutritional outcomes.

Despite nutritional support, nearly one-third of patients remained underweight at treatment completion. The ANCOVA analysis demonstrated that baseline BMI was a strong predictor of end-of-treatment BMI, whereas nutritional kit provision did not show an independent statistically significant effect after adjustment. This finding suggests that short-term nutritional supplementation alone may be insufficient to reverse pre-existing undernutrition

without addressing broader determinants such as chronic poverty and household food insecurity. The operational challenges identified in our study—irregular distribution of kits, lack of standardization, and donor-related coordination issues—are consistent with findings from other districts. Studies from Mandya and other regions have similarly reported concerns related to sustainability, donor engagement, and implementation gaps.^[7,13] National data indicate that although a large number of Nikshay Mitras are registered, most are individual contributors, which may affect consistency and scale of support.^[15] The variability observed across talukas in our study reflects these broader structural challenges.

Health workers in our setting perceived the initiative as beneficial in supporting vulnerable patients and promoting engagement in care. Comparable observations have been reported in Uttarakhand, where community-supported models had reported improvement in the treatment success rates⁸. However, as demonstrated in our quantitative analysis, measurable improvements in BMI were not independently associated with nutritional kit provision. These findings suggest that while the initiative has perceived value, its measurable impact may be influenced by implementation quality and broader socio-economic determinants.

CONCLUSION

Although most TB patients consented to community support under the Nikshay Mitra initiative, only one-third received assistance, indicating an implementation gap. Undernutrition remained prevalent at treatment completion, and nutritional kit provision showed no independent association with end-of-treatment BMI after adjustment. Health workers perceived the initiative as supportive but reported operational challenges including irregular distribution and weak monitoring. Strengthening implementation and oversight is essential to improve program effectiveness. Standardization of nutritional kits, improved monitoring systems, regular distribution schedules, enhanced patient counselling, and greater institutional participation are recommended to optimize the impact of the Nikshay Mitra initiative. Additionally, integrating routine nutritional assessment within TB care services may help address persistent undernutrition.

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