

## “Ni-kshay SETU”, A Digital Health Intervention for Capacity Building in Tuberculosis under the National TB Elimination Program in India: A Comprehensive mHealthapp review

Bhavesh Modi<sup>1</sup>, Bhavna Puwar<sup>2</sup>

<sup>1</sup>Professor and Head, Department of Community & Family Medicine, AIIMS, Rajkot, Gujarat, India

<sup>2</sup>Associate Professor, Department of Preventive and Social Medicine, Smt. NHL Medical College, Ahmedabad, Gujarat, India

**Correspondence:** Dr. Bhavna Puwar, Email: drbvumpavat@gmail.com

### Abstract:


This mHealthapplication review explores the evolution, design, and impact of Ni-kshay SETU, a digital health intervention tailored for India's National Tuberculosis Elimination Program (NTEP). Faced with escalating TB incidences, the NTEP prioritized capacity-building, leading to the conception of Ni-kshay SETU. This review describes the narrative of Ni-kshay SETU's concept from the beginning to the present day. It starts with the National Strategic Plan 2017–25, which says that capacity building of health care workers is important for reduction of tuberculosis morbidity and mortality by 2025. The digital platform materialized as a web app with Android and iOS versions, constituting a user-friendly interface. The app, embodying a ready reckoner and decision-making tool, offers cadre-specific modules in local languages, promoting ease of comprehension and applicability. The app's development, rooted in a consultative process, aligns with the nuanced needs of healthcare personnel across various geographies and cadres. With more than 40,400 subscribers and 1,450,000 visits, Ni-kshay SETU serves as a notable example of digital health intervention, providing a comprehensive and context-aware approach to TB care. However, it's important to acknowledge the limitations of Ni-kshay SETU. While the app aims to address various challenges in TB care, its effectiveness is contingent on factors such as digital literacy and access to smartphones. Additionally, the app's success relies on consistent updates and continuous user engagement for its usage, posing potential challenges in sustaining the momentum. In summary, Ni-kshay SETU is not just a tool for building capacity but also acts as a driver for affordable digital solutions in areas with limited resources, aiming to strengthen healthcare systems on the path to eliminating TB.

**Keywords:** Capacity Building, Digital Health Intervention, Ni-kshay SETU, Tuberculosis

### Introduction:

Tuberculosis (TB) is recognized as one of the health challenges that tends to be under reported globally, and there has been comparatively less emphasis on addressing the TB epidemic, considering its significant public health implications.<sup>[1]</sup> The END TB strategy aims to reduce TB incidence and mortality in 2035 (compared to 2015 figures) by 90% and 95%, respectively.<sup>[2]</sup> In the

past, developed countries with efficient anti-tuberculosis drugs and guaranteed adherence to therapy achieved cure rates in patients with TB of more than 95%, while the case fatality ratio (estimated mortality/estimated incidence) is 5% in high-income nations, it is still 20% in high-burden nations.<sup>[3]</sup> To meet these ambitious goals, it is imperative to work to lessen the disease burden and TB-related deaths in these nations, especially India.

Quick Response Code	Access this article online	How to cite this article :
	<b>Website :</b> <a href="http://www.healthlinejournal.org">www.healthlinejournal.org</a>	Modi B, Puwar B. “Ni-kshay SETU”, a Digital Health Intervention for Capacity Building in Tuberculosis under the National TB Elimination Program in India: A Comprehensive mHealth app review. Healthline. 2023; 14 (4): 342-347
	<b>DOI :</b> <a href="https://doi.org/10.51957/Healthline_584_2023">10.51957/Healthline_584_2023</a>	

Government of India has set forth an ambitious National Strategic Plan (NSP) 2017-2025 under National Tuberculosis Elimination Program (NTEP) in line with the National Health Policy 2015 and global efforts such as the World Health Organization's (WHO) END TB Strategy, and the Sustainable Development Goals (SDGs) of the United Nations.<sup>[4, 5]</sup> The NSP for TB elimination in India has essentially four pillars to address the major challenges for TB control, namely, "Detect, Treat, Build and Prevent." The capacity building of the health care staff and digital information ecosystem for TB care are one of the components of the pillar "Build".<sup>[4, 5]</sup>

### **Conceptual framework behind evolution of the Ni-kshay SETU**

The effective management of TB within healthcare services, particularly those incorporating work-based learning experiences, demands a substantial commitment from health care workers. To optimize patient outcomes, health care workers need not only the requisite skills but also adequate support for latest updates of patient management. However, the healthcare system encounters challenges, such as limited resources and insufficient knowledge, skills, and attitudes of health care workers in the management of TB patients. Additionally, delays in the screening to treatment completion and referral process, from the field to primary care levels and beyond, further hinder the timely delivery of services.<sup>[6, 7]</sup> These contribute to poor outcomes and delays in getting the services, ultimately leading to morbidity and mortality in TB patients.<sup>[8]</sup> These challenges, highlighted in the context of the NTEP program in India, underscore the critical need for solutions designed to enhance the capacity and efficiency of healthcare workers in managing TB through digital platforms and innovative approaches.<sup>[9, 11]</sup>

### **Need for Capacity Building and National TB Elimination Programme (NTEP)**

The rapid expansion of the NTEP and the continuous introduction of updated guidelines and protocols have necessitated the development of effective training strategies to ensure healthcare workers remain abreast of the latest advancements in TB care.<sup>[12]</sup> Furthermore, the challenges associated with engaging general health staff and the inadequate capacity-building infrastructure to address the vast need of healthcare providers highlight the critical role of digital technology-enabled solutions that support healthcare staff in accessing updates and undertaking training.<sup>[9, 13]</sup> A study was undertaken in the regions of Gujarat and Jharkhand in order to evaluate the necessity and potential strategies for improving the proficiency of healthcare personnel. The study emphasized the necessity of digital solutions that offer convenient access and user-friendly navigation to assist various levels of healthcare professionals in managing tuberculosis patients, based on their respective job roles. The consultative phase gathered suggestions from key stakeholders and NTEP officials from across the country and series of versions were piloted in Gujarat, Jharkhand, Himachal, Maharashtra, Goa and Andaman & Nicobar State, the Indian Institute of Public Health, Gandhinagar (IIPHG) to develop a learning mobile and web application known as "Ni-kshay (absence of TB) SETU (Support to End Tuberculosis)" under the USAID-funded "Closing the Gaps in TB Care Cascade" project.<sup>[14]</sup>

The Ni-kshay SETU (<https://nikshay-setu.in/>) application has been a promising solution with easy access to up-to-date information, comprehensive learning modules, and decision-support tools. This comprehensive digital platform empowers healthcare workers to deliver high-quality TB care services to manage the TB patients at community level. Moreover, the integration of TB services into

Ayushman Bharat’s network of HWCs further underscores the need for a robust digital solution to strengthen the reach and accessibility of TB care services.<sup>[15,16]</sup>

**Comments on Ni-kshay SETU mobile and web application** Key features

The landscaping of the application was created based on health workers cadre and level-specific individual login credentials and mapped with almost 75000+ health facilities and 6200+ tuberculosis units across all States and Union Territories of India. The app is comparatively easy to use, readily navigable, and intuitive with a clean interface. The content is distributed into six sections, i.e., Learn, Manage, Referral, Assess, Chatbot and Resource Materials. The app features an artificial intelligent (AI) driven chatbot that delivers over 70,000+ practical responses to the daily queries of healthcare personnel, spanning from front line workers to program managers to clinicians.

The application interface is designed to have brief directional learning in the form of algorithm-based decision-making interface, which takes user from the identification of presumptive TB patients to confirmation of the diagnosis to treatment completion. The modules are developed based on the national guidelines with the latest updates and contents landscaped in a precise manner in a way that supports the decision-making in TB patient management. The application is also equipped with repositories of all guidelines, global and India TB reports with learning videos on diagnostics and patient-centric care. It has quick assessment components to support the government health managers in accessing the training needs and designing the methods and modules.

The application interface is designed to have brief directional learning in the form of algorithm-based decision-making interface, which takes user from the identification of presumptive TB patients to confirmation of the diagnosis to treatment



completion. The modules are developed based on the national guidelines with the latest updates and contents landscaped in a precise manner in a way that supports the decision-making in TB patient management. The application is also equipped with repositories of all guidelines, global and India TB reports with learning videos on diagnostics and patient-centric care. It has quick assessment components to support the government health

managers in accessing the training needs and designing the methods and modules.

The back-end analytical dashboard with its assortment of reports greatly contributes to enhancing the capacity-building component of the NTEP interventions. The application also includes the user leader board for the completion of the modules, newer updates, app notifications and an interactive platform where a user can see the progress among their cadres.

### **Navigating Ni-kshay SETU: Strengths and Weaknesses**

The tester noted that app has similar interface in all three platforms: web, android and iOS that creates a wide acceptability among users across different devices and operating systems. Ni-kshay SETU exhibits numerous positive strengths contributing to its holistic nature, while it also presents weaknesses or limitations that necessitate further efforts for sustainability and scalability at a larger level.

Ni-kshay SETU's complete approach to TB care includes both excellent characteristics and needs for improvement from a program standpoint. The following observations were made:

#### **1. Digital Learning Platform and Mobile Accessibility:**

Strength: Ni-kshay SETU functions seamlessly on web, Android, and iOS platforms with OTP based individual login system, ensuring widespread accessibility with 40500+ users covering all States and presence in 65% districts of India.

Limitation: Despite this versatility, the application's efficiency may be influenced by the digital literacy levels of users, particularly in resource-constrained settings where internet is not available.

#### **2. Patient-Centric Diagnostic and Treatment Algorithm:**

Strength: The app provides a patient-centric

approach with diagnostic and treatment algorithms, promoting efficient management of TB cases.

Limitation: The effectiveness of the algorithm may be contingent on timely updates and adherence to evolving national guidelines.

#### **3. Cadre-Specific Modules and Easy Navigation:**

Strength: Ni-kshay SETU offers cadre-specific modules, enhancing the relevance and applicability of the content for various healthcare professionals.

Limitation: The interface's ease of navigation might still pose challenges for users with limited digital literacy.

#### **4. Access to Digital Repository and Resource Materials:**

Strength: The app includes a digital repository with resource materials, government orders, and guidelines, consolidating relevant information in one accessible location.

Limitation: The volume of available content could potentially overwhelm users, necessitating a user-friendly content filtering system.

#### **5. Artificial Intelligence and Voice-Assisted Chatbot:**

Strength: The inclusion of artificial intelligence and a voice-assisted chatbot enables the app to provide specific, timely solutions to user queries.

Limitation: The accuracy and effectiveness of the chatbot may be influenced by the complexity of queries and variations in language use.

#### **6. Assessment Sections and Backend Analytical Dashboard:**

Strength: Ni-kshay SETU incorporates assessment sections for health cadres, promoting continuous learning and skill development.

Limitation: The backend analytical dashboard, while valuable, requires careful interpretation to translate usage patterns into actionable insights for refinement.

#### 7. **Multiple Indian Language Support:**

Strength: The app caters to diverse linguistic needs by providing content in multiple Indian languages.

Limitation: Ensuring accuracy and cultural relevance in translations may pose challenges, impacting the effectiveness of communication.

Within the healthcare domain, numerous digital platforms have emerged, each catering to specific programs. The current necessity is to adopt an integrated approach by introducing dedicated applications for both health workers and patients or beneficiaries. These applications can encompass various domains such as knowledge management, record and reporting, program management, and communications. Ni-kshay SETU, specifically designed for knowledge management, does not necessitate patient information. However, it is essential to adhere to key considerations aligned with data privacy and ethical standards. These considerations include:

##### 1. **User Information Confidentiality:**

Strength: Ni-kshay SETU prioritizes user data confidentiality, adhering to established norms and regulations.

Limitation: Vigilance is crucial to prevent inadvertent breaches, especially in shared or public settings.

##### 2. **User Authentication and Access Controls:**

Strength: Secure user authentication enhances access controls for safeguarding sensitive information.

Limitation: User education on secure passwords and risks of unauthorized access is essential.

##### 3. **Secure Data Transmission and Data storage Practices:**

Strength: Ni-kshay SETU employs encryption for secure data transmission and data storage between the app and servers.

Limitation: Awareness of risks on public networks is vital for data security during data transmission and storage.

#### 4. **Informed Consent and User Awareness:**

Strength: Ni-kshay SETU emphasizes informed consent, ensuring users are aware of data use and protection.

Limitation: Ongoing efforts are required to enhance user awareness of data privacy implications.

#### 5. **Data Sharing Policies and User Control:**

Strength: Ni-kshay SETU establishes clear data sharing policies, limiting access to authorized personnel.

Limitation: User-friendly features for data control require continuous improvement to prevent unintended data disclosures.

In essence, Ni-kshay SETU represents a promising digital health intervention, excelling in accessibility, content relevance, and user engagement. Yet, sustained impact requires ongoing efforts in digital literacy, content management, and user feedback. Additionally, the app's robust data privacy measures necessitate continual vigilance and education to uphold its integrity in safeguarding sensitive healthcare information.

#### **Conclusion:**

The development of the Ni-kshay SETU mobile and web application represents a significant progress in addressing the training needs of healthcare professionals involved in tuberculosis (TB) care. The commendable aspect of the developers is in their forward-thinking methodology and unwavering commitment towards creating a comprehensive digital reference tool. The integration of Ni-kshay SETU with the pre-existing TB patient program reporting platform, known as "Ni-kshay,"

holds the promise of enhancing the overall implementation quality of the program. On the context of numerous digital platforms providing information on tuberculosis (TB), Ni-kshay SETU distinguishes itself by giving brief and simply available learning materials that are grounded on evidence-based practices and adhere to established guidelines.

#### Acknowledgement:

Authors wish to thank the team of Ni-kshay SETU and experts from the Indian Institute of Public Health, Gandhinagar for providing valuable inputs and feedback to the final draft of the manuscript.

#### Declaration:

Funding: Nil

Conflict of Interest: Nil

#### References:

1. Global Tuberculosis Report 2023. Geneva: World Health Organisation; 2023.
2. The END TB strategy: Global strategy and targets for tuberculosis prevention, care and control after 2015. Geneva: World Health Organization; 2014.
3. Jeremiah C, Petersen E, Nantanda R, Mungai BN, Migliori GB, Amanullah F, et al. The WHO Global Tuberculosis 2021 Report not so good news and turning the tide back to End TB. *International Journal of Infectious Diseases*. 2022. <https://doi.org/10.1016/j.ijid.2022.03.011>.
4. Khaparde S. The national strategic plan for tuberculosis step toward ending tuberculosis by 2025. *Journal of Mahatma Gandhi Institute of Medical Sciences*. 2019;24.
5. National Strategic Plan 2017-25. Ministry of Health and Family Welfare, Government of India, New Delhi; 2017.
6. Shrivastava SR, Shrivastava PS, Ramasamy J. Strengthening infrastructure in management of drug resistant tuberculosis in India. *Prog Health Sci*. 2014;4.
7. Thakur G, Thakur S, Thakur H. Status and challenges for tuberculosis control in India Stakeholders perspective. *Indian Journal of Tuberculosis*. 2021;68.
8. Bhargava A, Bhargava M. Tuberculosis deaths are predictable and preventable: Comprehensive assessment and clinical care is the key. *J Clin Tuberc Other Mycobact Dis*. 2020;19.
9. Maraba N, Hoffmann CJ, Chihota VN, Chang LW, Ismail N, Candy S, et al. Using mHealth to improve tuberculosis case identification and treatment initiation in South Africa: Results from a pilot study. *PLoS One*. 2018;13.
10. Gorini A, Mazzocco K, Triberti S, Sebri V, Savioni L, Pravettoni G. A P5 approach to m-Health: Design suggestions for advanced mobile health technology. *Front Psychol*. 2018;9.
11. Buregyeya E, Kasasa S, Mitchell EMH. Tuberculosis infection control knowledge and attitudes among health workers in Uganda: A cross-sectional study. *BMC Infect Dis*. 2016;16.
12. Alene KA, Adane AA, Yifiru S, Bitew BD, Adane A, Koye DN. Knowledge and practice of health workers about control and prevention of multidrug-resistant tuberculosis in referral hospitals, Ethiopia: A cross-sectional study. *BMJ Open*. 2019;9.
13. Noé A, Ribeiro RM, Anselmo R, Maixenchs M, Sitole L, Munguambe K, et al. Knowledge, attitudes and practices regarding tuberculosis care among health workers in Southern Mozambique. *BMC Pulm Med*. 2017;17.
14. Shah H, Patel J, Yasobant S, Saxena D, Saha S, Sinha A, et al. Capacity Building, Knowledge Enhancement, and Consultative Processes for Development of a Digital Tool (Ni-kshay SETU) to Support the Management of Patients with Tuberculosis: Exploratory Qualitative Study. *J Med Internet Res*. 2023;25:e45400.
15. INDIA TB REPORT 2022. Coming Together to End TB Altogether. Ministry of Health and Family Welfare Government of India; 2022.
16. Ved RR, Gupta G, Singh S. Indias health and wellness centres: realizing universal health coverage through comprehensive primary health care. *WHO South East Asia J Public Health*. 2019;8.