

Nutritional assessment and counselling of tuberculosis patients at primary care in India: do we measure up?

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SUMMARY

SETTING: Dakshina Kannada District, coastal South India, under the Revised National Tuberculosis Control Programme (RNTCP).

OBJECTIVE: To identify the potential and practices at primary health centres (PHCs) for the assessment of nutritional status of patients with tuberculosis (TB), the basic tools used to measure height and weight and the type of nutritional counselling provided.

DESIGN: A cross-sectional study was conducted with physical verification of availability of height and weight measuring equipment. Information was collected on the method used by medical officers for assessing nutritional status in PHCs, action taken in case the patient is undernourished and any formal training in nutritional assessment and counselling.

RESULTS: Of 37 PHCs assessed, weighing machines

were available in all and stadiometers in 38%. Medical officers were not calculating body mass index for nutritional assessment even when height and weight were being uniformly measured. Nutritional classification was mostly based on the appearance and physique of the patient. Counselling included advice to take milk, eggs and protein powders with efforts to arrange funds from village health, sanitation and nutrition committees.

CONCLUSION: There is a need to equip the PHCs and their medical officers with necessary tools and training for nutritional assessment and counselling of patients with tuberculosis.

KEY WORDS: Revised National Tuberculosis Control Programme; direct benefit transfer; operational research; primary health centres

TUBERCULOSIS (TB) REMAINS a major public health problem in India. According to the World Health Organization's (WHO's) 2017 global tuberculosis report, there are nearly 2.8 million incident cases, with more than 0.42 million deaths annually.¹ This amounts to a quarter of the global TB burden and 32% of global TB mortality. While the WHO's End TB Strategy aims to end the epidemic by 2035, the Government of India has committed itself to do so by 2025, exhibiting a high level of political commitment.^{2,3}

Pillar 1 of the End TB Strategy aims at integrated patient-centred care and prevention for all patients, including those at high risk, with conditions such as diabetes, human immunodeficiency virus (HIV) infection and undernutrition.⁴ Nutrition plays a major role in general well-being and is now recognised as an important comorbidity of TB.⁵ It is estimated that more than half of incident cases of TB are attributable to undernutrition in India.⁶ Undernutrition is an important risk factor for delayed sputum conversion,⁷

affects the pharmacokinetics of anti-tuberculosis drugs,⁸ increases adverse effects^{9,10} and is an important predictor of treatment outcome.¹¹

To address the issue of undernutrition in TB, in March 2018 the Government of India announced financial assistance of 500 INR (Indian rupees) per month for nutritional support for all patients diagnosed with TB.¹² This is to be delivered through a mechanism known as the Direct Benefit Transfer (DBT), whereby financial incentives are directly deposited into the patient's bank account.

Health care settings need to be equipped with basic nutrition assessment and counselling tools for the smooth implementation of this vital programme component. For India's Revised National Tuberculosis Control Programme (RNTCP), it is therefore pertinent to identify potentiality and practices at primary health care level for the assessment of nutritional status of TB patients, the basic tools used to measure height and weight and the type of nutritional counselling provided.

We conducted a survey at selected sites of Dakshina Kannada District, Karnataka, India, with the aim to identify the nutrition assessment and counselling practices among health care workers in primary health centres (PHCs).

METHODS

Dakshina Kannada is a coastal district in South India. Health care delivery services in the district are provided by both the public and private health sectors. The district has a population of 2.08 million, and has been implementing the RNTCP since 2006. For efficient programme management, the district is divided into seven TB units (TUs) which cover an average of 0.25 million population each. The TUs are comprised of PHCs, each of which caters to a population of 0.03 million. The PHCs are managed by medical officers and paramedical workers. The centres provide promotive, preventive, curative and rehabilitative services.

Mangalore and Bantwal TUs, which have respectively 18 and 21 PHCs, were purposively selected for this cross-sectional study. Nearly 300 TB patients were initiated and remained on treatment during the study period (1 January–28 February 2018) in these two TUs.

The principal investigator visited all of the PHCs to assess the availability and functionality of weight and height measuring equipment. After providing written informed consent, the medical officers were interviewed using a simple open-ended questionnaire on 1) methods used to assess the nutritional status of TB patients, 2) the actions that followed in case the patient was identified as undernourished, and 3) any formal training received on nutritional care and counselling in the past 3 years. Each interview was designed for 10–15 min at a place and time convenient to the respondents.

Ethics clearance for the study protocol was granted by the Institutional Ethics Committee (YUEC: 241/2017) of Yenepoya Medical College, Mangalore, India; permission for the conduct of the study was obtained from the district health authorities.

RESULTS

Of the 39 PHCs in the TUs selected for the study, 37 could be visited and their medical officers interviewed (95% response rate). The tools and system used at the PHCs for nutritional assessment and counselling are shown in Table 1. All the medical officers performed height and weight measurements of TB patients, and the majority (70%) weighed the patients on a monthly basis. The weighing machines commonly supplied by the state government were simple bathroom scales (76%); tools used to measure height were stadiometers (38%) or a scale manually marked on the wall (22%). Nearly 76% of the medical

Table 1 Nutritional assessment and counselling for tuberculosis patients in primary health centres ($n = 37$)

Primary health centre characteristics	<i>n</i> (%)
Frequency of weighing	
Monthly	26 (70)
At intervals of >1 month	11 (30)
Type of weighing machine used	
Bathroom scales	28 (76)
Digital	9 (24)
Type of height measuring device	
Stadiometer	14 (38)
Staturemeter	8 (22)
With the help of markings on the wall	12 (32)
Not measured	3 (8)
How the medical officer decides the patient is underweight*	
Looks, physique	28 (76)
Weight bands	8 (22)
Height – 100 (Broca's Index)	3 (8)
Weight <35 kg	5 (14)
History of weight loss	3 (8)
Others: anaemia, weight <30/40 kg	3 (8)
The action taken/advice by medical officer when patient is found to be underweight*	
Protein powder (prescribed/procured)	24 (65)
Eggs	34 (92)
Milk	8 (22)
Vegetables and fruits	6 (16)
Arrange from VHSNC/subcentre funds	26 (70)

* Percentages add up to more than 100% due to multiple responses. VHSNC = Village Health, Sanitation and Nutrition Committees.

officers identified poor nutritional status of the patients by arbitrary methods such as their appearance, physique and stature, while three said they used Broca's index (height in cm – 100) for assessment. About 22% of the medical officers used arbitrary weight-based cut-offs ranging from 30 to 40 kg, or weight bands provided by the RNTCP (25–39, 40–54 and 55–69 kg). Body mass index (BMI) was not used in any of the PHCs for nutritional assessment of patients with TB.

Advice given to patients by medical officers after the identification of undernutrition included the intake of protein powders (65%), haematinics, milk, eggs, deworming tablets, multivitamin tablets and adequate helpings of fresh fruit and vegetables. Many PHCs utilised existing Village Health, Sanitation and Nutrition Committee (VHSNC) funds to provide these food supplements. The mechanism of delivery was to link patients to the nearest grocery shop in their neighbourhood, which was later reimbursed by the PHC. The medical officers had received no training in nutrition counselling during their career.

DISCUSSION

Our study found that although medical officers at the PHCs assessed the nutritional status of patients with TB using weight and height measurements and provided nutritional counselling, most did not follow a systematic manner of calculating nutritional assessment based on BMI. The nutrition counselling

Table 2 BMI bands corresponding to weight bands using the mean height of Indian males and females¹⁸

Weight bands, kg	Corresponding BMI, kg/m ²	
	Males	Females
25–39	9.3–14.5	10.8–16.9
40–54	14.9–20.1	17.4–23.5
55–69	20.5–25.7	23.9–30

BMI = body mass index.

provided to patients was not standardised. Some mechanisms were in place to provide nutrition to patients; however, the question of sustainability remained.

In 2017, the RNTCP framed a guidance document for nutrition care and support for patients with TB.¹³ It is consistent with WHO Guidelines and was intended to complement the existing RNTCP framework.¹⁴ It gives programmatic guidance for bringing nutritional care within the ambit of anti-tuberculosis treatment in India.

The study has the following programme implications: 1) weight and height measurements were recorded at baseline for all TB patients, indicating good adherence. However, there were wide gaps in the meaningful interpretation of the information on the height of adult patients for the classification of nutritional status. The non-use of BMI, an accepted tool for the classification of nutritional status, leads to erroneous interpretations of nutritional status and an underestimation of the problem at the individual and programme levels. Possible reasons for the lack of routine computation of BMI could be the perceived complexity of calculation, interpretation and lack of time. Even the latest Technical and Operational Guidelines (2016) and training modules fail to emphasise the importance of the use of BMI.¹⁵ The recent RNTCP guidance document provides simplified, colour-coded, easy-to-use field charts that help assess the nutritional status of adult TB patients without having to calculate the BMI and grade the severity of undernutrition.¹³ This grading is important, as DBT is the minimum support to be provided to all TB patients, and extra support may be required by patients with severe undernutrition.

Second, measurement of periodic weight gain, an indicator of nutritional recovery, was occasionally performed at different time intervals. Patients diagnosed and initiated on treatment for TB need to visit the PHC after the intensive phase only for sputum examination. Weight assessment is crucial at this point because a weight gain of <5% during first 2 months is associated with an increased risk of relapse.^{11,16} Non-availability of a reliable height measuring device in 22% of the surveyed PHCs is also of concern. A wall-mounted staturemeter or a Microtoise is an inexpensive alternative to a stadiometer in a resource-limited setting such as India.

Third, medical officers had no formal training in nutritional assessment and counselling, which could ensure delivery of sound scientific nutritional advice. This has led to the use of suboptimal and variable methods of classifying patients as undernourished. Assessment based on appearance, physique and stature was the most common method, but was unscientific. The weight bands followed by the RNTCP (25–39, 40–54, 55–69 and >70 kg) are for drug dosages in adult TB patients, and not for nutritional assessment.¹⁵ Using these weight bands or arbitrary cut-off weights of 30, 35 or 40 kg for nutritional assessment may lead to serious underestimation of undernutrition, which has been found to be significant in India.⁶ The average height of Indian males and females is respectively 164 and 152 cm.¹⁷ Using these heights and weight bands, the corresponding BMI bands are as given in Table 2. The current practice of weight-based assessment is bound to miss undernutrition as a comorbidity in TB patients, with serious consequences in patient-related outcomes. At the programme level, the effectiveness and adequacy of the DBT cannot be monitored if current practice is not objective and uniform.

Although the advice on a protein-rich diet with eggs and milk is acceptable,¹² the use of protein-rich powders is not sustainable in resource-limited settings. Comparable amounts and quality of proteins can be provided by other locally available dietary sources. This will prevent unnecessary confusion about the usefulness of packaged nutritional supplements in the community.

The linkage of TB patients to grocery stores for food supplements through VHSNC funds is innovative and can be replicated or tested as a mechanism of delivery of nutrition support. A VHSNC is a committee at the level of village revenue with several health, government and civil society members, which addresses the social determinants of health at the village level. This mechanism can be particularly useful if states decide to provide nutritional support in kind, over and above the designated cash benefits under DBT.¹²

The effectiveness of nutritional interventions on nutritional, clinical and treatment outcomes is a less explored area of TB research. A recent systematic review concluded that there was insufficient research in the form of randomised trials on the effect of macro- and micronutrient supplementation on TB to either confirm or exclude any resultant benefits.¹⁸ Although the guidance document provides standardised tools and methodology,¹² it needs to be piloted for feasibility and operational refinements, and then uniformly incorporated into the RNTCP, failing which this important comorbidity will remain an obstacle to the achievement of TB elimination globally and nationally.^{2,3}

The present study was conducted in a limited

geographical area and in a district with better infrastructure and health systems in place than other districts in India. The generalisation of results to other areas or districts should therefore be done with caution. Operational research is needed to identify challenges at various levels and measure the outputs of nutritional support through DBT over a period of time. While DBT does not mandate this requirement for assessment and counselling, the benefit and adequacy of this support cannot be evaluated unless this is done.

CONCLUSION

The nutritional assessment and counselling of patients with TB is not being done in a systematic manner at the field level. The RNTCP needs to implement the robust mechanisms described in its guidance document for nutritional care and support for patients with TB. While this can be done in a graded manner for already overworked frontline workers, failing to do so will add little to the evidence of success or inadequacy of nutritional support through the DBT.

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R É S U M É

CONTEXTE : Sites du Revised National Tuberculosis Control Programme dans le district de Dakshina Kannada dans la zone côtière de l'Inde du Sud.

OBJECTIF : Identifier la potentialité et les pratiques dans les centres de soins de santé primaires (PHC) en termes d'évaluation du statut nutritionnel des patients tuberculeux, d'outils de base utilisés pour mesurer la taille et le poids ainsi que le type de conseils nutritionnels fournis.

SCHEMA : Une étude transversale a été réalisée avec une vérification physique de la disponibilité d'équipements de mesure de la taille et du poids. Les informations ont été recueillies sur les méthodes utilisées par les assistants médicaux pour l'évaluation du statut nutritionnel en PHC, les actions mises en œuvre dans les cas où le patient est malnutri et toute formation formelle en évaluation et en conseil nutritionnels.

RÉSULTATS : Sur les 37 PHC évalués, les balances étaient disponibles partout et les toises dans 38% d'entre eux. Les assistants médicaux ne calculaient pas l'indice de masse corporelle dans le cadre de l'évaluation nutritionnelle, même quand la taille et le poids étaient mesurés uniformément. La classification nutritionnelle a été principalement basée sur l'aspect physique du patient. Les conseils ont consisté à encourager la consommation de lait, d'œufs et de poudre de protéines avec des efforts pour obtenir une aide financière des comités villageois de santé, d'assainissement et de nutrition.

CONCLUSION : Il est nécessaire d'équiper les PHC et leurs assistants médicaux avec les outils requis et la formation à l'évaluation et au conseil nutritionnel des patients tuberculeux.

RESUMEN

MARCO DE REFERENCIA: Marco programático del Programa Nacional Revisado contra la Tuberculosis en el distrito costero de Dakshina Kannada, en el sur de la India.

OBJETIVO: Reconocer la potencialidad y las prácticas en los centros de atención primaria de salud (PHC) con respecto a la evaluación de la situación nutricional de los pacientes con tuberculosis (TB), los instrumentos básicos de medida de la estatura y el peso utilizados y el tipo de asesoramiento nutricional suministrado.

MÉTODO: Se realizó un estudio transversal con verificación física de la disponibilidad de instrumentos de medición de la estatura y el peso. Se recogió información sobre el método que utilizan los médicos al evaluar el estado nutricional de los pacientes en los PHC, las medidas adoptadas en caso de desnutrición y toda capacitación formal impartida en materia de evaluación y asesoramiento nutricional.

RESULTADOS: De los 37 centros de atención primaria evaluados, todos contaban con equipos de medición del peso y el 38% con tallímetro. Los médicos no calculaban el índice de masa corporal como parte de la evaluación nutricional, incluso cuando se practicaba la medición corriente del peso y la estatura. La clasificación nutricional se fundamentaba en la mayoría de los casos en la apariencia y la complexión del paciente. El asesoramiento incluía la recomendación de ingerir leche, huevos y proteínas en polvo, con iniciativas encaminadas a obtener fondos de los comités de salud, saneamiento y nutrición de la localidad.

CONCLUSIÓN: Existe la necesidad de equipar los PHC con los instrumentos necesarios y de impartir a los médicos la capacitación en materia de evaluación y asesoramiento nutricional de los pacientes con TB.
