



## Original article

## Dietary counseling adherence during tuberculosis treatment: A longitudinal study



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## SUMMARY

**Background:** The World Health Organization (WHO) recommends the use of dietary counseling to overcome malnutrition for patients with tuberculosis, with or without HIV, however the response to nutritional treatment depends on patient's adherence to nutritional counseling.

**Objective:** Identify the degree of adherence to dietary counseling and predictors of adherence among patients undergoing tuberculosis treatment.

**Design:** Observational prospective follow-up study conducted in adults treating for tuberculosis with or without HIV. Self-reported adherence and 24-h diet recall were checked. Diet counseling according to WHO strategy was offered at each visit for all patients. The endpoint was the adherence to the recommended dietary allowance (RDA) and total calories consumed during tuberculosis treatment. Data were mainly analyzed with marginal models to estimate adjusted trajectories.

**Results:** Sixty-eight patients were included in the study. The maximum probability of total calories consumption of at least one RDA was 80%. The adherence to dietary counseling was low regardless of HIV infection. The negative determinants of adherence were the presence of loss of appetite and nausea/vomiting. For patients with loss of appetite and nausea/vomiting, the probability of total calories consumption of at least one RDA is less than 20% at any time.

**Conclusion:** The loss of appetite and nausea/vomiting are highly prevalent and were the main causes of non-adherence to dietary counseling.

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## 1. Introduction

The Food and Nutrition Board of the National Academy of Sciences established the Recommended Dietary Allowance (RDA) [1] to determine the quantity and quality of nutrients required to maintain health in different life cycles [1,2]. It appreciates the variability between individuals; however, it disregards the special or individual nutritional needs. Furthermore, it does not address how different diseases affect a patient's nutritional status,

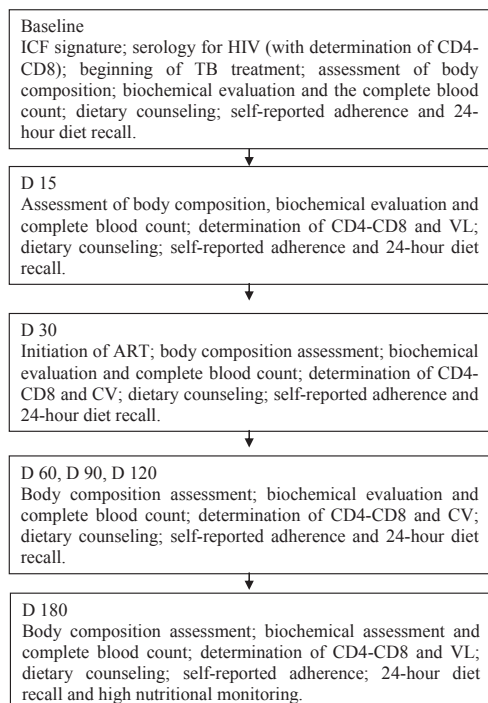
1. Make at least three meals (breakfast, lunch and dinner) and two healthy snacks a day. Do not skip meals. Avoid "pinching".
2. Include daily six servings of grain group (rice, corn, wheat, bread and pasta) or tubers (potatoes and roots as cassava) at meals. Preferably to whole grains and fresh food;
3. Eat at least three servings of vegetables as part of meals and three or more servings of fruits in desserts and snacks daily;
4. Eat beans and rice every day or at least five times a week. This Brazilian dish is a complete combination of protein and good for health;
5. Consume three servings of dairy products and a portion of meat, poultry, fish or egg daily's. Remove visible fat from meat and skin from poultry before preparation makes these healthier foods!
6. Don't consume more than one portion per day of vegetable oils, olive oil, butter or margarine. Look at all of food labels and choose those with lower amounts of trans fats;
7. Avoid regular consumption of soft drinks, processed juices, cakes, pastries and sandwich cookies, desserts and treats;
8. Decrease the amount of salt in food and remove the salt shaker from the table. Avoid consuming processed foods with too much salt (sodium) such as hamburger, beef jerky, sausage, ham, chips, vegetable preserves, soups, sauces and ready spices;
9. Drink at least two liters (six to eight cups) of water per day. Give preference to water consumption between meals;
10. Make your life healthier. Practice at least 30 minutes of physical activity every day and avoid alcohol and tobacco. Keep your weight within healthy limits.

Fig. 1. English version of "Ten steps for Adequate Food and Healthy" by Brazilian Ministry of Health (MoH) 2006 [18].

potentially generating various degrees and types of nutritional deficiency [1].

The World Health Organization (WHO) [5] and the Brazilian Ministry of Health (MoH) [3,4] recommend dietary supplementation only in severe cases of malnutrition in patients with tuberculosis (TB), with or without HIV infection. The recommendation for

TB patients with mild to moderate malnutrition is to offer health dietary counseling (that meets RDA) [1,3,5]. The dietary counseling is a simple and cheap strategy to change the eating behavior, but its full benefit will be achieved only if the individual adheres to counseling [6]. Unfortunately, the current recommendations do not make any comment on effectivity of dietary counseling or adherence to this type of strategy [3,5]. Adherence is the extent to which a person's behavior agrees with recommendations from a health care provider towards: a) use of medication; b) following recommendations related to diet or c) lifestyle changes. The patient's correct understanding of prescription and recommendations, as



D = day of visits; ICF = informed consent form; HIV = human immunodeficiency virus; ART = antiretroviral therapy; Biochemical assessment = albumin, iron fixation capacity, iron, selenium, zinc, retinol and tocopherol; CD4 = lymphocyte TCD4; CD8 = lymphocyte TCD8; VL = viral load; dietary counselling = was delivered and read with patients the document proposed by the ministry of health [52].

Fig. 2. Flow chart of study.

Table 1

Nutritional status between patients default and with the complete follow up.

	No	Yes	Test stat.	P value
<b>Total</b>	38	35		
<b>Protein malnutrition</b>			Chisq. (1 df) = 0	1
Malnutrition	32 (84.2)	30 (85.7)		
No information available	6 (15.8)	5 (14.3)		
<b>Micronutrient malnutrition</b>			Chisq. (1 df) = 1.94	0.164
Malnutrition	25 (65.8)	29 (82.9)		
No information available	13 (34.2)	6 (17.1)		
<b>Energy malnutrition<sup>1</sup></b>			Fisher's exact test	0.575
Malnutrition	26 (68.4)	21 (60)		
Nutrition	10 (26.3)	10 (28.6)		
No information available	2 (5.3)	4 (11.4)		
<b>Global malnutrition<sup>1</sup></b>			Fisher's exact test	0.778
Malnutrition	26 (68.4)	21 (60)		
Nutrition	4 (10.5)	4 (11.4)		
No information available	8 (21.1)	10 (28.6)		
<b>Nutritional status</b>			Fisher's exact test	1
Malnutrition	36 (94.7)	33 (94.3)		
No information available	2 (5.3)	2 (5.7)		

1 = n (%); the nutritional status of patients with a complete follow up according to Bacelo (2015) [25].

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