DOI: 10.1590/1413-81232018247.19642017

Nutritional aspects of people affected by leprosy, between 2001 and 2014, in semi-arid Brazilian municipalities

Camila Silveira Silva Teixeira (https://orcid.org/0000-0001-6340-7957) [1]
Danielle Souto de Medeiros (https://orcid.org/0000-0002-2480-8990) [2]
Carlos Henrique Alencar (https://orcid.org/0000-0003-2967-532X) [1]
Alberto Novaes Ramos Júnior (https://orcid.org/0000-0001-7982-1757) [1]
Jorg Heukelbach (https://orcid.org/0000-0002-7845-5510) [1]

Abstract *The study aimed to characterize food insecurity, nutritional status, and eating habits of people affected by leprosy. This is a descriptive cross-sectional study based on a census population. We evaluated 276 cases, reported in the Notifiable Diseases Information System, between 2001 and 2014, in the municipalities of Vitória da Conquista and Tremedal, in the state of Bahia. Food insecurity was estimated according to the Brazilian Food Insecurity Scale. We collected weight and height measurements, meal frequency, and household, socioeconomic, psychosocial and clinical variables. The prevalence of food insecurity was 41.0% among the study population - 28.3% mild, 8.0% moderate and 4.7% severe. Overweight/obesity was estimated in 60.1% of the study participants, and excessive salt intake was reported by 8.6%. Beans and red meat were the most regularly consumed foods; there was low consumption of milk, raw and cooked vegetables, and fruits. This population presented high food insecurity prevalence, inadequate eating habits and nutritional status, reflecting nutritional vulnerability. The insertion of nutritional assistance in the leprosy control programmes is recommended, to improve health care.*

Key words *Food and nutrition security, Nutritional status, Food habits, Leprosy*

[1] Departamento de Saúde Comunitária, Faculdade de Medicina, Universidade Federal do Ceará. R. Professor Costa Mendes 1608/Bloco Didático/ 5º andar, Bairro Rodolfo Teófilo. 60460-140 Fortaleza CE Brasil. camilasilveira.nutri@gmail.com
[2] Instituto Multidisciplinar em Saúde, Universidade Federal da Bahia. Vitória da Conquista BA Brasil.

Introduction

Neglected Tropical Diseases (NTDs) prevail in vulnerable populations, contributing to poverty, inequality and social exclusion[1]. The NTD leprosy is a chronic bacterial disease[2] of compulsory notification, and still poses a serious public health problem in endemic areas[3].

The disease is transmitted through the respiratory tract and occurs through intimate and prolonged interaction of people mainly with multibacillary disease and with untreated people[4]. It primarily affects skin and nerves, which can cause neurological, motor, ophthalmological and stigmatizing sequelae[5]. It is diagnosed via clinical history, dermatoneurological examination and smear test, performed to confirm the initial evaluation[6]. Treatment consists of multidrug therapy based on the combination of three drugs (dapsone, rifampicin and clofazimine), and therapeutic schemes vary according to the operational, paucibacillary and multibacillary classification and patient's age[7]. Leprosy-affected people may also show acute inflammatory conditions, triggered by recurrence and/or disease severity, the so-called leprosy reactions[8]. These reactions have a significant disabling and stigma generating potential[2,9].

In Brazil, leprosy is a highly endemic disease, and most cases are distributed in the Midwest, North and Northeast regions[10]. In the state of Bahia, the municipalities Vitória da Conquista and Tremedal are characterized as highly endemic and hyperendemic municipalities, respectively[10], and show typical socioeconomic and health characteristics that contribute to their vulnerability.

The complex social determination of leprosy is reflected from social inequalities[11] and populations in a greater context of vulnerability, such as indigenous and quilombola groups, and low-income population strata. These populations generally have a higher prevalence of food insecurity (FI), in many cases with greater severity[12-15]. The state of FI is perceived when there is no assurance of regular and permanent access to quality, nutritional and healthy food in sufficient quantity, which may also compromise access to other basic needs[16]. Access to food can be interrupted by political, socioeconomic and demographic determinants, which affects the multifactorial profile and the vast complexity of FI[17].

Food restriction in socially vulnerable groups may result in impaired nutritional quality of eating habits[18]. The financial conditions of access to food and the influence of a Western diet based on industrialized foods are factors that can directly contribute to these modifications and lead to a worse nutritional status[19].

Assuming that leprosy-affected people are subject to greater vulnerability, the assessment of FI, food consumption and nutritional status may reveal health inequities and the need to improve nutritional care. Considering the disease's sequels, such as physical disabilities, neurological impairments, reactive episodes, stigma, prejudice and poverty, this approach is of particular importance. In addition, few studies address nutritional aspects in the context of leprosy.

This study aimed to characterize food insecurity, nutritional status and eating habits of people affected by leprosy, between 2001 and 2014, in two municipalities in the southwestern part of Bahia State.

Methodology

Study design and location

This is a cross-sectional study performed as part of the so-called IntegraHans - North/Northeast (N/NE) study: *Health care for leprosy in highly endemic areas in the states of Rondônia, Tocantins and Bahia: an integrated approach to operational, epidemiological (space-time), clinical and psychosocial aspects*. The present data were collected in the two municipalities of Vitória da Conquista and Tremedal in Bahia State.

Study population

In this census, we included all cases of leprosy (reference cases) reported in the Brazilian Notifiable Diseases Information System (SINAN) of the Ministry of Health (MS) in the period 2001-2014, living in these two municipalities.

Data sources and collection

The application of structured questionnaires, clinical evaluation and collection in medical records (clinical profile of the reference case) occurred between October 2014 and August 2015. Interviews were conducted using questionnaires and scales, based on nationally and internationally validated tools[20-22].

The following variables were used to describe the study population: municipality; rural/urban area; type of house construction; water supply; waste disposal; proportion og residents < 18 years; number of residents; *Bolsa Família Pro-*

gram (PBF) Family Grant benefit; ethnicity/skin color; schooling; work status. A socio-economic score was obtained by the total sum of goods and household utensils owned – color TV, radio, bathroom, automobile, monthly wage house cleaner, washing machine, video/DVD, refrigerator and freezer – and adapted to the Brazilian Economic Classification Criterion[23].

The psychosocial and clinical description were performed as follows: limited activity – due to deformities caused by leprosy and other neuropathies; restricted social participation – restrictions related to leprosy, disabilities or other stigmatizing conditions; quality of life in dermatology – impaired quality of life related to dermatosis caused by leprosy; operational classification – based on the number of skin lesions and nerve injuries; occurrence of leprosy reactions; permanent physical disability.

FI was calculated according to the Brazilian Food Insecurity Scale (EBIA)[16,17]. One point was assigned for "yes" and zero for "no" and "don't know" answers. At least one "yes" response defined the state of FI, categorized at different levels (mild, moderate and severe), in households with and without residents under 18 years of age[24].

We interviewed the heads of the families, provided that they were at least 18 years of age and able to respond. If they were unavailable, the reference cases were interviewed. In households with more than one reported leprosy case, the first reported case was interviewed. In the case of absence, families were visited up to three times.

The anthropometric evaluation was performed according to the recommendations of the Technical Norms of the Food and Nutrition Surveillance System[25]. The body mass index (BMI) for adults and the elderly was classified, as low weight (< 18.5 kg/m²; ≤ 22.0 kg/m²), eutrophy (≥ 18.5 and < 25.0 kg/m²; > 22.0 and < 27.0 kg/m²), overweight (≥ 25.0 and < 30.0 kg/m²; ≥ 27.0 kg / m²) and obesity (≥ 30.0 kg/m²)[26-28].

Food consumption was estimated from the individual Food Frequency Questionnaire (FFQ), based on a tool used by the National Health Survey[29]. The frequency of intake (0-5 days or more per week) of 17 foods, food groups or preparations, such as: excess of animal fats, soft drinks, soft drinks, sweets, fast food, meat (red and white), milk, beans, vegetables (raw and cooked), fruits and fruit juice. Salt intake was obtained by response to daily consumption options as very high, high, adequate, low or very low.

Regular intake was described considering the intake of food on five or more days per week. Among proteins, we considered the intake of red meat and chicken on three or more days, and fish, on one or more days per week as regular consumption. To evaluate the excessive consumption of salt, categories were considered as high and very high[29].

Data review and ethical aspects

We present relative frequencies of the collected variables. Pearson's chi-squared test (uncorrected), Fisher's exact test (for categories with expected number of observations < 5) and linear trends (for variables with 3 or more categories) were applied. All tests had a significance level of 5%. The Stata program, version 15.0 (Stata Corporation, College Station, USA) was used for data analysis.

The Ethical Review Board of the Federal University of Ceará approved this study, according to Resolution Nº 466/12 of the National Health Council[30].

Results

A total of 643 cases was identified in the city of Vitória da Conquista, and 51 cases in Tremedal, totaling a target population of 694. Most of the cases had already been released from multidrug therapy. We evaluated a total of 319 reference cases, namely, 272 from Vitória da Conquista and 47 from Tremedal. The proportion of 45.0% (312) of not evaluated individuals, included refusal (1.3%); death (9.3%); address change (30.1%); wrong address (40.1%); no approach after three attempts (14.7%); and not attending evaluation (4.5%). 21 cases did not meet the inclusion criteria and 22 cases refused to answer the questions of the FI tool, resulting in a study population of 276 individuals (Figure 1).

Most respondents were from the urban area of Vitória da Conquista, Afro-Brazilians and with elementary school education. The evaluation of clinical and psychosocial characteristics showed that 47.5% had some limited activity, 25.8% had restricted social participation, 36.0% had a dermatological effect on quality of life and 75.4% had permanent physical disabilities (Table 1).

FI was found in 41.0% of the total population, estimated at 39.4% of the population of Vitória da Conquista and 51.4% Tremedal (Figure 2). Overweight/obesity was found in 60.1% of the total population. In Vitória da Conquista and Tremedal, overweight/obesity was estimated

at 62.0% and 46.7%, respectively. No statistically significant differences were found between the two municipalities (Figure 2).

There was excessive salt consumption in 8.6% of the total population. The evaluation of regular food consumption showed that beans and red meat were the most consumed foods regularly and there was low intake of milk, vegetables (raw and cooked) and fruits (Table 2).

Discussion

This study demonstrated a high prevalence of FI and overweight/obesity, in addition to unsatisfactory consumption of healthy food in people affected by leprosy. This result points to nutritional vulnerability that may have been affected by the clinical and psychosocial consequences of leprosy, progression and treatment difficulties in the state of Bahia.

The prevalence and degrees of FI encountered were higher than in the general Brazilian population (22.6%)[24]. The municipality of Vitória da Conquista had similar values to the Northeast region (38.1%) and the state of Bahia (37.8%)[24]. Among people in the municipality of Tremedal, FI was higher. In a study by Saboia and Santos[31] including families from a peripheral area of the city of Teresina-Piauí, 65.0% of households presented any degree of FI. Pérez-Zepeda et al.[32], evaluating communities of the elderly by the National Health and Nutrition Survey of Mexico, found that 73.7% of families lived with FI. A study by Pardilla et al.[33] demonstrated that 76.7% of the Navajo Nation Indians in the U.S, had an FI situation. The prevalence of mild FI was higher than in Brazil (14.8%), the Northeast region (23.6%) and Bahia (21.8%). When frequencies of moderate and severe FI were evaluated, they were higher than in Brazil, 4.6% and 3.2%, respectively. Tremedal had a prevalence of moderate and severe FI also higher than in the Northeast (8.9% and 5.6%) and Bahia (9.4% and 6.6%)[24].

Studies with other vulnerable populations showed similar results, such as Fachinni et al.[12], that showed high prevalences of mild (31.3%), moderate (13.4%) and severe (9.5%) FI, higher than the respective prevalence rates (19.8%, 4.7% and 2.8%) of the southern region. Rosa et

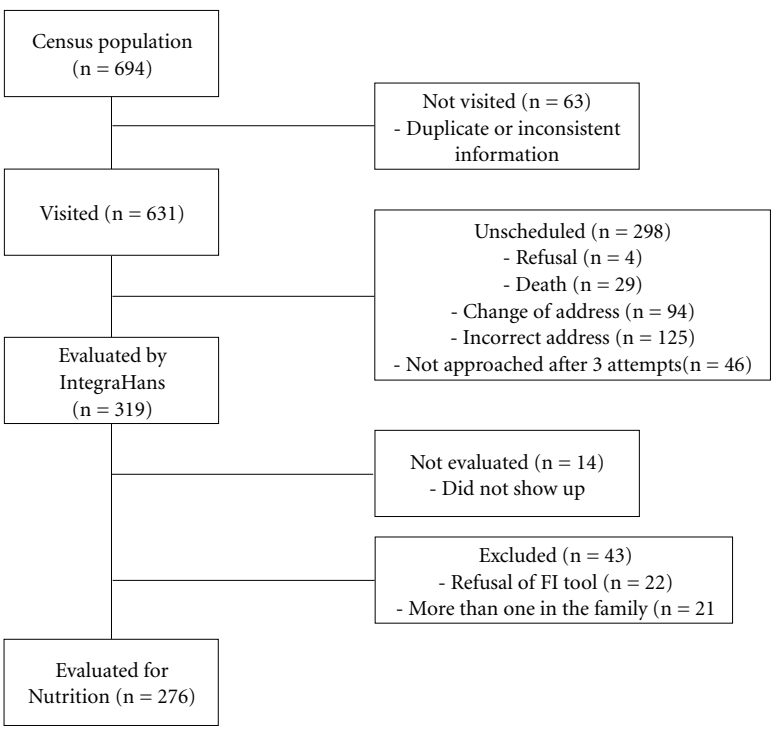

Figure 1. Flowchart of study population to investigate nutritional aspects in people affected by leprosy in the municipalities of Vitória da Conquista and Tremedal. IntegraHans - N / NE, Bahia, 2015.

Table 1. Characteristics of population studied (n* = 276). IntegraHans – N/NE, Bahia, 2015.

Variables	n*	%	IC95%†
Municipality			
Vitória da Conquista	241	87.3	82.8-90.8
Tremedal	35	12.7	9.2-17.2
Residence area			
Urban	161	61.5	55.4-67.2
Rural	101	38.5	32.8-44.6
Household external walls			
With coating	213	81.3	76.7-85.6
Without coating	49	18.7	14.4-23.9
Water supply			
General water distribution network	202	77.1	71.6-81.8
Well. spring. rainwater. water truck's water	60	22.9	18.2-28.4
Waste disposal			
Cleaning services	190	72.5	66.8-77.6
Burned. Buried. Thrown into wasteland	72	27.5	22.4-33.2
Dwellers < 18 years			
No	134	48.5	42.7-54.5
Yes	142	51.5	45.5-57.3
Number of residents			
Up to 2	79	30.2	24.9-36.0
3 or 4	119	45.4	39.4-51.5
5 and over	64	24.4	19.6-30.0
PBF Benefit			
No	196	74.2	68.6-79.2
Yes	68	25.8	20.8-31.4
Household assets score			
1st tertile	80	30.5	25.2-36.4
2nd tertile	93	35.5	29.9-41.5
3rd tertile	89	34.0	28.4-40.0
Ethnicity			
Other	53	20.0	15.6-25.3
Afro-Brazilian /Pardo-Brazilian	212	80.0	74.7-84.4
Schooling			
Secondary school/Higher Education (incomplete/complete)	49	18.6	14.3-23.8
Elementary School (incomplete/complete)	136	51.7	45.6-57.7
Did not go to school	78	29.7	24.4-35.5
Work status			
Working	100	37.7	32.1-43.8
Pension/benefit	116	43.8	37.9-49.8
Never worked/idle	49	18.5	14.2-23.7
Limited activity			
No limitation	128	52.5	46.1-58.7
Some limitation	116	47.5	41.3-53.9
Restricted social participation			
No restriction	181	74.2	68.3-79.3
Some restriction	63	25.8	20.7-31.7
Quality of life in dermatology			
No effect	155	64.0	57.7-69.9
Some effects	87	36.0	30.1-42.2
Operational classification			
Paucibacillary	71	31.3	25.5-37.6
Multibacillary	156	68.7	62.4-74.5
Reactive episode			
No	130	50.8	44.6-56.9
Yes	126	49.2	43.1-55.4
Physical disability			
No	63	24.6	19.7-30.3
Yes	193	75.4	69.7-80.3

it continues

Table 1. Characteristics of population studied (n* = 276). IntegraHans – N/NE, Bahia, 2015.

* Absolute frequency (information not available in all cases).

† 95% confidence interval.

al.[34], evaluating families headed by elderly people, showed that FI was more prevalent in the North and Northeast of the country, where levels of moderate or severe FI were perceived in more than 1/4 of the households. A study by Anschau et al.[35] with families benefiting from Income Transfer Programs in Toledo, Paraná, showed that 44.9% of these patients had mild FI, 23.8% had moderate FI and 5.9% severe FI.

In this study, people affected by leprosy had unfavorable economic and social conditions. Vitória da Conquista had one of the fastest growing GDPs in the Southwest region of Bahia and, in the last census, had the mean standard of the Municipal Human Development Index (MHDI) (0.678)[36]. Despite this, the studied population had a homogeneous distribution among the tertiles of assets' score, which shows that a significant portion of these people still survived in poor conditions.

On the other hand, Tremedal is a small municipality with an MHDI of 0.528, which represents low development, and relies on the linkage to federal government social programs, especially for investments in education, health, basic sanitation and infrastructure sectors[36]. In

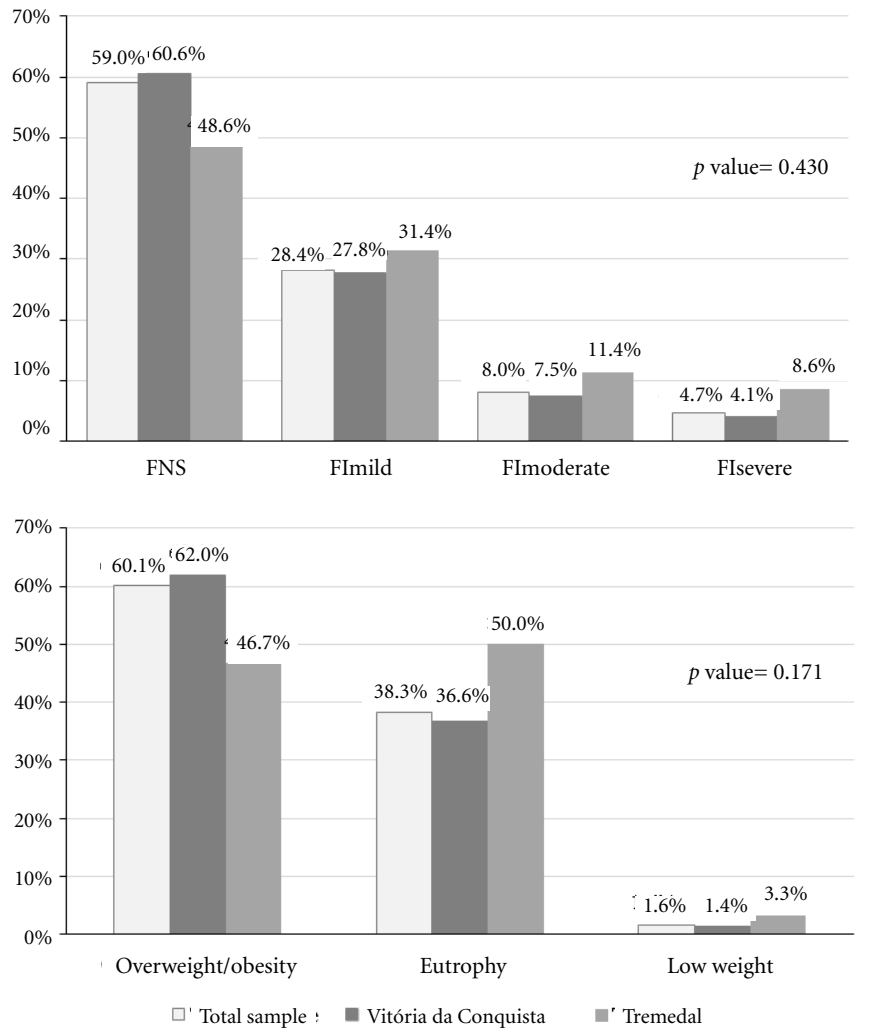

Figure 2. Prevalence of FI and nutritional status of people affected by leprosy (n*=276). IntegraHans - N/NE, Bahia, 2015.

* Information was not available in all cases, due to population composition process and interview losses. † p-value calculated through Pearson's chi-square or Fisher's exact test to compare municipalities.

this municipality, almost all families were from rural areas, with poorer housing conditions, which adds greater vulnerability to the occurrence of FI, when compared to urban populations[13,37].

The evaluation of nutritional status evidenced a high prevalence of overweight / obesity. The highest prevalence of overweight / obesity was also found in the Brazilian population (63.8%)[38] and is typical of the nutritional transition process that occurred in the country in recent decades. A similar result was found by Bruschi et al.[39], with cured individuals and leprosy patients undergoing treatment in a dermatology outpatient clinic in Porto Alegre, Rio Grande do Sul, where 71.8% were diagnosed as overweight / obese.

The nutritional transition is a process characterized by changes in diet and body composition of the population, which had an impact on the increase of morbimortality rates. The traditional food standard based on a higher consumption of grains and cereals, was gradually replaced by

Table 2. Regular food intake (n* = 276). IntegraHans - N/NE, Bahia, 2015.

Food	Regular Intake† (n)	Regular Intake (%)	CI95%‖
Excess meat fat	111	41.6	35.8-47.6
Soft drinks	41	15.4	11.5-20.2
Sweetened soft drink	40	15.0	11.2-19.8
Sweets	68	25.6	20.7-31.2
Snacks (fast food)	8	3.0	1.5-5.9
Red meat	193	72.3	66.6-77.4
Chicken	26	9.7	6.7-13.9
Milk	86	32.3	26.9-38.2
Leite	104	39.0	33.2-45.0
Bean	226	84.6	79.8-88.5
Vegetables	121	45.3	39.4-51.4
Raw vegetables	87	32.8	27.4-38.8
Cooked vegetables	90	33.8	28.4-39.8
Fruits	117	44.0	38.1-50.0
Fruit juice	77	28.8	23.7-35.6

* Information was not available in all cases due to interview losses. † Frequency ≥ 5 days. ‡ Frequency ≥ 3 days. § Frequency ≥ 1 day. ‖ 95% confidence interval.

foods of low nutritional quality, poor in fiber, rich in fats and sugars, as well as by processed and ultra-processed foods[19].

While there are no specific nutritional recommendations for leprosy, good nutrition is fundamental to improving nutritional status in any health condition. In the case of people who have had leprosy, an adequate diet is a protective factor based on improved immunity and quality of life, minimizing relapses and reactions[40].

The FFA evidenced excessive salt intake, especially among Tremedal dwellers, who had a prevalence higher than that found in the Brazilian population (14.2%). The values of regular consumption of red meat and chicken fat were higher than those found in the Brazilian population (37.2%) and in the Northeast (29.7%)[41].

A study on the accumulated behavioral factors for cardiovascular diseases (CVD) in southern Brazil demonstrated that the habit of regularly consuming excess salt and the availability of unhealthy food markers were factors associated with the predisposition and development of CVD[42]. In a study of dietary risk for CVD in people with type 2 diabetes mellitus, Mann[43] demonstrated that regular consumption of animal fats, high intake of saturated fats and food sources of cholesterol were associated with increased risk of coronary disease and other CVDs. The results of this study indicate that the behavior and eating habits found can damagingly contribute to poor diet and be considered additional risk factors for these populations.

On the other hand, beans, considered the marker food of a healthy diet, were most regularly consumed among the populations studied, higher than the result of the Brazilian population (71.9%)[41]. A study by Montenegro et al.[44] evidenced bean consumption similar to that found in this study (81.8%) in leprosy patients treated at a Health facility in Vitória, Espírito Santo. Beans have a high nutritional value, are rich in nutrients (proteins, iron, folic acid and other essential) and become an important food substitute when there is no regular intake of animal proteins[45]. Culturally, consumption of this food is routine for these populations, and, perhaps because of this, has been high.

The independent evaluation of regular fruit and vegetable intake (raw and cooked) showed low consumption. Montenegro et al.[44] showed that fruit intake was only 41.1% and that of vegetables of 57.0% among people affected by leprosy.

Tardido and Falcão[19] showed that the purchase of these foods was directly associated to the high cost of the diet, since they have a higher cost when compared to others. Families who are more socially and economically vulnerable may have less access to these food groups and, consequently, have greater use of calory-dense foods.

A case-control study on people with leprosy residing in an endemic area of Bangladesh identified an association between leprosy and conditions of low total caloric intake, lower variety and lack of food stocks in the households, suggesting a greater probability of developing the disease[46]. Due to the greater vulnerability of these people, the consumption of healthy foods may have been compromised. Among the populations of the municipalities studied, about half had some limited activity and approximately one third had a restricted social participation. In view of the disabling nature of the disease, daily life activities and social participation of people under study are aspects that may have affected working conditions, income generation and other means of food acquisition.

Ayres et al.[11] evaluated the repercussions of leprosy in the daily life of patients at a PHC fa-

cility in Botucatu, São Paulo and observed that these people suffered impairments in their work capacity and, consequently, restriction in own and family subsistence. Monteiro et al.[9] evidenced that in a hyperendemic municipality of the Northern Region of Brazil, functional limitation was one of the factors that overly affected the performance of activities and restricted social participation of people who were discharged from leprosy, focusing on the health conditions of these people. In this study, we observed a relevant proportion of people who were retired and/or who received some type of benefit. However, other variables indicated that these populations still lived in conditions of social and economic vulnerability.

The population of this study evidenced specific features, corroborating their programmatic and individual vulnerability. In terms of health, Tremedal is a municipality assisted by the Regional Health Center of the Southwest, based in Vitória da Conquista, and until 2009, leprosy care services were centralized, hindering the timely diagnosis and widening comprehensive care gaps in both municipalities[47].

While comprehensive care for these people was effective, services such as nutritional care were not planned, since the multi-professional team did not include nutritionists. Such evidence reveals the possibility of iniquities such as FI, poor eating habits and inadequate nutritional status.

This study has some limitations. The composition of the population may have been biased by situations such as the lack of consistency of secondary data found in SINAN-MS. Selection bias may have occurred due to an incomplete database. The territorial extension of the mainly rural municipalities generated difficulties during fieldwork. To minimize participation bias, up to three direct attempts and/or telephone contacts were made. In addition, due to mobility difficulties of the case, care was performed through home visits. In spite of these potential limitations, we highlight the representativeness of the study population.

Conclusions

The population had a high prevalence of FI associated with an inadequate nutritional status and food habits. The patterns observed reflect the social and economic context and the varying degrees of social and human development. Physical, social and psychological impacts associated with leprosy over time may affect living and health conditions, favoring household's food vulnerability in the family context, perpetuating the cycle of poverty.

Nutritional care should be cross-sectional with regard to public leprosy control policies, as a way of providing care to leprosy-affected people; the poor eating habits and the nutritional state compromise further worsen the health conditions. An integration with Primary Health Care is required, as well as the inclusion of nutritionists within the context of Family Health Support Centers.

Collaborations

The authors CSS Teixeira, DS Medeiros and J Heukelbach participated in the conception of the study, its implementation and data collection. Teixeira CSS and Medeiros DS, Alencar CH, Ramos Júnior AN and Heukelbach J, participated in writing the article, analyzing and interpreting the results. The authors Teixeira CSS, DS Medeiros, CH Alencar, AN Ramos Júnior and J Heukelbach made the relevant critical analysis of the intellectual content. In addition to the contributions already cited, the authors CSS Teixeira, DS Medeiros and J Heukelbach were responsible for all aspects of the work, ensuring the accuracy and integrity of any part of the work. All authors read and approved the final version of this manuscript.

Acknowledgements

We wish to thank the Foundation Coordination for the Improvement of Higher Education Personnel (CAPES), the Regional Health Center for the Southwest of Bahia, the Municipal Health Secretariats of Vitória da Conquista and Tremedal, families and people affected by leprosy, interviewers and Primary Health Care professionals, fundamental to the implementation of this work. JH is Class 1 research fellow at the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq/Brazil).

References

1. Adams J, Gurney KA, Pendlebury D. *Thomson Reuters Global Research Report Neglected Tropical Diseases* 2012.
2. Barbosa JC, Ramos Júnior AN, Alencar OM, Pinto MSP, Castro CGJ. Atenção pós-alta em hanseníase no Sistema Único de Saúde: aspectos relativos ao acesso na região Nordeste. *Cad Saúde Coletiva* 2014; 22:351-358.
3. Penna MLF, Oliveira MLVDR, Penna GO. The epidemiological behaviour of leprosy in Brazil. *Leprosy Review* 2009; 80:332-344.
4. Alencar CHM, Ramos Júnior AN, de Sena Neto AS, Murto C, Alencar MJ, Barbosa JC, Heukelbach J. Diagnóstico da hanseníase fora do município de residência: uma abordagem espacial, 2001 a 2009. *Cad Saude Publica* 2012; 28(9):1685-1698.
5. Fonseca MS, Garcia MR. Aspectos psicossociais em hanseníase. In: Alves ED, Ferreira TL, Ferreira IN, organizadores. *Hanseníase: avanços e desafios*. Brasília: NESPROM; 2014. p. 373-388.
6. Lyon S, Grossi MAF. Diagnóstico de Tratamento da Hanseníase. In: Alves ED, Ferreira TL, Ferreira IN, organizadores. *Hanseníase: avanços e desafios*. Brasília: NESPROM; 2014. p. 141-170.
7. World Health Organization (WHO). *WHO Expert Committee on Leprosy: eighth report*. Geneva; WHO; 2012.
8. Teixeira MAG, Silveira VM, França ER. Características epidemiológicas e clínicas das reações hansênicas em indivíduos paucibacilares e multibacilares, atendidos em dois centros de referência para hanseníase, na Cidade de Recife, Estado de Pernambuco. *Rev Soc Bras Med Trop* 2010; 43(3):287-292.
9. Monteiro LD, Alencar CH, Barbosa JC, Novaes CCBS, Silva RCPS, Heukelbach J. Pós-alta de hanseníase: limitação de atividade e participação social em área hiperendêmica do Norte do Brasil. *Rev Bras Epidemiol* 2014; 17(1):91-104.
10. Brasil. Ministério da Saúde (MS). Departamento de Informática do SUS – DATASUS 2016. Sala de Apoio à Gestão Estratégica – SAGE. *Situação de Saúde. Indicadores de Morbidade: Hanseníase*; 2016 [serial na internet] [acessado 2017 Jan 25]. Disponível em: http://datasus.saude.gov.br/informacoes-de-saude.
11. Ayres JA, Paiva BSR, Duarte MTC, Berti HW. Repercussões da hanseníase no cotidiano de pacientes: vulnerabilidade e solidariedade. *Rev Min de Enferm* 2012; 16(1):56-62.
12. Facchini LA, Nunes BP, Motta JVS, Tomasi E, Silva SM, Thumé E, Silveira DS, Siqueira FV, Dilélio AS, Saes MO, Miranda VIA, Volz PM, Osório A, Fassa AG. Insegurança alimentar no Nordeste e Sul do Brasil: magnitude, fatores associados e padrões de renda per capita para redução das iniquidades. *Cad Saude Publica* 2014; 30(1):161-174.
13. Mondini L, Rosa TE, Gubert MB, Sato GS, Benício MHD'A. Insegurança alimentar e fatores sociodemográficos associados nas áreas urbana e rural do Brasil. *Informações Econômicas* 2011; 41(2):52-60.
14. Monego ET, Peixoto MRG, Cordeiro MM, Costa RM. (In) segurança alimentar de comunidades quilombolas do Tocantins. *Segur Aliment Nutr* 2010; 17(1):37-47.
15. Souza NN, Dias MM, Sperandio N, Franceschini SCC, Priore SE. Perfil socioeconômico e insegurança alimentar e nutricional de famílias beneficiárias do Programa Bolsa Família no município de Viçosa, Estado de Minas Gerais, Brasil, em 2011: um estudo epidemiológico transversal. *Epidemiol Serv Saúde* 2012; 21(4):655-662.
16. Segall-Corrêa AM, Marin-León L. A segurança alimentar no Brasil: Proposição e usos da Escala Brasileira de Insegurança Alimentar (EBIA) de 2003 a 2009. *Segur Aliment Nutr* 2009; 16(2):1-19.
17. Hoffmann R. Brasil, 2013: mais segurança alimentar. *Segur Aliment Nutr* 2014; 21(2):422-436.
18. Navas R, Kanikadan AYS, Santos KMP, Garavello MEPE. Transição alimentar em comunidade quilombola no litoral sul de São Paulo. *Rev NERA* 2015; 18(27):138-155.
19. Tardido AP, Falcão MC. O impacto da modernização na transição nutricional e obesidade. *Rev Bras Nutr Clin* 2006; 21(2):117-124.
20. Scale, SALSA. *Users Manual*. 2010 [acessado 2012 Fev 5]. Disponível em: http://www.ilep.org.uk/fileadmin/uploads/Documents/Infolep_Documents/Salsa/ SALSA_manual_v1.1pdf.pdf.
21. Participation Scale Users. 2005 [acessado 2012 Fev 21]. Disponível em: http://www.leprastichting.nl/assets/infolep/Participation%20Scale%20Users%20Manual%20v.4.6.pdf.
22. Finlay AY, Khan G. Dermatology Life Quality Index (DLQI) - a simple practical measure for routine clinical use. *Clinl Experimental Dermatol* 1994; 19(3):210-216.
23. Associação Brasileira de Empresas de Pesquisa (ABEP). *Critério de classificação econômica Brasil 2014* [serial na internet] [acessado 2016 Jan 12]. Disponível em: http://www.abep.org/criterio-brasil
24. Instituto Brasileiro de Geografia e Estatística (IGBE). *Pesquisa Nacional por Amostra de Domicílios: segurança alimentar 2013*. Rio de Janeiro: IBGE; 2014.
25. Brasil. Ministério da Saúde (MS). *Orientações para a coleta e análise de dados antropométricos em serviços de saúde*: *Norma Técnica do Sistema de Vigilância Alimentar e Nutricional*. Brasília: MS; 2011.
26. World Health Organization (WHO). *Physical status: use and interpretation of anthropometry*. Genova: WHO; 1995.
27. World Health Organization (WHO). *Obesity: preventing and managing the global epidemic*. Geneva: WHO; 2000.
28. The Nutrition Screening Initiative. *Incorporating nutrition screening and interventions into medical practice: a monograph for physicians*. Washington D.C. US: American Academy of Family Physicians, The American Dietetic Association, National Council on Aging Inc; 1994.
29. Instituto Brasileiro de Geografia e Estatística (IBGE). *Pesquisa Nacional de Saúde 2008*. Rio de Janeiro: IBGE; 2009.
30. Brasil. Ministério da Saúde. Conselho Nacional de Saúde. Resolução nº 466, de 12 de dezembro de 2012. *Diário Oficial da União* 2012; 12 dez.

31. Sabóia RCB, Santos MM. Prevalência de insegurança alimentar e fatores associados em domicílios cobertos pela Estratégia Saúde da Família em Teresina, Piauí, 2012-2013. *Epidemiol Serv Saúde* 2015; 24(4):749-758.
32. Pérez-Zepeda MU, Castrejón-Pérez RC, Wynne-Bannister E, Garcia-Penã C. Frailty and food insecurity in older adults. *Public Health Nutr* 2016; 19(15):2844-2849.
33. Pardilla M, Prasad D, Suratkar S, Gittelsohn J. High levels of household food insecurity on the Navajo Nation. *Public Health Nutr* 2013; 17(1):58-65.
34. Rosa TEDC, Mondini L, Gubert MB, Sato GS, Benício MHD'A. Segurança alimentar em domicílios chefiados por idosos. *Rev Bras Geriatr Gerontol* 2012; 15(1):69-77.
35. Anshau FR, Matsuo T, Segall-Corrêa AM. Food insecurity among recipients of government assistance. *Rev Nutr* 2012; 25(2):177-189.
36. Bahia. Superintendência de Estudos Econômicos e Sociais (SEI). *Estatística – Territórios – Bahia* 2015 [internet] [acessado 2016 Abr 04]. Disponível em: http://www.sei.ba.gov.br/
37. Hoffmann R. Determinantes da insegurança alimentar no Brasil em 2004 e 2009. *Segur Aliment Nutr* 2013; 20(2):219-235.
38. Instituto Brasileiro de Geografia e Estatística (IBGE). *Pesquisa de Orçamentos Familiares 2008-2009*. Rio de Janeiro: IBGE; 2011.
39. Bruschi KR, Labrêa MGA, Eidt LM. Avaliação do estado nutricional e do consumo alimentar de pacientes com hanseníase do Ambulatório de Dermatologia Sanitária. *Hansen Int* 2011; 36(2):53-61.
40. Silva CPG, Miyazaki COM. Hanseníase e a Nutrição: uma revisão da literatura. *Hansen Int* 2012; 37(2):69-74.
41. Instituto Brasileiro de Geografia e Estatística (IBGE). *Pesquisa Nacional de Saúde 2013*. Rio de Janeiro: IBGE; 2014.
42. Muniz LC, Schneider BC, Silva ICM, Matijasevich A, Santos IS. Fatores de risco comportamentais acumulados para doenças cardiovasculares no sul do Brasil. *Rev Saude Publica* 2012; 46(3):534-542.
43. Mann JI. Diet and risk of coronary heart disease and type 2 diabetes. *Lancet* 2002; 360(9335):783-789.
44. Montenegro RMN, Molina MDC, Moreira MM, Zandonade E. Avaliação nutricional e alimentar de pacientes portadores de hanseníase tratados em unidades de saúde da grande Vitória, Estado do Espírito Santo. *Rev Soc Bras Med Trop* 2010; 44(2):228-231.
45. Brasil. Ministério da Saúde (MS). *Guia alimentar para a população brasileira*. Brasília: MS; 2014.
46. Wagenaar I, Van Muiden L, Alam K, Bowers R, Hossain MA, Kispotta K, Richardus JH. Diet-Related Risk Factors for Leprosy: A Case-Control Study. *PLoS Negl Trop Dis* 2015; 9(5):1-15.
47. Bahia. Secretaria de Saúde do Estado. *Regiões de saúde do estado da Bahia* 2014 [serial na internet]. [acessado 2016 Dez 19]. Disponível em: www1.saude.ba.gov.br/mapa_bahia/

Article submitted 10/01/2017
Approved 03/10/2017
Final version submitted 05/10/2017