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ORIGINAL ARTICLE

THE LEVEL OF PHYSICAL INABILITY OF PATIENTS WITH LEPROSY

GRAU DE INCAPACIDADE FÍSICA DE PACIENTES COM HANSENÍASE

EL GRADO DE INVALIDEZ FÍSICA DE LOS PACIENTES CON LEPROSIA

Jaylinne Ribeiro Moraes¹, Érida Zoé Lustosa Furtado²

ABSTRACT

Objective: to evaluate the level of physical inability of patients with leprosy. **Method:** a quantitative, cross-sectional, retrospective study with 73 patients diagnosed with leprosy. For the data collection, there was used pre-structured questionnaire tool containing sociodemographic and epidemiological data extracted from the connectors of the SINAN research and electronic medical records. The data were analyzed using the IBM® SPSS®, version 21.0. **Results:** it was found that the male patients with low schooling, dimorphous clinical form, Virchowian and neural pure, operational classification multibacillary leprosy and the presence of one or more nerves affected had a greater chance of presenting some level of physical inability. **Conclusion:** it underlines the importance of assessing the level of physical inability at the time of diagnosis of leprosy and the guidelines for self-care. **Descriptors:** Leprosy; Epidemiology; Health Services; Public Health; Risk factors; Nursing.

RESUMO

Objetivo: avaliar o grau de incapacidade física de pacientes com hanseníase. **Método:** estudo quantitativo, transversal, retrospectivo, com 73 pacientes diagnosticados com hanseníase. Para a coleta de dados utilizou-se instrumento pré-estruturado contendo dados sociodemográficos e epidemiológicos extraídos das fichas de investigação do SINAN e do prontuário eletrônico. Os dados foram analisados no software IBM® SPSS®, versão 21.0. **Resultados:** constatou-se que pacientes do sexo masculino com baixa escolaridade, forma clínica dimorfa, virchowiana e neural pura, classificação operacional multibacilar e a presença de um ou mais nervos afetados tiveram maior chance de apresentar algum grau de incapacidade física. **Conclusão:** ressalta-se a importância da avaliação do grau de incapacidade física no momento do diagnóstico de hanseníase e as orientações para o autocuidado. **Descritores:** Hanseníase; Epidemiologia; Acesso aos Serviços de Saúde; Saúde Pública; Fatores de Risco; Enfermagem.

RESUMEN

Objetivo: evaluar el grado de invalidez física de los pacientes con lepra. **Método:** estudio cuantitativo, de corte transversal, retrospectivo, con 73 pacientes diagnosticados de lepra. Para la recolección de datos se utilizó un cuestionario estructurado previamente que contenía datos sociodemográficos y epidemiológicos extraídos de los conectores del SINAN de investigación y registros médicos electrónicos. Los datos fueron analizados utilizando IBM® SPSS®, versión 21.0. **Resultados:** se encontró que los pacientes masculinos con baja escolaridad, forma clínicas dimorfas, virchowianas y neurales puras, clasificación operacional multibacilar y la presencia de uno o más nervios afectados tuvieron mayor probabilidad de presentar algún grado de invalidez física. **Conclusión:** se marca la importancia de evaluar el grado de invalidez física en el momento de diagnóstico de la lepra y las directrices para el autocuidado. **Descriptores:** Lepra; Epidemiología; Accesibilidad a los Servicios de Salud; Salud Pública; Factores de Riesgo; Enfermería.

¹Residence in High Complexity in Health, Multidisciplinary Health Residency Program of the Federal University of Piauí/UFPI. Teresina (PI), Brazil. Email: jaylinne_morais@hotmail.com ORCID: <https://orcid.org/0000-0002-2577-7313>; ²Master, Federal University of Piauí/UFPI. Teresina (PI), Brazil. Email: eridazoe@hotmail.com ORCID: <https://orcid.org/0000-0002-6162-7558>

INTRODUCTION

Leprosy still represents a great challenge to health, despite being reached its elimination as a global health problem in the year 2000.¹ Early diagnosis and treatment are essential for prevention and treatment of complications that may arise, physical debility, which can reach the eyes, hands and feet, compromising the quality of life of patients. In addition, it is important to investigate and identify the level of physical disability in leprosy patients at the time of diagnosis, in order to prevent and/or minimize these complications.

According to the World Health Organization (WHO), there were recorded more than 213 thousand cases of leprosy in 2014 throughout the world. Approximately 94.0% were detected in only 13 countries and Brazil is one of them, who, along with India and Indonesia are responsible for 81.0% of the cases of the disease. In 2015, there were 28,761 new cases of leprosy in Brazil, being more prevalent in the Northeast region, with 12,848 new cases were notified. In this region, the State of Piauí, who in 2016 gave 755 new cases, with a coefficient of detection of 32,05/100,000 inhabitants.¹⁻³

It is chronic, infectious disease caused by *Mycobacterium leprae*. The bacillus presents tropism for the skin and peripheral nerves, mainly by Schwann cells, which may cause degeneration of the peripheral nervous system, being the neural injury the most important aspect of leprosy and the response of the nervous tissue to the invasion of the nerve by *Mycobacterium leprae* is highly variable, which may or may not cause functional alterations.⁴

When present, this response may cause neural thickening, changes in tactile sensitivity, thermal and painful of the lesion and in the path of damaged nerves, losses in motor function. It causes paralysis and paresis, trophic alterations in specific muscles of the face, hands, and feet, in addition to slow down the functioning of the sebaceous glands and sweat glands, these compromises that are related to the establishment of physical disabilities.⁵

The level of physical injury is classified from 0 to II. To evaluate it is recommended to use the set of Semmes-Weinstein monofilaments (6 monofilament: 0.05 g, 0.2 g, 2g, 4 g, 10 g and 300 g) at the points of evaluation of sensitivity in the hands and feet and floss (without flavor) for the eyes, taking as a basis the form adopted by the Ministry of Health. The Level 0 corresponds to the absence of disability; Level I concerns the

decrease or loss of sensibility in eyes, hands, and feet and Level II refers to abnormalities in eyes, hands or feet or visible deformities and is related to the classification of disease progression time and occurrence of leprosy reactions.²

OBJECTIVE

- To assess the level of physical injury of leprosy patients in a university hospital in the Northeast of Brazil.

METHOD

Quantitative study, cross-sectional, retrospective, carried out at a University Hospital in the Northeast of Brazil in April 2017. The population consisted of 100 patients who received a diagnosis of leprosy in this service, in the period from January 2014 to November 2016. The sample consisted of patients who met the following inclusion criteria: they answered via an outpatient or inpatient in the hospital and submitted assessment of the level of physical incapacity at the time of diagnosis of leprosy. In turn, we excluded those who were diagnosed with leprosy in another health service, those who had no level of physical incapacity assessed at the time of diagnosis, as well as the connectors for research with incomplete data. After analysis of the inclusion criteria, 27 patients were excluded from the study.

For the data collection form was used with sociodemographic characteristics (gender, schooling, skin color/race, municipality of residence and zone of origin) and epidemiological characteristics (number of cutaneous lesions, clinical form, operational classification, number of nerves affected, use of sputum smear microscopy, initial therapeutic regimen and degree of disability).

The data were collected in the Service of Health Surveillance of the University Hospital, where are filed, the connectors of research into diseases and diseases of compulsory notification. Afterwards, the collected data were coded in Microsoft Excel in double-entry spreadsheet, processed in the Software IBM® SPSS®, version 21.0, and presented in tables.

Descriptive statistics were calculated as averages, standard deviations, minimum and maximum for quantitative variables and frequencies for qualitative variables. There was the Chi-square test of Pearson for verification of associations between the sociodemographic and clinical characteristics of the patients and the degree of functional disability. The quantitative variables were dichotomized based on the median of the distribution of values. The categories were

identified from the Adjusted Residual of Contingency Table. All analyzes were performed at a significance level of 5.0%.

The study was submitted to and approved by the Ethics in Research Committee of the University Hospital where the data were collected, under the CAAE N 1,961.621/2017, obeying the guiding ethical-legal principles of research involving human subjects, prepared in Resolution 466/2012 of the National Health Council. It was requested waiver of the Informed Consent Form, bearing in mind that the study used secondary data.

RESULTS

The average age of the participants in this study was 49.8 years old. The majority were male (53.4%), non-literate (27.4%) or with the formation of the first to fourth grade (24.7%)

and brown (64.4%). Little more than 2/3 of the patients were from Teresina (67.1%), being a significant portion of these coming from the urban zone of the capital (84.9%). How to epidemiological aspects, 57.5% of the patients had five or more cutaneous lesions and 56.2% had one or more nerves affected.

Less than half of the patients underwent sputum smear microscopy (41.1%) and among those who have made this examination, 12.3% showed positive result. Approximately 70.0% of the patients used the multibacillary polychemotherapy. A little over half of the patients presented no physical disability at diagnosis (54.8%) and among those in which it was verified some degree of disability, 31.5% were Level I, while 13.7% had Level II (Table 1).

Table 1. Sociodemographic and epidemiological characterization of patients with Hansen's disease (N = 73). Teresina (PI), Brazil, 2017.

Feature	A	SD	N	%
Age				
Up to 49 years old			36	49.3
Above 49 years old			37	50.7
Gender				
Male			39	53.4
Female			34	46.6
Schooling				
Not literate			20	27.4
1 st to 4 th year			18	24.7
5 th to 8 th year incomplete			10	13.7
Elementary school complete			7	9.6
High school incomplete			4	5.5
High school complete			11	15.1
Incomplete higher education			2	2.7
Complete higher education			1	1.4
Color/race				
White			11	15.1
Black			13	17.8
Pardo			47	64.4
Yellow			1	1.4
Indigenous			1	1.4
Origin				
Teresina			49	67.1
Other municipalities of Piauí			19	26
Other States			5	6.8
Area of origin				
Rural			11	15.1
Urban			62	84.9
Number of cutaneous lesions	6.4	7.9		
Less than 5			31	42.5
5 or more			42	57.5
Number of nerves involved	1.5	2.1		
One or more			41	56.2
None			32	43.8
Smear				
Positive			9	12.3
Negative			21	28.8
Not held			43	58.9
Initial therapeutic scheme				
PQT/PB 6 doses			22	30.1
PQT/MB 12 doses			51	69.9
Degree of disability				
Degree 0			40	54.8
Degree I			23	31.5
Degree II			10	13.7

Legend: A: average; SD: standard deviation.

The data in Table 2 show that there was a statistically significant association between sex ($p=0.025$), schooling ($p=0.034$), clinical form ($p<0.001$), operational classification ($p<0.001$) and number of nerves affected ($p=0.002$) with the degree of physical incapacity of patients with leprosy.

Table 2. Association between sociodemographic and epidemiological characteristics and the degree of disability of patients with Hansen's disease (n = 73). Teresina (PI), Brazil, 2017.

Characteristics	Degree of disability						p
	Degree 0		Degree I		Degree II		
	n	%	n	%	n	%	
Age							0.305
Up to 49 years old	23	31.5	9	12.3	4	5.5	
Above 49 years old	17	23.3	14	19.2	6	8.2	
Gender							0,025
Male	17	23.3	13	17.8	9	12.3	
Female	23	31.5	10	13.7	1	1.4	
Schooling							0.034
Up to incomplete elementary school	16	21.9	17	23.3	5	6.8	
Complete elementary education or greater	24	32.9	6	8.2	5	6.8	
Area of origin							0.547
Rural	5	6.8	5	6.8	1	1.4	
Urban	35	47.9	18	24.7	9	12.3	
Number of injuries							
Less than 5	21	28.8	7	9.6	3	4.1	
5 or more	19	26	16	21.9	7	9.6	
Clinical							<0.001
Dimorphous, Virchowian or pure neural	20	27.4	21	28.8	10	13.7	
Indeterminate/tuberculoide	20	27.4	2	2.7	0	0	
Operating rating							<0.001
Paucibacillary	19	26	2	2.7	0	0	
Multibacillary	21	28.8	21	28.8	10	13.7	
Number of nerve involvement							0,002
One or more	15	20.5	18	24.7	8	11	
No	25	34.2	5	6.8	2	2.7	
Smear							0.096
Positive	4	5.5	5	6.8	0	0	
Negative	8	11	8	11	5	6.8	
Not held	28	38.4	10	13.7	5	6.8	

Legend: p: significance of the Pearson's Chi-square Test

DISCUSSION

Male patients with incomplete basic education, clinical forms Virchowian dimorphous, neural, and pure, operational classification multibacillary leprosy, and the presence of one or more nerves affected had a greater chance of presenting some degree of physical incapacity.

The predominance of male patients in this study corroborates by the literature that considers the leprosy in adults is more frequent in female in which the risk of exposure is increased and the demand for health services is lower. According to a report by the World Health Organization, although leprosy affects both sexes, in many parts of the world, men are affected more often than women, at a ratio of 2:1.⁶⁻⁸

Considers that a proportion of cases diagnosed with grade II of incapacity is equal to or above 10.0% is considered high, between 5.0 and 9.99%, average, and less than 5% as low. Thus, the percentage of patients with physical disability in this study is considered high, and may be related to low effectiveness of activities of timely detection and/or early

diagnosis of the disease and difficulty of access to health services.⁹

A study carried out by Araújo et al found low frequency of physical disabilities at the beginning of treatment. Contrary to this finding, the survey of Aquino et al showed worrying results: high frequency of disability Level 1 or 2, corroborating the results found in the present study.^{5,9}

The male gender, according to Table 2, it was associated with the degree of inability, followed by the Level II, agreeing with the findings in the literature, in which male patients have a 2.4 times higher chance to evolve with some degree of physical incapacity in relation to female patients. This finding may suggest that men take longer to seek health services when they arise the first manifestations of the disease and, when already on treatment, there are more queries/return those women, as well as the fear that this population has to lose their source of income because of the stigma that surrounds the leprosy.^{8,10-1-2-3-4}

According to race/skin color, in 2015, the detection rate of new cases of leprosy by race in the population of black and mulatto was higher than that observed for the general

population of the country. It indicates high endemicity of the disease in the population of black and brown color, which is also observed an increase in the proportion of new cases diagnosed in this portion of the population. In this sense, the predominance of brown color found in this study was also evidenced in other, which relate to the brown color to the strong miscegenation existing in the country, mainly in the Northeast.^{9,10-4}

In relation to schooling, the results obtained in this study reinforce the referenced in the literature in which the leprosy, with frequency, relates to indicators such as low schooling, low family income or per capita income and lack of basic conditions of health, among others. It should be emphasized that the illiteracy rate, although it has decreased 4.3 percentage points over the years 2001 to 2014, according to the National Household Sample Survey (PNAD), this last year, Brazil was the 8th country in the world with the highest rates of illiteracy. Functional illiteracy among adults, with a predominance of this rate in the Northeast region, highlights education as an important social determinant of health.^{8,9,10-6}

A significant portion of patients diagnosed with leprosy in the studied hospital was founded in the capital and metropolitan regions, as shown in Table 1, a fact also observed in other studies. Thus, it is perceived that, although basic attention is qualified to diagnose and treat leprosy cases and their coverage, it is greater than 97.0% in the municipality in question, with the ability to perform effectively active search of cases. There was a lack of family health teams in identifying suspected cases of the disease, diagnose and institute timely treatment for the confirmed cases.^{12-8-10,17}

The multibacillary clinical form was the most frequent among the patients studied, as found in a study conducted in the capital of the Brazilian northeast with high endemicity. Especially the clinical forms dimorphous and Virchowian, to understand the more severe forms of the disease have higher chances of neural involvement, may lead the individual with leprosy have some degree of physical incapacity. These findings demonstrate that the diagnosis of leprosy was carried out late, there is a higher probability of transmission of the disease, as well as the development of neural complications and physical disabilities in patients.^{5,8,10}

In the pure neural form, as there are no cutaneous lesions, only nervous impairment, the diagnosis is hindered or delayed by difficulties in physical examination of this

clinical form. As a result, there may be a delay in diagnosis of the disease by the professional, favoring the establishment of some degree of physical inability.^{13,18-9}

In addition, it was found that, on average, the patients had more than one nerve affected. This finding was also evidenced in other studies, thus reinforcing the existing relationship between the increase of the time elapsed since the onset of the first signs and symptoms of leprosy and the initiation of treatment, with higher probability of occurrence of neural damage.^{11,20}

The patients had, on average, more than five lesions being indicated; therefore, the use of multibacillary regimen, associated to immune reactions and intense inflammatory response, causing reactional states, neural lesions severe and permanent. This figure shows a delay in diagnosis, which occurred after the polarization to the more severe forms of the disease and contagious diseases. However, the number of lesions was not associated with the degree of physical incapacity, since a single lesion may contain high loads bacillary, modifying the operational classification of leprosy patient. In some cases of difficult clinical classification, it uses laboratory examination for correct identification of paucibacillary or multibacillary cases, disregarded and the number of lesions identified.^{8,11,21}

In spite of the efforts for the early diagnosis, a considerable contingent of people is still affected by physical disabilities caused by leprosy. It observes, among other factors, the difficulty of access to health services, low-skilled professionals for diagnosis of the disease, poorly qualified professionals to perform the diagnosis of the disease, or who perform short consultations, without thoroughly evaluate the entire body surface area are among the factors that contribute to the late diagnosis of the disease. This results in a delay in the initiation of treatment and a higher chance to evolve with some degree of physical disability.⁹

By this disease, that treatment occurs in the public health system, which does not lead to death in alarming levels and does not require sophisticated technology for the diagnosis and treatment, the leprosy ends up getting in the background on the priority of care. Therefore, it is necessary to encourage campaigns designed to educate the population regarding the signs and symptoms of the disease; empower health professionals to diagnose and treat leprosy cases, as well as conduct health promotion actions and ensure adequate structure to the health units, in

order to ensure the access of the population to service.^{14,22-3}

The sputum smear microscopy has high specificity but low sensitivity, being negative in up to 70.0% of the patients with leprosy, not interfering in the occurrence of physical disabilities at the time of diagnosis, fact that has been observed in other studies, so that patients with negative sputum smear microscopy may present some degree of physical incapacity. The realization of this exam is not compulsory, bearing in mind that the diagnosis of leprosy is predominantly clinical.^{8,11,21}

CONCLUSION

This study allowed us to characterize the patients diagnosed with leprosy in a university hospital, as well as to identify the sociodemographic and epidemiological variables with greater chance of a statistically significant association to the degree of physical inability.

Thus, the results showed that the majority of the study participants had Level 0 physical incapacity, and among those who had some level of disability, predominated the Level I. The average age was 49.8 years old, and the majority of the male gender, not literate, that is self-declared of brown color, from the urban area of Teresina, with an average of 6.4 and 1.5 cutaneous lesions affected nerves. Among the microscopies performed, 9 had positive result and were multibacillary regimen.

Statistically significant associations were observed between the male gender, schooling until the fundamental education, dimorphous and Virchowian forms, pure neural cases multibacillary forms and presence of more than one nerve affected to some degree of physical incapacity.

In this way, it is fundamental to a multidisciplinary approach with early diagnosis, taking into consideration the variables that are directly associated with physical disabilities, implementing actions of prevention and treatment of same, as well as the stimulus to adherence to treatment, in order to avoid complications of the disease.

It is believed that the knowledge of epidemiological and sociodemographic characteristics, as well as the degree of physical incapacity, more frequent among leprosy patients treated in this service, may subsidize the implementation of strategies for prevention of disabilities. In the event of damage that already exist, the adoption of measures to prevent complications, in order

to promote improvements in the quality of life of affected patients.

REFERENCES

1. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Departamento de Vigilância das Doenças Transmissíveis. Diretrizes para vigilância, atenção e eliminação da Hanseníase como problema de saúde pública: manual técnico-operacional [recurso eletrônico] / Ministério da Saúde, Secretaria de Vigilância em Saúde, Departamento de Vigilância das Doenças Transmissíveis. - Brasília: Ministério da Saúde, 2016. 58 p. Available from: www.saude.gov.br/svs. ISBN 978-85-334-2348-0
2. Alves CJM, Barreto AJ, Fogagnolo L, Contin LA, Nassif PW. Avaliação do grau de incapacidade dos pacientes com diagnóstico de hanseníase em serviço de dermatologia do estado de São Paulo. *Rev Soc Bras Med Trop* [Internet]. 2010 Aug [cited 2017 Feb 1] 43(4):460-1. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S003786822010000400025&lng=en&nrm=iso > dx.doi.org/10.1590/S0037-86822010000400025
3. Secretaria de Estado da Saúde do Piauí - SESAPI/Superintendência de Atenção Integral à Saúde - SUPAT/ Diretoria de Unidade de Vigilância e Atenção à Saúde - DUVAS/ Gerência de Vigilância em Saúde - GVS/Boletim de Informação em Saúde. [Internet]. 2016 Dez [cited 2016 Oct 30]. Available from: <http://www.saude.pi.gov.br/boletins>
4. Gonçalves SD, Sampaio RF, Antunes CMF. Fatores preditivos de incapacidades em pacientes com hanseníase. *Rev Saude Pública* [Internet]. 2009 Apr [cited 2017 Feb 19]; 43(2):267-274. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S003489102009000200007&lng=en. <http://dx.doi.org/10.1590/S0034-89102009000200007>
5. Araújo AER, Aquino DMC, Goulart IMB, Pereira SRF, Figueiredo IA, Serra HO et al. Neural complications and physical disabilities in leprosy in a capital of northeastern Brazil with high endemicity. *Rev Bras. Epidemiol* [Internet]. 2014 Dec [cited 2017 Feb 19]; 17(4):8999-10. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1415790X2014000400899&lng=en. <http://dx.doi.org/10.1590/18094503201400040009>
6. Xavier MB, Macedo GMM, Gonçalves BK, Ramos MMAB, Tavares, NCS, Correa, SC.

Correlação entre as formas clínicas da hanseníase e o grau de incapacidade neurológica. Rev Par Med [Internet]. 2014 Jun [cited 2017 Feb 12];28(2):15-21. Available from:

<http://bases.bireme.br/cgi-bin/wxislind.exe/iah/online/?IscScript=iah/iah.xis&src=google&base=LILACS&lang=p&nextAction=lnk&exprSearch=721606&indexSearch=ID>

7. World Health Organization [Internet]. Global leprosy update, 2014: need for early case detection. Weekly Epidemiological Record. [cited 2017 Feb 5] 90(36):461-74. Available from: www.who.int/wer/2015

8. Mesquita R, Melo LTM, Vasconcelos RS, Soares DM, Félix GAA, Ferrer LPA, et al. Avaliação neurofuncional em pacientes com hanseníase. Rev Pro Saúde [Internet]. 2014 Abr [cited 2017 Feb 3];27(2):247-55. Available from:

<http://periodicos.unifor.br/RBPS/article/view/2826>

9. Gracie R, Peixoto, JNB de, Soares, FBR dos, Hacker MAVB de. Analysis of the geographical distribution of cases of leprosy. Cien Saude Col [Internet]. 2017 [cited 2017 Oct 01];22(5):1695-1704. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/28538938>

10. BRASIL. Ministério da Saúde. Secretaria de Vigilância em Saúde. Coordenação Geral de Desenvolvimento da Epidemiologia em Serviços. Guia de Vigilância em Saúde. Vol 2. 1. ed. Brasília: Ministério da Saúde, 2017.

11. Aquino DMC, Caldas AJM, Silva AAM, Costa JML. Perfil dos pacientes com hanseníase em área hiperendêmica da Amazônia do Maranhão, Brasil. Rev Soc Bras Med Trop [Internet]. 2003 Jan [cited 2017 Feb 19];36(1):57-64. Available from:

http://www.scielo.br/scielo.php?pid=S003786822003000100009&script=sci_abstract&lng=pt

12. Leite SN, Barros ARSB, Fonseca MCR, Andrade TA M, Foss NT, Frade MAC. Avaliação sensitiva de hansenianos pelos monofilamentos semmes-weinstein em serviço terciário de fisioterapia [Internet]. 2010 [cited 2017 Mar 17]; 35(2):9-15. Available from: http://periodicos.ses.sp.bvs.br/scielo.php?script=sci_arttext&pid=S1982-51612010000200002&lng=pt.

13. Queiroz TA, Carvalho FPB, Simpson CA, Fernandes ACL, Figueiredo DLA, Knackfuss ML. Perfil clínico e epidemiológico de pacientes em reação hansênica. Rev Gaucha Enferm [Internet]. 2015 Jun [cited 2017 Mar 17];36(esp):185-91. Available from: <http://www.scielo.br/pdf/rgenf/v36nspe/0102-6933-rgenf-36-spe-0185>

14. Brito KKG, Araújo DAL, Uchôa REMN, Ferreira JDL, Soares MJGO, Lima JO. Epidemiologia da hanseníase em um estado do nordeste brasileiro. Journal of nursing UFPE on line [Internet]. 2014 Ago [cited 2017 Feb 15];8(8):2686-93. Available from: http://www.revista.ufpe.br/revistaenfermagem/index.php/revista/article/viewFile/6092/pdf_5872

15. Joshua V, Gupte MD, Bhagavandas M. A Bayesian approach to study the space time variation of leprosy in an endemic area of Tamil Nadu, South India. Int J Health Geographics 2008; 7:40

16. Instituto Brasileiro de Geografia e Estatística - IBGE. Pesquisa Nacional por Amostra de Domicílios (Pnad) 2014. [cited 2017 Feb 15]. Available from: <http://www.ibge.gov.br>

17. Barreto JOM, Nery IS, Costa MSC. Estratégia Saúde da Família e internações hospitalares em menores de 5 anos no Piauí, Brasil. Cad Saude Publica [Internet]. 2012 Mar [cited 2017 Mar 23];28(3):515-526. Available from:

http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0102-311X2012000300012&lng=en.
<http://dx.doi.org/10.1590/S0102311X2012000300012>.

18. Bezerra PB, Silva MCL, Andrade MCF, Silva LVC. Avaliação física e funcional de pacientes com hanseníase. Journal of nursing UFPE on line [Internet]. 2015 Set [cited 2017 Feb 18];9(Supl.8):9336-42. Available from: www.revista.ufpe.br/revistaenfermagem/index.php/revista/article/download/.../13123

19. Ministério da Saúde (BR). MS/SVS/CGHDE - Coordenação Geral de Hanseníase e Doenças em Eliminação. SINAN - Sistema de Informações de Agravos de Notificação. [Internet]. 2016 [cited 2016 Set 20]. Available from: <http://datasus.saude.gov.br>.

20. World Health Organization [Internet]. Estratégia global aprimorada para redução adicional da carga da hanseníase: 2011-2015: diretrizes operacionais (atualizadas). Organização Mundial da Saúde. Brasília: Organização Pan-Americana da Saúde. 2010 [cited 2017 Jan12]. Available from: http://bvsms.saude.gov.br/bvs/publicacoes/estrategiaglobal_aprimorada_reducao_hansenia_se.pdf

21. Moschioni C, Antunes CMF, Grossi MAF, Lambertucci JR. Risk factors for physical disability at diagnosis of 19,283 new cases of leprosy. Rev Soc Bras Med Trop [Internet]. 2010 Feb [cited 2017 Mar 25];43(1):19-22. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0037-86822010000100005&lng=pt.

<http://dx.doi.org/10.1590/S0037-86822010000100005>

22. Arantes CK, Garcia MLR, Filipe MS, Nardi SMT, Paschoal VD. Avaliação dos serviços de saúde em relação ao diagnóstico precoce da hanseníase. Epidemiol Serv Saude [Internet]. 2010 [cited 2013 Oct 01];19(2):155-64. Available from:

http://bvsms.saude.gov.br/bvs/periodicos/revista_epi_vol19_n2.pdf

23. Carvalho NV, Araújo TME. Ações realizadas por profissionais de saúde da família no controle de hanseníase em um município hiperendêmico. J Health Biol Sci online [Internet]. 2015 Jul-Set [cited 2017 Mar 17];3(3):144-150. Available from:

<http://periodicos.unichristus.edu.br/index.php/jhbs/issue/view/13>

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Corresponding Address

Jaylinne Ribeiro Moraes
Conjunto Habitacional Morada Nova II
Q12, Bl 07, Ap 104
Bairro Lourival Parente
CEP: 64023-204 – Teresina (PI), Brazil

English/Portuguese

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