REVISTA O MUNDO DA SAÚDE

Factors associated with physical disabilities of leprosy: a cross-sectional study

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Abstract

Leprosy is an infectious disease that can cause physical disability, classified according to degrees ranging from 0 to II. The objective of this study was to evaluate factors related to the degree of physical disability (DPD) of leprosy cases. This was an epidemiological, cross-sectional, and retrospective study, with leprosy notification data with DPD from Rondonópolis (MT) (2009 to 2018). Descriptive statistics and Pearson's chi-squared test for associations were used (significance level 5%). Research was approved by the Ethics Committee (Opinion: 3.036.673). There were 1633 leprosy notifications, with a predominance of Zero DPD (60.32%). The predominant sociodemographic characteristics were: males (58%), brown race (55.66%), age group 20 to 59 years old (72.81%), elementary education (50.83%), and from an urban area (90.39%). Epidemiological characteristics that predominated were: dimorphic clinical form (70.3%), multibacillary operational classification (84.81%), multibacillary polychemotherapy therapeutic approach of 12 doses (83.77%), spontaneous demand mode of detection (39.13%), and type of discharge due to cure (79.98%). The zero degree of physical disability represented 60.32% of the cases and of these, 53.97% had cutaneous lesions and 32.72% had affected nerves. With the exception of the variables number of skin lesions and affected nerves, the others showed statistical significance. We conclude that it is necessary that the active search for leprosy cases and notification are efficient, with a view to early diagnosis and adequate treatment, avoiding the occurrence of physical disabilities.

Keywords: Hansen's disease; Public health; Epidemiology.

INTRODUCTION

Leprosy is a chronic, infectious disease, whose etiologic agent is *Mycobacterium leprae*, a resistant alcohol-acid bacillus. The form of transmission occurs through the airways through close and prolonged contact of the susceptible person with a patient who is not being treated[1].

The physical disabilities generated are classified in grades from 0 to II and are an important epidemiological indicator that determines the early diagnosis and the success of activities aiming at interrupting the transmission chain. Grade 0 corresponds to the absence of disabilities, I to the

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The physical disabilities generated are classified in grades from 0 to II and are an important epidemiological indicator that determines the early diagnosis and the success of activities aiming at interrupting the transmission chain. Grade 0 corresponds to the absence of disabilities, I to the decrease or loss of sensation in eyes, hands, and feet, and II to motor changes in eyes, hands, or feet and/or visible deformities. The assessment of the degree of these disabilities aims to identify patients with the potential to develop reactions and new disabilities during and after treatment and discharge[2].

In 2018, according to the World Health Organization (WHO), in the world, more than 208 thousand new cases of leprosy were registered, and in the Americas, Brazil is responsible for more than 92% of cases, second only to India in the world[3]. Between the years 2014 to 2018, more than 140 thousand new leprosy cases were diagnosed in Brazil and, regarding the prevalence rate, it was 1.48/10 thousand inhabitants in 2018. In the period from 2009 to 2018, more than 20 thousand cases were reported with grade II physical disability in the country. The Midwest region recorded a detection rate of new cases with grade II physical disability of 20.87 cases per 1 million inhabitants in 2009 and, in 2018, 21.63/1 million inhabitants. In 2018, Mato Grosso ranked second in the rate of detection of new leprosy cases, with 62.08 cases per 100 thousand inhabitants[4].

The number of leprosy cases in the Midwest region in 2015 was 5,623, and its prevalence coefficient was above the national average, with the state of Mato Grosso being responsible for these indices, whose prevalence coefficient was 7.75/10,000 inhabitants[5]. In the municipality of Rondonópolis (MT), the prevalence of new cases of leprosy between 2001 and 2015 was 2,696 cases and in 2016 in children under 15 years old there were 139 cases[6,7].

Leprosy is a comorbidity that remains a major challenge for Brazilian public health and the municipality under study is endemic for this disease. Early screening is necessary to prevent and treat complications that may arise, including physical disability, which can compromise patients' quality of life. Therefore, measures must be taken to reduce the number of cases through early diagnosis and immediate treatment to prevent or reduce the complications caused by physical disabilities.

A better understanding of the epidemiological profile of leprosy allows the development of specific actions by health services to face this epidemic, whether through preventive actions, treatment, or rehabilitation of users, in addition to the joint effort of the population and health services together working on the prevention, control, diagnosis, and treatment of this pathology[8].

In this sense, considering that the municipality under study is considered hyperendemic for leprosy and that there are few publications on the subject, investigating the factors that may be related to the development of physical disability in individuals with leprosy, may assist in taking actions for prevention and the early diagnosis of cases. It is hypothesized that the degree of physical disability (DPD) may be associated with the characteristics of leprosy cases.

Thus, the objective of this study was to evaluate factors related to the degree of physical disability in cases of leprosy in Rondonópolis (MT) in the period from 2009 to 2018.

METHODOLOGY

This was an epidemiological, quantitative, cross-sectional, and retrospective study, with data from secondary sources in the municipality of Rondonópolis (MT), from January 2009 to December 2018, carried out with confirmed and notified cases of leprosy with the assessment of the degree of physical disability.

The research population consisted of all leprosy cases with an assessment of the degree of physical disability. Data were collected from the Notifiable Diseases Information System (SINAN), available at the Informatics Department of the Unified Health System (DATASUS), which is public and free of charge.

All reported cases of leprosy in Rondonópolis (MT) in the period from 2009 to 2018 were included and cases that were blank and/or ignored/empty were excluded. These notifications are made in 52 basic health units and a polyclinic in this municipality; all establishments are registered in the National Register of Health Establishments[9].

The variables used for sociodemographic characterization were sex, race, age group, education, area of origin, and municipality of residence. As for epidemiological data DPDs, clinical form, number of skin lesions, number of affected nerves, operational classification, therapeutic approach, method of detection, and type of discharge were used.

Statistical analyses were performed with the aid of the software package R[10]. For the description of the profile of leprosy cases and physical disabilities, descriptive statistics was used, with the absolute frequencies (N) of cases with their respective percentages. Pearson's Chi-Squared Test was performed to verify associations between the sociodemographic and clinical characteristics of the cases and the DPD. All analyses were performed at a 5% significance level. The data were arranged in Microsoft Excel in a double entry spreadsheet.

Considering that this is a study with secondary data, all the principles of research with human beings were respected and is part of the thematic project entitled "Hansen's disease: case analysis and program management in a hyperendemic municipality", which was submitted to the Brazil Platform and approved by the Research Ethics Committee of the Federal University of Rondonópolis (CAAE 97441618.2.0000.8088 and Protocol 3.036.673)[11].

RESULTS

In the ten years of study (2009 to 2018), 1633 new leprosy cases were notified in the municipality of Rondonópolis (MT). The predominating degree of physical disability in the cases was Grade Zero (60.32%) and the least reported was Grade II (3.86%) in these ten years studied (Table 1).

According to leprosy cases with DPD reported in the municipality of Rondonópolis (MT), in the last ten years, the predominant sociodemographic characteristics were: males (58%), brown race (55.66%), 20 to 59 years old (72.81%), incomplete and/or complete elementary education (50.83%) and coming

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In relation to the predominating epidemiological characteristics, clinical form dimorphic (70.3%), multibacillary operational classification (84.81%), therapeutic scheme of 12 doses of multibacillary polychemotherapy (83.77%), and mode of detection by means of spontaneous demand (39.13%) stood out. The zero degree of physical disability represented 60.32% of the cases and of these, 53.97% had cutaneous lesions and 32.72% had affected nerves. Finally, the type of discharge that stood out was discharge due to cure (79.98%). Apart from the variables number of skin lesions and affected nerves, the other variables showed statistical significance (p<0.005) (Table 3).

Table 1– Distribution of new leprosy cases and degree of physical disability, in the municipality of Rondonópolis (MT), in the period from 2009 to 2018. Rondonópolis, 2020.

Year	New cases of leprosy			Degree of Physical Disability (DPD)				
				Degree Zero	Degree I	Degree II	Not Rated	Blank
	N	%	P value*	N	N	N	N	N
2009	211	12.92	<0,005	146	13	5	43	4
2010	234	14.33		156	18	13	38	9
2011	174	10.66		120	17	5	27	5
2012	144	8.82		91	18	7	28	0
2013	194	11.88		113	33	11	21	16
2014	154	9.43		77	22	5	14	36
2015	178	10.9		96	21	5	31	25
2016	114	6.98		56	13	3	40	2
2017	112	6.86		49	13	7	28	15
2018	118	7.23		81	23	2	3	9
Total	1633	100		985	191	63	273	121

Source: Notifiable Diseases Information System (SINAN).
* = Chi-squared adherence test

Table 2– Sociodemographic characteristics of new leprosy cases according to the degree of physical disability in the municipality of Rondonópolis, from 2009 to 2018. Rondonópolis, 2020.

	Degree Zero	Degree I	Degree II	Not rated	Blank	Total	%	P value*
SEX								
Female	450	60	24	101	51	686	42	<0.005
Male	535	131	39	172	70	947	58	
RACE								
White	361	75	26	86	32	580	35.52	<0.005
Black	64	22	5	21	16	128	7.84	
Brown	552	92	32	163	70	909	55.66	
Indigenous	3	0	0	0	2	5	0.31	
Not informed/blank	5	2	0	3	1	11	0.67	-
AGE RANGE								
0 to 9 years	36	1	2	9	3	51	3.12	<0.005
10 to 19 years	67	7	3	9	8	94	5.76	
20 to 59 years	747	121	32	202	87	1189	72.81	
60+ years	135	62	26	53	23	299	18.31	
EDUCATION								
Illiterate	107	36	16	29	9	197	12.06	<0.005
Incomplete and/or complete elementary	480	101	37	151	61	830	50.83	
Incomplete and/or complete high school	267	34	5	56	29	391	23.94	
Incomplete and/ or complete higher education	69	4	0	11	8	92	5.63	
Not informed/blank	62	16	5	26	14	123	7.53	-
ZONE OF EVENT								
Urban	893	172	56	250	105	1476	90.39	<0.005
Rural	46	12	5	15	11	89	5.45	
Not informed/blank	46	7	2	8	5	68	4.16	-
CITY OF RESIDENCE								---------**
Alto Araguaia	0	0	0	1	0	1	0.06	-
Alto Graças	1	0	0	2	0	3	0.18	
Colider	0	0	0	1	0	1	0.06	
Guiratinga	1	0	0	0	0	1	0.06	
Itiquira	1	0	0	1	0	2	0.12	
Jaciara	0	0	0	1	0	1	0.06	
Juscimeira	0	1	1	0	0	2	0.12	

to be continued...

continuation table 2...

	Degree Zero	Degree I	Degree II	Not rated	Blank	Total	%	P value*
Paranatinga	3	0	0	1	0	4	0.24	
Pedra Preta	3	1	0	0	1	5	0.31	
Poxoréo	3	0	0	0	0	3	0.18	
Primavera do Leste	0	0	0	1	0	1	0.06	
Rondonópolis	973	189	62	261	120	1605	98.29	
Santo Antônio do Leverger	0	0	0	1	0	1	0.06	
São José do Povo	0	0	0	2	0	2	0.12	
São Pedro da Cipa	0	0	0	1	0	1	0.06	
TOTAL	985	191	63	273	121	1633	100	

Source: Notifiable Diseases Information System (SINAN).
* = Chi-squared adherence test
** = It was not possible to perform the statistical calculations for City of Residence

Table 3– Epidemiological characteristics of new cases of leprosy according to the degree of physical disability in the municipality of Rondonópolis, from 2009 to 2018. Rondonópolis, 2020.

	Degree Zero	Degree I	Degree II	Não avaliado	Blank	Total	%	P value*
CLINICAL FORM								
Dimorfa	692	144	42	182	88	1148	70.30	<0.005
Undetermined	54	2	1	12	5	74	4.53	
Tuberculoid	188	14	2	36	12	252	15.43	
Virchowiana	40	27	17	39	12	135	8.27	
Not informed/blank/ unclassified	11	4	1	4	4	24	1.47	-
SKIN LESIONS								---------**
TOTAL	4725	1449	566	1262	752	8754	100	
AFFECTED NERVES								---------**
TOTAL	71	59	41	30	16	217	100	
OPERATIONAL CLASSIFICATION								
Multibacillary	797	182	61	237	108	1385	84.81	<0,005
Paucibacilar	188	9	2	36	12	247	15.13	
Not informed/blank	0	0	0	0	1	1	0.06	-
THERAPEUTIC APPROACH								
MDT/MB 12 doses	791	179	57	233	108	1368	83.77	<0,005
MDT/PB 6 doses	177	8	2	34	12	233	14.27	
Other approaches	15	3	4	6	0	28	1.71	
Not informed/blank	2	1	0	0	1	4	0.24	-
MODE OF DETECTION								
Spontaneous demand	410	64	26	92	47	639	39.13	<0,005
Referral	361	58	26	106	38	589	36.07	

to be continued...

continuation table 3...

	Degree Zero	Degree I	Degree II	Não avaliado	Em Branco	Total	%	Valor p*
Collective examination	65	15	1	12	8	101	6.18	
Examination of contacts	57	9	0	14	5	85	5.21	
Other modes	5	1	0	1	2	9	0.55	
Not informed/blank	87	44	10	48	21	210	12.86	-
TYPE OF DISCHARGE								
Cure	814	140	43	222	87	1306	79.98	<0,005
Abandonment	35	9	2	11	2	59	3.61	
Death	7	4	4	2	3	20	1.22	
Diagnostic error	8	4	0	1	0	13	0.80	
Transfer within the same city	48	13	4	9	12	86	5.27	
Transfer to another state	14	5	3	4	3	29	1.78	
Transfer to another city	27	5	5	20	8	65	3.98	
Not informed/blank	32	11	2	4	6	55	3.37	-
TOTAL	985	191	63	273	121	1633	100	

Source: Notifiable Diseases Information System (SINAN).
* = Chi-squared adherence test
** = For these variables, it was not possible to perform statistical analyses.

DISCUSSION

The highest prevalence of new cases of leprosy with a degree of physical disability found in Rondonópolis (MT), in the period from 2009 to 2018, were in 2010 (14.3%) and the lowest in 2017 (6.86%). In the city of Fortaleza (CE), 2008 was the year with the most, new cases (13.53%) and 2017 with the least (7.41%)[12]. In Maracanaú (CE), a study conducted between 2009 and 2018 demonstrated that cases prevailed in 2018 (14.86%) and 2013 had the lowest number of cases (6.41%)[13].

Regarding the degree of physical disability, among the new cases in this study, those who did not have any degree of physical disability (60.32%) predominated and was followed by grade I (11.70%) and grade II (3.86%). Moreover, in studies carried out in Maracanaú (CE), Maricá (RJ), Teresina (PI), and Marituba (PA), grade zero (43.4%, 67.5%, 54.8%, and 71.8%) also predominated followed by grade I (33.2%, 21%, 31.5%, and 17.7%) and grade II (13.6%, 11.46%, 13.7%, and 10.5%), respectively[13,14,15,16].

In Palmas (TO) the results were different, 62.2% of the cases started treatment with grade I physical disability[17]. In Barbacena (MG), from 2001 to 2010, grade I (47.8%) also predominated, followed by grade 0 (31%) and grade II (21.2%)[18]. In Mossoró (RN), 70.49% of the patients had some degree of physical disability, the most prevalent being grade I (44.26%)[19].

In this study, the cases with a degree of physical disability predominated without much statistical difference regarding the male sex (58%); similar results were seen in São Miguel do Oeste (SC) (62%) and in the state of Alagoas (50.5%)[20,21]. This fact is probably linked to the greater exposure to work-related activities, the reduced demand for health services, the low level of self-care and the decreased access to

information[22].

The profile of these cases prevailed among the brown race, adults with a low degree of education, and residents in the urban area. These results are similar to a study at Hospital Universitário do Nordeste, in the years 2014 to 2016, whose profile of leprosy cases with physical disability had an average age of 49.8 years, brown race (64.4%), incomplete and/or complete elementary education (48%) and coming from the urban area (84.9%)[15].

Most of the cases notified in this study lived in the notifying city itself, contrarily from the study in Barbacena (MG) in which 36.8% lived in the city of study and 63.2% were from other municipalities in the macro-region[18]. It should be noted that Rondonópolis (MT) is a main center for another 18 municipalities in the southern region of Mato Grosso, so part of the leprosy cases are referred there for treatment (1.71%).

In this study, it can be seen that all sociodemographic variables (gender, race, age group, education, and area of origin) analyzed are associated ($p<0.005$) with the DPD of the patients. Also, in a study carried out in Paço do Lumiar (MA), in the period from 2006 to 2015, where age group, sex, race, and education were associated factors ($p=0.277$), ($p=0.239$), ($p=0.082$), ($p=0.026$)[23]. The study carried out in the Metropolitan Region of Belém, Pará, from 2005 to 2014, also showed statistical significance in these sociodemographic variables mentioned above, with age ($p=0.0390$), sex ($p=0.0101$), and education ($p=0.0259$)[24].

As for the epidemiological characteristics of leprosy cases with a degree of physical disability in this study, the dimorphic clinical form and multibacillary operational classification predominated; similar to a study in the state of Acre (AC) between 2004 and 2012, where the dimorphic form represented 49% and the multibacillary classification 60.3% of the cases[25]. Among the clinical forms of leprosy, the one with the greatest transmissibility is Virchowian leprosy, whereas the operational classification is multibacillary; thus, the treatment becomes more rigorous and painful when associated with these clinical conditions[1].

Regarding the therapeutic approach, 12 doses of MDT/MB predominated, which is similar to the study in the micro-region of Tucuruí (PA), between the years 2010 to 2014 (67.4%)[26]. The mode of detection in the municipality that prevailed was spontaneous demand, as in the city of Diamantina (MG) (77.5%)[27].

The discharge due to cure prevailed in leprosy cases in Rondonópolis (MT), consistent with the study in the city of Palma (TO) in the years 2005 and 2010 (81.7%)[17]. The lack of investments for early diagnosis, treatment, and cure of leprosy, which could eliminate the disease, is not the only problem, it is also necessary to invest in the continuing education of professionals so that during the entire process of treatment and discharge due to cure, there will be effective care and follow-up[19].

With the exception of the variables number of injuries and number of affected nerves, in this study, the epidemiological characteristics had a significant association ($p<0.005$) with patients with DPD. The clinical form ($p=0.0000$) in the study carried out in the state of Paraíba (PB), from 2001 to 2011[28], and operational classification ($p = 0.030$), carried out in the municipality of Vitória da Conquista (BA), among 2001 and 2014[29], were significant factors. In the study carried out in Barbacena (MG), the clinical form, therapeutic approach, and type of discharge had a significant association ($p=0.001$), ($p=0.001$), and ($p=0.038$)[18].

It should be noted that the identification of this information can contribute to different care and management aspects of nursing care. Thus, nurses must consider the health needs existing in their territory, without losing sight of the socio-epidemiological and clinical aspects

experienced by people with leprosy[30].

In addition, it is worth noting that the social support offered by the family and the health team can help in the process of illness. In a study with individuals diagnosed with leprosy who had disabilities and those who did not have participation restrictions, a positive correlation was observed with the satisfaction of this support[31].

Still, it should be reinforced that investments by managers and local teams in the processes could empower the workforce to reduce programmatic vulnerability in leprosy care in the context of primary health care services[32].

CONCLUSION

It is concluded in this study that the highest prevalence of new cases of leprosy with degree of physical disability found in the period from 2009 to 2018, were in the year 2010 and with a degree of zero. The sociodemographic variables gender, race, age group, education, and area of origin showed a statistically significant difference in relation to DPD, as well as the epidemiological characteristics, clinical form, operational classification, therapeutic approach, mode of detection, and type of discharge.

It can be observed that this study has limitations because it is a regionalized study and from secondary sources which may suffer from underreporting and incomplete of information. Thus, it is essential that the active search for leprosy cases in the population of the city be efficient and notified, with a view to early diagnoses and adequate treatments, avoiding the occurrence of physical disabilities which impact quality of life, due to physical, psychological, and social repercussions.

REFERENCES

1. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Departamento de Vigilância e Doenças Transmissíveis. Guia prático sobre a Hanseníase. Brasília: SVS, 2017. [acesso em 10 de fev de 2020]. Disponível em https://portalarquivos2.saude.gov.br/images/pdf/2017/novembro/22/Guia-Pratico-de-Hanseniase-WEB.pdf
2. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Coordenação-Geral de Desenvolvimento da Epidemiologia em Serviços. Guia de Vigilância em Saúde. Brasília: SVS, 2019. [acesso em 10 de fev de 2020]. Disponível em https://portalarquivos2.saude.gov.br/images/pdf/2019/junho/25/guia-vigilancia-saude-volume-unico-3ed.pdf
3. Organização Mundial da Saúde. Global leprosy update, 2018: moving towards a leprosy free world. Weekly Epidemiological Record, Genebra: WHO, 2019. 94:389-412. [acesso em 10 de fev de 2020]. Disponível em: https://apps.who. int/iris/bitstream/handle/10665/326775/WER9435-36-en-fr.pdf?ua=1
4. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Boletim Epidemiológico de Hanseníase. Brasília: SVS, 2020. [acesso em 02 de fev de 2020]. Disponível em http://www.aids.gov.br/pt-br/pub/2020/boletim-epidemiologico-de-hanseniase-2020
5. Ribeiro MDA, Silva JCA, Oliveira SB. Estudo epidemiológico da hanseníase no Brasil: reflexão sobre as metas de eliminação. Rev Panam Salud Publica 2018; 42(42): 1-7. [acesso em 12 de fev de 2020]. Disponível em: https://doi.org/10.26633/RPSP.2018.42
6. Santos DAS, Spessatto LB, Melo LS, Olinda RA, Lisboa HCF, Silva MS. Prevalência de casos de Hanseníase. Rev Enferm UFPE online 2017; [acesso em 12 de fev de 2020]. 11(supl. 10): 4045-4055. Disponível em: DOI: 10.5205/reuol.10712-95194-3-SM.1110sup201706
7. Santos DAS, Santos SB, Ribeiro NRS, Goulart LS, Olinda RA. Trends of leprosy in children under fifteen years in Rondonópolis-MT (2007 to 2016). O Mundo da Saúde. 2018; [acesso em 15 de fev de2020] 42(4): 1032-1049. Disponível em: DOI: 10.15343/0104-7809.2018420410321049
8. Sousa TJ, Cruz Neto LR, Lisboa HCF. Perfil epidemiológico de hanseníase em Rondonópolis/MT: 2001 A 2010. Revista Saúde- Santa Maria 2018; [acesso em 12 de fev de 2020] 44(3): 1-10. Disponível em: DOI: 10.5902/2236583419084
9. Brasil. Ministério da Saúde. Banco de dados do Cadastro Nacional de Estabelecimentos de Saúde. Brasília: CNES, 2020. [acesso em 02 de fev de 2020]. Disponível em: http://cnes.datasus.gov.br/pages/estabelecimentos/consulta.jsp
10. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna: Austria. [acesso em 02 de

fev de 2020]. Disponível em: http://www.R-project.org/. 2020.
11. Brasil. Portaria nº 466/2012 de dezembro de 2012. Cria no Conselho Nacional de Saúde, as Diretrizes e Normas Regulamentadoras de Pesquisa com Seres Humanos. Diário Oficial da União de 13 de junho de 2013. [acesso em 02 de fev de 2020]. Disponível em: https://bvsms.saude.gov.br/bvs/saudelegis/cns/2013/res0466_12_12_2012.html
12. Ceará. Coordenadoria de Vigilância em Saúde. Núcleo de Vigilância Epidemiológica. Secretária da Saúde do Estado do Ceará. Boletim Epidemiológico de Hanseníase. Fortaleza: SES, 2018. [acesso em 06 de fev de 2020]. Disponível em: https://www.saude.ce.gov.br/wp-content/uploads/sites/9/2018/06/Boletim-2018_Cear%C3%A1-revisado-FINAL.pdf
13. Souza CRS, Feitosa MCR, Pinheiro ABF, Cavalcante KKS. Aspectos epidemiológicos da hanseníase em um município nordestino do Brasil. Rev Bras Promoç Saúde. 2019; 32: 1-10. [acesso em 18 de fev de 2020]. Disponível em: DOI: https://doi.org/10.5020/18061230.2019.9469
14. Oliveira JCF, Leão AMM, Britto FVS. Análise do perfil epidemiológico da hanseníase em Maricá, Rio de Janeiro: Uma contribuição da enfermagem. Rev enferm UERJ. 2014; 22(6): 815-821. [acesso em 18 de fev de 2020]. Disponível em: DOI: https://doi.org/10.12957/reuerj.2014.13400
15. Morais JR, Furtado ÉZL. Grau de incapacidade física de pacientes com Hanseníase. Rev enferm UFPE on line. 2018; 12(6): 1625-1632. [acesso em 18 de fev de 2020]. Disponível em: DOI: https://doi.org/10.5205/1981-8963-v12i6a231049p1625-1632-2018
16. Silva JSR, Palmeira IP, Sá AMM, Nogueira LMV, Ferreira AMR. Variáveis clínicas associadas ao grau de incapacidade física na hanseníase. Rev Cuid. 2019; 10(1): 1-12. [acesso em 19 de fev de 2020]. Disponível em: DOI: https://doi.org/10.15649/cuidarte.v10i1.618
17. Neves TV, Valentim IM, Vasconcelos KB, Rocha ESD, Nobre MSRS, Castro JGD. Perfil de pacientes com incapacidades físicas por hanseníase tratados na cidade de Palmas – Tocantins. Revista Eletrônica Gestão & Saúde. 2013; 4(2): 2016-2025. [acesso em 1 de mar de 2020]. Disponível em: https://periodicos.unb.br/index.php/rgs/article/view/239/228
18. Mendes AO, Costa CEG, Silva RC, Campos AS, Cunha VMG, Silva GC. et al. Caráter clínico-epidemiológico e grau de incapacidade física nos portadores de hanseníase no município de Barbacena – MG e macrorregião no período de 2001 a 2010. Rev Med Minas Gerais. 2014; 24(4) 486-494. [acesso 11 de mar de 2020]. Disponível em: DOI: http://www.dx.doi.org/10.5935/2238-3182.20140140
19. Queiroz TA, Carvalho FPB, Simpson CA, Fernandes ACL, Figueiredo DLA, Knackfuss MI. Perfil clínico e epidemiológico de pacientes em reação hansênica. Revista gaúcha de Enfermagem. 2015; 36: 185-191. [acesso em 15 de mar de 2020]. Disponível em: https://doi.org/10.1590/1983-1447.2015.esp.57405
20. Palú FH, Cetolin SF. Perfil clinico epidemiológico dos pacientes com hanseníase no extremo oeste catarinense, 2004 a 2014. Arq. Catarin Med 2015; [acesso em 25 de fev de 2020] 44(2): 90-98. Disponível em file:///C:/Users/User/Downloads/29-53-1-SM.pdf
21. Silva DDB, Tavares CM, Gomes NMC, Cardoso AC, Arcêncio RA, Nogueira PSF. A hanseníase na população idosa de Alagoas. Rev Bras de Geriatr Gerontol 2018; [acesso em 28 de fev 2020] 21(5): 573-581. https://doi.org/10.1590/1981-22562018021.180076
22. Oliveira MHP, Romanelli G. Os efeitos da hanseníase em homens e mulheres: um estudo de gênero. Cad Saude Publica. 1998;14(1):51-60. https://doi.org/10.1590/S0102-311X1998000100013
23. Portela NLC, Sousa PHL, Melo LNL. Fatores associados à incapacidade física de casos novos de hanseníase em paço do Lumiar – MA, de 2006-2015. Hygeia 2018; [acesso em 28 de fev de 2020] 14(27): 80-88. Disponível em: https://doi.org/10.14393/Hygeia142706
24. Silva JSR, Palmeira IP, Sá AMM, Nogueira LMV, Ferreira AMR. Fatores sociodemográficos associados ao grau de incapacidade física na hanseníase. Rev Cuid 2018; [acesso em 28 de fev de 2020] 9(3): 1-11. Disponível em: http://dx.doi.org/10.15649/cuidarte.v9i3.548
25. Silva MS, Silva EP, Monteiro FF, Teles SF. Perfil clínico-epidemiológico da hanseníase no estado do Acre: estudo retrospectivo. Hansen Int. 2014; 39(2): 19-26. [acesso em 27 de fev de 2020]. Disponível em: http://hi.ilsl.br/download.php?id=imageBank/v39n2a03.pdf
26. Costa LA, Borba-Pinheiro CJ, Reis JH, Reis Junior SH. Análise epidemiológica da hanseníase na microrregião de Tucuruí, Amazônia brasileira, com alto percentual de incapacidade física e de casos entre jovens. Rev Pan-Amaz Saúde 2017; [acesso em 28 de fev de 2020] 8(3): 9-17. Disponível em: doi: 10.5123/S2176-62232017000300002
27. Ribeiro GC, Lana FCF. Incapacidades físicas em hanseníase: caracterização, fatores relacionados e evolução. Cogitare Enfermagem 2015; [acesso em 28 de fev de 2020] 20(3): 496-503. Disponível em: file:///C:/Users/User/Downloads/41246-162513-1-PB.pdf
28. Uchôa REMN, Brito KKG, Santana EMF, Soares VL, Silva MA. Perfil clínico e incapacidades físicas em pacientes com hanseníase. Rev Enferm UFPE online 2017; [acesso em 2 de mar de 2020] 11(supl. 3): 1464-1472. Disponível em: DOI: 10.5205/reuol.10263-91568-1-RV.1103sup201719
29. Reis MC, Raposo MT, Alencar CHM, Ramos Junior NA, Heukelbach J. Incapacidades físicas em pessoas que concluíram a poliquimioterapia para hanseníase em Vitória da Conquista, Bahia, Brasil. Acta Fisiatrica 2018; [acesso em 2 de mar de 2020] 25(2): 78-85. Disponível em: DOI: 10.11606/issn.2317-0190.v25i2a162582
30. Viana LS, Aguiar MIF, Aquino DMC. Perfil socioepidemiológico e clínico de idosos afetados por hanseníase: contribuições para enfermagem. Rev. fundam. care. online. 2016; [acesso em 2 de mar de 2020] 8(2): 4435-4446. Disponível em: DOI: 10.9789/2175-5361.2016.v8i2.4435-4446
31. Loures LF, Mármora CHC. Suporte e participação social em indivíduos com hanseníase. O mundo da saúde. 2017; [acesso em 3 de mar de 2020] 41(2): 244-252. Disponível em: DOI: 10.15343/0104-7809.20174102244252
32. Pires AR, Barboza R. Sensibilização de profissionais da saúde para a redução de vulnerabilidades programáticas na hanseníase. O mundo da saúde. 2015; [acesso em 3 de mar de 2020] 39(4): 484-494. Disponível em: DOI: 10.15343/0104-7809.20153904484494

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