



Journal of Nursing

Revista de Enfermagem

UFPE On Line

ISSN: 1981-8963

ORIGINAL ARTICLE

PARASITIC PROFILE OF A COMMUNITY ASSIGNED TO THE FAMILY HEALTH UNIT

PERFIL PARASITÁRIO DE UMA COMUNIDADE ADSCRITA À UNIDADE DE SAÚDE DA FAMÍLIA PERFIL DE ENFERMEDAD PARASITARIA DE UNA COMUNIDAD JUNTO A LA UNIDAD DE SALUD FAMILIAR

Ana Dorcas de Melo Inagaki¹, Maria Ilda Alves de Oliveira², Rafaela Chaves Pimentel Pereira³, Ana Cristina Freire Abud⁴, Lincoln Vitor Santos⁵, Vanessa Ramos de Faria Sea⁶

ABSTRACT

Objective: to describe the parasitic profile of the community assisted by the Family Health Strategy. **Method:** this was a descriptive epidemiological, descriptive, retrospective, with a quantitative approach study conducted at the Family Health Unit in the Rosa Elze neighborhood, municipality of São Cristóvão, Sergipe/SE. The data was collected from medical charts and analyzed by simple statistics. The project was approved by the Research Ethics Committee, CAAE 05213212.9.0000.5546. **Results:** a quarter of the patients had at least one entero parasitosis. Infestation by *Entamoeba histolytica*, *Giardia lamblia*, and *Ascaris lumbricoides* were the most frequent. Parasitized individuals were most females, between the ages of 20-60 years; among men, the infestation was most frequent in children and adolescents; among pregnant women, the highest occurrence was *Entamoeba histolytica*. **Conclusion:** a high frequency of parasitized individuals was observed in the studied community. **Descriptors:** Parasitic Diseases; Prevalence; Public Health.

RESUMO

Objetivo: descrever o perfil parasitário de uma comunidade assistida pela Estratégia de Saúde da Família. **Método:** estudo descritivo epidemiológico, descritivo, retrospectivo, com abordagem quantitativa realizado em Unidade de Saúde da Família, bairro Rosa Elze, município de São Cristóvão, Sergipe/SE. A coleta de dados foi feita nos prontuários e analisada pela estatística simples. O projeto foi aprovado pelo Comitê de Ética em Pesquisa, CAAE 05213212.9.0000.5546. **Resultados:** um quarto dos pacientes possuíam pelo menos uma enteroparasitose. Infestação por *Entamoeba histolytica*, *Giardia lamblia* e *Ascaris lumbricoides* foram as mais frequentes. Dos indivíduos parasitados a maioria era do sexo feminino, na faixa etária de 20-60 anos; entre os homens, a infestação foi mais frequente nas crianças e nos adolescentes; dentre as gestantes, a maior ocorrência foi de *Entamoeba histolytica*. **Conclusão:** verificou-se alta frequência de indivíduos parasitados na comunidade estudada. **Descritores:** Doenças Parasitárias; Prevalência; Saúde Pública.

RESUMEN

Objetivo: describir el perfil de enfermedades parasitarias de una comunidad atendida por la Estrategia de Salud Familiar. **Metodología:** estudio descriptivo epidemiológico, descriptivo, retrospectivo, con enfoque cuantitativo realizado en Unidad de Salud Familiar en el barrio Rosa Elze, en la municipalidad de São Cristóvão/SE. La recopilación de datos fue realizada en los registros y analizada por estadística simple. El proyecto fue aprobado por el Comité de Ética en Investigación, CAAE 05213212.9.0000.5546. **Resultados:** un cuarto de los pacientes poseían al menos enteroparasitose. Infestación por *Entamoeba histolytica*, *Giardia lamblia* y *Ascaris lumbricoides* fueron más frecuentes. De los individuos parasitados, la mayoría era del sexo femenino, en la franja etaria de 20 a 60 años; entre los hombres la infestación fue más frecuente en niños y adolescentes; entre las embarazadas fue más frecuente la *Entamoeba histolytica*. **Conclusión:** fue verificada alta frecuencia de individuos parasitados en la comunidad investigada. **Descriptores:** Enfermedades Parasitarias; Prevalencia; Salud Pública.

¹RN, PhD Professor, Nursing School, Federal University of Sergipe/UFS. Aracaju (SE), Brazil. E-mail: ana-dorcas@hotmail.com; ²Nursing student, Nursing School, Federal University of Sergipe/UFS. Aracaju (SE), Brazil. E-mail: lldinhaao16@hotmail.com; ³Nursing student, Nursing School, Federal University of Sergipe/UFS. Aracaju (SE), Brazil. E-mail: rafa_ellla@hotmail.com; ⁴Doutora, Professora Doutora, Nursing School, Federal University of Sergipe /UFS. Aracaju (SE), Brazil. E-mail: acfabud@uol.com.br; ⁵RN, Master degree in Parasitology Biology, Family Health Strategy/ESF. Aracaju (SE), Brazil. E-mail: lincoln_vitor@hotmail.com; ⁶RN, Master degree in Parasitology Biology. Aracaju (SE), Brazil. E-mail: vanessa.ramos.faria@gmail.com

INTRODUCTION

Short of Brazil's development, entero parasitoses persist as one of the most important problems in public health because they are correlated with socioeconomic conditions and general infrastructure. Thus, they relate to precarious conditions of sanitation, the general standard of living, lack of hygiene and health education, housing, insufficient salaries, in addition to cultural habits.¹

The World Health Organization (WHO) estimates that approximately 1.45 billion individuals are affected by *Ascaris lumbricoides*, 1.3 billion by hookworms, and 1.5 billion by *Trichuris trichiura*. Previous estimates calculated around 200 million as the number of people that are parasitized by *Giardia lamblia*.²

In Brazil, the communities most infected with *Ascaris lumbricoides* are inserted in both in rural and urban areas, which is detected in about 39% of the population and related to low socioeconomic levels and precarious conditions of sanitation, representing a scourge, especially in the poorest populations.³

Entero parasitoses affect different ages, races, and social classes and are most common in less-favored populations. The damage that parasites can cause are nutritional balance changes, bleeding, intestinal obstruction, rectal prolapse, and diarrhea among others, whose clinical manifestations are usually proportional to the parasite load and may lead the individual to death.⁴

The classic epidemiologic triad of parasitic diseases (host, parasite, and environment conditions) is essential for the infection to occur. In relation to the host, the predisposing factors include: age, nutritional status, genetic, cultural, behavioral, and professionals factors. The environmental conditions associated with the previous factors will promote or define the occurrence of infection and disease.⁵⁻⁶

In general, parasitic diseases do not show symptoms and are neglected by public health, which contributes to the deterioration of the clinical condition. For this reason, the current epidemiological and statistical systems need to be reinforced, especially in developing countries.⁶⁻⁷

The control of these diseases requires improvements in sanitation, creating programs in health education, personal hygiene, early treatment of symptomatic and asymptomatic infected individuals, care in food storage,

water treatment, and use of footwear. If possible, find a basic health unit regularly and not just when feeling sick, which is essential for an early detection of infected individuals and promotion of health and prevention of diseases.⁸

Given the above, it is assumed that the occurrence of entero parasitoses is characterized as a national problem that is still neglected. The Family Health Unit (USF), as the gateway to the Unified Health System (SUS) and as a space for resolution of the main health problems in the community, has an important role in the detection, treatment, and follow-up of patients with intestinal parasitoses, diseases that can and should be easily dealt with in the Basic Attention.⁹

The interest in this study built upon the discovery of the large number of assisted individuals with positive parasitological examination in the study environment, and frequent poli-parasitoses, recurrence of parasitism, and infection of several components within the same family. The high population density in this community is also relevant where residents are exposed to risk factors such as the lack of basic sanitation and low socioeconomic conditions.

The conduction of research on the subject becomes inevitable. The following question arises << *What is the prevalence of intestinal parasitoses among residents who utilized the USF services in the period between 2009 and 2012?* >> <<*Which entero parasitoses most affected this population?* >> Consequently, the study enables the planning of health actions aimed at prevention of parasitic infections in the study area in addition to the enrichment of the current literature that addresses the topic in question. This study will also provide subsidies for the situational diagnosis of entero parasitoses in São Cristóvão and will contribute to the development of new interventions by the Family Health Team and new Public Health Policies in the municipal scope.

This study aims to:

- Describe the parasitic profile of the community assisted by the Family Health Strategy/ESF.

METHOD

This was an epidemiological study, descriptive, retrospective, with a quantitative approach conducted in the Family Health Unit in the Rosa Elze neighborhood, municipality of São Cristóvão, Sergipe.

The target study population is formed by the third largest community in the municipality, totaling 950 registered families or 3,300 inhabitants. All the people assisted in the unit, who had medical charts (family folder) showing results from parasitological examination of feces in the period from 2009 to 2012 were included in the study.

The data collection was carried out d from August 2012 to January 2013. The data were transcribed to the data collection form, which contained demographic, clinical, and laboratory data. All medical charts (family folder) from the USF filing unit were analyzed using the software *Microsoft Office Excel* 2010 and *Microsoft Office Word* 2010 and simple statistics.

The research project was approved by the Committee of Ethics in Research with human beings from the Federal University of Sergipe (CAAE-05213212.9.0000.5546) and met the recommendations of Resolution 466/2012 ensuring confidentiality, anonymity, and privacy with the data being used only for carrying out the study.

RESULTS

A total of 2,568 charts were analyzed, of which approximately 60% corresponded to female users. The average age of patients was 23.9 years, with variance of 1 to 86 years, median of 21, and the most frequent age was 5 years old (mode). Among the examined records, 633 (24.6%) presented records of positive feces parasitologic exams with one or more parasitosis, among them, a small proportion (8.1%) corresponded to pregnant women.

Figure 1 presents the distribution of entero parasitoses in order of prevalence; the pathogenic species are the most prevalent. The most frequent entero parasitosis was by *Entamoeba histolytica*, followed by *Giardia lamblia*, *Ascaris lumbricoides*, and *Trichuris trichiura*.

Prevalence of parasitoses		
	n	%
<i>Entamoeba histolytica</i>	238	37.6
<i>Giardia lamblia</i>	211	33.3
<i>Ascaris lumbricoides</i>	161	25.4
<i>Endolimax nana</i>	153	24.1
<i>Entamoeba coli</i>	134	21.1
<i>Trichuris trichiura</i>	128	20.2
<i>Ancilostomideo</i>	48	7.5
<i>Enterobius vermiculares</i>	26	4.1
<i>Schistosoma mansoni</i>	15	2.3
<i>Strogyloides stercoralis</i>	14	2.2
<i>Hymenolepis nana</i>	04	0.6
<i>Iodamoeba butschillii</i>	02	0.3
<i>Entamoeba disparate</i>	01	0.1

The same user can have more than one parasite. There were no recorded or detected cases of: *Escherichia coli*; *Taenia Soliun*; *Taenia Saginata*, *Wuchereria bancrofti*

Figure 1. Distribution of entero parasitoses among users of a Family Health Unit. São Cristóvão, 2009 to 2012.

Table 1 shows that most of the parasitized individuals were females. Among women, the age group most affected was from 20 to 60 years old, while among men, a higher prevalence of children and young people was observed. This prevalence was inversely proportional when ages between the sexes were compared, noting that almost 60% of women with entero parasitoses were between the ages of 20 years old or older;

among men, more than 60% of entero parasitoses occurred in individuals younger than 20 years old.

Individuals were grouped according to stages of development: Infant or early childhood (0 to 2 years old), preschool (3 to 5 years old), school (6 to 12 years old), teens (13 to 19 years old), adults at reproductive age (20 to 35 years old), adults (36 to 60 years old), and seniors (over 60 years old).

Table 1. Distribution of users with entero parasitoses assisted in a Family Health Unit according to age and gender. São Cristóvão, 2009 to 2012.

Sex					
Age (in years)	Female n%		Male n%		Total n%
Up to 02	17	4.3	14	6.1	31 4.9
03-05	24	5.9	38	16.6	62 9.8
06-12	50	12.4	53	23.1	103 16.3
13-19	74	18.3	36	15.6	110 17.4
20-35	108	26.7	39	16.9	147 23.3
36-60	117	29.1	37	16.1	154 24.3
Over 60	13	3.3	13	5.6	26 4.0
Total	403	100.0	230	100.0	633 100.0

Average Age = 23.9; Variance = 1-86; Mode = 5 (23 x); Median = 21

Figure 2 presents the distribution of users according to age and the most prevalent parasitoses. *E. histolytica* involved fewer children, concentrating in adults 20 years and older. *G. lamblia* presented a more uniform distribution from 3 to 60 years of age, similarly to *A. lumbricoides*. *E. nana* was most frequent among individuals from 13 to 60 years old. Infants and children were most affected by *G. lamblia*. In adolescents, *G. lamblia* and *E. histolytica* showed high frequencies.

Parasitoses						
Age group (in years)	<i>E. Histolytica</i>	<i>G. Lamblia</i>	<i>A. Lumbricoides</i>	<i>E. Nana</i>	<i>E. Coli</i>	<i>T. Trichiura</i>
Up to 02	9 (1.4 %)	20 (3.1 %)	7 (1.1 %)	6 (0.9 %)	5 (0.7 %)	5 (0.7 %)
03-05	18 (2.8 %)	32 (5.0 %)	14 (2.2 %)	11 (1.7 %)	12 (1.8 %)	14 (2.2 %)
06-12	30 (4.7 %)	45 (7.1 %)	31 (4.8 %)	18 (2.8 %)	14 (2.2 %)	27 (4.2 %)
13-19	40 (6.3 %)	45 (7.1 %)	31 (4.8 %)	34 (5.3 %)	24 (3.7 %)	18 (2.8 %)
20-35	58 (9.1 %)	33 (5.2 %)	35 (5.5 %)	32 (5.0 %)	34 (5.3 %)	28 (4.4 %)
36-60	76 (12.0 %)	30 (4.7 %)	36 (5.6 %)	46 (7.2 %)	41 (6.4 %)	30 (4.7 %)
Above 60	7 (1.1 %)	6 (0.9 %)	7 (1.1 %)	6 (0.9 %)	4 (0.6 %)	6 (0.9 %)

The same user can have more than one parasitosis.
Figure 2. Distribution of users with entero parasitoses assisted in a Family Health Unit according to age and prevalence of parasitoses. São Cristóvão, 2009 to 2012.

Among pregnant women, 35.3% showed positive tests for *E. histolytica*. The genus *Entamoeba* remained predominant. Among the disease-causing parasites, *G. lamblia* and *A. lumbricoides* were the most prevalent. Parasites such as *S. mansoni* can cause serious repercussions and was detected in 3.9%.

Table 2. Distribution of entero parasitoses among pregnant women assisted in a Family Health Unit. São Cristóvão, 2009 to 2012.

Prevalence of parasitoses in pregnant women		
	n	%
<i>E. histolytica</i>	18	35.3
<i>E. coli</i>	17	33.3
<i>E. nana</i>	14	27.4
<i>G. lamblia</i>	13	25.5
<i>A. lumbricoides</i>	13	25.5
<i>T. trichiura</i>	06	11.7
<i>S. mansoni</i>	02	3.9

The same user can have more than one parasite

Figure 3 presents the distribution of users according to the occurrence of co-infestation of parasitoses. Parasitoses like *E. histolytica* and *E. nana* were the most prevalent association. The survey of drugs used for treatment by these patients revealed that albendazole was used by over half of the sample, followed by secnidazole, metronidazole, and mebendazole. Only a small proportion of

patients were treated with mentha crispa.
Of the 15 patients with *S. mansoni*, 11

received treatment with praziquantel
(7.3%).

Parasitoses	Number of cases	%
<i>E. histolytica/e. nana</i>	108	17.0%
<i>E. histolytica/e. coli</i>	103	16.2%
<i>E. nana/e. coli</i>	52	8.2%
<i>A. lumbricoides/t. trichiura</i>	51	8.0%
<i>E. histolytica/t. trichiura</i>	44	6.9%
<i>G. lamblia/T. trichiura</i>	42	6.6%
<i>E. histolytica/a. lumbricoides</i>	41	6.4%
<i>E. histolytica/g. lamblia</i>	33	5.2%
<i>G. lamblia/E. nana</i>	23	3.6%
<i>A. lumbricoides/e. coli</i>	23	3.6%
<i>E. nana/t. trichiura</i>	18	2.8%
<i>A. lumbricoides/e. nana</i>	13	2.0%
<i>E. coli/t. trichiura</i>	13	2.0%
<i>G. lamblia/E. coli</i>	11	1.7%

The same user can have more than one parasitosis.

Result based on the first exam.

Figure 3. Distribution of users of a Family Health Unit according to the occurrence of co-infestation of parasitoses. São Cristóvão, 2009 to 2012.

This study allowed identifying hematological effects in parasitized patients. The number of patients with hemoglobin levels lower than the standard was low; this was more expressive among pregnant women, reaching nearly a quarter of them.

Eosinophilia occurred in expressive figures affecting more than 60% of children under the age of 2 and more than 27% of pregnant women.

DISCUSSION

The results showed that one quarter of the studied population was infested by one or more types of intestinal parasites, among whom, women were the majority. The lowest percentage of infections in males may be related to the absence of this public in the primary health care services in addition to their lack of adherence to treatments and late seek for care.¹⁰

Variations in the frequency of infestations between men and women may be caused by physiological differences, intrinsic or behavioral, being distributed and influenced by the structure of the population.^{4,11} Additionally, the fact that more male children and adolescents were infested by entero parasitoses could be justified by habits of kids to walk barefoot and play in the sand, while girls play less on the street and adhere more easily to habits of personal hygiene care. That ratio

was reversed among young adults and elders, which might be justified by the fact that women deal with home care, domestic services, and attend health services more frequently.

According to the results, the high rate of infection by pathogenic protozoa such as *G. lamblia* and *E. histolytica* is highlighted. *G. lamblia* was the most prevalent between the ages of 1 to 19 years old. One of the main factors that favor the occurrence of outbreaks of giardiasis may be related to its form of transmission because this protozoan cysts are infectious since their elimination in feces, which allows for easy contamination particularly among children who have the habit of carrying hands to their mouth, causing autoinfection.¹⁰

The transmission of Amebiasis occurs by ingestion of contaminated food and water. Despite the significant mortality rate, many cases are asymptomatic. *E. histolytica* was the most prevalent among adults above 21 years old.¹² The factors that may interfere with the increased prevalence of these infections are: studied geographic area, socioeconomic level, accessibility to goods and services, nutritional status, age, and occurrences that increase predisposition to parasitic infection.¹⁰

Among the 51 pregnant women with parasitoses, *E. histolytica* proved to be the most relevant, which represents a

hidden risk factor for maternal iron deficiency anemia and fetal growth retardation.¹³ Therefore, a high frequency of entero parasitoses and anemia has been observed, however, with no association between these occurrences. In addition, there is a statistically significant relationship between education level and the presence of intestinal parasites in pregnant women.¹

The strongest relationship of poli parasitoses presented was *E. histolytica*/*E. nana*, responsible for 108 (17.9%) cases. The poli-parasitism verified can be justified by the fact that the parasites involved present the same transmission mechanism acting as good indicators of social-sanitary conditions and providing a better understanding of the epidemiology of parasitic diseases.¹⁴

The prevalence of parasitoses is high in places where the living conditions and sanitation are poor or nonexistent; therefore, the knowledge of principles of personal hygiene and care in the preparation of foods are measures that seek to prevent infection and reinfection in endemic areas.¹⁰

Infections by intestinal parasitoses can be controlled effectively when the socioeconomic status is improved and the sanitary conditions of a region are implemented and when other measures such as health education and evaluation of nutritional status of the population are deployed. Health education aims to promote hygiene habits, favoring adequate nutrition, and creating environmental conditions suitable to the healthy physical and mental development of the population in general.¹⁵

CONCLUSION

A high prevalence of parasitized individuals in the studied community was observed. Male children and adolescents are more exposed to parasitoses. Species of parasites with pathogenic potential such as *Entamoeba histolytica*, *Giardia lamblia*, and *Ascaris lumbricoides* are part of the parasitic profile in the studied population. Thus, it becomes necessary to develop an effective sanitary policy, together with monitoring health conditions in the population, and

prevention strategies such as improvement of basic sanitation, quality of drinking water, health education, incentive to dietary hygiene care, and poverty reduction through responsible public agencies in order to modify this reality.

REFERENCES

1. Souza PAC, Faro CCP, Pinheiro MS, Neto JMR, Brito AMG. Ocorrência de enteroparasitoses em portadores de transtornos mentais assistidos na clínica de repouso São Marcello em Aracaju (SE). Ciênc saúde coletiva on line [Internet]. 2010 [cited 2013 May 10]; 15(Suppl.1):1081-84. Available from: <http://www.scielo.br/pdf/csc/v15s1/015.pdf>.
2. Andrade EC, Leite ICG, Vieira MT, Abramo C, Tibiriça SHC, Silva PL. Prevalência de parasitoses intestinais em comunidade quilombola no município de Bias Fortes, Estado de Minas Gerais, Brasil. Epidemiol serv saúde on line [Internet]. 2011 July/Sept [cited 2013 May 10];20(3): 337-44. Available from: <http://scielo.iec.pa.gov.br/pdf/ess/v20n3/v20n3a08.pdf>.
3. Silva JC, Furtado LFV, Ferro TC, Bezerra KC, Borges EP, Melo ACFL. Parasitismo por *Ascaris lumbricoides* e seus aspectos epidemiológicos em crianças do Estado do Maranhão. Rev Soc Bras Med Trop on line [Internet]. 2011 Jan/Feb [cited 2013 May 10];44(1):100-02. Available from: <http://www.scielo.br/pdf/rsbmt/v44n1/22.pdf>.
4. Santos SA, Merlini LS. Prevalência de enteroparasitoses na população do município de Maria Helena, Paraná. Ciênc saúde coletiva on line [Internet]. 2010 May [cited 2013 June 15];15(3):899-05. Available from: <http://www.scielo.br/pdf/csc/v15n3/v15n3a33.pdf>.
5. Frei F, Juncansen C, Ribeiro-Paes JT. Levantamento epidemiológico das parasitoses intestinais: viés analítico decorrente do tratamento profilático. Cad Saúde pública on line [Internet]. 2008 Dec [cited 2013 June 15];24(12):2919-25. Available from: <http://www.scielo.br/pdf/csp/v24n12/21.pdf>.
6. Oliveira GG, Teti CMF, Lima ICO, Fernandez BO, Silva AM, Santos LV. Prevalência de parasitoses intestinais em famílias do movimento dos trabalhadores rurais sem terra. J NursUFPE on line [Internet]. 2012 Oct [cited 2013 Oct 28];6(10):2490-6. Available from: <http://www.revista.ufpe.br/revistaenfe>.

rmagem/index.php/revista/article/view/3155

7. Tiago PV, Costa MS, Perassolo V, Souza EM, Gomes M. Prevalência de parasitoses intestinais em pacientes da unidade mista de saúde em tangará da serra, Mato Grosso, Brasil. *Revista de Ciências Agro-Ambientais* [Internet]. 2005 [cited 2013 June 15];3:117-24. Available from: http://www.unemat.br/revistas/rcaa/docs/vol3/11_artigo_v3.pdf.
8. Meneses AL, Lima VMP, Freitas MTS, Rocha MO, Silva EF, Dolabella SS. Prevalência de enteroparasitoses em crianças de creches públicas da cidade de Belo Horizonte, Minas Gerais, Brasil. *Rev Inst Med Trop São Paulo* on line [Internet]. 2008 [cited 2013 July 20];50(1):57-9. Available from: <http://www.revistas.usp.br/rimtsp/article/view/31150>.
9. BRASIL. Ministério da Saúde. Portaria nº 648,28 de março de 2006. Aprova a Política Nacional de Atenção Básica, estabelecendo a revisão de diretrizes e normas para a organização da Atenção Básica para o Programa Saúde da Família (PSF) e o Programa Agentes Comunitários de Saúde (PACS) [Internet]. 2006 [cited 2013 July 22]. Available from: <http://dtr2001.saude.gov.br/sas/PORTARIAS/Port2006/GM/GM-648.htm>.
10. Melo EM, Cortes MCJW, Miranda PSC, Camara ACS, Alves RA, Pereira VOM, et al. Eles morrem mais do que elas. Por quê? *Rev méd Minas Gerais* on line [Internet]. 2008 [cited 2013 July 20];18(Supl 4): 12-8. Available from: <http://rmmg.medicina.ufmg.br/index.php/rmmg/article/viewArticle/97>.
11. Filho AAO, Abrantes HFL, Fernandes HMB, Viana WP, Pinto MSA, Cavalcanti AL, et al. Perfil enteroparasitológico dos habitantes de uma cidade doNordeste do Brasil. *Rev Soc Bras Clín Méd* [Internet]. 2012 May/June [cited 2013 Aug 18];10(3):179-82. Available from: <http://files.bvs.br/upload/S/1679-1010/2012/v10n3/a2894.pdf>.
12. Andrade EC, Leite ICG, Rodrigues VO, Cesca MG. Parasitoses intestinais: uma revisão sobre seus aspectos sociais, epidemiológicos, clínicos e terapêuticos. *Rev APS* on line [Internet]. 2010 Apr/June [cited 2013 Aug18];13(2):231-40. 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=560229&indexSearch=l>.
13. Weigel MM, Calle A, Armijis RX, Vega IP, Bays BV, Montenegro CE. O efeito da infecção parasitária intestinal crônica sobre os

- resultados maternos e perinatais. *Int j gynaecol obstet* [Internet]. 1996 Jan [cited 2013 Aug 18];52(1):9-17 Available from: <http://www.ncbi.nlm.nih.gov/pubmed/8620997>.
14. Zaiden MF, Santos BMO, Cano MAT, Junior LAN. Epidemiologia das parasitoses intestinais em crianças de creches de Rio Verde - GO. *Medicina (Ribeirão Preto)* on line [Internet]. 2008 Apr/June [cited 2013 Aug 30]; 41(2): 182-87. Available from: http://revista.fmrp.usp.br/2008/VOL41N2/ao_parasitoses_intestinais_crianças_creches_rio_verde.pdf.
 15. Ely LS, Engroff P, Lopes GT, Werlang M, Gomes I, Carli GA. Prevalência de Enteroparasitos em Idosos. *Rev bras geriatr gerontol* [Internet]. 2011 [cited 2013 Sept 5];14(4): 637-46. Available from: <http://revista.unati.uerj.br/pdf/rbgg/v14n4/v14n4a04.pdf>.

Submission: 2014/04/27

Accepted: 2014/09/18

Publishing: 2015/01/01

Corresponding Address

Ana Dorcas de Melo Inagaki
Rua Duque de Caxias, 167 / Ap. 1202
Bairro São José
CEP 49015-320 — Aracaju (SE), Brazil