
HEALTH EDUCATION IN SOUTH AMERICA

REGARDING LEISHMANIASIS: A SYSTEMATIC REVIEW

*Claudia Teresa Vieira de Souza*¹, *Carlos Augusto Ferreira de Andrade*², *Dinair Leal da Hora*¹, *Eloisa Leal da Hora*¹, *Idanir Antonio Momesso Neto*², *Michelle Campos de Matos*¹, *Maria de Fátima Moreira Martins*³ e *Sandro Javier Bedoya-Pacheco*¹.

ABSTRACT

Leishmaniasis are important anthroponoses, representing a disease complex with high morbidity and mortality in Brazil as well as worldwide. The aim of this study was to perform a systematic review on the production of scientific knowledge in South America related to health education on leishmaniasis. The following databases were used: *PubMed*, *Literatura Latino-Americana/Caribe em Ciências da Saúde (LILACS)*, *Scopus*, *Science Direct*, *Web of Knowledge* and *Scielo*. An analytical matrix for the evaluation of the selected studies was elaborated considering the education categories: frameworks and models; educational intervention; educational proposal, assessment of policies, educational programs and projects. Studies were considered for analysis when they included at least two of these categories. We found 389 suitable manuscripts, of which 54 were included for full reading. Six studies were approved and selected for data extraction. Of these, four were conducted in Brazil, one in Colombia and one in Peru. Four of the six studies addressed cutaneous leishmaniasis and the other two were related to visceral leishmaniasis. Among the selected manuscripts five were of intervention and one was a survey. The findings suggest that studies on health education in leishmaniasis, in Brazil as well as in other South American countries, should be encouraged because of the wide dispersion and great impact of these diseases in the affected populations. Educational interventions on health occupy an important place regarding the control of neglected diseases because they interfere with several epidemiological components of the disease, presenting potential for transformation.

KEY WORDS: Leishmaniasis; health education; review; epidemiology.

-
- 1 Research Laboratory of Epidemiology and Social Determination of Health, Evandro Chagas National Institute of Infectious Diseases/Oswaldo Cruz Foundation, Fiocruz, Rio de Janeiro, Brazil.
 - 2 Laboratory of Clinical Epidemiology, Evandro Chagas National Institute of Infectious Diseases/Oswaldo Cruz Foundation, Rio de Janeiro, Brazil.
 - 3 Libraries Network, Institute of Communication and Information Science and Technology in Health/Oswaldo Cruz Foundation, Rio de Janeiro, Brazil.

Corresponding author: Claudia Teresa Vieira de Souza, Av. Brasil, 4365, Manguinhos, CEP 21045-900, Rio de Janeiro, RJ, Brasil. E-mail: clau@fiocruz.br

Received for publication: 5/9/2014. Reviewed: 2/6/2015. Accepted: 6/6/2015.

RESUMO

Educação em Saúde na América do Sul referente às Leishmanioses: uma revisão sistemática

As leishmanioses são importantes antroponozoonoses que representam um complexo de doenças com elevada morbimortalidade no Brasil e no mundo. O objetivo do estudo foi realizar uma revisão sistemática sobre a produção de conhecimento na educação em saúde na América do Sul referente às leishmanioses. Utilizamos as bases de dados: Pubmed, Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS), Scopus, Science Direct, Web of Knowledge e Scielo. Para a avaliação dos estudos selecionados elaboramos uma matriz analítica considerando as seguintes categorias educacionais: referenciais e modelos; intervenção educativa; proposta educativa; avaliação de políticas, programas e projetos educativos. Foram considerados adequados os estudos que contemplaram pelo menos duas das categorias indicadas. A pesquisa resultou em 389 registros e 54 foram incluídos para leitura na íntegra. Seis estudos da América do Sul foram aprovados e selecionados para extração dos dados. Destes, quatro foram realizados no Brasil, um na Colômbia e um no Peru. Quatro dos seis estudos eram sobre leishmaniose cutânea e dois eram sobre leishmaniose visceral. Dos artigos selecionados cinco eram de intervenção e um inquérito. Os resultados obtidos sugerem que estudos na área de educação em saúde em leishmaniose, tanto no Brasil como nos países da América do Sul devem ser incentivados devido a dispersão e o grande impacto dessa doença na população afetada. Intervenções educativas em saúde ocupam um lugar de importância no controle das doenças negligenciadas, porque interferem com os diferentes componentes epidemiológicos da doença, apresentando um potencial transformador.

DESCRITORES: Leishmaniose; educação em saúde; revisão; epidemiologia.

INTRODUCTION

Leishmaniasis comprises a group of diseases caused by different species of the *Leishmania* protozoa, being among the six parasitic infectious diseases of major importance in the world (Desjeux 2001). The World Health Organization (WHO) estimates that 350 million people may have this infection, with approximately two million new cases per year, distributed in 98 countries (Desjeux 2001; Desjeux 2004; Reithinger 2007, WHO, 2001).

In the New World, leishmaniasis can be grouped according to species and the tropism of the parasites involved in the infection into Visceral Leishmaniasis (VL), caused by viscerotropic species that firstly affect the mononuclear phagocyte system, affecting the spleen, liver, bone marrow and lymph nodes, and Cutaneous Leishmaniasis (CL) caused by dermatropic species that produce lesions in the skin and/or mucosae (Yanik et al. 2004). In the American continent, the possibility of developing lesions on the mucosae, due to the etiologic agent of cutaneous leishmaniasis commonly receives the name of American Cutaneous Leishmaniasis (ACL) (Coutinho et al., 1987, Marsden & Jones, 1985).

In the American continent, ACL still extends from the southern tip of the United States to northern Argentina (WHO, 2013). Among South American countries, Brazil has the highest prevalence. Between 2000 and 2008, there were 238,749 cases of ACL, with an annual average of 26,528 new cases, with the

highest incidence of cases reported in the North and Northeast regions of the country (Brasil, 2010).

Although VL presents a lower geographic expansion, it has been described in most South American countries, with 90% of its occurrence in Brazil, especially in the Northeast (Brasil, 2011).

ACL and VL have been observed throughout all the Brazilian territory, with autochthonous cases registered in all federal units. Over the past decade, the average annual VL cases in the country was 3,156, with an incidence of two cases per 100,000 habitants and a mortality rate of approximately ten percent (Brasil, 2006; Brasil 2011). The importance of ACL is related to morbidity and stigmatization of mucocutaneous lesions, while in VL it is related to its mortality potential (Kassi et al., 2008).

In the past, these diseases were concentrated in small endemic areas, but the environmental changes caused by economic and social pressures, as well as the migratory process and the increase of urbanization are changing this profile with an expansion of endemic areas and the emergence of new foci of infection, both peri-urban and urban (Bedoya-Pacheco et al., 2011; Brasil, 2010; Marzochi & Marzochi, 1994; Schubach et al., 1998).

The occurrence of several *Leishmania* species, the continued spread of the disease in its different clinical forms and epidemiological changes have increased the need for the adoption of new and different strategies for the control of the disease.

Thus, in order for successful control, there is a need to provide the communities with education about leishmaniasis, and involve these populations in the planning, development and maintenance of adopted programs (Marzochi & Marzochi, 1994). In this sense, health education, targeted at the population, becomes an essential tool for any program for disease control (WHO, 2013).

In the current context of health education the conduction of educational activities is being consolidated, presupposing a commitment to the development of solidarity and citizenship building, linked to improving quality of life and health promotion (Machado et al., 2007).

The knowledge of the population on leishmaniasis in areas where it occurs is often restricted, leading to a delay in seeking diagnosis and treatment. Rural populations in endemic areas are those most affected by this lack of information (WHO, 2013).

The high production demands and complexity of health information indicates a need to create alternatives that provide access to such information in a more clear and objective manner. Systematic review may be one of the useful tools to achieve this purpose (Galvão et al., 2004).

With this in mind, the present study aimed to analyze systematically the production of knowledge in South America on leishmaniasis related health education, in order to organize and conduct new educational proposals, as well as serving as a stepping stone for future research on this situation.

MATERIALS AND METHODS

This is a systematic review study, conducted in accordance with guidelines established by PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) (Moher et al., 2009).

Search strategies

We performed a search and review of research studies that were conducted, using a protocol built specifically to answer our question regarding the identification of knowledge about available references in the databases dealing with studies and practices of health education related to leishmaniasis.

We selected, with the assistance of a librarian specialized in systematic reviews (MFMM), the following scientifically reliable databases with networks that offered access to references in electronic format: *PubMed*, *Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS)*, *Scopus*, *Science Direct*, *Web of Knowledge* and *Scielo*.

For PubMed, the following words/expressions were used for the search: *LEISHM*[Title/Abstract] "Health Education" OR "Community Health Education" OR "Patient Education" OR "Education Health" OR "Health Promotion"*. Equivalent searches were done in the other databases.

Eligibility criteria and selection of articles

We selected studies conducted in South America. There were no restrictions regarding the language of publications, study designs, and socio-demographic characteristics (age, gender and education) of the target population. The search began on September 3, 2010, and was updated until July 26, 2011. We did not consider gray literature for inclusion (theses, dissertations, conferences or research reports), primarily because these are not produced for publication, are difficult to obtain, have little or no bibliographic control and do not pass through panels of editors or peer reviewers for validation and analysis (Tillet & Newbold, 2006; Zeghmouri & Shöpfel, 2006).

A database of the results of the electronic search was created with the program *Web Endnote REUTERS* (Reuters, 2013) and duplicate citations were excluded.

Potentially relevant titles and abstracts were screened independently by two pairs of reviewers (DLH/ELH and IAMN/MCM).

The complete articles related to selected titles and abstracts were obtained and read in full by the same pairs of reviewers. The differences in both the selection of titles and abstracts, as well as the full articles were resolved by consensus and, when necessary, by third and fourth reviewers (CAFA and CTVS).

The reference lists of all articles were investigated manually looking for cross-references.

Evaluation of study characteristics

For a critical assessment of the selected studies we developed an analytical matrix in which we considered the following categories in their educational dimension (Hora 2012): frameworks and models (theoretical or methodological issues that present or discuss models and trends in health education on leishmaniasis); educational intervention (empirical studies on educational activities for professionals and patients); educational proposals (inclusion of suggestions for educational programs or projects related to the theme); assessment of educational policies, programs and projects (assessments of educational policies, programs and projects in the field, including suggestions for improvement). Studies were considered for analysis when they included health education on leishmaniasis for at least two of the four categories above.

Data Extraction

Extraction of data, including the quality assessment of the initially selected articles was done independently by the same pairs of reviewers who selected the studies. Differences were also resolved by consensus and, when necessary, by third and fourth reviewers (CAFA and CTVS).

The selected articles were classified by type of study, country and population. A form was used to record information during data extraction. We recorded data on study selection (variables: authors, year, region, type of study, inclusion [yes or no], exclusion and reason) and data on study quality assessment (variables: code, type of study, study quality according to the analytical matrix, education technique and research subjects).

Ethical Considerations

This study was approved by the Research Ethics Committee of the Evandro Chagas Institute Of Clinical Research under number 015/2011.

RESULTS

The research in six databases initially resulted in 389 records; 54 were included for full reading. From these, six were selected for data extraction (Figure 1) and were approved during systematic review because they were located in South America (Tables 1 and 2). From these, we found four studies conducted in Brazil (Uchôa et al., 2004; Luz et al., 2005; Reis et al., 2006; Magalhães et al., 2009), one in Colombia (Isaza et al., 1998); and one in Peru (Bauer, 2002).

The research resulted in 389 records; 54 were included for full reading. Of these, six were approved during systematic review because they were located in South America.

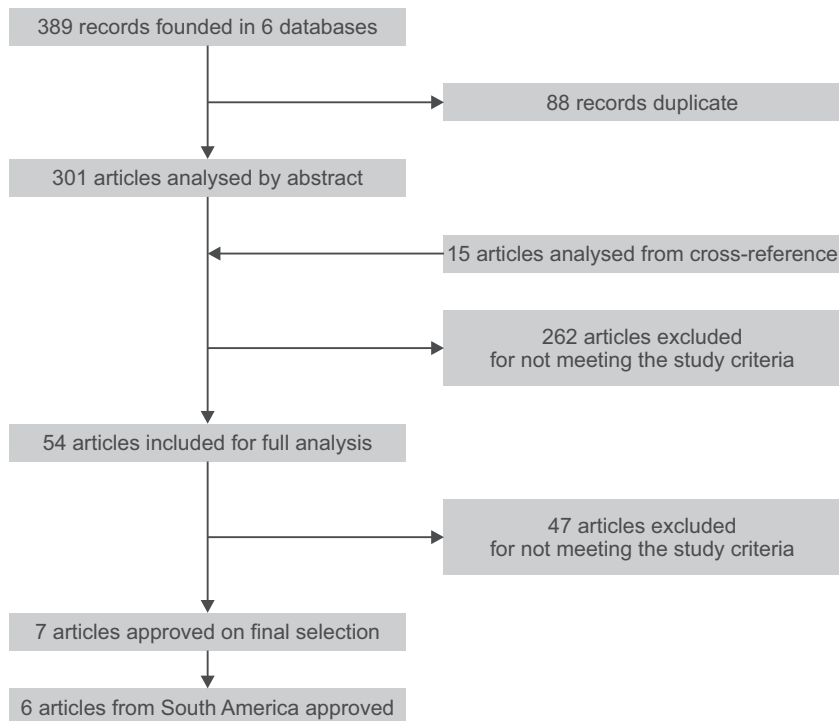


Figure 1. Flow chart illustrating the process of study selection

Most of the studies addressed cutaneous leishmaniasis (Isaza et al., 1999; Bauer, 2002; Uchôa et al., 2004; Reis et al., 2006). Two papers studied visceral leishmaniasis (Luz et al., 2005; Magalhães et al., 2009).

Of the selected articles, five were interventions (Uchôa et al., 2004; Bauer, 2002; Luz et al., 2005; Magalhães et al., 2009; Reis et al., 2006), and one was a survey (Isaza et al., 1999).

Regarding the evaluation of methodological characteristics, all selected articles met the minimum criteria, i.e. had at least two categories of the analytical matrix mentioned in the methodology. We highlight that the category “Educational Proposal” was present in all studies. We emphasize that the category “Educational Intervention” was absent in the survey published by Isaza et al. (1999).

The selected studies evaluated different research subjects: community educators, residents of rural communities, public school students and teachers, health professionals and tourists.

Table 1. Main characteristics of the selected studies

Author /Year	Country	Leishmaniasis Type	Study Type	Study Quality*	Research subjects
Isaza et al. (1999)	Colombia	Cutaneous	Survey	Frameworks and models. Educational proposal.	Selection by systematic sampling. 345 black people > 14 years from 7 rural communities with similar prevalence of ACL.
Uchôa et al. (2004)	Brazil	Cutaneous	Intervention	Frameworks and models. Educational intervention. Educational proposal. Assessment of educational policies, programs and projects.	1334 elementary students (1st - 5th years) and 56 teachers from seven schools of the municipal districts of Maricá.
Bauer (2002)	Peru	Cutaneous	Intervention	Educational intervention. Educational proposal.	373 tourists from two operators in Cusco who visited the Manu National Park, who spoke English (of these, 173 in the intervention group and 200 in the control group).
Luz et al. (2005)	Brazil	Visceral	Intervention	Educational intervention. Educational proposal.	551 health professionals (community workers/zoonosis/nurses) and 379 individuals in the population (teachers, students and users of health services in two cities: Ribeirão das Neves and Santa Luzia) in the metropolitan area of Belo Horizonte / Minas Gerais.
Reis et al. (2006)	Brazil	Cutaneous	Intervention	Educational intervention. Educational proposal.	34 residents with a history of current / previous ACL, 16-35 years of age from Brejo do Mutambal, a district of Varzelândia/ state of Minas Gerais.
Magalhães et al. (2009)	Brazil	Visceral	Intervention	Educational intervention. Educational proposal.	Students from two public schools at Caeté / greater Belo Horizonte - Minas Gerais, totaling 188 children from 5th to 8th grades who received leaflets after a lesson on VL.

*The brochure mentioned by Luz et al. (2005) is the same that was assessed by Magalhães et al. (2009), **Study quality according to the analytical matrix.

Table 2. Methodological aspects and results of the selected studies

Author /Year	Strategies of health education	Methods/ Results	Conclusion
Isaza et al. (1999)	Discussion groups and focus groups.	A questionnaire with 10 questions on knowledge and practices about ACL was used. Ninety-four percent of participants knew leishmaniasis was a skin disease, with ulcers or blemishes; 35% associated the disease with the bite by an infected 'mosquito' and only 10% of the participants used the appropriate drug treatment. There was a statistical difference by gender in relation to the number of people answering the questions who did not know any treatment for ACL, which was higher in women than in men (RR = 2.22, 95% CI 1.09 - 4.52). It was observed that 47% of participants did not know how to prevent the disease.	Studies on knowledge of ACL are useful for designing and organizing educational programs on the control of ACL.
Uchúa et al. (2004)	Lectures, distribution of booklets, educational activities.	One of seven schools was selected to assess students. A lecture was given by teachers, university students and researchers with the help of educational posters. After the lecture, a booklet was handed out with information about the disease. Two months after the intervention 178/198 (89.9%) students remembered the disease and 63.1% answered correctly about its transmission.	The clarification of the population becomes imperative as a tool to help in the control of ACL. So, informed children and teachers can act as diffusers of the theme in their homes and communities.
Bauer (2002)	Leaflet	Two questionnaires were applied to 373 tourists. The first questionnaire was applied to all participants the day before the trip and addressed prior knowledge of ACL and previous trips. After that a brochure about preventing ACL was distributed to the intervention group. The second questionnaire was distributed to all participants at the end of the visit to the park. It concerned preventive measures and, in the intervention group, the usefulness of the leaflet. There were no significant differences for preventive measures between the group who received the leaflet (98.2%) compared to the control group (97.5%).	Even with no significant differences between groups, the author considers important the information and guidance of tourists about ACL. Furthermore, it reinforces the need for replicating the study.
Luz et al. (2005) *	Leaflet	Questionnaire with 7 multiple choice questions before and after reading the brochure for both groups. There was no significant difference (p>0.05) compared to the percentage of correct answers for qualified nurses and users of the health service. For other groups the percentage of correct responses was statistically significant (p<0.05).	The high number of correct responses showed the potential for transmitting information through the leaflet was appropriate.
Reis et al (2006)	Educational moments (guidelines) lectures.	To address the cognitive and affective dimensions and daily practices associated with ACL individual interviews, dialogues, group discussions, construction of risk maps, slideshows/lectures were used. After the educational activities it was observed that the knowledge about the use of mosquito nets and insecticides as important measures that can prevent disease was acquired.	Social representations are favorable to scientific knowledge and may be used for other endemic diseases.
Magalhães et al (2009) *	Leaflet	Guidelines were provided to the intervention group (92 students) on how to disseminate the information received in the classroom and in the leaflet for their family, as homework. The control group (96 students) were not given this task. Knowledge by family members (n=100) on VL was assessed by a questionnaire before and after the intervention with students, applied by a health care provider. There was a significant improvement in knowledge (p<0.05) of the disease in the family members of the group that received the leaflet; the difference with the correct answers of the questionnaires before and after 90 days of the intervention in the control group was 10.3% and in the intervention group it was 20.1%.	The dissemination of information on VL by students can contribute to measures of disease prevention.

* The leaflet quoted by Luz et al. (2005) is the same as the one assessed by Magalhães et al. (2009)

Concerning the strategies for health education, one study was of discussion groups and focus groups (Isaza et al., 1998), and five evaluated the influence of educational materials (such as lectures, pamphlets, courses and posters), showing an improvement or reinforcing the importance of educational activities to improve access to knowledge by the population (Isaza et al., 1999; Uchôa et al., 2004; Luz et al., 2005; Reis et al., 2006; Magalhães et al., 2009).

We highlight a study of Reis et al. (2006) which showed the actions of local social representations as effective instruments of information and prevention of leishmaniasis. This same study evaluated effective methods to control the disease through guidance to the public on the use of screens and mosquito nets impregnated with insecticide.

Among the results of the selected articles, the work by Isaza et al. (1999) draws much attention. Although 94% of participants knew leishmaniasis as a skin disease, with ulcers or blemishes, only 35% associated the disease with the bite of an infected 'mosquito' and only 10% used the appropriate drug treatment. The same study showed that 47% of people who answered the survey did not know how to prevent the disease. Another important result was presented by Uchôa et al. (2004) in which after conducting a lecture at a school, a booklet with information about the disease was handed out. Two months after the intervention 178/198 (89.9%) students remembered the disease and 63.1% provided correct answers on its transmission. Finally, Magalhães et al. (2009) evaluated the knowledge of family members (n=100) of students on visceral leishmaniasis. Guidelines were provided to the intervention group (92 students) on how to disseminate the information received in the classroom and a leaflet was handed to their families as homework. The control group (96 students) did not receive this homework. The difference in the correct questionnaire answers before and 90 days after the intervention in the control group was 10.3% and in the intervention group it was 20.1% ($p < 0.05$), implying that the intervention group retained the knowledge for a longer period.

DISCUSSION

This systematic review provides information on the studies conducted in the field of health education in leishmaniasis in South American countries. Although research has been extensive and meticulous, carefully consulting six databases using keywords judiciously selected and without language restriction, only six were approved for analysis (four from Brazil, one from Colombia and one from Peru).

We believe that health education on leishmaniasis for affected populations can be adapted to any disease control program, making them more efficient. The lifestyle of these populations and their perception of the disease process has a critical role in the maintenance and spread of diseases. Based on this design, new strategies for control are adapted to the cultural and social reality, incorporating "active" participation of individuals within the "affected" population in order to

reduce vulnerability to “risk” of transmission and improve awareness of “disease perception”, for an early and appropriate diagnosis (WHO, 2001; Weiss, 2008).

Our results clearly show the lack of studies published in peer-reviewed articles on health education in relation to leishmaniasis, both in Brazil and the rest of South American countries where these diseases are prevalent. This lack of studies is present both for visceral and cutaneous leishmaniasis, confirming its position within the neglected diseases, which are those that prevail not only in poverty, but also contribute to maintaining the inequalities scenario, since they represent strong obstacles to the development of the countries (WHO, 2013; Yanki et al., 2004).

However, even conducting this methodologically appropriate review, the lack of studies on the subject is not an absolute indicator of lack of educational proposals on leishmaniasis, because a number of factors in the process of identification and selection of the publications may have led to distortions in our analysis, as in the publication bias case. Although we have not restricted the language (avoiding language bias), despite results of interest many studies are not published or are perhaps undertaken in the context of government agencies, forcing us to seek information in future from these organizations, including non-governmental organizations. In many cases, the decision not to publish is subject to the absence of statistically significant results. Moreover, the domains are smaller in magazines in the area of health education in comparison with other areas, making the publication of such studies difficult. We emphasize that this review of published articles, did not search the gray literature, perhaps we are missing the opportunity to include some other studies on this topic, even if they were performed without the methodological rigor that is required for publication in peer reviewed journals .

Educational interventions on health occupy a place of importance in the control of large endemic diseases because they interfere with the different epidemiological components of the disease, presenting a potential for transformation. However, for these proposals to be effective and sustainable, they must be appropriate to the reality where the disease is present and must be permanent (Breilh, 2006).

As shown above, despite significant differences in the methodologies used and the populations studied, all studies emphasize the importance of educational practices for the control of leishmaniasis.

The fact that we found only two studies in Brazil related to the cutaneous form of leishmaniasis (Luz et al., 2005; Reis et al., 2006), reveals the gap that exists, on one hand, between the lack of education proposals, and on the other, the epidemiological reality that has been observed throughout the southeastern region, with a wide geographical spread of the disease and autochthonous cases registered in all federal units (Bedoya-Pacheco et al., 2011). Regarding visceral leishmaniasis, although the geographic dispersion is lower, there are new foci in areas where the disease had previously been eradicated, making it a reemerging disease and requiring further studies and new proposals for control (Brasil, 2006; Brasil, 2011).

While educational interventions are the focus of this review, since they are considered effective proposals, surveys were addressed in the same way to increase coverage and provide useful information in the assessment of educational policies, programs and projects. This review shows that the methodological design of most studies in South America contains some form of educational intervention. Nevertheless, only one of the six studies (Uchôa et al., 2004) had innovative health education proposals that address the complex epidemiology of the disease, focusing on evaluating the influence of educational materials such as lectures, in relation to access to knowledge by the study population (Bauer, 2002; Uchôa et al., 2004; Luz et al., 2005; Reis et al., 2006; Magalhães et al., 2009).

The study by Reis et al. (2006) draws our attention in this regard, because it uses a methodology that is more dynamic: group discussions, interviews, dialogues and even construction of risk maps and prevention in educational activities. To better address the cognitive dimension, it incorporates a better understanding of the representations and cultural perceptions of the disease.

Education becomes even more of a priority, considering that new endemic foci of CL in Brazil have a higher pathogenic potential with an increased proportion of mucosal forms. Mucosal leishmaniasis causes more complex problems because of its potential social stigma resulting from deformity with destructive lesions of prolonged evolution, located in the mucous membranes of the nose, mouth, pharynx and larynx. These sequelae may affect self-esteem and self-perception, having an impact on quality of life (Kassi et al., 2008; WHO, 2001; WHO, 2013).

Interestingly, the studies evaluated have been conducted in different populations, from individuals of the community (Luz et al., 2005), elementary school students (Luz et al. 2005; Reis et al., 2006), tourists (Bauer, 2002), health professionals (Luz et al. 2005), and even residents with current and past histories of Leishmaniasis (Reis et al., 2006). However, despite this diversity, we emphasize the need to conduct larger studies.

Health education cannot be considered as a simplified and passive perspective, but as a dynamic category that encompasses various developments that seek to cover all possible aspects of the disease in the general population (Killick-Kendrick, 2010; Yanik et al., 2004).

Leishmaniasis control programs should be appropriate to the social and cultural realities where they will be applied. All strata and possible segments of the population where the disease is present should be targeted. Health perception of diversified individuals and populations leads to a need and desire for care, and is essential at this point. Thus, health education on leishmaniasis should lead to changes in attitudes and habits, from a critical reflective position, allowing the necessary epidemiological transformations and not just be limited to the dissemination of information (Abazid et al., 2012; Reuters, 2013; Saberi et al., 2012).

Our research, based on the described methodology, suggests that studies of health education on leishmaniasis, both in Brazil and elsewhere in South America,

should be encouraged because of the dispersion and impact of these diseases in the affected populations. Thus, we emphasize the need for conducting epidemiological studies to evaluate health education in leishmaniasis.

ACKNOWLEDGMENTS

We thank Dr. Maria Ines Fernandes Pimentel for the English revision and the valuable contributions to this manuscript. Financial support: Research Technological Development Incentive Program/Evandro Chagas National Institute of Infectious Diseases, Oswaldo Cruz Foundation.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest associated with this paper.

REFERENCES

1. Abazid N, Jones C, Davies CR. Knowledge, attitudes and practices about leishmaniasis among cutaneous leishmaniasis patients in Aleppo, Syrian Arab Republic. *East Mediterr Health J* 18: 7-14, 2012.
2. Bauer IL. Knowledge and behavior of tourists to Manu National Park, Peru, in relation to leishmaniasis. *J Travel Med* 9: 173-179, 2002.
3. Bedoya-Pacheco SJP, Melo MHA, Valete-Rosalino CM, Pimentel MIP, Conceição-Silva F, Schubach AO, Marzochi MC. Endemic Tegumentary Leishmaniasis in Brazil: Correlation between Level of Endemicity and Number of Cases of Mucosal Disease. *Am J Trop Med Hyg* 86: 901-905, 2011.
4. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Departamento de Vigilância Epidemiológica. *Manual de vigilância e controle da leishmaniose visceral. Ministério da Saúde, Secretaria de Vigilância em Saúde, Departamento de Vigilância Epidemiológica.* – Brasília: Editora do Ministério da Saúde, 2006. Available: http://portal.saude.gov.br/portal/arquivos/pdf/manual_leish_visceral2006.pdf. Accessed in 25/12/2013.
5. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Departamento de Vigilância Epidemiológica. *Manual de vigilância da leishmaniose. Ministério da Saúde, Secretaria de Vigilância em Saúde, Departamento de Vigilância Epidemiológica – 2 ed. atual* – Brasília: Editora do Ministério da Saúde, 2010. Available: http://bvsmms.saude.gov.br/bvsm/publicacoes/manual_vigilancia_leishmaniose_tegumentar_americana.pdf Accessed in 01/05/2014.
6. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Departamento de Vigilância Epidemiológica. *Leishmaniose Visceral: Recomendações Clínicas para a redução da letalidade.* Ministério da Saúde, Secretaria de Vigilância em Saúde, Departamento de Vigilância Epidemiológica – 1ed. – Brasília: Editora do Ministério da Saúde, 2011. Available: http://bvsmms.saude.gov.br/bvsm/publicacoes/leishmaniose_visceral_reducao_letalidade.pdf Accessed in 27/04/2014.
7. Breilh J. *Epidemiologia crítica: Ciência emancipadora e intercultural.* Editora Fiocruz, Rio de Janeiro, 2006.
8. Coutinho Sérgio G, Pirmez Claude Mendonca SCF, Conceição-Silva F, Dorea RCC. Pathogenesis and immunopathology of leishmaniasis. *Mem Inst Oswaldo Cruz* 82: 214-228, 1987.
9. Desjeux P. The increase in risk factors for the leishmaniasis worldwide. *Trans R Soc Trop Med Hyg* 95: 239-243, 2001.
10. Desjeux P. Leishmaniasis: current situation and new perspectives. *Comp Immunol Microbiol Infect Dis* 27: 305-318, 2004.
11. Galvão CM, Sawada NO, Trevizan MA. Revisão Sistemática: recurso que proporciona a incorporação das evidências na prática da enfermagem. *Rev Latino-Am Enfermagem* 12: 548-556, 2004.

12. Hora DL. *Gestão Educacional Democrática*. Alinea, Campinas, 2012.
13. Isaza DM, Restrepo BN, Arboleda M, Casas E, Hinestroza H, Yurgaqui T. La leishmaniasis: Conocimientos y practicas en poblaciones de la costa del Pacifico de Colombia. *Rev Panam Salud Públ* 6: 177-184, 1999.
14. Kassi M, Kassi M, Afghan AK, Rehman R, Kasi PM. Marring Leishmaniasis: The Stigmatization and the Impact of Cutaneous Leishmaniasis in Pakistan and Afghanistan. *PLoS Negl Trop Dis* 2: e259, 2008.
15. Killick-Kendrick R. Education is the key to controlling visceral leishmaniasis. *Bull World Health Organ* 88: 11-12, 2010.
16. Luz ZMP, Schall V, Rabello A. Evaluation of a pamphlet on visceral leishmaniasis as a tool for providing disease information to healthcare professionals and laypersons. *Cad Saúde Pública* 21: 606-621, 2005.
17. Machado MFAS, Monteiro EMLM, Queiroz DT, Vieira NFC, Barroso MGT. *Integralidade, formação de saúde, educação em saúde e as propostas do SUS – uma revisão conceitual*. Ciênc Saúde Coletiva 12:2, 2007. Available: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1413-81234007000200009&lng=pt&nrm=iso. Accessed in 20/11/2012.
18. Magalhães DF, Silva JA, Haddad JPA, Moreira EC, Fonseca MIM, Ornelas ML, Borges BHA, Luz ZMP. Dissemination of information on visceral leishmaniasis from schoolchildren to their families: a sustainable model for controlling the disease. *Cad Saúde Pública* 25: 1642-1646, 2009.
19. Marsden PD, Jones TC. *Clinical manifestations, diagnosis and treatment of leishmaniasis*. Elsevier Science Publishers. Amsterdam, 1985.
20. Marzochi MCA, Marzochi KBF. Tegumentary and visceral leishmaniasis in Brazil – Emerging antrozoosis and possibilities for their control. *Cad Saúde Pública* 10: 359-375, 1994.
21. Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *J Clin Epidemiol* 62: 1006-1012, 2009.
22. Reis DC, Gazzinelli A, Silva CAB, Gazzinelli MF. Educação em saúde e representações sociais: uma experiência no controle da leishmaniose tegumentar em área endêmica de Minas Gerais, Brasil. *Cad Saúde Pública* 22: 2301-2310, 2006.
23. Reithinger R, Dujardin JC, Louzir H, Pirmez C, Alexander B, Brooker S. Cutaneous leishmaniasis. *Lancet Infect Dis* 7: 581-596, 2007.
24. Reuters T. *EndNote Web*. 2013. Available: <http://www.myendnoteweb.com>. Accessed in 01/01/2013.
25. Saberi S, Zamani A, Moamedini N, Nilforoushzadeh MA, Jaffary F, Rahimi E, Hejazi SH. The knowledge, attitude, and prevention practices of students regarding cutaneous leishmaniasis in the hyperendemic region of the Shahid Babaie Airbase. *Vector Borne Zoonotic Dis* 12: 306-309, 2012.
26. Schubach A, Marzochi MCA, Cuzzi-Maya T, Araújo ML, Oliveira ALC, Pacheco RS, Momen H, Conceição-Silva F, Coutinho SG, Marzochi KB. Cutaneous scars in American tegumentary leishmaniasis patients: a site of *Leishmania* (Viannia) *braziliensis* persistence and viability eleven years after antimonial therapy and clinical cure. *Am J Trop Med Hyg* 58: 824-827, 1998.
27. Tillett S, Newbold E. Grey Literature at the British Library: Revealing a Hidden Resource. *Interl & Doc Sup* 34: 70-73, 2006.
28. Uchôa CMA, Serra CMB, Magalhães CM, Silva RMM, Figliuolo LP, Leal CA, Madeira MF. Educação em saúde: ensinando sobre a leishmaniose tegumentar americana. *Cad Saúde Pública* 20: 935-941, 2004.
29. Weiss MG. Stigma and the social burden of neglected tropical diseases. *PLoS Negl Trop Dis* 2: e237, 2008.
30. World Health Organization. *Macroeconomics and Health: Investing in Health for Economic Development*. 2001. Available: <http://whqlibdoc.who.int/publications/2001/924154550x.pdf>. Accessed in 25/02/2013
31. World Health Organization. *Resolutions and decisions: Control of leishmaniasis Sixtieth World Health Assembly*. 2013. Available: http://www.who.int/neglected_diseases/mediacentre/WHA_60.13_Eng.pdf Accessed in 25/02/2013.
32. Yanik M, Gurel MS, Simsek Z, Kati M. The psychological impact of cutaneous leishmaniasis. *Clin Exp Dermatol* 29: 464-467, 2004.
33. Zeghmouri. BC, Shöpfel J. Document Supply and Open Access: An International Survey on Grey Literature. *Interl & Doc Sup* 34: 96-104, 2006.