

Educational program in schistosomiasis: a model for a methodological approach

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Keywords

Health education. Schistosomiasis. Outpatient attendance. Nursing in community health. Knowledge, attitudes and practice. Questionnaires.

Abstract

Objective

Lack of knowledge is one of the factors responsible for the persistence of infectious diseases in Brazil. This study had the objective of developing, implementing and evaluating a low-cost educational program using schistosomiasis patients as a model.

Methods

This was a descriptive study developed using a population of healthy people (group 1) and schistosomiasis patients (groups 2 and 3), with 20 individuals in each group. Teaching material (illustrated manual and album of leaflets) and a questionnaire consisting of 17 questions to evaluate the groups' knowledge were devised. The questionnaire was applied to groups 1 and 2 before and to group 3 after the educational program. The variables studied were the educational program, level of schooling, age, clinical form of schistosomiasis, symptoms, and the subject's performance when answering the questionnaire. For the statistical analysis, Fisher's exact test and variance analysis with one fixed factor were utilized.

Results

The educational program was evaluated in the form of four topics: cycle, clinical presentation, treatment and prevention of the disease. The median number of correct responses to the questionnaire was higher for group 3 than for groups 1 and 2, for all the topics dealt with. This median was also higher for group 2 than for group 1, for all topics except for the item "prevention".

Conclusions

The educational process applied was efficient and improved the knowledge of the disease. It may provide an effective low-cost methodological model that can also be applied to combating other endemic diseases.

INTRODUCTION

Schistosomiasis is a serious public health problem. Around the world, more than 200 million people are infected by it, of whom 10 million are in Brazil, with 6 to 8 million in the country's northeastern region.¹² The disease was introduced to Brazil through the slave trade in the seventeenth century, in which Africans were brought in, to work in the sugar cane plantations of the northeast.

Among the factors that have contributed towards the propagation of schistosomiasis are migratory movements, inadequate exploitation of water resources, the widespread distribution of intermediate hosts, the longevity of the disease, and the lack of sanitary education. The agent, intermediate host, transmission mechanism and the treatment for the disease and the water are known, but this knowledge is not shared by part of the population, especially among people who now live outside of the endemic areas.

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Moreover, such people return to the endemic areas with a certain frequency, even if only for short periods. Coura-Filho⁵ has shown in Minas Gerais that, even after two centuries of contact with the disease, the community was unaware of the role of water in the transmission of schistosomiasis. Only a very small percentage of the population in that study (4.6%) attributed a role to bathing and washing clothes in the river, in the transmission of the disease.

Chemotherapy in the treatment of schistosomiasis in areas of high prevalence has not had long-lasting success. There has been rapid reinfection, which reinforces the need for knowledge of the disease among the population.⁶

Education is an essential component of nursing attendance in the field of community health. Its aim is the promotion, maintenance and restoration of health, and the adaptation to the residual effects of diseases. Experience from a specialized multidisciplinary service attending schistosomiasis outpatients* has shown that such patients mostly come from endemic regions. This experience acquired while conducting nursing consultations has led to consideration of what effect the utilization of educational actions would have. The presupposition would be that the greater the knowledge of the disease were, the greater the adherence to treatment might be (including monitoring the cure), and the lower the rates of reinfection and evolution to more severe forms of the disease would be.

The objective of the present study was therefore to develop, implement and evaluate an educational program regarding schistosomiasis aimed at outpatients. Such an experience could contribute towards redirecting the actions within the primary healthcare level. Furthermore, such study utilizing scientific methodologies would allow an assessment to be made of situations in which improvements in quality of life, human satisfaction and social behavior are observed, among other changes that form objectives in healthcare promotion.

METHODS

Sample

This was a descriptive study developed within the schistosomiasis outpatient service of the Discipline of Gastroenterology of the Federal University of São Paulo. It was performed after approval of the study protocol by the Research Ethics Committee of Unifesp (n. 154/01).

The sample was formed by three groups, all of whom were aged over 18 years and had given their informed consent for their participation. Group 1 was composed of healthy people without connection with the outpatient service, while groups 2 and 3 were selected sequentially from among the patients who, upon receiving attendance, had not yet participated in the program. For group 3, cancellation of their registration with the outpatient service was considered to be an exclusion criterion. Since the patients were selected sequentially, individuals with both the mild and severe chronic forms of schistosomiasis were included, considering their clinical, echographic and endoscopic characteristics. Since the clinical form could possibly have an influence on the responses to the questionnaire, we evaluated the specific and non-specific signs and symptoms of the disease in the two groups (groups 2 and 3).^{3, 11}

The groups were formed as follows:

- Group 1 (control): made up of 20 people (thirteen originating from the city of São Paulo, six from the State of Bahia and one from the city of Rio de Janeiro), without any epidemiological history of schistosomiasis or connection with the outpatient service. This group did not participate in the educational program and just had the questionnaire applied.
- Group 2: made up of 20 people (nine originating from Bahia, one from Pernambuco, six from Minas Gerais and three from Alagoas) with a diagnosis of the chronic form of schistosomiasis, selected sequentially from among the outpatients who had not yet participated in any educational program. The questionnaire was applied to this group before it participated in the educational program.
- Group 3: made up of 20 people (nine originating from Bahia, three from Pernambuco, three from Minas Gerais, one from Paraíba, two from Alagoas and one from Sergipe) with a diagnosis of the chronic form of schistosomiasis. The questionnaire was applied to this group after it participated in the educational program. The delay in applying the questionnaire enabled assessment of how well the knowledge transmitted had been assimilated.

Most of the individuals in groups 2 and 3 had been living in the city of São Paulo for at least ten years, although they were periodically visiting relatives in the endemic areas.

The variables studied were the individuals' participation or not in the educational program, perform-

*Outpatient service linked to the Discipline of Gastroenterology of the Federal University of São Paulo (Unifesp).

ance in the program (if they had participated), level of schooling, age (number of completed years), clinical form of schistosomiasis and symptomatology.

Educational program

The educational program was accomplished in groups, in which the educator directed the subject in accordance with the participants' interests and each person's experience, and stimulated an exchange of experiences. With the aim of catching participants' attention in presenting the program, an album* of leaflets was devised, with illustrations on the cycle, clinical presentation, treatment and prevention of the disease. This album consists of 29 sheets and substitutes for the use of projection slides, which therefore allows the program to be undertaken in places without electricity. A manual* was also prepared for distribution at the end of the program with the aim of contributing towards disseminating the knowledge. The language utilized is simple and the illustrations reinforce the teaching of each topic dealt with. Figure gives an example of the illustrations and text of this teaching material.

To assess the groups' knowledge regarding the disease, a two-part questionnaire was devised. The first part of this instrument asks for data to characterize the individual, and the second part contains 17 multiple-choice questions on the main characteristics of the disease. For some questions, more than one correct answer is accepted.

The questions deal with five aspects of the disease: its cycle (questions 1 to 5), clinical presentation (questions 6 to 10), treatment (questions 11 to 14) and prevention (questions 15 to 17). A test was made on the original questionnaire that preceded the definitive version, using individuals who were not included in this study. During the test phase, we observed that the questions involving long statement needed to be repeated one or more times, since when we reached the end of the sentence, the interviewee had forgotten the beginning. The test allowed us to make corrections and put the questions into language that was simple, direct and easily understood by the interviewee.

The instructions on how to answer the questionnaire were given orally a few minutes before the individual interview applied by the researcher. The manner of applying the questionnaire placed the literate and il-

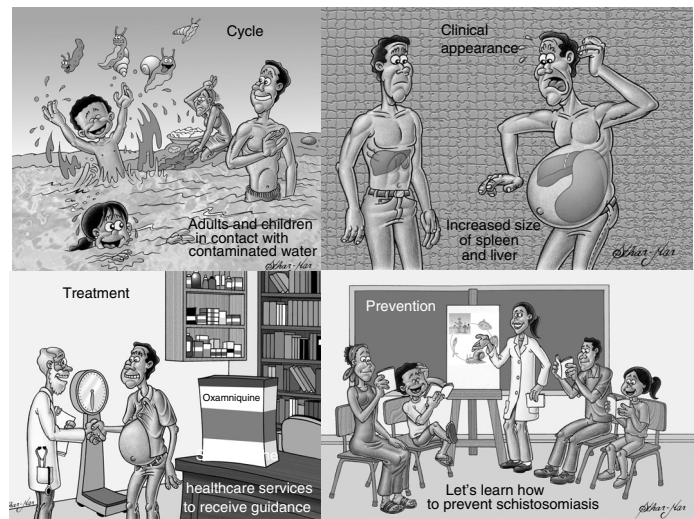


Figure – Examples of illustrations about the cycle, clinical presentation, treatment and prevention of schistosomiasis. São Paulo, 2002.

literate interviewees on the same level, because the questions were read out and the responses were noted down by the interviewer, after giving the explanations.

The questionnaire was applied to the three groups studied over a four-month period (May to August 2001).

The team that took part in drawing up and evaluating the educational program was formed by the head of the outpatient service (a senior professor in the Discipline of Gastroenterology), a doctor doing doctoral level postgraduate research, three nurses doing master's level postgraduate research, three medical residents, four specialized doctors, three students on the nursing course (monitors), and fifth-year students on the medicine course. The presentational part of the educational program was given by a nursing monitor accompanied by a qualified nurse. This presentation was previously standardized at meetings of the team, to guarantee homogeneity of the information transmitted to the participants.

The educational program had the following characteristics. First, there was a presentation lasting for 20 to 30 minutes for a group of maximum of ten people. Following this, the teaching strategy utilized was the stimulation of group participation and the exchange of experiences.

Independent of interviewees' level of schooling, all questions and their possible responses were read out to each group of interviewees. Participants then verbally chose the alternative(s) that in their opinions were correct, and the researcher noted down the response(s) chosen. The response was considered

*Available on CD at low reproduction cost, and from the UNIFESP web site (www.unifesp.br/dmed/gastro/dgastro.htm).

Table 1 – Distribution of the groups according to schooling. São Paulo, 2002.

Group	1		2		3	
	N	%	N	%	N	%
Schooling						
None	0	0	3	15	6	30
Elementary	2	10	16	80	12	60
High school	10	50	1	5	2	10
Tertiary	8	40	0	0	0	0
Total	20	100	20	100	20	100

wrong when, in addition to choosing a correct alternative, the interviewee chose one or more wrong responses. The performance was evaluated by means of the number of correct responses.

Statistical analysis

The association between the level of schooling, clinical form of schistosomiasis, presence of symptoms and responses of the groups in relation to the cycle, clinical presentation, treatment and prevention of the disease were evaluated via Fisher's exact test. The groups were compared with regard to age by using variance analysis with a fixed factor. The median of the percentage of correct responses on each topic dealt with in the questionnaire was also calculated for each group.

RESULTS

It was found that group 1 (median age of 24.5 years) was younger ($p=0.029$), with a larger proportion of individuals (45%) in the age group from 21 to 30 years than in group 2 (median age of 36 years) and group 3 (median age of 41.5 years). In groups 2 and 3, the greatest proportion of individuals (60%) was in the age group from 31 to 50 years, and these groups did not differ from each other ($p=0.438$). With regard to gender, there was a predominance of women in the three groups (group 1, 70%; group 2, 80%; and group 3, 55%), which did not differ from each other in this respect ($p=0.272$). With regard to marital status ($p=0.003$), there was a predominance of married people in group 3 (85%), in relation to groups 1 (55%) and 2 (35%).

Table 1 shows that group 1 had a higher level of schooling ($p<0.001$) than the other groups. No individual in groups 2 and 3 had tertiary-level education and the illiteracy rates in these groups were, respectively, 15 and 30%, percentages that did not statistically differ from each other ($p=0.438$).

Table 2 shows that the majority of the individuals in group 2 had the mild form of schistosomiasis, while those in group 3 had the severe form ($p=0.001$). Despite this distribution, Table 3 shows that there was no statistical difference ($p=0.333$) with regard to the

presence or absence of symptoms, between groups 2 and 3. The signs and symptoms considered were the ones that could be more specifically associated with the disease (anemia, hematemesis, melena and ascites), and not the less specific symptoms (diarrhea, intestinal constipation, vomiting, headache and weight loss). In group 1, there was no report of the presence of these symptoms.

After analysis of the results, it was found that group 3 presented a higher percentage of correct responses than did groups 1 and 2, for all the topics dealt with. Group 2 presented a higher percentage of correct responses than did group 1, for all topics except in relation to prevention (Table 4). This Table displays the use that individuals participating in the educational program (group 3) were able to make of it.

DISCUSSION

In this work, illustrated teaching material on schistosomiasis was developed to attend to the educational needs of a population of children and adults, bearing in mind their illiteracy rate and low level of schooling. In fact, in the population we studied, the illiteracy rate was 30% in group 3 and 15% in group 2. In group 1, despite the greater level of schooling, the grasping of concepts was no better than in group 3. The lack of teaching material regarding schistosomiasis that could enliven and motivate such classes, to

Table 2 – Distribution of groups 2 and 3 according to the clinical form of schistosomiasis. São Paulo, 2002.

Clinical form	Group 2	Group 3
MCS	12	6
SCS	8	14
Total	20	20

MCS: mild chronic form of schistosomiasis
SCS: severe chronic form of schistosomiasis.

Table 3 – Distribution of groups 2 and 3 according to the presence or absence of symptoms. São Paulo, 2002.

Symptoms	Group 2	Group 3
Asymptomatic	14	10
Symptomatic	6	10
Total	20	20

Table 4 – Distribution of the percentages of right and wrong responses to the topics dealt with in the questionnaire, in the three groups. São Paulo, 2002.

Subject	No. of questions	Groups					
		1		2		3	
		R	W	R	W	R	W
Cycle	5	60.0	40.0	64.0	26.0	80.0	20.0
Clinical presentation	5	50.0	50.0	65.0	35.0	78.0	22.0
Treatment	4	57.5	42.5	60.0	40.0	87.5	12.5
Prevention	3	60.0	40.0	45.0	55.0	90.0	10.0

R: right response; W: wrong response.

generate interest and participation among the students, has already been reported by other authors.⁹ The relationships between the disease and illiteracy, migratory flow and lower purchasing power have also become known.⁴

Schall et al⁹ devised teaching material based on a text of literary style and applied this in elementary schools in the municipality of Rio de Janeiro. It was shown to be efficacious in promoting the learning of concepts and basic care in relation to schistosomiasis. This type of approach would not have been appropriate for the characteristics of the population we attended, because of the low level of schooling and high illiteracy rate.

Santos et al⁷ developed and applied an educational game about transmittable diseases (schistosomiasis, Aids, dengue and leishmaniasis). They called the game “*bate-boca*” (“disputes”) and applied it among pre-adolescents and adolescents with an average age of 15 to 16 years. The game helped significantly in the comprehension of the concept, transmission, control, symptoms and treatment of the diseases.

The album of leaflets that we developed has the format of a panel, which makes it possible to utilize it in locations without electricity. This strategy showed itself to be efficacious in rural areas.¹⁰

A study on schistosomiasis was carried out in public elementary schools on the periphery of Belo Horizonte to assess the impact of an educational program regarding knowledge of the disease.⁸ For this, a questionnaire was applied and a feces test for parasitic protozoa was performed before the educational program and one year afterwards. Over this one-year interval, the knowledge of the disease increased significantly. A decline from 12.9% to 9% was observed for the average prevalence of the disease (estimated from the feces test for parasitic protozoa). Four schools were surveyed, and in one of them the decrease was from 19.5% to 10.2%.

Barreto² also utilized a questionnaire listing risk factors related to schistosomiasis when screening for *S. mansoni* infection among children aged 12 to 14

years in the municipality of Santo Antônio de Jesus, in Bahia. The questionnaire was made up of two parts (family conditions and the child’s conditions) and inquired into the type and frequency of contact activity with water, migration and reports of *S. mansoni* infection in the past and present. The protozoan parasitology of the feces was utilized in the validation of the variables. The results showed that the discrimination power of the questionnaire increased when variables were associated. In this author’s opinion, one of the great advantages of questionnaires is the low cost of implementing them, since there is no need for highly specialized equipment or personnel.

None of the works cited contained questions that dealt with schistosomiasis as a whole (the cycle, clinical presentation, treatment and prevention). Furthermore, the programs described in the literature are not available. In these studies, analysis of the responses regarding the disease cycle showed that, in a general manner, the patients knew that water was involved in the transmission of the disease. Rivers and reservoirs were cited as important sources of contamination; on the other hand, so were the water in toilet bowls and swimming pools. A study developed among the population of the municipality of Cachoeirinha (Recôncavo Baiano)¹ found that these people did not have much information about the schistosomiasis cycle, nor did they make any distinction between this and other parasitic worm diseases. According to some interviewees, it was not the river where they fished that the worms came from, but the domestic water, in which some residues were visible to the naked eye (“some little red balls”).

In the present study, the best known test for diagnosing schistosomiasis was the feces test, rather than rectal biopsies. What may have contributed to this is the fact that only the people with the disease would go through the situation of being submitted to rectal biopsy as well as feces tests since, in accordance with the protocol under which the study was performed, if the individual was not submitted to rectal biopsy during the diagnosis of the disease, he would be during the phase of checking the cure.

In the question dealing with clinical complaints,

the alternatives most cited were the absence of symptoms and the emergence of a clinical condition years later. On the other hand, the signs and symptoms of the severe form were not so well known. Some of the patients with schistosomiasis said that they had found out that they had it by chance, when they went to do periodical tests required for their work or, among the women, at prenatal examinations.¹

With regard to the treatment of schistosomiasis, even though some people had passed through processes of cure and checkup, they had not acquired knowledge that they could transmit.

In discussing prevention, we reinforced how important it was for patients to avoid contact with contaminated water, since this could infect them again. We sought to make our patients aware that prevention is important both for healthy individuals and for sick people.

In a general manner, the results revealed a notable lack of knowledge among the interviewees regarding

the disease. Group 3 (patients with schistosomiasis who participated in the educational program) presented better performance than groups 1 (control) and 2 (patients with schistosomiasis who did not participate in the educational program). Since the questionnaire was applied to patients living outside of the endemic zone, there is a need for it to be validated among patients living in such regions and exposed to the risk of acquiring the disease.

The educational process applied to this population was efficient, since it improved these people's knowledge of the disease. It thus forms a model for effective low-cost action that could also be applied in the combat of other endemic diseases that exist within this country.

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REFERENCES

- Alves PC, Souza IM, Moura MA, Cunha LA. A experiência da esquistossomose e os desafios da mobilização comunitária. *Cad Saúde Pública* 1998;4(Supl 2):79-90.
- Barreto ML. Use of risk factors obtained by questionnaires in the screening for *Schistosoma mansoni* infection. *Am J Trop Med Hyg* 1993;48:742-7.
- Camacho Lobato L, Borges DR. Early liver dysfunction in schistosomiasis. *J Hepatol* 1998;29:233-40.
- Coura-Filho P. Distribuição da esquistossomose no espaço urbano. 1. O caso da região metropolitana de Belo Horizonte, Minas Gerais, Brasil. *Cad Saúde Pública* 1997;13:245-55.
- Coura-Filho P. Participação popular no controle da esquistossomose através do Sistema Único de Saúde (SUS), em Taquaraçu de Minas, (Minas Gerais, Brasil), entre 1985-1995: construção de um modelo alternativo. *Cad Saúde Pública* 1998;14(Supl 2):111-22.
- Santana VS, Teixeira MG, Santos CP, Andrade CAR. Efetividade do programa de comunicação e educação em saúde no controle da infecção por *S. mansoni* em algumas áreas do Estado da Bahia. *Rev Soc Bras Med Trop* 1997;30:447-56.
- Santos MG, Moreira MM, Malaquias MLG, Shall VT. Educação em saúde em escolas públicas de 1º grau da periferia de Belo Horizonte, MG, Brasil. II – Conhecimentos, opiniões e prevalência de helmintíases entre alunos e professores. *Rev Inst Med Trop São Paulo* 1993;35:573-9.
- Shall VT, Jurberg P, Almeida EM, Casz C, Cavalcante FG, Bagno S. Educação em saúde para alunos de primeiro grau: avaliação de material para ensino e profilaxia da esquistossomose. *Rev Saúde Pública* 1987;21:387-404.
- Shall VT, Dias, AGP, Malaquias MLG, Santos MG. Educação em saúde em escolas públicas de 1º grau da periferia de Belo Horizonte, MG, Brasil. I – Avaliação de um programa relativo à esquistossomose. *Rev Inst Med Trop São Paulo* 1993;35:563-72.
- Shall VT. Health Education, Public Information and Communication in Schistosomiasis Control in Brazil: a Brief Retrospective and Perspectives. *Mem Inst Oswaldo Cruz* 1995;90:229-34.
- Souza MR, Toledo CF, Borges DR. Thrombocytopenia as a predictor of portal hypertension in schistosomiasis. *Dig Dis Sci* 2000;45:1964-70.
- World Health Organization. The world health report: bridging the gaps: report of the director. Geneva; 1995. p. 118.