

ORIGINAL RESEARCH

Knowledge, Attitudes, and Practices Related to Schistosomiasis Among Children in Northern Senegal



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Abstract

BACKGROUND Schistosomiasis is a highly prevalent parasitic disease in Senegal. The early symptoms are hematuria and dysuria. Children's comprehension of the disease is fundamental to preventing the infection.

OBJECTIVES The aim of this study was to investigate the knowledge attitudes, and practices related to schistosomiasis among schoolchildren in 2 rural villages in Northern Senegal and to evaluate their impact on the disease.

METHODS A cross-sectional study was conducted. Data about children's knowledge of schistosomiasis, behavior, and preventive measures were collected through a questionnaire.

FINDINGS Questionnaire responses from 575 schoolchildren were analyzed. Correct answers about risky behavior for schistosomiasis were associated with early symptoms ($P = 0.010$). Wearing shoes and washing hands with soap were associated with not having hematuria and dysuria ($P = 0.007$ and 0.049 , respectively). Playing in rivers was associated with the aforementioned symptoms ($P < 0.001$). Children who had good knowledge of schistosomiasis reportedly did not have symptoms ($P = 0.002$). A logistic regression model showed that female sex (odds ratio = 0.35; $P = 0.01$) and attending a primary school (odds ratio = 0.13; $P < 0.001$) were significant predictors of a lower risk of the early symptoms of urinary schistosomiasis.

CONCLUSIONS This study revealed that the level of knowledge among children in North Senegal about the causes, transmission, prevention, and treatment of schistosomiasis warrants implementing educational intervention.

KEY WORDS attitude, children, knowledge, practices, schistosomiasis, Senegal

Schistosomiasis, a neglected tropical disease, is a parasitic infection characterized by intestinal and urogenital forms. *Schistosoma intercalatum*, *Schistosoma japonica*, *Schistosoma mansoni*, and *Schistosoma mekongi* cause the intestinal infection, while

Schistosoma haematobium causes the urogenital form.¹ This disease has infected 207 million people, mostly in sub-Saharan Africa,^{1,2} causing a disability rate ranging from 0.5% to 15%.^{3,4} The prevalence in the north of Senegal was 61% for *S. mansoni* and

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50% for *S haematobium* infection.⁵ For urinary schistosomiasis, the reported prevalence among children aged 7 to 15 years was 57.6%.⁶ Children aged between 5 and 15 years have a higher infection rate, with a consequent reduction in the adult population.^{3,7–10} The reported risk of infection was higher in women,⁵ but in other studies,^{11,12} male children were more likely to be infected than female children were.^{8–10} Socioeconomic status, level of education, and untreated water and sanitation were associated with transmission of the pathogens.¹

In the pediatric population, the early symptoms of urinary schistosomiasis are haematuria, with a prevalence ranging from 15.8% to 52.4%,^{13,14} and dysuria, with a prevalence ranging from 19.5% to 54.3%.¹⁵ Urinary schistosomiasis is a debilitating chronic illness that causes hydronephrosis and sequelae such as bladder calcification and bladder cancer. It also increases the risk of HIV infection.^{14,16} The main consequences of this public health challenge are disturbed growth, impaired cognitive development, and reduced capacity to work.¹⁷

Three diagnostic methods have been reported as effective. The microscopic detection of eggs in urine is considered the gold standard. Indirect diagnosis can be performed with hematuria dipsticks or simple questionnaires. These tools are easy and inexpensive for rapid screening in endemic areas.⁷ The World Health Organization recommends questionnaires as the first step in controlling schistosomiasis.^{13,18}

The intervention strategies for this disease are safe water, hygiene, education, and preventive treatment with praziquantel.¹ In particular, inculcating the habit of washing hands with soap and playing away from rivers and other water sources is fundamental.^{14,19} Working and playing near a river was significantly associated with *S haematobium* infection.^{10,20} Another important strategy is fostering knowledge about the disease. In a study in Zimbabwe in 2011, Midzi et al. reported that 32% of children knew the causes of schistosomiasis and 22% knew the preventive actions. A questionnaire that targets knowledge, attitudes, and practices (KAPs) is the most recognized method for investigating awareness of disease.^{8–10,21}

To our knowledge, no studies have used KAPs for schistosomiasis Senegal. Thus, the aim of this study was to describe the KAPs around the early symptoms of schistosomiasis among schoolchildren in 2 rural villages in Northern Senegal and to evaluate the impact these KAPs had on the disease.

METHODS

Study Setting. Kassak North is one of the largest villages in the Saint Louis region in northern Senegal, with 3200 inhabitants. Roughly 10 km downstream, Kassak South has 1390 inhabitants. Both villages have primary schools, but students progress to the only secondary school present, in Kassak North. Power is transmitted to both villages by lines from the dam, but it is not available to the whole village. Chlorine-treated, chargeable water is conveyed from the river to the mainly brick or mud-and-straw houses through municipal pipelines. Each village has a health post run by a nurse and a maternity service managed by experienced mothers. The nearest clinic is 40 km away, and the nearest hospital is 75 km away. Both villages are near a stream. At Kassak South, the stream is less accessible due to irrigation dams.

Study Design and Participants. A cross-sectional study recruiting primary and secondary school children in Kassak North and Kassak South was carried out during school classes over 3 days in May 2014. All children present at school were recruited with no age limits.

Data Collection. In this study, the knowledge, behavior, and preventive measures related to schistosomiasis were investigated. Socioeconomic data and data on the presence of hematuria and dysuria in the previous month were collected, as reported by children. Local residents helped to improve the readability and comprehensibility of the questionnaire, which pooled 22 queries that followed examples in the literature.^{13,15} All items were in a “yes” or “no” format. The present authors tested the questionnaire among 10 schoolchildren to evaluate its readability, clarity, and conciseness. The questionnaire was then approved by directors and teachers. Teachers actively helped the researchers to administer the questionnaire.

Statistical Analysis. Statistical analysis was carried out using STATA V.13 (Stata Corp, College Station, TX). A descriptive analysis of the sample was conducted, according to the presence of the early schistosomiasis symptoms (hematuria and dysuria) and considering the distribution of gender, classroom, village, school, knowledge of schistosomiasis, previous diagnosis of schistosomiasis, and socioeconomic status. Results were expressed in frequencies and percentages. Finally, multivariate analysis was conducted using a logistic regression model to assess the potential predictors of early symptoms of urinary

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