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## ORIGINAL ARTICLE

# Schistosomiasis knowledge, attitude, practices, and associated factors among primary school children in the Siphofaneni area in the Lowveld of Swaziland

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**Abstract** *Background:* Schistosomiasis, a worldwide concern, has received attention in Swaziland through control programs such as deworming programs, education programs, and school health programs; however, these programs neglect the importance of monitoring and evaluation strategies such as assessing children's knowledge, attitudes and practices (KAPs) and the prevalence of the disease. Children are a high-risk group because of their water contact practices, and need to be informed about schistosomiasis to influence their attitudes and practices. Social and cultural factors are involved in schistosomiasis control because they instill myths and misconceptions about the disease. As a result, children in the community may be comfortable with bad practices. This study aimed to assess the KAPs of schoolchildren on schistosomiasis, and to identify practices that support or hinder the progress of schistosomiasis control.

*Methods:* In 2014, a descriptive quantitative cross-sectional survey was conducted through questionnaires among Siphofaneni primary schools, an area hit by schistosomiasis in the Lowveld of Swaziland. A logistic regression model was applied to analyze the data.

*Results:* Moderate knowledge, good attitudes, and fairly good practices were observed in the children. However, practices of certain children were risky and they still had some misconceptions. Knowledge was correlated with practice and with predictors of good and bad practices such as male sex, always urinating in water, and always using river water for domestic practices.

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**Conclusion:** This study suggests that empowering children with knowledge and attempting to modify their water contact, and improved human waste disposal practices are necessary for schistosomiasis control.

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## Introduction

Schistosomiasis, a worldwide concern, affects more than 200 million people globally, and another 500–779 million people are at risk, especially children.<sup>1</sup> It is estimated to cause more than 200,000 deaths per year globally and at least 90% of people requiring treatment live in Africa.<sup>2</sup> The global burden of the disease is 4.5 million disability-adjusted life years.<sup>3</sup> Approximately 80% of all infected people live in sub-Saharan Africa.<sup>4</sup> Neighbors to Swaziland, South Africa, and Mozambique have both *Schistosoma haematobium* and *Schistosoma mansoni* endemics in different parts of these countries.<sup>5</sup>

Most morbidities due to schistosomiasis are borne by school-age-children whose nutritional, physical, and cognitive potential are consequently impaired.<sup>6</sup> Schistosomiasis is prevalent in tropical and subtropical areas, and common in poor communities with limited access to safe water and adequate sanitation.

*Schistosoma haematobium* has been endemic in the Kingdom of Swaziland for several decades, particularly in the Lowveld. In 1984, northern Lowveld had the highest prevalence (58%) of urinary schistosomiasis in 10- to 14-year-old children, which demonstrates an alarming prevalence of 65.1%. Intestinal schistosomiasis was essentially limited to the Lowveld (18%).<sup>7</sup> In 2010, the Siphofaneni area, which is in the Lowveld, had a prevalence of 6.1% for *S. haematobium* with females having a significantly higher prevalence (10.5%) than males (1.4%). Children had a significantly higher schistosomiasis prevalence (15.3%), when compared with the age group of >19 years (2.6%).<sup>8</sup>

Swaziland has a poor schistosomiasis information collecting system because only data from patients who self-referred to the National Bilharzia Worm Control Program (NBWCP) are systematically collected and reported on a regular basis. Moreover, the *S. haematobium* infection status in most parts of the country is unclear to date. Only 59% of the rural population has pit latrines and 18% of the rural population still uses surface water.<sup>9</sup> Secondary to new dam construction (i.e., the Lubovane Dam) and irrigation schemes in the Siphofaneni area, there is an increased risk of bilharzia infection.<sup>7,10,11</sup> Due to water scarcity, people of the Lowveld utilize water from these dams for various purposes such as domestic use, recreation, and agriculture.

The World Health Organization recommends that children aged 10–14 years should be the target group in the control of schistosomiasis because of their water contact behaviors, and that they should normally be the study population for the baseline survey and for monitoring and the evaluation of intervention strategies because of the epidemiological importance of this group with regard to

schistosomiasis.<sup>12</sup> Swaziland has taken steps to control schistosomiasis since 1982 through the establishment of the NBWCP to provide intensive bilharzia surveillance, health education, and routine deworming in primary schools among children in the age group of 6–14 years old to reduce bilharzia-related morbidities. The deworming program was regrettably suspended in 2010 because of drug-related adverse events that occurred in some children.<sup>10</sup>

Immense efforts are being made to control morbidity caused by schistosomiasis; however, it should be borne in mind that monitoring and evaluation of schistosomiasis distribution (i.e., prevalence and intensity), knowledge, attitudes, and practices of the communities have a major role in sustainable control interventions. It is surprising that little is known about the knowledge, attitudes, and practices of children in Grades 5–7 (i.e., 10–14 years), which is the most susceptible age group with regard to causes of and control measures for schistosomiasis. Therefore, this study aimed to explore and describe the knowledge, attitudes and practices of Grade 5–7 primary school children towards schistosomiasis. The specific objectives were (1) to assess the knowledge (K) about schistosomiasis among Grade 5–7 primary school children in the Siphofaneni area; (2) to explore and describe the attitudes (A) of these children towards schistosomiasis control measures; (3) to explore and describe the practices (P) of this target group; and (4) to investigate the correlates of schistosomiasis practices of these children. The study findings have informed the NBWCP about the children's current KAPs so that relevant health education and necessary control measures could be planned.

## Materials and methods

### Study area and the design

The study was conducted in four of six primary schools in the Siphofaneni area, which is in the Lowveld of Swaziland. This area contains the Lusutfu River, the recently built Lubovane Dam, and 17 streams that are all used for domestic, recreational, and agricultural purposes. There are also new sugarcane irrigation schemes managed by Swaziland Development. There were 869 Grade 5–7 primary school children in the six schools; among these, 146 children responded to the questionnaires on KAP. To investigate schistosomiasis KAPs among Grade 5–7 school children, a descriptive cross-sectional survey was conducted through self-administered questionnaires. Ethical approval was granted by the Swaziland Ethics Committee (Ministry of Health, Mbabane, Swaziland; ethical approval

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