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SCHISTOSOMIASIS RISK-BEHAVIOURS AMONG PRIMARY SCHOOL PUPILS AND ALTERNATIVE MEDICINE THERAPY IN ENDEMIC AREAS OF OGUN STATE, NIGERIA

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Abstract

Schistosomiasis is one of the neglected tropical diseases in Nigeria which continues to plague inhabitants of rural and peri-urban areas. This study assessed schistosomiasis risk-behaviours among primary school pupils and alternative medicine therapy in endemic areas of Ogun state. Descriptive survey design was adopted. The sample consisted of 600 pupils, 40 Health officers and 30 traditional medicine practitioners**.** Data were collected using standardized questionnaires. A large proportion (53.04%) of participants engaged in unhealthy lifestyle that promotes schistosomiasis infection in the areas. Herbs used in the treatment of Schistosomiasis in the areas include, *Cassia obtusifolia*, *Kigelia Africana*, *Momordica charantia* and *Anthocleista djalonensis*. Phytochemical analysis of the herbs indicated seven active ingredients with Phytate being of highest proportion. Unhealthy cultural behaviours of the pupils account for the prevalence of schistosomiasis in the areas. Therefore, advocacy programmes on the need to adopt healthy lifestyle by young ones should be enforced.

Keywords: Schistosomiasis risk behavior, prevalence, primary school pupils, alternative medicine therapy and endemic areas

1.0 Introduction

Schistosomiasis remains one of Nigeria's neglected tropical diseases, affecting people in rural and peri-urban areas where poor sanitation and extreme poverty are prevalent. This parasitic disease, caused by trematodes

or flukes of the genus *Schistosoma*, has afflicted humanity for centuries. In some rural endemic communities, it was once mistaken for a form of menstruation and even celebrated as a rite of passage for young males (Oyeyemi, Jeremias & Grenfell, 2020). Globally, more than 600 million people are at risk of infection, particularly those who engage in daily activities involving contaminated water in areas infested with snails (Odeniran, Omolabi & Ademola, 2020). Urinary schistosomiasis, a chronic condition caused by the digenetic trematode *Schistosoma haematobium*, continues to be a major public health concern (Balogun, Adewale, Balogun, Lawan, Haladu, Dogara, Aminu, Caffrey, De Koning, Watanabe & Balogun, 2022). The disease is transmitted through a snail intermediate host, specifically an aquatic pulmonate from the family Planorbidae (Usman, Adamu & Abdulhamid, 2019).

The rise in urinary schistosomiasis cases in sub-Saharan Africa has been linked to the expansion of water impoundment projects like irrigation and dam construction (Ezeh, Onyekwelu, Akinwale, Shan & Wei, 2019). Additionally, the spread of the disease is exacerbated by the lack of awareness among populations living in endemic areas (Boih, Okaka & Igetei, 2021). Urinary schistosomiasis remains one of the most common parasitic infections worldwide (Kone, Onifade & Dada, 2022).

In Nigeria, the disease is endemic (Ezeh *et al.*, 2019), with water-based activities and traditional agricultural practices contributing to its spread, as well as the distribution of snail vectors (Mereta *et al.*, 2023). Young boys and girls are particularly vulnerable due to their frequent contact with water bodies, as girls often fetch water for household use, while boys play in stagnant or flowing water (Dickin & Gabrielsson, 2023). In some regions, men who engage in fishing, irrigation, and water-fetching activities also experience a higher incidence of schistosomiasis, illustrating how cultural practices influence transmission rates (Balogun *et al.*, 2022). Globally, the lack of comprehensive data on disease distribution continues to hinder effective control efforts.

Previous studies, including those by Nelwan (2020) and Aruleba *et al.* (2019) have revealed that the parasite responsible for schistosomiasis has developed resistance to several commonly used drugs, such as Praziquantel, Oxaminiquine, and Metrifonate. These drugs are also known to cause various side effects, which can be harmful to patients' health. Given this, the present research focuses on investigating local herbs traditionally used by rural communities to treat schistosomiasis. The

study aims to analyze the plant extracts responsible for their therapeutic effects.

This research was designed to provide updated epidemiological data on schistosomiasis infections among school-aged children in endemic areas of Ogun State, Nigeria. The findings from this study are expected to complement existing baseline data on the epidemiology of the infection in Nigeria. Additionally, it seeks to explore alternative medicine therapies, specifically focusing on herbal medicine, as a potential treatment for schistosomiasis. This study, therefore, assessed schistosomiasis risk behaviours among primary school pupils and alternative medicine therapy in endemic areas of Ogun State, Nigeria.

2.0 Methods

The research design employed for this study was descriptive survey. A total sample of 600 pupils was randomly selected from 15 primary schools across three local government areas in Ogun State: Abeokuta North, Odeda, and Obafemi-Owode. From each local government, 200 pupils were chosen (40 from each school). Additionally, 30 traditional medicine practitioners were selected using the snowball sampling technique, along with 40 health officers from Ijoun communities in Yewa North, which includes Ijoun town, Ijaka Oke, and Ijaka Isale. One traditional medicine practitioner's referral led to another, creating a network of practitioners involved in schistosomiasis treatment.

Three key research instruments were used: the Pupils Schistosomiasis-Risk Behaviour Questionnaire (PSRBQ), which collected data on pupils' demographics, perceptions, knowledge of symptoms, water sources, transmission modes, and health implications of schistosomiasis; the Key Informant Interview Schedule (KIIS) for gathering ethno-medicinal information from traditional practitioners; and the Perception of Schistosomiasis High-Risk Behaviours among Pupils Questionnaire (PSHRBAPQ), which measured health officers' knowledge and perceptions of the disease and its high-risk behaviors in their communities.

The instruments were validated by experts in epidemiology, and a pilot study was conducted with non-participating pupils, teachers, and practitioners. Reliability was tested using Cronbach's alpha, with coefficients of 0.92 for PSRBQ, 0.89 for KIIS, and 0.92 for PSHRBAPQ, ensuring the instruments' reliability. Phytochemical analysis was conducted on herbs used in schistosomiasis treatment, following the

methods of Brian and Tunner (1975) and Evans (1996) to identify active ingredients; i.e. alkaloids, flavonoids, phenols, saponin, tannins, oxalate, and phytate.

3.0 Data analysis

The data obtained were analyzed using frequency counts, simple percentages and t-test statistics at 0.05 level of significance.

4.0 Results

It was observed that many of the pupils involved in the study exhibited behaviors that put them at risk for schistosomiasis. More than half (51.2%) of the pupils reported having contracted schistosomiasis prior to the study. The data also revealed that a significant number (76.2%) of the pupils regularly accompanied their parents to the farm, while 62.5% entered streams without wearing protective footwear. Additionally, 50.3% of the pupils admitted to drinking from streams on their way to the farm, and 55.3% urinated directly in the streams. A smaller group (28.8%) reported defecating in streams. Interestingly, 47% of the pupils had never encountered anyone with the disease before.

More so, a high proportion of the health officers (51.7%) identified streams and rivers as the primary water sources for the local community. They also noted that farming is the main occupation for 66.7% of the residents and that 61.6% of children in the community frequently go barefoot.

The findings reveal that 63.3% of health officers agreed that children in the community urinate indiscriminately in streams, while 58.3% noted that children regularly dip their feet into any available pool of water. Additionally, 63.3% observed that community members often drink directly from streams while traveling to and from the farm. Health officers' perceptions about children defecating in streams were 50%.

Regarding schistosomiasis, 57.1% of Traditional Health Practitioners believe there are two types of the disease, while 42.9% think there are three. All Traditional Medicine Practitioners identified blood in the urine (100%) and intestinal pain (14.29%) as symptoms of schistosomiasis, with some symptoms resembling those of gonorrhea. They identified the sources of infection as dog urine (57.14%) and streams or rivers (85.7%). Moreover, all Traditional Medicine Practitioners indicated that there are herbal treatments available for schistosomiasis, including *Cassia obtusifolia* (Epa Ikun) (71.43%), *Kigelia Africana* (Ewe Rorongbodo) (14.29%), *Momordica charantia* (Ewe Ejirin) (14.29%), and *Anthocleista djalonensis* (Itakun Sapo) (42.86%).

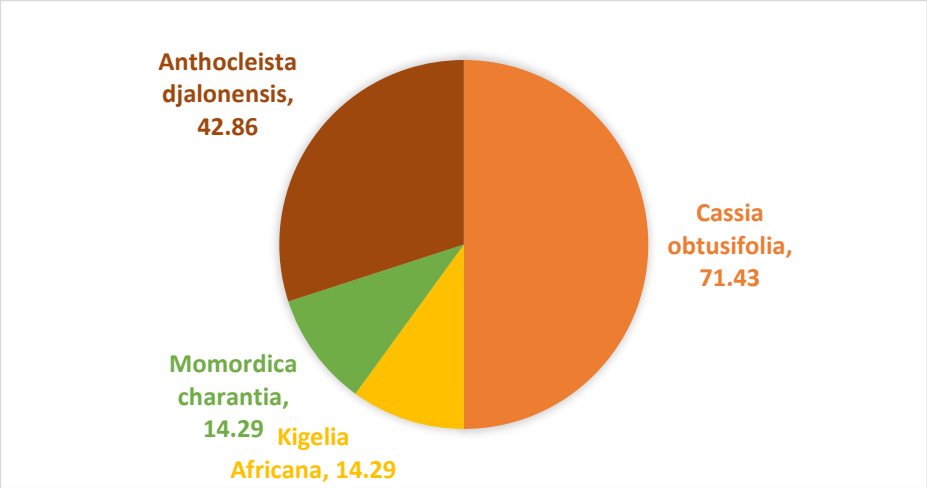

Figure 1: Herbs in use for schistosomiasis with percentage of respondents

Some of the respondents (57.14%) claimed the herbal treatment has no side effect while others (42.9%) claimed there are side effects and they include stooling and frequent urination. In addition, all the respondents asserted that herbal treatment takes one to two weeks and are readily available with traditional medicine practitioners. Eighty five percent (85%) of the respondents affirmed herbal treatment alone is sufficient to cure the infection while 14.3% affirmed it is not sufficient.

Table 1 indicates that a significant difference exists between male and female pupils on schistosomiasis risk-behaviours (t-value = -2.394; $p < .05$)

Table 1 T-test summary for gender difference in schistosomiasis risk-behaviours of pupils

	N	X	SD	Df	t-value	P value	Remarks
Male	292	4.85	1.99	598	-2.394	.017	Significant
Female	308	5.24	1.98				

Table 2 gives the phytochemical analysis of the medicinal plants used by traditional medicine practitioners in the treatment of schistosomiasis. It was observed that Phytate had the highest proportion across the three medicinal herbs.

Table 2 Phytochemical Analysis of Some Medicinal Plants used by Traditional Medicine Practitioners in the Treatment of Schistosomiasis (Aqueous extract)

S/N	Plant Samples	Tanin (%)	Saponin (%)	Alkaloids (%)	Flavonoid (%)	Phenol (%)	Phytate (%)	Oxalate (%)
1	*Momordica charantia* (Ejinrin)	1.42	5.08	1.56	4.72	1.22	7.62	4.56
2	*Anthocleista djalonensis* (Itakun Sapo)	2.38	7.23	4.38	10.24	3.14	12.24	8.45
3	*Cassia obtusifolia* (Epa Ikun)	2.26	12.35	1.28	8.57	3.52	16.25	3.59

5.0 Discussion

The findings of the study show that selected primary school pupils in Abeokuta North, Odeda and Obafemi-Owode local government engage in unhealthy lifestyle that promotes schistosomiasis infection. This finding aligns closely with earlier research by Nwachukwu, Nwoke, Ukaga, Ajero, and Nwachukwu (2018), which reported that school-aged students engage in high-risk

behaviors. Similarly, Markus and Bishop (2024) found that the highest infection rate (20%) occurred among children aged 18–19, with 12.1% and 5.6% infection rates among the 14-15 and 12-13 age groups, respectively. The study also revealed that junior secondary school students (10.4%) were more affected than those in senior secondary school (7.7%). Major risk factors included irrigation farming, swimming, fishing, and washing clothes in rivers, with painful urination and terminal haematuria being significant symptoms of the disease.

The findings also support health officers' claims that primary school pupils engage in behaviors that promote schistosomiasis infection, which could have important implications for treatment strategies. The health officers' assertions are likely based on their extensive experience providing healthcare services in these communities. Many of these practitioners live within the communities themselves, giving them a deep understanding of the habits and behaviors of the local population.

However, the responses from traditional health practitioners suggest a misunderstanding regarding the identity of schistosomiasis. These practitioners, who primarily speak Yoruba, associate the term *Atosi* with schistosomiasis. To them, *Atosi* refers to two or three different ailments, which in English are interpreted as schistosomiasis and gonorrhea. This indicates a limited understanding of the disease's specific nature.

The observed significant difference in schistosomiasis risk behaviors between male and female pupils supports the notion that the infection is more prevalent among males. This finding is consistent with earlier research by Ayabina, Clark, Baylay, Lamberton, Toor, and Hollingsworth (2021), which reported that while differences in infection rates between males and females exist, only 41% of cases for *S. mansoni* and 34% for *S. haematobium* were statistically significant. Similarly, differences in the intensity of infection between genders were only statistically significant in 27% of *S. haematobium* cases and 34% of *S. mansoni* cases.

Additionally, the phytochemical analysis of the medicinal herbs identified by traditional practitioners shows they contain phytate, saponin, flavonoid, tannin, alkaloids, phenol, and oxalate. The high concentration of phytate across these herbs may explain their effectiveness in treating schistosomiasis, as claimed by traditional medicine practitioners.

Notably, the role of phytate in schistosomiasis treatment has not been documented in previous studies, making this a potentially significant finding.

6.0 Conclusion

Given the findings of the study, it is obvious that unhealthy cultural behaviors among children, especially boys, contribute significantly to the prevalence of schistosomiasis in the identified endemic areas. However, it's encouraging to note that just like orthodox medicine, effective treatment and cures for this infection can also be found in medicinal herbal therapies.

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