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Prevalence of Soil-Transmitted Helminthiasis Among Public School Learners in City of San Fernando, La Union, Philippines

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Introduction

Soil-Transmitted Helminthiasis (STH) is a group of parasitic infections common in tropical and subtropical countries such as the Philippines. It is estimated that 300 million people in ASEAN countries are infected with intestinal helminths, specifically 126.7 million people infected with Ascaris lumbricoides, 115.3 million with Trichuris trichiura, and 77.0 million with hookworm species [1].

According to several factors such as widespread poverty, inadequate hygiene and sanitation, illiteracy, and malnutrition are associated with higher risk of contracting STH. This poses a particular health risk to school children in areas with insufficient resources [2].

The prevalence and intensity of Ascaris and Trichuris are seen greatest in children of five to 14 years old, classifying this age group as the most vulnerable and at significant risk for soil-transmitted helminthiasis [3]. Furthermore, 18.87% of the 5.3 billion people living in endemic areas of STH infection are projected to be school-aged children [4]. Despite being significantly debilitating, infections are typically overlooked and neglected as it tends to be under recorded and are overshadowed by more prominent diseases.

In the Philippines, the Department of Education (DepEd) in coordination with the Department of Health (DOH), through the DepEd order 10 series of 2016, is the government-based agency mandated to conduct preventive and therapeutic interventions on primary school children, including mass deworming campaign, vaccination, feeding programs, and other health education and promotion activities. Particularly, a nationwide school-based mass drug administration (MDA) is implemented biannually, in January and July. This initiative targets pre-elementary and grades 1 to 6 elementary students aged 6–12 years old in all public schools in the country.

The COVID-19 pandemic caused a significant disruption to the routine educational system. Educational institutions were forced to adopt a remote-type of learning modality as social interactions were restricted from 2020 to early 2022. This shift greatly interfered with the conduct of the school-based mass deworming programs as the responsibility has been momentarily transferred to the barangay health units. The compliance and utility by school children however has not been effectively monitored.

According to the World Health Organization, resurgence in STH infections is expected in view of the pandemic. As emphasized by an estimated 370 million children worldwide lost access to the school-based health education programs, which consequently constrained with their health benefits. Moreover, mathematical modelling showed that delays in MDA in high STH prevalence settings may mean that the 2030 target for STH elimination as a public health problem may not be achievable [5, 6].

Objective

The LORMA College of Medical Laboratory Science established a research partnership with the City Schools Division of the Department of Education and the City Health Office of the City of San Fernando, La Union. The study investigated the prevalence of soil-transmitted helminthiases among public school learners of the City. The study provided an accurate and up-to-date information regarding the status of parasitism among public school learners, fulfilling the previous gap in the health data. Lastly, the results of this study is important for health policy making and implementation [7-9].

Materials and Methods

A quantitative, descriptive, cross-sectional study is utilized for the study. The study covered all the thirty-three (33) public elementary and high schools in the City of San Fernando, La Union, Philippines. The study constitute schools on the city proper, far flung, mountainous, and near the beach. A total of 398 participants were enrolled to the study through stratified random

sampling method, of which 200, 131, and 57 were elementary, junior, and senior high school learners, respectively.

Participants are accepted regardless of their age and gender, but shall be voluntarily participating, enrolled during the School Year 2022 to 2023, and not be under an active anthelminthic therapy. The researchers utilized a modified Kato-Katz method to identify soil-transmitted helminths. The data was treated with the use of prevalence percentage and frequency and percentage formula. Prior the data collection, the researchers sought ethical approval from the LORMA Colleges Research Ethics Committee. Informed and parental consents were secured from all the participants, and permission were also obtained from the school principals and other administrators.

Results

Table 1: Prevalence rate among public school learners

NAME OF SCHOOL	TARGET FOR ELEM	NUMBER OF POSITIVE ELEM	NUMBER OF NEGATIVE ELEM	HELMINTHS SEEN AND REPORTING	TARGET FOR JHS	NUMBER OF POSITIVE JHS	NUMBER OF NEGATIVE JHS	HELMINTHS SEEN	TARGET FOR SHS	NUMBER OF POSITIVE SHS	NUMBER OF NEGATIVE SHS	HELMINTHS SEEN
Bangbangolan ES	2	0	2	None	0	0	0	None	0	0	0	None
Bangbangolan NHS	0	0	0	None	3	0	3	None	1	0	1	None
Baraoas ES	3	0	3	None	0	0	0	None	0	0	0	None
Bungro ES	4	0	4	None	0	0	0	None	0	0	0	None
Cadaclan ES	3	0	3	None	0	0	0	None	0	0	0	None
Canaoay ES	9	1	8	Trichuris trichiura	0	0	0	None	0	0	0	None
Catbangen ES	36	12	24	A. lumbricoides & T. trichiura	0	0	0	None	0	0	0	None
Dalangayan ES	3	0	3	None	0	0	0	None	0	0	0	None
Dalumpinas ES	3	1	2	Trichuris trichiura	0	0	0	None	0	0	0	None
[illegible] NHS	0	0	0	None	5	0	5	None	3	0	3	None
Ilocanos ES	15	[illegible]	4	A. lumbricoides & T. trichiura	0	0	0	None	0	0	0	None
La Union NHS	0	0	0	None	60	18	42	Ascaris lumbricoides, Trichuris trichiura	47	2	45	Ascaris lumbricoides, Trichuris trichiura
La Union NHS-Sacyud Annex	0	0	0	None	3	0	3	None	1	0	1	None
Lingsat IS	24	0	24	None	18	1	17	T. trichiura	5	1	4	T. trichiura
Mameltac ES	8	0	8	None	0	0	0	None	0	0	0	None
Masicong ES	2	0	2	None	0	0	0	None	0	0	0	None
[illegible] IS	1	1	0	Strongyloides stercoralis	2	1	1	Fasciola hepatica	1	1	0	Ascaris lumbricoides
Pagudpud IS	11	0	11	None	6	0	6	None	1	0	1	None
Pao ES	2	0	2	None	0	0	0	None	0	0	0	None
Pao NHS	0	0	0	None	1	0	1	None	1	1	0	None
Parparoroc ES	1	0	1	None	0	0	0	None	0	0	0	None
[illegible] ES	1	0	1	None	0	0	0	None	0	0	0	None
Sacyud ES	2	0	2	None	0	0	0	None	0	0	0	None
Sagayad ES	4	0	4	None	0	0	0	None	0	0	0	None
San Agustin ES	12	[illegible]	3	T. trichiura & A. lumbricoides	0	0	0	None	0	0	0	None
San Fernando City NHS	0	0	0	None	8	0	8	None	1	0	1	None
San Fernando CSPEDS	2	0	2	None	1	0	1	None	1	0	1	None
San Fernando North CS	17	3	14	T. trichiura & A. lumbricoides	0	0	0	None	0	0	0	None
San Fernando South CS	[illegible]	[illegible]	17	T. trichiura	24	0	24	None	4	0	4	None
Santiago ES	7	0	7	None	0	0	0	None	0	0	0	None
Sevilla ES	8	2	6	T. trichiura & A. lumbricoides	0	0	0	None	0	0	0	None
Siboan-Otong IS	2	0	2	None	1	0	1	None	1	0	1	None
[illegible] ES	3	0	3	None	0	0	0	None	0	0	0	None
	200	27	[illegible]		131	20	111		57	[illegible]	[illegible]	

% of Positive in Elem	13.50%	% of Positive in JHS	15.27%	% of Positive in SHS	7.64%
% of Negative in Elem	86.50%	% of Negative in JHS	84.73%	% of Negative in SHS	92.36%

Among elementary schools, the percentage of positive cases is relatively low at 13.50%, with the majority (86.50%) testing negative. The most frequently identified helminths include Ascaris lumbricoides, and Trichuris trichiura, though many schools report no infections.

Junior high schools display a similar trend, with 15.27% testing positive and 84.73% negative, while identified helminths are less diverse, including only a few cases of Ascaris lumbricoides and Trichuris trichiura.

Senior high schools have the lowest percentage of positive cases, with only 7.64% testing positive and 92.36% negative, suggesting improved hygiene or lesser exposure to risk factors at this level.

Discussion

Notably, soil-transmitted helminthiasis are either absent or minimally reported across the public schools in the City of San Fernando, La Union. However, schools with higher positive cases may require targeted health interventions.

To address the prevalence of helminth infections, the researchers recommend to strengthen biannual mass deworming programs in schools, especially those with higher positive cases. Alongside this, schools should implement health education initiatives to teach students proper hygiene practices, such as handwashing, safe food handling, and the importance of using clean toilets, to reduce exposure to helminths. Regular health monitoring and more detailed reporting systems should be established to track trends and evaluate the effectiveness of interventions.

Additionally, collaboration with local government units and communities is essential to improve access to clean water, sanitation, and hygiene infrastructure in schools and surrounding areas. Engaging parents and community members in health and sanitation awareness campaigns can help create a supportive environment to minimize transmission. These efforts, combined with targeted health interventions for high-risk schools, can significantly reduce helminth infections and improve the overall health and well-being of students.

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