

Original Research Article

Correlates of the Prevalence of Soil Transmitted Helminth (STH) Infection among Selected Students of Cataggaman National High School, Tuguegarao City

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Abstract: Soil-transmitted Helminth (STH) infections are one of the causes of morbidity among high school students. This study was aimed to assess the prevalence as well as the correlates of the prevalence of STH infection among selected high school students of Cataggaman National High School, Tuguegarao City. Sixty-two high school students from Cataggaman National High School were randomly selected. Direct fecal smear and Kato-Katz technique testing of stool samples elucidated the prevalence of ascariasis and trichuriasis in high school students. Data such as socio-demographic, water source, environmental sanitation, and personal hygiene were collected to better understand the correlation of these factors with STH infection. Educational attainment of the father and water storage correlated significantly positive ($p < 0.05$) with STH infection. All of these findings indicate further that a good sanitation is associated with a reduced risk of transmission of helminthiasis to high school students. Identifying factors that contribute to the dynamics of STH transmission in vulnerable groups can help plan for effective prevention strategies.

Keywords: *Ascaris lumbricoides*, Hookworm, Parasite, Parasitic infection, Sanitation, Socioeconomic status.

INTRODUCTION

Soil-transmitted Helminth (STH) infections are among the most common infections worldwide, and the global diseases burden caused by common STHs, estimates about 39 million disability-adjusted life years which pose a serious concern.

The Philippines is one of the countries at risk of having a high prevalence of STH infection. One of the possible reasons that can be attributed to such is that a lot of areas in the Philippines are prone to flooding. Also, it has been known that STH infection is a risk brought about by flooding vis-à-vis poor sanitation [1]. In the Philippines, the three major causes of intestinal parasitism are infections due to *Ascaris lumbricoides*, *Trichuris trichiura*, and species of hookworms (Department of Health Philippines).

A lot of factors are deemed to be contributory in the prevalence of such infection, and these factors are said to be predominant in tropical countries [2].

STHs are transmitted through eggs present in infected human feces, which thereby possibly contaminate the soil, especially in places with inadequate sanitation. High school students living in such environment are especially vulnerable to STH infections, such as Ascariasis and Trichuriasis, since the agents of the latter infections are said to have increased activity in potentially infective environment and lack of

appropriate sanitary behavior [3]. This therefore changed the perspective of the researcher in terms of the threats that STH infections bring. As such, the researcher of this study thought of some factors that could contribute to the prevalence of STH infection.

Socio-economic, behavioral, and environmental factors are always a part of the health system. These factors directly or indirectly affect the infestation of STH and other parasites. In the same way, the prevalence of STH infection can also become a key determinant of a country's health and hygiene status.

Department of Health deworming program annually caters limited scope, which is favorable to elementary and grade 7 students only.

In this study therefore, the researcher hoped to generate an idea about the prevalence rate of STH infection among selected students of Cataggaman National High School, Tuguegarao City, as well as to correlate this with the socio-economic variables that could precipitate the process or spread of STH infection.

MATERIALS AND METHODS

The data gathering instruments utilized is questionnaires and interviews. The procedural methods used in the analysis of stool samples are Direct Fecal Smear (DFS) and Kato-Katz. A light compound

microscope was utilized in observing the specimen, and a Canon Digital Single-lens Reflex (DSLR) Camera was utilized to take the photos of the ova. For proper identification of the ova, the Textbook of Medical Parasitology by Belizario and de Leon (2004) as well as Merckell and Vogue's Medical Parasitology (1999) were used as reference materials. The researcher conducted the collection and analysis for about two (2) months. The researcher obtained between one and two stool samples on consecutive days from those participants who provided at least one sample. Participants were asked to provide one stool sample (first morning) before entering to school per day for two (2) consecutive days. Each participant provided between one and two stool samples. If a participant provided a stool sample on one of the two days but was unable for any reason to provide stool samples on other days, that person was considered as a stool sample provider. The estimates of sensitivity and specificity of the Kato-Katz technique to detect STH infection based on examination of one (1) day stool sample will be different from the estimates of sensitivity and specificity of the technique to detect STH infection based on examination of two (2) days or three (3) days stool samples due to day-to-day variation in STH egg output. To estimate the sensitivities and specificities of the Kato-Katz stool examination technique when one, two or three stool samples are available from each participant, the researcher adapted the method to accommodate multiple samples and used previously in the analyses of *S. japonicum* in animals.

Examination of several stool specimens collected over consecutive days is recommended to improve the sensitivity of the test, repeat in two (2) or three (3) days. Repeat for a total of two (2) to three (3) times within seven (7) to ten (10) days; if no parasites are seen after two (2) to three (3) examinations it is likely the animal is not infected.

Research Design

This study is of a descriptive type of research that deals on determining the prevalence of soil-transmitted helminth infection among the selected students of Cataggaman National High School, and on finding the correlates of the prevalence of STH infection. A point-prevalence survey was used in this study. In selecting the subjects of the study, purposive sampling method was used. Descriptive survey methods in gathering the data regarding the student's profile were used.

Respondents/ Subjects of the Study

A number of sixty two (62) students per year level, a total of six hundred seventy four (674) students, who are beneficiaries for the current year, were targeted as respondents for stool examinations.

Data Gathering Procedure

For the gathering of data, the following procedures were followed:

1. A letter was given to the head of school division to ask for assistance in conducting the research.
2. Another letter was given to the school principal and barangay captain in Cataggaman, Tuguegarao City concerning the conduct of interviews and health education to the students.
3. Upon approval sixty-three (63) students were randomly selected per year level.
4. The questionnaires were distributed to the respondents and one hundred forty three (143) were retrieved.
5. Students and Parents were interviewed.
6. Consent Letters were distributed to the one hundred forty three (143) students and retrieved after. Only seventy eight (78) of them responded.
7. Fecal Sampling was done (6:30) in the morning for two consecutive days per year level.

Fecal Sampling and Analysis

For a routine examination of parasites, a minimum of two (2) fecal specimens is recommended. Many organisms do not appear in fecal specimens in consistent numbers on a daily basis; thus collection of specimen on alternate days tends to yield a higher percentage of positive findings.

The time of specimen collection must be recorded. Liquid specimens must be examined within thirty (30) minutes of passage or the specimen should be placed on a polyvinyl alcohol (PVA) fixative or another suitable preservative. Semi-formed or soft specimen must be examined within one (1) hour of passage; if it is not possible, the stool material must be preserved. It is recommended that all passed specimen on that day must be examined on the same day. If the time limits cannot be met, portions of the sample should be preserved. Specimens should not be held at room temperature but should be refrigerated at 3 to 4 degrees Celsius and stored in closed containers to prevent desiccation. At this temperature, eggs, protozoan cyst and larvae remain viable for several days. Fecal specimens should not be incubated or frozen before examination.

For the analysis of fecal samples, (a) Direct Fecal Smear technique, (b) Kato Katz technique were used, and the following procedures were based in the Philippine Textbook of Medical Parasitology (2nd Edition):

(a). Direct Fecal Smear

This method is performed best for the diagnosis of common helminth infections, especially in combination with Kato-Katz technique for the diagnosis of protozoa, both trophozoites and cysts.

1. A small amount of fecal sample was mixed with a saline solution.
2. The mixture was placed on a slide, and overlaid with a cover glass.
3. The entire smear was examined under a microscope with a low power objective, and then with a high power objective.
4. The specimen was observed for helminth eggs and larvae.
5. Pictures of STH eggs were taken using a camera.
6. Presence of STH eggs was identified and verified with the assistance of parasitology experts.

(b).Kato Katz Technique

1. A small amount of fecal material was placed on newspaper or scrap paper and a piece of nylon screen was pressed on top so that some of the feces sieved through the screen and accumulated on top.
2. A flat-sided spatula was scraped across the upper surface of the screen to collect the sieved feces.
3. A template was placed on the slide and the sieved feces were added with the spatula so that the hole in the template was completely filled. The spatula was passed over the filled template to remove excess feces from the edge of the hole.
4. The template was removed carefully so that a cylinder of feces was left on the slide. The fecal material was covered with a pre-soaked cellophane strip.
5. The slide was inverted and the fecal sample was pressed firmly against the hydrophilic cellophane strip to spread evenly. The slide was placed on the bench with cellophane upwards to enable the evaporation of water while glycerol cleared the feces.
6. Observe the specimen using microscope.
7. Pictures of the STH eggs were taken using a camera.
8. Presence of STH eggs was identified and verified with the assistance of parasitology experts.

Data Analysis

Descriptive statistics (frequency, cumulative frequency, and percentages) were used to characterize the study population. Pearson’s Correlation Coefficient was used to test the associations of STH infection prevalence with demographic, socio-economic, environmental and behavioral factors. The level of significance of 0.05 was used for all the statistical tests. The variables that showed association with p-value ≤ 0.20 in the univariate analysis were used to develop a multivariate logistic regression model.

RESULTS AND DISCUSSION

PROFILE OF THE STUDY RESPONDENTS

The profile of the study respondents consists of their socio-demography, environmental sanitation, and personal hygiene. The distribution of the family size of the respondents is shown in Table 1. It shows that respondents (N=62), respondents with five (5) to

six (6) members have the highest percentage (38.7%). Out of this proportion fourteen (14) respondents tested positive, on the other hand respondents with 37.1%, in which nine (9) respondents tested are positive; respondents with three (3)to four(4) members has a percentage of 24.2%, in which five (5)respondents tested are positive(Shown in Table 15).

Table 1. Frequency and Percentage Distribution of respondents when grouped according to Family size.

Family Size	Frequency	Percentage (%)
3-4 Members	23	37.1
5-6 Members	24	38.7
6 or more Members	15	24.2
Total	62	100.0

The distribution of the source of income of the respondents is shown in table 2. It shows that among the respondents (N=62), respondents with the blue collar job has (company driver, tricycle driver, welder, carpenter , and tailor) as a source of income has the highest percentage of 80.6% in which twenty- four(24) respondents tested are positive, followed by government employees with 8.1% in which one (1) respondent tested is positive, businessmen with 6.5% in which one (1) respondent tested is positive, and self-employed respondents with 4.8% in which two (2) respondents tested are positive (Shown in Table 16.)

Table 2. Frequency and Percentage Distribution of respondents when grouped according to Source of Income.

Source of Income	Frequency	Percentage (%)
Blue-Collar	50	80.6
Government Employees	5	8.1
Businessmen	4	6.5
Self-employed	3	4.8
Total	62	100.0

The distribution of the educational attainment of mother of the respondents is shown in Table 3. It shows that among the respondents who finished high school has the highest percentage with 35.5%, in which eleven (11) respondents tested are positive, followed by high school level but did not graduate with 22.6%, in which eight (8) respondents tested are positive; college level but did not graduate with 11.3%, in which one (1) respondent tested is positive; elementary graduate with 9.7%, in which three (3) respondents tested are positives; elementary level but did not graduate with 8.1%, in which three (3) tested are positive; college graduate and vocational have 6.5%, in which one(1) respondent tested is positive (Shown in Table 17).

Table 3. Frequency and Percentage Distribution of respondents when grouped according to Educational Attainment of Mother.

	Frequency	Percentage (%)
Elementary Level	5	8.1
Elementary Graduate	6	9.7
High School Level	14	22.6
High School Graduate	22	35.5
Vocational/Technical	4	6.5
College Level	7	11.3
College Graduate	4	6.5
Total	62	100.0

The distribution of the educational of attainment of father of the respondents is shown in table 4. It shows that among the respondents (N=62), fathers who reached high school has the highest percentage of 37.1%, in which eight (8) tested positive. This followed by high school level but did not graduate with 21%, in which nine (9) tested positive; elementary graduate with 12.9%, in which seven (7) tested positive; college level but did not graduate with 9.7%, in which zero (0) positive; elementary level and college graduate have 8.1%, in which college graduate has one (1) tested positive, and elementary level has three (3) tested positive (Shown in Table 18)

Table 4. Frequency and Percentage Distribution of respondents when grouped according to Educational Attainment of Father.

	Frequency	Percentage (%)
Elementary Level	5	8.1
Elementary Graduate	8	12.9
High School Level	13	21.0
High School Graduate	23	37.1
Vocational/Technical	2	3.2
College Level	6	9.7
College Graduate	5	8.1
Total	62	100.0

The distribution of the respondents when grouped according to garbage disposal is shown in Table 5. This shows that garbage that is collected has the highest percentage with 72.6%, in which seventeen (17) tested positive. This followed by burning of garbage with 14.5%, in which six (6) tested positive; waste segregation with 9.7%, in which three (3) tested positive; and lastly respondents with "others" with 3.2%, in which two (2) tested positive (Shown in Table 19).

Table 5. Frequency and Percentage Distribution of respondents when grouped according to Garbage Disposal.

	Frequency	Percentage (%)
Collected	45	72.6
Waste Segregation	6	9.7
Feeding to Animals	0	0
Open-Dumping	0	0
Burning	9	14.5
Throw in the River/Canal	0	0
Others	2	3.2
Total	62	100.0

The distribution of respondents when grouped according to waste disposal is shown in Table 6. This shows that wastes that are disposed through flushing have the highest percentage with 48.4%, in which ten (10) tested positive. This followed by pit disposal with 30.6% in which twelve (12) tested are positive; followed by wrap and throw disposal with 21%, in which six (6) tested positive (Shown in Table 20).

Table 6. Frequency and Percentage Distribution of respondents when grouped according to Waste Disposal.

	Frequency	Percentage (%)
Flushed	30	48.4
Wrap and Throw	13	21.0
Pit	19	30.6
Total	62	100.0

The distribution of respondents when grouped according to drainage system is shown in Table 7. It shows that closed system has the highest percentage with 91.1%, in which twenty-five (25) tested positive. This followed by open system with 8.1%, in which three (3) tested positive (Shown in Table 21).

Table 7. Frequency and Percentage Distribution of respondents when grouped according to Drainage System.

	Frequency	Percentage (%)
Open	5	8.1
Closed	57	91.9
Total	62	100.0

The distribution of the respondents grouped according to water source is shown in Table 8. It shows that respondents utilizes water from refilling station has the highest percentage with 61.3%, in fourteen (14) tested positive. This followed by pump well with 21.3%, in which six (6) tested positive; pied water with 12.9%, in which five (5) tested positive; and open-well with 4.8%, in which three (3) tested positive (Shown in Table 22).

Table 8. Frequency and Percentage Distribution of respondents when grouped according to Water Source.

	Frequency	Percentage (%)
Open-well	3	4.8
Piped water	8	12.9
River Water	0	0
Pump well	13	21.3
Spring Water	0	0
Refilling Station	38	61.3
Total	62	100.0

The distribution of the respondent grouped according to water storage shown in Table 9. It shows that unrefrigerated but covered water has the highest percentage with 71%, in which twenty-five (25) tested positive. This followed by refrigerated and covered water with 29%, in which three (3) tested positive (Shown in Table 23).

Table 9. Frequency and Percentage Distribution of respondents when grouped according to Water Storage.

	Frequency	Percentage (%)
Refrigerated, Covered	18	29.0
Refrigerated, Uncovered	0	0
Unrefrigerated, Covered	44	71.0
Unrefrigerated, Uncovered	0	0
Total	62	100.0

The distribution of the respondent grouped according to food storage shown in Table 10. It shows that covered food has the highest percentage with 77.4%, in which twenty-three (23) tested positive. This followed by refrigerated and covered with 21%, in which five (5) tested positive; refrigerated but uncovered with 1.6% in which zero (0) tested positive (Shown in Table 24).

Table 10. Frequency and Percentage Distribution of respondents when grouped according to Food Storage.

	Frequency	Percentage (%)
Refrigerated, Covered	13	21.0
Refrigerated, Uncovered	1	1.6
Uncovered	0	0
Covered	48	77.4
Total	62	100.0

The percentage distribution of the respondents grouped according to Personal hygiene shown in Table

11. It shows that among the respondents (N=62), 88.7% rated the personal hygiene as Very Good, in which twenty-five (25) tested positive; 11.3% rated Good, in which three (3) tested positive (Shown in table 25.).

Table 11. Frequency and Percentage Distribution of respondents when grouped according to Personal Hygiene.

	Frequency	Percentage (%)
Good	7	11.3
Very Good	55	88.7
Poor	0	0
Total	62	100.0

Table 12. Extent of the prevalence of soil-transmitted helminth infections among selected students of Cataggaman National High School according to Kato-Katz.

	Frequency	Percentage (%)
Positive	28	45.2
Negative	34	54.8
Total	62	100.0

Table 13. Extent of the prevalence of soil-transmitted helminth infections among selected students of Cataggaman National High School according to Direct Fecal Smear.

	Frequency	Percentage (%)
Positive	23	37.1
Negative	39	62.9
Total	62	100.0

The number of parasites seen in the stools examined is seen in Table 14. It shows that only roundworm (*Ascaris lumbricoides*) and whipworm (*Trichuristrichiuria*) were observed to be present in the stool samples. Roundworm (*Ascaris lumbricoides*) has a higher in number than whipworm (*Trichuristrichiuria*). No hookworms were found in the stool samples examined. This is unusual because in other parts of the world, roundworm and hookworm infections are more common than trichuriasis [4].

Table 14. Extent of the prevalence of soil-transmitted helminth infections among selected students of Cataggaman National High School according to Parasites.

	Kato-Katz	DFS
Roundworm	17	15
Whipworm	11	8
Hookworm	0	0
Total	28	23

The absence of hookworm infection in this study may be due to the fact that the study population was on the average younger in age [5]. Also, based on the survey and interviews conducted by the researchers,

it was noted that only a few parents had occupations that are in line with agriculture. This factor could have affected the occurrence of hookworm infection since

higher prevalence rate of hookworm infection is seen in family heads whose occupation is in line with agriculture).

Table 15. Extent of the prevalence of soil-transmitted helminth infections among selected students of Cataggaman National High School according to Family Size.

			Family Size			Total
			3-4 Members	5-6 Members	6 or more members	
KATO-KATZ	Positive	Count	9	14	5	28
		% within Family Size	39.1%	58.3%	33.3%	45.2%
	Negative	Count	14	10	10	34
		% within Family Size	60.9%	41.7%	66.7%	54.8%
	Total	Count	23	24	15	62
		% within Family Size	100.0%	100.0%	100.0%	100.0%

Table 16. Extent of the prevalence of soil-transmitted helminth infections among selected students of Cataggaman National High School according to source of income.

			Source Income				Total
			Blue-collar jobs	Government Employees	Businessmen	Self-employed	
KAT O-KATZ	Positive	Count	24	1	1	2	28
		% within Source Income	48.0%	20.0%	25.0%	66.7%	45.2%
	Negative	Count	26	4	3	1	34
		% within Source Income	52.0%	80.0%	75.0%	33.3%	54.8%
	Total	Count	50	5	4	3	62
		% within Source Income	100.0%	100.0%	100.0%	100%	100%

Table 17. Extent of the prevalence of soil-transmitted helminth infections among selected students of Cataggaman National High School according to educational attainment of mother.

			EDUCATIONAL ATTAINMENT							TOTAL
			01	02	03	04	05	06	07	
KAT O-KATZ	Positive	Count	3	3	8	11	1	1	1	28
		% within Education Attainment of mother	60%	50%	57.1%	50%	25%	14.3%	25%	45.2%
	Negative	Count	2	3	6	11	3	6	3	34
		% within education attainment of mother	40%	50%	42.9%	50%	75%	85.7%	75%	54.8%
	Total	Count	5	6	14	22	4	7	4	62
		% within education attainment of mother	100%	100%	100%	100%	100%	100%	100%	100%

*01=Elementary Level; *02= Elementary Graduate; *03= High School Level; *04= High School Graduate; *05= Vocational/Technical; *06= College Level; *07=College Graduate

Table 18. Extent of the prevalence of soil-transmitted helminth infections among selected students of Cataggaman National High School according to educational attainment of father.

			Educational attainment of father							Total
			01	02	03	04	05	06	07	
K A T O - K A T Z	Positive	Count	3	7	9	8	0	0	1	28
		% within educational attainment of father	60%	87.5%	69.2%	34.8%	0%	0%	20%	45.2%
	Negative	Count	2	1	4	15	2	6	4	34
		% within educational attainment of father	40%	12.5%	30.8%	65.2%	100%	100%	80%	54.8%
	Total	Count	5	8	13	23	2	6	5	62
		% within educational attainment of father	100%	100%	100%	100%	100%	100%	100%	100%

*01=Elementary Level; *02= Elementary Graduate; *03= High School Level; *04= High School Graduate; *05= Vocational/Technical; *06= College Level; *07=College Graduate

Table 19. Extent of the prevalence of soil-transmitted helminth infections among selected students of Cataggaman National High School according to garbage disposal.

			Garbage disposal				
			Collected	Waste Segregation	Burning	Others	Total
KATO - KATZ	Positive	Count	17	3	6	2	28
		% within garbage disposal	37.8%	50%	66.7%	100%	45.2%
	Negative	Count	28	3	3	0	34
		% within garbage disposal	62.2%	50%	33.3%	0%	54.8%
	Total	Count	45	6	9	2	62
		% within garbage disposal	100%	100%	100%	100%	100%

Table 20. Extent of the prevalence of soil-transmitted helminth infections among selected students of Cataggaman High School according to waste disposal.

			Waste disposal			
			Flushed	Wrap and throw	Pit	Total
KATO-KATZ	Positive	Count	10	6	12	28
		% within waste disposal	33.3%	46.2%	63.2%	45.25%
	Negative	Count	20	7	7	34
		% within waste disposal	66.7%	58.3%	36.8%	54.8%
	Total	Count	30	13	19	62
		% within waste disposal	100.0%	100.0%	100.0%	100.0%

Table 21. Extent of the prevalence of soil-transmitted helminth infections among selected students of Cataggaman High School according to drainage system.

			Drainage system		
			Open	Closed	Total
KATO-KATZ	Positive	Count	3	25	28
		% within drainage system	60.0%	43.9%	45.2%
	Negative	Count	2	32	34
		% within drainage system	40.0%	56.1%	54.8%
	Total	Count	5	57	62
		% within drainage system ³	100.0%	100.0%	100.0%

Table 22. Extent of the prevalence of soil-transmitted helminth infections among selected students of Cataggaman National High School according to water source.

			Water source				Total
			Open-well	Piped water	Pump well	Refilling station	
KATO-KATZ	Positive	Count	3	5	6	14	28
		% within water source	100.0%	62.5%	46.2%	36.8%	45.2%
	Negative	Count	0	3	7	24	34
		% within water source	0.0%	37.5%	53.8%	63.2%	54.8%
	Total	Count	3	8	13	38	62
		% within water source	100.0%	100.0%	100.0%	100.0%	100.0%

Table 23. Extent of the prevalence of soil-transmitted helminth infections among selected students of Cataggaman National High School according to water storage.

			Water storage			Total
			Covered and refrigerated	Covered but unrefrigerated		
KATO-KATZ	Positive	Count	3	25		28
		% within water storage	16.7%	56.8%		45.2%
	Negative	Count	15	19		34
		% within water storage	83.3%	43.2%		54.8%
	Total	Count	18	44		62
		% within water storage	100.0%	100.0%		100.0%

Table 24. Extent of the prevalence of soil-transmitted helminth infections among selected students of Cataggaman National School according to food storage.

			Food storage			Total
			Covered and refrigerated	Uncovered but refrigerated	Covered	
K A T O - K A T Z	Positive	Count	5	0	23	28
		% within food storage	38.5%	0.0%	47.9%	45.2%
	Negative	Count	8	1	25	34
		% within food storage	61.5%	100.0%	52.1%	54.8%
	Total	Count	13	1	48	62
		% within food storage	100.0%	100.0%	100.0%	100.0%

Table 25. Extent of the prevalence of soil-transmitted helminth infections among selected students of Cataggaman National High School according to personal hygiene.

			Personal hygiene		
			Good	Very good	Total
KATO-KATZ	Positive	Count	3	25	28
		% within personal hygiene	42.95	45.5%	45.2%
	Negative	Count	4	30	34
		% within personal hygiene	57.1%	54.5%	54.8%
	Total	Count	7	55	62
		% within personal hygiene	100.0%	100.0%	100.0%

The present study also assessed the correlates of the prevalence of Soil Transmitted Helminth infections among selected high school students of Cataggaman National High School. Table 26 shows that among the categorical values, two variables show significant correlation with the prevalence of Soil

Transmitted Helminth Infection and that this significant association was obtained using Pearson Chi-Square test (χ^2). The father’s educational attainment and water source had a more positive correlation which tends to the prevalence of Soil Transmitted Helminth Infection. All other factors had a negligible correlation.

Table 26. Significant relationship between the profile of the subjects and the presence of Soil Transmitted Helminthes.

Variables	X ²	P-value	Decision
Family size	2.866	0.239	NS
Source of income	2.658	0.447	NS
Educational attainment of mother	5.528	0.478	NS
Educational attainment of father	18.143	0.006	S
Garbage disposal	5.157	0.161	NS
Waste disposal	4.185	0.123	NS
Drainage	0.484	0.487	NS
Water source	5.681	0.128	NS
Water storage	8.315	0.004	S
Food storage	1.206	0.547	NS
Personal hygiene	0.017	0.897	NS

*NS= Not significant; *S= Significant
*Correlation is significant at 0.05 levels.

CONCLUSION

Through Pearson correlation coefficient, two correlates were found to be significant ($p < 0.05$). These correlates were educational attainment of father and water storage. Despite being in a flood-prone area, the findings reveal that there is a good environmental sanitation behavior among high school students of Cataggaman National High School, Tuguegarao City.

The findings of the study therefore divulge that a good sanitation is associated with a reduced risk of transmission of helminthiasis to high school students. Hence, access to improved sanitation as well as health education should be prioritized alongside preventive chemotherapy in order to achieve a durable reduction of the burden of STH infection among high school students of flood-prone barangay.

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