Influent Factor toward Based Helminth Infections among of Thai-Cambodian Border in Phusing District, Sisaket Province, Thailand

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Abstract
This cross-sectional study aimed to determine a) prevalence of helminth infection among pupils along six target Thai –Cambodian border primary schools in Phu Sing District, Sisaket Province via FECT under universal parasitology, and b) the influent factors via constructed questionnaire. Three hundred subjects were allocated sampling size under Taro Yamane formula within stratified simple random sampling based for each school. The meeting among pupils' parents and the local units of school-related and public health was formed for congruence and consent. Each pupil was provided Standard FECT while 125 items questionnaire, under five experts with a reliability range between 0.80-0.95 formulas of Kr 20 and Cronbach alpha, were conducted as well. Descriptive statistics and stepwise multiple regression were applied. The results, respectively to the prevalence and influent factors, were as follows;
1) The infected cases were 11.66%. Among the prevalence, sequentially, comprised the hookworm (74.00 %), Trichuris triciura (17.00 %), Ascaris lumbricoides (6.00 %), and Opisthorchis viverrini (3.00 %). Noticeable for high percentage data mode comprised age in 8-9 years who's not attend boy scout regulation with wearing shoe uniform (77.10%), relevantly to, "not wearing shoes" (71.40%), family agricultural career (71.40%), majority of the Khmer ethnicity (71.40%), and unwell-cooked-food consuming (62.90%).
2) Five Statistically Significant influent factors were, respectively to Standardized Regression Coefficient (β), (i) Self-care for prevention practice (β= 0.834), (ii) Perceived its severity (β= -0.298), (iii) Attitudes (β= -0.245), (iv) Knowledge (β= -0.134), and (v)Recognizing the benefits (β= -0.081). Total predictive power was 85.60% (R2=0.856, p <0.05).
These results inter-supported each other leading to accountability. "Not wearing shoes" and "Not well-cooked food eating" was for this crisis. The helminth-infection prevention should be on target behavior-changing as its output with additional school base regulation within a spontaneous holistic approach among collaborated units from school, family, community, profession, and policy under the five significant concerns related to cultural uniqueness of ethnicity and countryside agricultural ways as well as geographical concerns. The usefulness is the challenge to the effective holistic intervention integrated with GIS-based on stakeholders' simultaneous collaboration within the concept of "One size will never fit all", especially in the distinctive areas.

Keywords: Soil-borne Helminth Infection, Prevalence, International -border, Pupils, Influent Factors

1. Introduction

Soil-borne helminth infection has remained a major public health problem worldwide for decades. Its victim- estimation shows 1.5 billion people or 24% of the global population (WHO, 2020) while 300 million people in ASEAN countries gained the same disease (Hotez et al., 2015). Wongsaroj (2014) claimed that 18.1% of the total Thai population in 2018 were approximately infected and confirmed that in 2014, infections were more commonly found in the Northeast area of Thailand.

The most important and common soil-borne parasitic helminth diseases are *Ascaris lumbricoides*, hookworm (*Necartor americanus* and *Ancyclostoma* spp.), and *Trichuris trichiura* (whipworm) (Vegvari et al., 2021). In the Northeast of Thailand, the main infections are liver fluke, while hookworms, whipworms, and *Trichuris trichiura* have been found in the South (Anantaphruti et al., 2000 and WHO, 2021). Parasitic infections are still an ongoing problem and are spread across all regions of the country, especially in rural areas. GIS was fruitful to apply in this professional area confirmable by a research title "Helminthiasis Prevalence Based on GIS along Thai-Cambodian border in Phusing District, Sisaket Province, Thailand" indicated that Parasitic infection was varied by regions and geographical concerns (Soncharoen et al., 2021).

Although related-helminths research on the Thai-Myanmar border area has been started in Northern Thailand, only one above is supported in the Thai-Cambodian border especially Sisaket province, the area of the lower Northeastern region, where there is the longest inter-border length. Besides Thai residents, the adjacent sides yield many ethnic minorities. In Laos, a high number of Khmer and Soih have been found along there, especially in the area of Chong Sang Ngam. The people inter-crossing forms immigration and smuggling to become expatriate workers. This shapes cultural diversity. Its cultural distinctiveness in such a rural area along with their poverty leads them into poor sanitation. Inadequate legal right allocation additionally attacks their quality of life as well as related-helminths infection.

The infection affects people who are in poor-low education. They have barriers to access technology in the situation of unhygienic lifestyle from their behavior and inappropriate sanitation. These highly involved in the prevention and control of communicable diseases including such infection. Focusing on pupil helminth infection, the main causes of infection were (i) health behavior/health habits such as washing hands ignorance before meal or after toilet time, (ii) insufficient rinsing to get rid of helminth-eggs contaminated vegetables. These as well as deteriorate sanitation were considerable for the transmission of soil-borne helminths (STH). Helminths life cycle flows along with soil-water agricultural norm which highly involve in their way of life and spreadable to other people easily. The main infections are liver fluke, while hookworms, whipworms, and *Trichuris trichiura* have been found in the South (Anantaphruti et al., 2000 and WHO, 2021). Different life cycle in different helminth types makes different regional helminths prevalence. People with such factor conditions are more vulnerable to helminth infections including in border schools. Its infection rate was 5.1%, which was divided between 3.01% of *Ascaris lumbricoides* and 1.03% *Trichuris trichiura* (Department of Disease Control, 2020).

Focusing the prevalence among children and teenagers over the past 5 years of 2014- 2018 was 10.1%, 7.1%, 9.8%, 8.34%, and 7.62 % respectively. The range of 7-10 % is stable and has no evidence of an upcoming declined tendency. These are important for school pupils who live along rural-tropical adjacent sides. The disease effects relate to malnutrition, anemia caused by insufficient protein intake (Sumbele et al., 2021), hybrid to lower brain functioning (Pabalan et al., 2018), and those subjects' physical development (Djuardi et al., 2021), and also to memory loss and slower learning (Brooker et al., 2008). Turning the point to hookworm, it was a direct and indirect cause of death in patients. They become pale, loss of protein and other nutrients (Sari et al., 2021) leading to heart disease and heart attacks. A single one consumes, averagely, 0.097 milliliters of blood per day (Keiser and Utzinger, 2008 and Sripa et al., 2011). Moreover, in the years 2020-2030, the World Health Organization has 75% indicator for goal setting in health care among pupils in preschool and schools comprising prevention, control, and treatment (WHO, 2020). Looking through Thai border schools, although the infection rate was 5.1%, 3.01% of *Ascaris lumbricoides* and 1.03%*Trichuris trichiura* (Department of Disease of Control M, 2020),their long-term effects were serious for the learning capacity, permanent health habits, and death 1.03% *Trichuris trichiura* (Department of Disease Control, 2020), their long-term effects were serious for the learning capacity, permanent health habits and death chances. They will be a key model in this affair in their own family, their community, and related others. The importance of this research was in the affairs on regular declined prevalent rate and the importance of this target group.

Considering the above problems, related campaigning in the former years has been focused on the prevention, STH incidence. Anyhow, its annual rate reveals continuously stable, especially in border areas including school pupils. Many studies, in border areas, showed the students' weakness in risk behavior and knowledge. The contemporary trend was hinted by the study of Sule et al., (2020) and Darlan et al., (2019).

It was also consistent with Akinsanya et al., (2021) who found that it was an important causative and risk factor for soil-transmitted helminth infections from the education level, knowledge, attitudes, and behaviors such as not washing hands before and after eating and defecation. Those who had helminth infections were not treated easily to spread the infection. The data showed that helminth infections transmitted through soil can be transmitted to people of various age groups, especially in rural communities and with poor sanitation. Therefore, the fruitfulness of this study, through accurate and comprehensive information, will be organizable for prevention and control in the specific area related to psycho-social views. The gained benefits will be in the hands of public health agencies in planning, controlling, preventing, and treating. Moreover, this health problems monitoring will improve the target pupils' quality of life influencing to regular incident rate of the total population/communities

2. Materials and Methods

The study tools included the questionnaire and a record form for helminth egg detection by direct simple smear, formalin-ethyl acetate concentration technique (FECT) (Sanprasert et al., 2016). The data were analyzed using descriptive and stepwise multiple regression analysis (Ghani and Ahmad, 2010).

2.1 Materials

FECT under universal parasitology was conducted. The specimen collection and the detection of helminth through soil were achieved through collaboration with school teachers and relevant agencies in the area to collect helminth eggs in the feces of the samples. A plastic jar was provided to the teacher for collecting feces from the sample group in the morning. Then the specimens were maintained at 4-8°C using an ice pack to store the specimen until they were taken to the laboratory. The plastic jar samples had written labels providing sequence number, name, last name, school name, and specimen collection date, the jars were submitted to inspectorate laboratory professionals for direct simple smear, and formalin-ethyl acetate test. They were checked for helminth eggs (based on structural morphology) under a light microscope at magnification 10x (Sanprasert et al., 2016).
Research Tools and Data Collection:

2.2 Tools

The questionnaire was constructed by 5 experts. It comprised 125 items questionnaire with 8 open-end questions for interviewing, two for each point of pupil, family, school, and community. The reliability range was between 0.80-0.95 under Kr 20 and Cronbach alpha formulas. The accountability of excreted qualitative data was under the congruence of ¾ among those 4 groups' perceptions. The questionnaire construction in details were as follows, respectively, a) a literature review, which has been reviewed face validity by five experts, b) After the improvement following those experts' comments, it was tried out with primary school pupils who have similar characteristics in the Chong Chom border crossing, Kap Choeng District, Surin Province Its location is the next left below to Sisaket province in the line of adjacent sides and c) Quantitative questionnaire quality was analyzed. They have perceived expectations for disease prevention practices (r=0.949), perceived barriers of practice prevention (r=0.954), attitude towards disease prevention (r=0.950), disease prevention practices (r= 0.886), and the knowledge of the herbal usage (r=0.832).

Data Collection: This cross-sectional analytical research aimed to study the prevalence and influent factors toward helminth infection among students in Thai-Cambodian border schools, Phu Sing District, Sisaket Province. Purposive sampling was applied sequentially to the first two steps while Taro Yamane formula was for sampling size allocation in the last one as follows:

1. Step for target province, the sequential criteria was the Thai-Cambodian border province in the northeast of Thailand, and the maximum border length of adjacent sides. It is Sisaket province in Thailand.

2. Step for target schools, the sequential criteria was primary schools, not more than 15 Kilometers away from the adjacent sides of Sisaket province. They were 6 primary schools in bureaucratic work line of Sisaket Primary Educational Service Area Office 1.

3. Step for target subjects, stratified simple random sampling was conducted.1208 registered pupils in the above 6 target schools were as population. 300 pupils were as sampling size using Taro Yamane formula followed by percentage stratification for sampling size in each school covering both genders. They were able to read and write Thai language, living with their parents or responsible caregivers for at least 6 months. Parents' consent was concretely focused. The 2 below sub-steps were revealed as:

3.1) Sampling size in total as total following taro Yamane formula (Israel, 1992):

$$n = \frac{N^2}{1 + Ne^2}$$

$$n = \frac{1208^2}{1 + 1208(0.05)^2}$$

$$n = 300$$

Equation 1

3.2) Sampling size in each school (Table 1)

Table 1 Sampling size allocation in details

Schools	Total Pupils	Sampling Size in Each School
1	222	55
2	231	57
3	197	49
4	212	53
5	187	46
6	159	40
Total schools=6 schools	Total pupils=1208	Total sampling subjects=300

The data was collected between Januarys – March, 2020.

2.3 Data Analysis

According to research tool quality analysis, KR 20 and Cornbrash Alpha were applied while research results data analysis were under descriptive statistics and stepwise multiple regression through a computer program (Ghani and Ahmad, 2010). Content analysis was for qualitative data analysis.

2.4 Research Approval

This research has been approved by the Human Research Ethics Committee of Mahasarakham University. (Approval No.146/2020) under formal parents' consent of primary school research subjects.

3. Results

Subjects' Information who got fecal was testing with positive helminth infection results from January - March 2020 were 27 as follows:

According to descriptive results, 11.66% of 300 students were infected. None have pure Thai ancestors (Khamer = 71.40 %, Lao = 20.00 % and Soih =8.60 %). Distribution mode as nine years old (min= 7,max=10) at 40.00 %, Getting former fecal examination at 65.70%, raw/not well-cooked animal meat eating at 62.90%, habitually disliked wearing shoes at 71.40 %, parents' education as primary school level at 40.00 %, Agriculture as the main career at 71.40 %. These are shown in Table 2.

Helminth types Infection results were found as Hookworms (74.00%), *Trichuris trichiura* (17.00 %), *Ascaris lumbricoides* (6.00%), and liver flukes (3.00 %) respectively, as shown in Table 3 and Figure 1. When classified by the school, it was found that the rate of helminth infection was as shown in Figure 2. Considering the attitude, the percentage among three attitude types was run to be ranked in the reverse direction from maximum frequency (mode) to its next lesser one. Attitude levels in all types (Self-health behavior, Effectiveness of formal health services was in the same result direction. Much agree level was the mode among the 3-attitude type, the next sequential lesser level comprised very much, not sure do not agree, and very much not agree. The ranking was reversed following percentage number, which showed the mind-imprinted level yielding the lesser rank, the more behavioral-changes influence.

Table 2: Socio-demographic characteristics of 35 children in a border primary school with soil-transmitted helminths

Variables	Infection of cases(n=35)	Infection Percent (%)
Gender		
Male	21	60.00
Female	14	40.00
Age (Year)		
7	7	20.00
8	13	37.10
9	14	40.00
10	1	2.90
Ethnicity		
Khmer	25	71.40
Laos	7	20.00
Soih	3	8.60
History of stool examination		
Ever	12	34.30
Never	23	65.70
Eating up-well cook food		
Yes	13	37.10
No	22	62.90
Own wear shoes		
Yes	10	28.60
No	25	71.40
Parent education level		
Uneducated		
Primary school	8	23.00
Junior high school	14	40.00
High school	7	20.00
Bachelor's degree	4	11.00
	2	6.00
Occupation of parent		
Agricultural	25	71.40
Self-employed	10	28.60
Household characteristic		
Woodhouse	16	45.70
Cement house	19	54.30

Table 3: Results of stool examinations (n=35)

Type of worm	Number of infection (n=35)	Infection rate (%)
Hookworm	26	74.00
Trichuris trichiura	6	17.00
Ascaris lumbricoides	2	6.00
Opisthorchis Viverrini	1	3.00

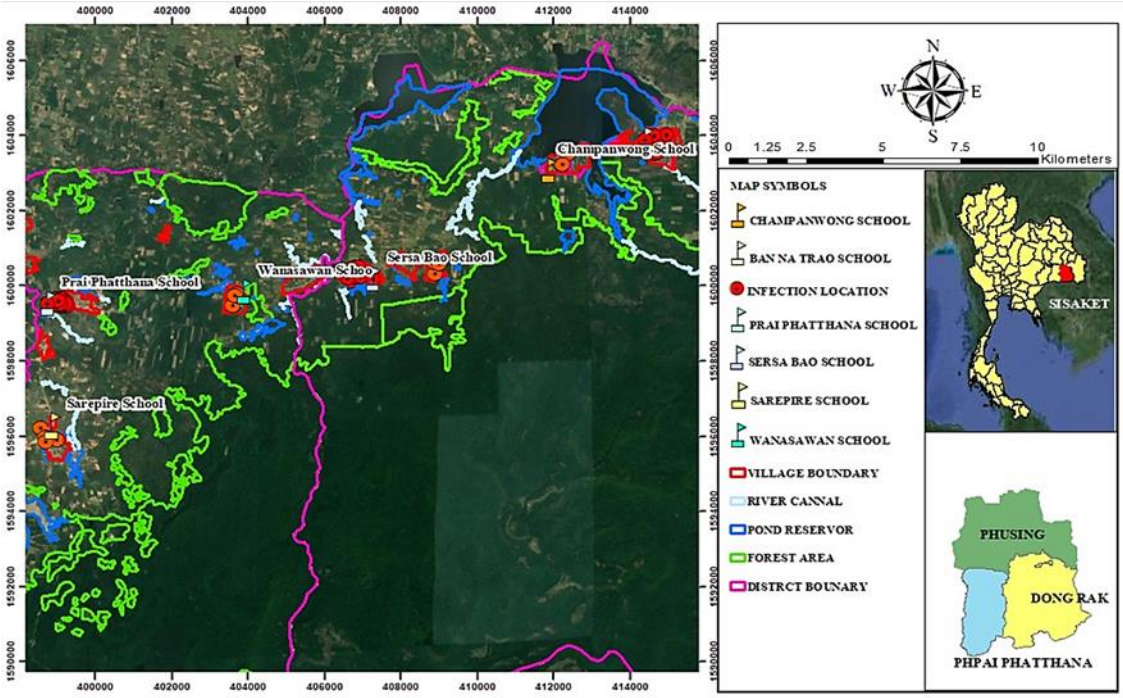
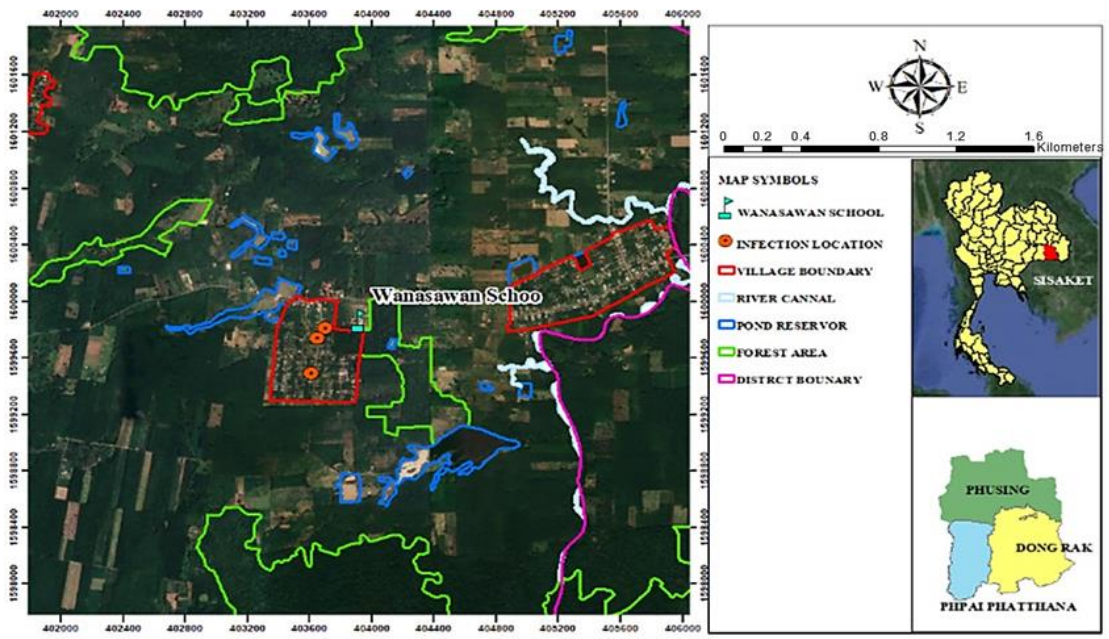
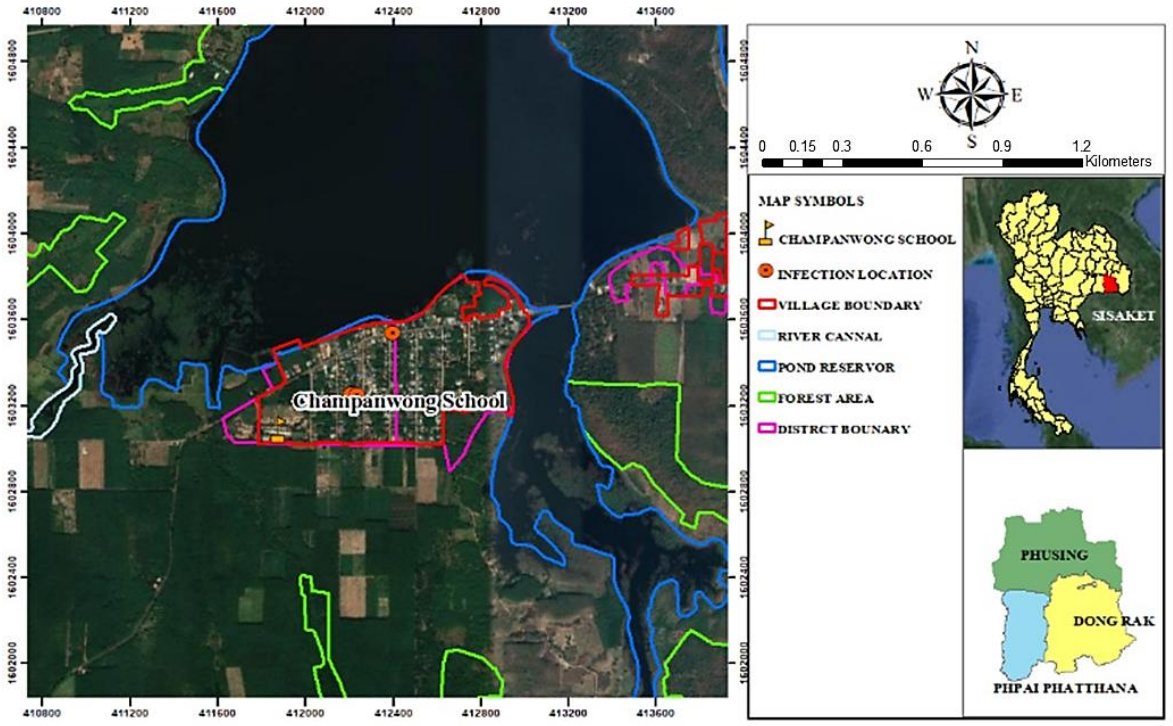


Figure 1: Geographical prevalent map of soil-borne helminth infection in 6 target Thai-Cambodian border schools



(A)

Figure 2: Geographical prevalent map of soil-borne helminth infection in each of 6 target Thai-Cambodian border schools: Wanasawan School (A), Champanwong School (B) Ban Na Trao School (C), Sare Pier School (D), Sersa Bao School (E), Prai Phatthana School (F) (Continue Next Page)



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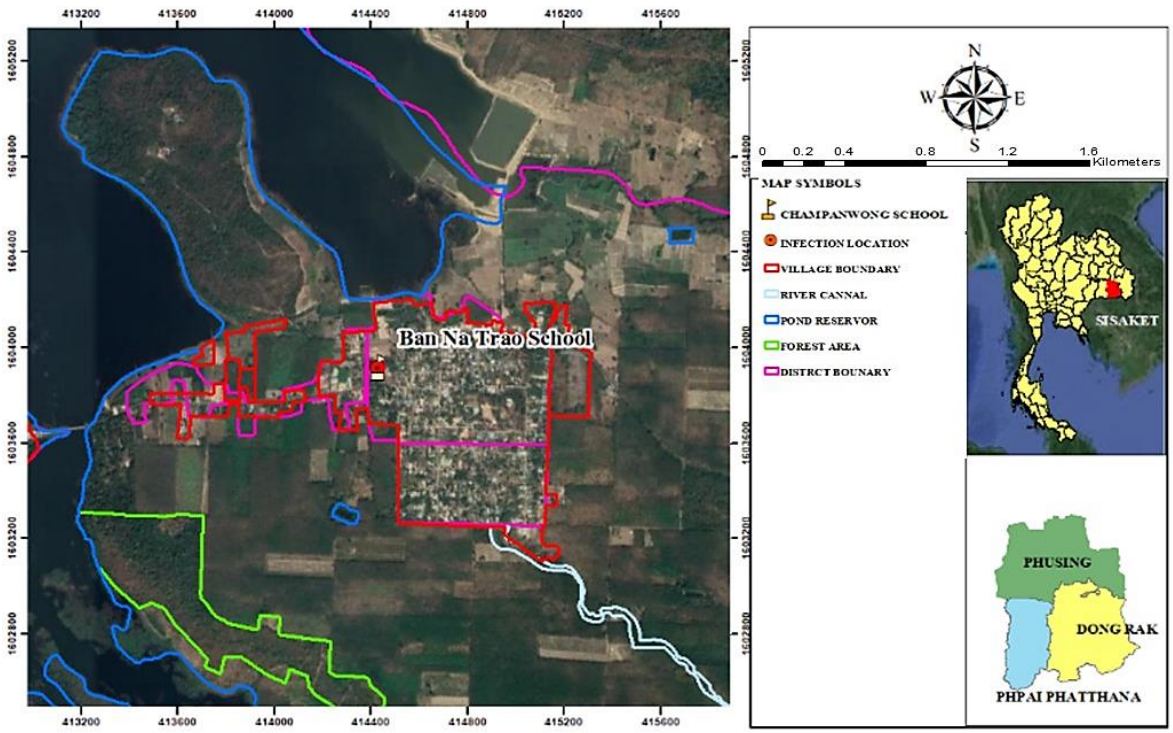

(C)

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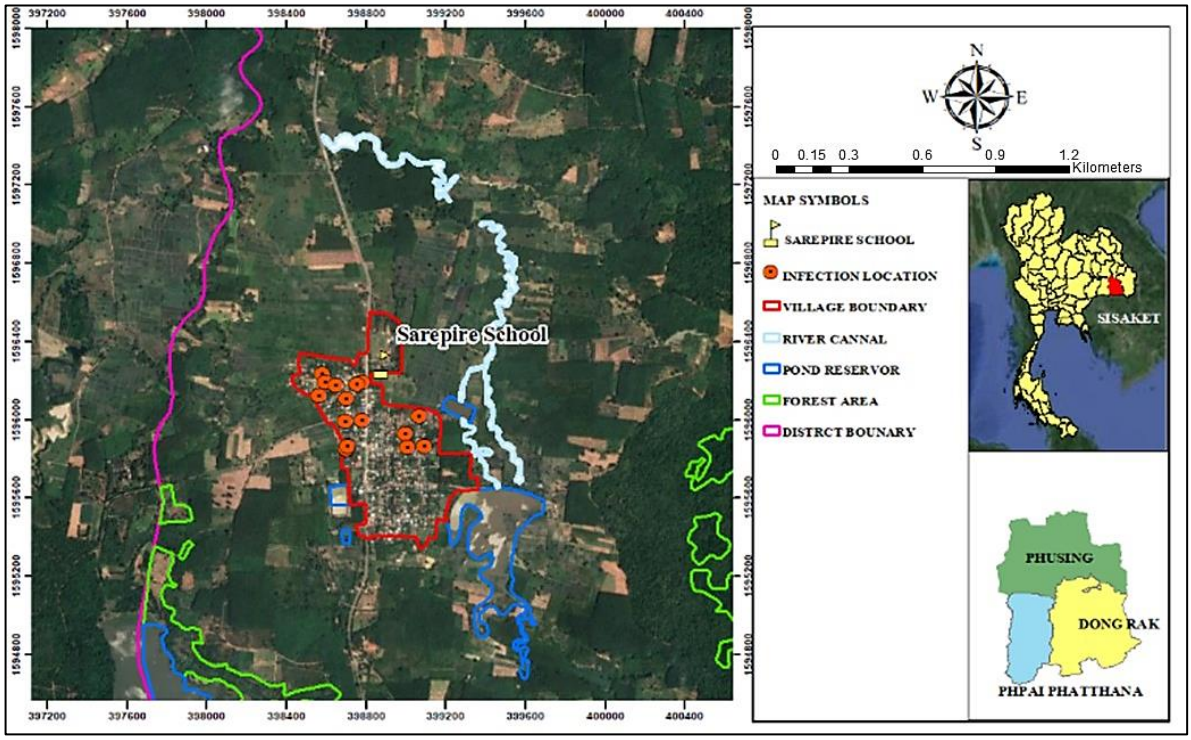

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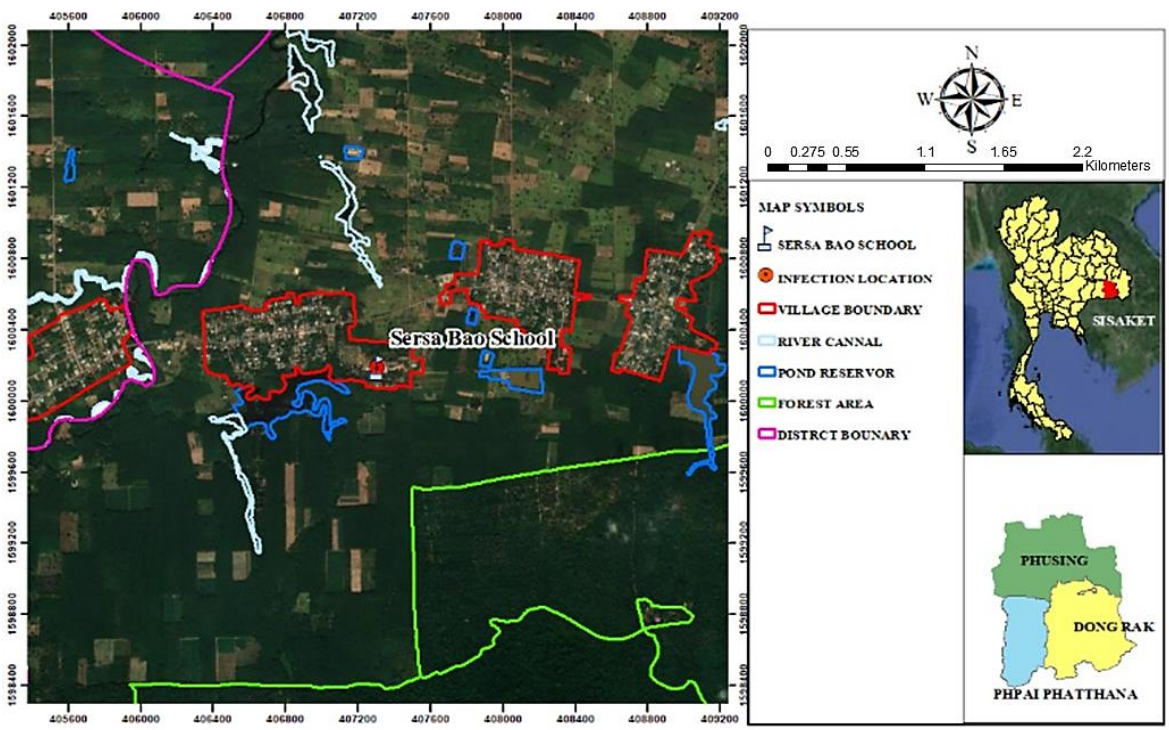

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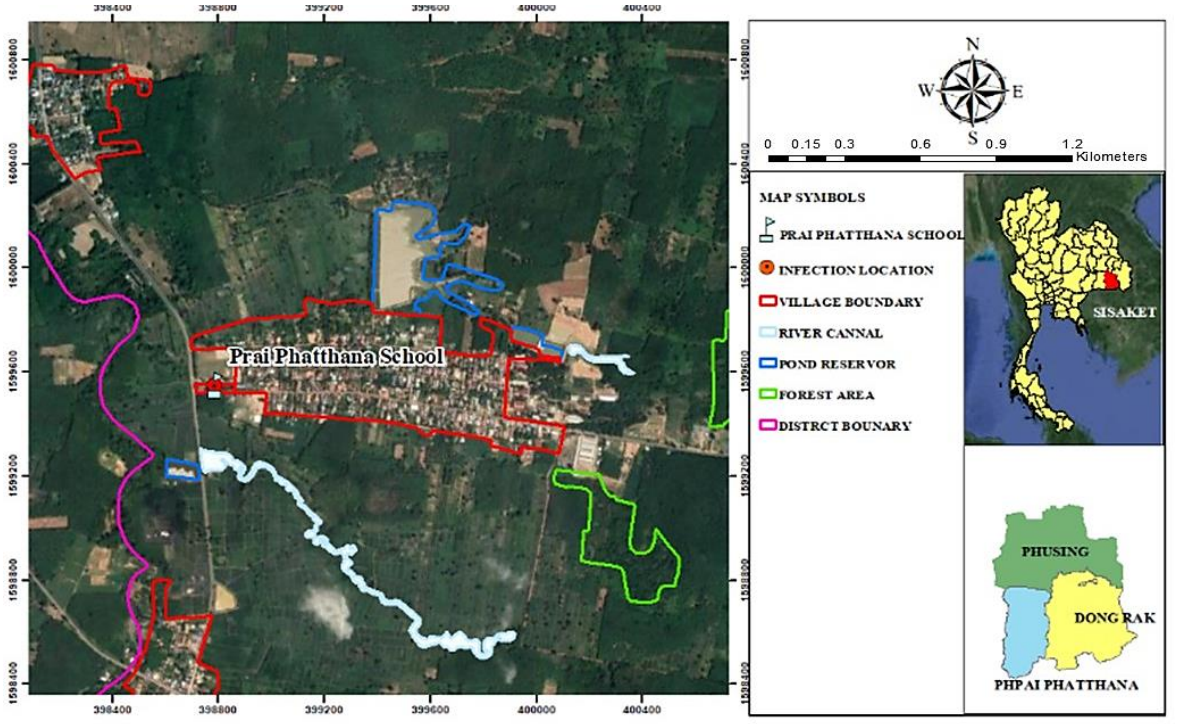

(F)

Figure 2: Geographical prevalent map of soil-borne helminth infection in each of 6 target Thai-Cambodian border schools: Wanasawan School (A), Champanwong School (B) Ban Na Trao School (C), Sare Pier School (D), Sersa Bao School (E), Prai Phatthana School (F)

Table 4: Frequency and ranking of Pupils 'attitude towards helminth prevention

Attitude aspects	**Average % of frequency discriminated in 5 strength scale**					**Ranking (Reverse to number of frequency)**				
	1	2	3	4	5	1	2	3	4	5
Self-health behavior	1.30	2.70	9.30	70.00	16.70	5	4	3	1	2
Effectiveness of formal health services	0.80	2.30	10.30	70.90	15.70	5	4	3	1	2
Stakeholders' Involvement	0.70	3.60	9.40	67.80	18.50	5	4	3	1	2
Total attitude	0.94	2.87	9.67	69.56	16.96	5	4	3	1	2

Table 5: Coefficients of regression for analyzing the predictive power of factors affecting helminth infections (n=35)

Predictive factors for the infection	**Coefficient**			R^2	Adj. R^2	t	p
	B	β					
Self-care for prevention practice	-0.899	-0.834		0.696	0.694	7.43	<0.001
Perceived its severity	-0.343	-0.298		0.779	0.777	12.66	<0.001
Attitude towards disease prevention	-0.232	-0.245		0.834	0.832	12.35	<0.001
knowledge of disease prevention practices	-0.189	-0.134		0.851	0.848	13.61	<0.001
Benefits Recognition	-0.058	-0.081		0.856	0.853	14.16	<0.003
Constant = 37.22, R^2=0.856, R^2_{adj}=0.853, SE_{est}=2.172, F= 8.808, p=0.003							

Addition results from interviewing: Raising cattle under the house and allowing the animals to feed themselves increased the risk factors for infection

3.1 Soil-borne Helminth Infections Influent Factors among this Research Subjects in Thailand-Cambodia border schools

Five Statistically Significant influent factors about disease prevention practical perception were, with respective Standardized Regression Coefficient (β) as (i) Self-care for prevention practice (β= -0.834). (ii) Perceived its severity (β= -0.298), (iii) Attitudes (β= -0.245), (iv) Knowledge (β= -0.134), and (v) benefits recognition (β= -0.081). Total predictive power was 85.60% (R^2=0.856, p <0.05). The predicting factors formula for soil-borne helminth infection in school children can be generated as follows Equations 2:

Raw score Equation Y = 37.22 - 0.899 (X1) - 0.343 (X2) - 0.232(X3) -0.189 (X4) - 0.058 (X5)

Standard Equation ZY = 37.22- 0.834 (ZX1) -0.298 (ZX2) - 0.245 (ZX3) -0.134 (ZX4) - 0.081(ZX5)

Equation 2

Condition:

Y = Independent variable as soil-borne helminth infection

X1-X5 = Five statistical significant dependent variables as influent factors comprise

X1= Self-care for prevention practice

X2= Perceived its severity

X3= Attitude

X4 = knowledge

X5= Benefit recognizing

4. Discussion

4.1 Distribution Results

Hookworms' prevalence, geographical regions, Gender leading sequentially to male family member role in out-house career, self-restroom regulation invert into a habit.

4.1.1) The infected cases were 11.66 %

Among this prevalence, respectively, comprised the hookworm (74.00 %), *Trichuris triciura (*17.00 %), *Ascaris lumbricoides* (6.00 %), and *Opisthorchis viverrini* (3.00 %). The mode of the prevalence was supported by phenomena inside this research comprising "disliked wearing shoes in a habit (71.40 %)" and "main career (Agriculture:71.40 %)" and these extend infection door for this type of helminth infection relevantly to the life cycle illustration about cutaneous transmission in phase 3 of filariform lava in the agricultural tropical geography (soil ground, moisture). According to the community factors, a study by Incani et al., (2021) found that the predisposing factors to severe soil parasitic infection were the home environment was overcrowded and with disposal wasted system (Incani et al., 2021). Therefore, culturally consistent health education should be provided along with poverty alleviation. Njitchouang et al., (2021) found that campaigns or education services were not effective if the environment was not properly managed and can lead to continual helminth infections (Anegagrie et al., 2021). Therefore, environmental sanitation should be developed, especially toilet construction, non-contaminated water, deworming, and health education to down the rate of soil-born helminth infection.

The door is opened much wider with unhealthy behavior of not wearing-shoes habits, relevantly to Fetene (2021), who related the infection, life cycle, and wearing-shoes habit. Moreover, Getaneh (2021) stated that some school-age children still have poor hygiene habits, such as: liking to suck their fingers which play on or touch the ground. In addition, in another country, it is also comparable, who stated that the top three prevalence of helminth infections were *Opisthorchis viverrini* (47.08%), Hookworm (28.17%), *and Taenia spp* (6.91%) while. Noticeably, contrasting prevalence mode, the Department of Disease Control, Ministry of Public Health (2018) stated that the Northeast saw the highest rates of liver fluke infection; for instance, in Nakhon Phanom Province (41.90%), followed by Sisaket Province (39.70%). Focusing on the north of Thailand, the Department of disease control (2018) reported that the mode was *Ascaris lumbricoides* (3.01%) and also higher than the Thai public health national plan which had goals to reduce the prevalence of all types of helminth diseases, especially *Ascaris lumbricoides* and hookworms to less than% 5 and to reduce the severity of helminth infection disease. In 2015, the rate of infection was not reduced at all, indicating that they could not achieve the goals of the Development Plan for helminth prevention (Sumbele et al., 2021). The Department of Disease Control's report on the situation of helminth infection among people in Thailand in 2018 showed that the incidence of helminth infections among children and young people in Thailand within the past five years (2014-2018) was 10.1%, 7.1%, 9.8%, 8.34%, and 7.62%, for 2014, 2015, 2016, 2017, and 2018 respectively. In the border schools, the infection hookworm rate was 5.1% involving *Ascaris lumbricoides* 3.01%, followed by 1.03% for *Trichuris trichiura* (Department of Disease Control, 2020).

This study found that the rate of helminth infection was considerably higher than the figure provided by the Ministry of Public Health in the Eleventh National Economic and Social Development Plan (2012-2016).

Sub-gained Issue for Suggestion Synthesis: Referable to the parasitic profession, hookworm infection in Thai-Cambodian border schools is in a hazard zone and needs effective intervention to deal with it.

This study found that rates of infection in males were more than in females (60.00% and 40.00 %, respectively). Relevantly to South-East Asian rural agriculture family member role. Fathers have taken the role of out-house working in the agricultural field and none of the restrooms are available there. Not easy to have a restroom nearby the area so they release stool directly around there. This enriches hookworms' life cycle according to an illustration of hookworms life cycle by Ghodeif and Jain (2021). Relevant findings can be seen in past studies Suntaravitun and Dokmaikaw, (2018), Wijayantiet al., (2013), and Nasr et al., (2013) revealed more infection prevalence of intestinal parasites than females, this may be because men tend to play with or touch the soil more than women and are less cautious about cleanliness. These were strengthened environmental sanitation that needs to be developed, especially the construction of toilets, providing clean water along with deworming medication, and health education to reduce the rate of soil-borne infection. Another environmental factor concerning household and community was found to be that community settlements on the border area are founded on kinship and family. Most communities are occupied with people with health problems associated with helminth infections along with their own context. Consistently with a study by Anegagrie et al., (2021) found that environmental factors were associated with hookworm infections at individual and domestic levels (Anegagrie et al., 2021). In addition, shoe-wearing was reported to be at a low level (Silvia et al, 2021) noted that not wearing shoes when performing farming tasks or going outside can lead to infection (Rahmi et al., 2021 and Suntaravitun and Dokmaikaw, 2018). Although these were in contrast with a study by Ruth et al., (2021) who found that the rate of infection with soil-borne parasites was higher in females than males (Ruth et al., 2021 and Tegen and Damtie, 2021) found the males and females had no difference in infection rates (Tegen and Damtie, 2021), researcher resists the previous logic.

Sub-gained Issue for Suggestion Synthesis: Referable to family, it is more hardness in economic possibilities to provide restrooms nearby the agricultural fields than self-regular stool releases at home.

4.2 Five Statistically Significant Influent Factors

4.2.1(i) Self-care for prevention practice (β=-0.834)

The influent self-care in this research distribution findings were not shoes-wearing health habits (71.90 %), and the agricultural-career environment (70.30 %). This will enrich the infection chance. These two empirical distributions were relevant respectively to Njitchouang et al., (2021) in accordance with Getaneh, (2021). Njitchouang et al., (2021) found that campaigns or education alone cannot control these infectious if the environment is not properly managed, leading to continual helminth infections and outbreaks (Anegagrie et al., 2021). Moreover, the study of Ruth et al., (2021) was in accordance with Getaneh, (2021), who found that never wearing shoes was a factor that promoted infection when contacting the soil (Anegagrie et al., 2021 and Ruth et al., 2021).

Sub-gained Issue for Suggestion Synthesis: Referable to school, a deep understanding of the two health habits should be focused on.

4.2.2 (ii) Perceived its severity (β= -0.298)

The severity in this research was framed to the former daily self-regular habits that contrast with the reduction. The distribution findings directed this discussion. They were not eating well-done cooked food (62.50%) and no shoes-wearing habit (71.90 %). This hinted at the ignorance of severity because they were not able to cross over their former habit related to the infection. Parents affect the reduction. Family factors influence helminth infections transmitted through soil. Father's occupation, educational level, and household characteristics are associated with soil-borne helminth infections. This study was closely similar to the previous study concerning the factors affecting intestinal parasite infection, including factors such as socioeconomic status (Occupation and Educational Level), environment, sanitation, personal hygiene, crowded community, race, age, and customs (Getaneh, 2021).

This led to the point of who claimed that behavioral modification needed to stress in cultural norms and behaviors, and the researcher included family as this root too. Parents' assimilation fighting towards its severity to their children is less as the symptoms do not impact their comfortable daily living (Budiapsari et al., 2021). Alo et al., (2021) claimed in their research discussion that the more symptom seriousness, the lesser ignorance. These infection symptoms appear slowly and make the severity recognition too late while they have been already this infection carrier for times (Alo et al., 2021). In addition, most of the parents were educated in primary school or uneducated, and most of them were working in agriculture. The study found that the mother's level of education and occupation were important factors for the child's growth and development due to the short knowledge space of the parents and the lack of awareness about helminth prevention both for themselves and for their children. The mother was the person who influences the child and the role model for the child (Ayele et al., 2021). Ayele et al., (2021) and Akinsanya et al., (2021) also found that helminth infection in children was associated with occupation and educational level of parents.

Sub-gained Issue for Suggestion Synthesis: Referable to family, a pathway to empower the right health behavior in contradiction with the root norms.

4.2.3 (iii) Attitudes (β= -0.245)

The fourth predictive power issue, in this finding, with the first two high order were pointed out. There was an agricultural career within the water resources (71.40 %) followed by regular daily activities such as not shoes-wearing habits, contacting the soil-ground (71.40%), and the none well-cooked food eating (62.90%) in addition to no annual medical checkup routine for parasite surveillance (65.70%). The percentage range of the 3 attitude groups was focused on two attitude levels of much and very much, respectively. The components (percentage/ranking) comprised Individual health behavior (70.00%/1, 16.70%/2), Effectiveness of formal public health activities (70.90%/1, 15.70%/2), and Stakeholders involvement (67.50%/1, 15.70%/2). This revealed the relevance between the four issues and the much level attitude, while the contradiction was found between those and the very much level one.

Related knowledge was much perceived but not effective to reduce the infection (in this research findings). Relevant to Ayumba et al., (2016) who claimed that their desired lifestyles were contrasted with community/social attitudes towards those which were significant barriers to do so. Their research referred to a better community-based approach among community members for their health problems and context. Public health /school activities in the target area were effective in the knowledge level but not deep enough to change these health behaviors.

Sub-Gained Issue for Suggestion Synthesis: Referable to the community, this leads to fights with individualized conflict from community/social alienation under the reinforcement.

4.2.4 (iv) Knowledge (β= -0.134)

The pupils delivered a high percentage range of knowledge between 74%-88% among constructed 20 items. Noticeable, this was in opposite results to two health habits in barefoot walking on soil ground (71.90%) and not cooked well food eating (63.50%). The same direction was seen by comparing with the three attitude groups on very much level comprise individual health behavior, the effectiveness of public health-related services, and local stakeholders' involvement. Its percentage range was 11-23 %). These contradictions were from the three related sources, affecting pupils' behavior changing, including school curricular aspects, family functioning, and community congruence. The schools reached learning standards and evaluation in knowledge but not deep into attitude and practical level which were hard and consumed very much time to assess. This deficiency remained because those interventions are not strong enough for their age nature. The related imprint attitude can be run as an example in children's spinach-eating behavior impacted by the Popeye series. Considering to family, members should encourage and provide supports for target behavior changes and realize that those changes are ok with the family and do not disturb their daily agricultural way. The community gesture needs to shift their response to target behavior changing from negative to positive and confide ten them of no community alienation. These were supported as barriers to attitude improvement, which become the psychological family/community obstruction. The same discussion base is the same as the above attitude (Item 4.2.3).

Sub-Gained Issue for Suggestion Synthesis: Referable to school, reduction attitude barrier not only knowledge assessment for pupils' behavior changing.

4.2.5 (v) Benefit recognizing (β= -0.081)
Total predictive power was 85.60% (R^2=0.856, p <0.05). These research findings showed risky health habits and obstructed attitudes, as in the above discussion along with agricultural- career environment (70.3 %). The benefits from behavior changes should be focused prominently as a distinguish figure while the above discussed barriers were as ground relevantly to Gestalt's view. This was in sensory perception and adopted into behavior by Westheimer (Schacter et al., 2011 and Wagemans et al., 2012). This was supported in behavior by Neil et al., (2007) who claimed the influence of the observer's psychological dependency rather than inside elements. In this research, benefit recognizing was inside the individual which was as a figure while another will be as other surroundings. This focused importance was led as a behavior branch route to the proper main healthy behavior to reduce the infection.

Sub-Gained Issue for Suggestion Synthesis: Referable to policy, Cases of excellence can lead to benefit recognition as a motivation for target behavior changes

5. Conclusion

Helminth infections have been one of the main public health issues in Thailand within the central protocol. Looking at the Northeast of Thailand, those were focused on main population/in regular geographical concerns. Only one previous research which included this research author was found to investigate specifically for Thai-Cambodian Borders within distinctive ethnic groups focusing on regular area subjects who were the majority of pupils' parents. Probing track was focused to their own children who are in school age population. Exploration was tracked in two dimensions of public health related and school base related. Those two data sets were discussed in 4 times of formal meeting with parent's involvement. This led to inter- congruence among those 3 groups and gained parents' consent to prolong the research. Research instruments were standard FECT and acceptable 125 items questionnaire were conducted to sampling pupils. The results indicated influent factors gained from multiple regression analysis which should be fit for two target behaviors of "Not wearing shoes" and "Not well-cooked food eating" in the cultural distinctiveness of ethnicity and local agricultural way of life in addition to school-based concerns for school age pupils along the collaboration among family, local health units, and school related ones. Moreover, modern tools such as Geographic Information System or Geographic Information Systems (GIS) were fruitful in health professions.

Suggestion for Further Studies: The effective model for dealing with helminth infection should be developed from the routine base integrated with specific high-risk behaviors under distinctiveness of related dimensions towards influent factors within stakeholders' congruence.

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