



## Prevalence of Intestinal Parasite among School Children of Bharatpokhari V.D.C., Kaski, Nepal

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### Authors' contributions

This work was carried out in collaboration between all authors. Authors DRP and BRT designed the study, wrote the protocol and carried out the experiment. Author SJ designed the study, wrote the protocol, carried out the experiment, performed the statistical analysis and wrote the first draft of the manuscript. Author JPS managed the analyses of the study. Authors RB and SU managed the literature searches. All authors read and approved the final manuscript.

Original Research Article

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### ABSTRACT

**Aims:** To determine the prevalence of the intestinal parasitic infection among school children and the factors associated with it.

**Study Design:** Cross Sectional

**Place and Duration of Study:** This study was conducted among school children in Bhulbhula Intermediate School, Janjyoti Primary School and Sukla Primary School of Bharatpokhari VDC, Kaski, western region of Nepal during December, 2012 to February, 2013.

**Materials and Methods:** A total of 163 faecal samples were collected. Samples were investigated under standard WHO guidelines for identification of parasites. Samples were analysed microscopically.

**Results:** Out of the 163 children screened, the overall parasitic infection rate was found to be 18(11%). There was no statistically significant association between sex ( $p=0.935$ ), schools ( $p=0.570$ ) or age group ( $p=0.327$ ) and the infection status. On the whole, *Entamoeba histolytica* (*E.h*) had the prevalence of 61.0% followed by *Trichuris trichuria* (*TT*) 22.0% and Hook worm, *Ascaris/Giardia*, *Trichuris trichuria/Entamoeba histolytica* 6.0% each.

**Conclusion:** Results of this study indicates a low prevalence of intestinal parasite among school children in Bharatpokhari VDC, kaski, Western region of Nepal.

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## 1. INTRODUCTION

Intestinal parasitosis continues to be one of the major causes of public health problems in the world, particularly in the developing countries. Globally an estimated 3.5 billion people are affected by intestinal parasites, while 450 million are ill as a result of intestinal parasitic infections, the majority being children [1]. Approximately, 10% of the world's population is suffering from amoebiasis [2]. An estimated 250 million, 151 million and 45 million people are affected by *Ascaris lumbricoides*, Hook Worm and *T. trichuria* respectively, which relate thousands of deaths [2,3,4].

Nepal is a landlocked and least developed country located in South Asia. Intestinal parasitosis still constitutes one of the major public health problems (Both morbidity and mortality) in Nepal [3,4]. The reported prevalence varies considerably approaching nearly one hundred percent in some areas [3,5-7] and polyparasitism is common in rural areas [4,8]. Intestinal worm infection alone ranks fourth in "top-ten-diseases" in Nepal [9,10] and attributing to low socio-economic, educational and poor hygienic status of the people [3,4,10].

Among the various types of infectious diseases, intestinal parasitic infection alone constitutes one of the major causes of health problems [11]. Previous studies in Nepal have reported prevalence rate of intestinal parasitosis from low to nearly hundred percent [12,13]. In Nepal, giardiasis, ascariasis, amoebiasis, ancylostomiasis and taeniasis are common intestinal parasitic infection [14,15]. Intestinal protozoan infection and helminthic infection rank the third and the fourth respectively in Nepal [14-16].

Schools are the main places to get together the children and the children in schools are not only educated for knowledge, but also for good sanitary habits. The re-enforcement programme and better sanitation hygienic education in the school would decrease the infection rate among the school children. Therefore, the present study was carried out for the diagnosis of intestinal parasitic infection status among the school children and the data are important for evaluating and improving the sanitation hygienic education and system in the schools.

## 2. MATERIALS AND METHODS

The study was carried out during December 2012 to February 2013 at Bhulbhula Intermediate Secondary School, Janjyoti Primary School and Sukla Gandaki Primary School which are the three schools present in Bharatpokhari V.D.C., Kaski, Nepal. Sample processing was done at Microbiology Laboratory, School of Health and Allied Sciences, Pokhara University. An official permission to undertake the study was obtained from the office of the school and ethical clearance certificate was obtained from the Research cell, Pokhara University. A total of 163 school children were enrolled in the study. Children's age ranged from 3 to 15 years. All the school children were provided with clean, dry, screw capped and properly labeled plastic container for the collection of the stool sample. Only a single morning stool sample was collected along with the filled questionnaire including children's name, age, sex, ethnic group and school [16].

All the fecal samples were examined for the presence of parasites both macroscopically and microscopically. Microscopic examination was done by wet mount (Saline mount and Iodine preparation) method, by concentration method employing formal-ether sedimentation

technique and diarrheal samples were also subjected to sucrose flotation method [16]. The significance in difference of quantitative data was analyzed by Chi-square test. A 95% confidence interval and less than 5% level of significance was used to check for association between independent and dependent variables by SPSS software [16,17].

### 3. RESULTS

Of the 163 subjects examined, 18 (11%) were found to be infected with intestinal parasite Fig. 1. There was no statistically significant association between sex ( $p=0.935$ ), schools ( $p=0.570$ ) or age group ( $p=0.327$ ) and the infection status Table 1. On the whole, the prevalence of *E. histolytica* (*E.h*) had the prevalence of 61.0% followed by *Trichuris trichuria* (*TT*) 22.0% and Hookworm, *Ascaris* /*Giardia*, *Trichuris trichuria*/*Entamoeba histolytica* 6.0% each Fig. 2.

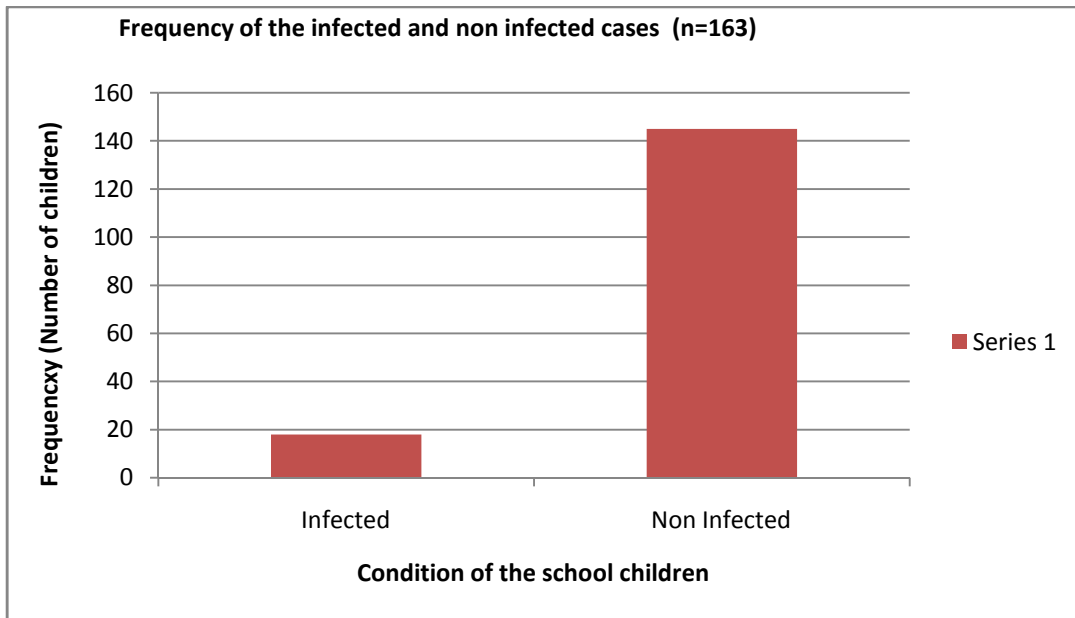
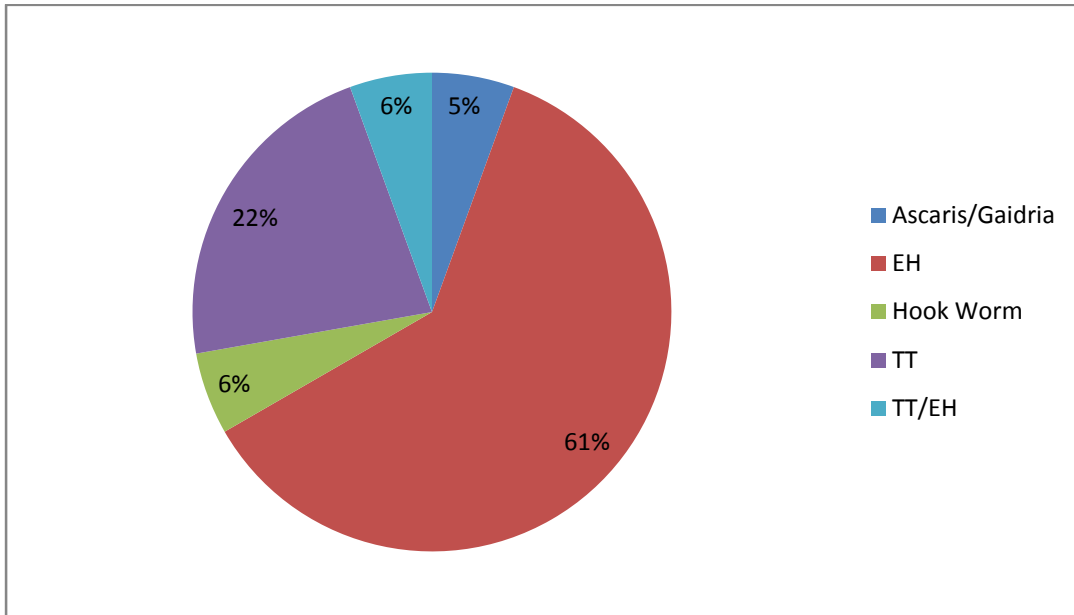


Fig. 1. Status of school children with the infection 18 (11%) out of 163

Table 1. Association of infection cases with sex, age group and different schools

Variable	Infection status		$\chi^2$ (95% CI)	P value
	Infected n (%)	Not infecte n (%)		
Sex				
Male	9(10.7)	73(89.3)	0.007	$p=0.935$
Female	9(11.1)	72(88.9)		
Schools				
Bhulbhula Int. school	10(12.7)	59(87.3)	1.124	$p=0.570$
Janjyoti Primary	4(12.9)	27(87.1)		
Sukla Primary	4(7.3)	59(92.7)		
Age group				
<5years	1(3.3)	29(96.7)	2.23	$p=0.327$
5-10years	11(13.1)	73(86.9)		
>10years	6(12.0)	44(88.0)		



**Fig. 2. Distribution of the parasitic infections amongst the school children (n=18)**

#### **4. DISCUSSION**

The prevalence of intestinal parasitosis status found in this study is much lower than that reported earlier by Rai et al. [3,4] and similar studies reported elsewhere in Nepal, however it seems alarmingly high in comparison to international scenario [3,4]. These differences may be due to place, seasonal variation and time differences of the study, health awareness, education and living standards of people and regular deworming programs being conducted mainly for children by the government [3,5,7,8,16,18].

Hence, genderwise parasitic infection rate was found to be almost equal among males and females, which agrees to the findings of other studies done previously on general population in Nepal and in other countries [9-11,16,18].

Based on the age of children included in the study, parasitic infection was found to be highest among children aged 5-10 years (11) followed by >10 years age (6) and it was lowest among children of <5 years (1) [10,11,18].

Reports of various studies have shown that, the intestinal parasitic infection rate depends upon many factors including socio-economic status of people, being more common among people belonging to low socioeconomic status. This might be related to illiteracy, unhygienic practices, unawareness, open defecation and consumption of raw water, which is mostly contaminated in rural areas etc. [16,18].

#### **5. CONCLUSION**

Results of this study indicate lower prevalence of intestinal parasite compared to other parts of Nepal. However, less prevalence compared to that in previous studies may be due to

continued public health education, health awareness programs and regular deworming programs being conducted by health agencies and government in the community. However, a higher prevalence compared to that in developed countries indicates high soil and water contamination with intestinal worms, which proves the need of periodic administration of anti-parasitic drugs and improvement of sanitary/hygienic practice to completely reduce the prevalence [18].

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## **COMPETING INTERESTS**

Authors have declared that no competing interests exist.

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