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Intestinal Parasitic Infestation and Hygiene Practices among the Street Children

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Abstract

A cross-sectional study was conducted among the 125 students selected by systemic sampling within 4 schools, randomly selected and found that overall condition of the health status of the children of low socioeconomic segment which need to intervene immediately.

Objective: *To assess intestinal parasitic infestation and hygiene practices among the students of the specialized school for the street children in Dhaka city.*

Materials and methods: *A cross sectional descriptive type of study was carried out among 125 students of the specialized school of Dhaka city by face to face interview using a semi structured questionnaire and check list from January to June 2008.*

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Results: *The mean age of the respondents was 10.2±1.8 years ranging from 6-15 years. The number of girls studying in this school was higher than the boys. Their knowledge on parasitic disease was 30.9%, but 77.8% of the respondents had the habit of hand washing before each meal. About 66.76% always wear shoes and a vast majority (97.5%) drink comparatively safe tap water. 71.6% had no health related problems in last 30 days from the date of study. Most of the respondents about 87.7% get their treatment from school doctors. Out of the respondents 44.4% were stunted, 39.5% were under weight and malnutrition rate had been 56.8%. Since they get regular medical checkup from the school doctors, they were comparatively less infected with both protozoal and helminthic infections. Most of the results found in the cross tables were not statistically significant as the sample size was small and also the respondents had antihelminthic drugs just 30 days before the study started.*

Conclusion: *The results shows poor health status of the children of low socioeconomic segment which need to intervene immediately.*

Keywords: parasitic infestation, hygiene practices, sanitary latrine and malnutrition

Introduction

The health of school-age children can play a major role in determining the successful development of a nation. School serve as an ideal setting to positively affect children's health because they reach young people at a critical age of development in which lifestyles are tested, developed and adapted through social interactions between students, teachers, parents and others. In 1995 the World Health Organization (WHO) launched the 'Global School Health Initiative' which offers a vision for the development of comprehensive school-based efforts to improve health. That vision is manifested by the creation of health-promoting schools (World Health Organization, 1997✦). A health-promoting school is a school that strives to constantly strengthen its capacity as a healthy setting for living, learning and working. In order to effectively address important health concerns in the context of a health-promoting school, WHO suggests that various health problems or risks be identified and prioritized, A priority health concern, e.g. malnutrition, tobacco use, HIV/AIDS infection, parasitic infection, etc. is then suggested to be used as an entry point for the development of health-promoting schools.[1]

Helminthes such Ascaris, Trichuris and Hook worms are approximately infect 3.5 billion individuals worldwide.[2] The intestinal parasites are distributed in host community so that a minority of the individual is heavily infected. Whereas the majority harbors few or no worms.[3] This aggregated distribution is probably due to a complex combination of factors related the host's ability to resist infection such as genetic constitution and immune responsiveness.[4] Intestinal parasites are widely prevalent in developing countries due to poor sanitation and

inadequate personal hygiene. The commonest parasitic infection reported globally Ascaris 20%, Trichuris trichiura 10% and Entamoeba histolytica.[5]

More than one quarter of world's population in the developing countries are infected with one or more species of intestinal parasites (WHO, JOICEF 1980). In our country it is also a major public health problem in rural and urban areas with a wide spread endemicity. Low socioeconomic conditions, poor hygienic habits and most importantly lack of health education are the reasons behind this. Low living conditions, unhygienic surroundings, lack of sanitary latrines are main causes of the widespread prevalence of intestinal parasitic infestations. Due to availability of very limited resources the developing countries cannot prevent the spread of this commonest infection.[6]

Dhaka city with its 15million population is one of the most densely populated cities in the world. Around 35% of the total populations of Dhaka city reside in slums where the living standard is well below standard. Supply of pure drinking water is absent and proper sanitation facilities are not available. To make the situation even more complicated everyday a considerable percentage of people are adding up with the already sizeable slum dwelling population. A particular vulnerable group in this regard is 'Street Children'. They live and grow up on the margin of society in a state of neglect and deprivation, often without protection, without education, affection, care and guidance from the adult members of the family. Their presence and situation is symptomatic of social problems such as poverty, overpopulation, unemployment, illiteracy and the absence of alternative options to fulfill the minimum basic rights' fulfillment of these children and their families. Although street children are not new phenomena in Bangladesh, the hard fact is that at neither macro-level nor micro level, appropriate data or reliable statistics are available on their number, their actual living conditions, needs and interests. According to the 'Estimation of the Size of Street Children and their Projection for Major Urban Areas of Bangladesh 2005' commissioned to BIDS by ARISE, the present number of Street Children in six divisional cities has been estimated as 3,89,892 with a major concentration in Dhaka city 63.91% and the lowest concentration being 2.50% of the total in Barisal. The problem is thought to be escalating due to the rise in urban migration and rural poverty. Despite the hazardous living conditions in the cities, out-migrants from rural areas are pouring into urban centers due to rural poverty, unemployment, landlessness, river erosion, family conflict, worse law and order situation, disintegration of traditional family and community structures that have ushered changes in the socio-economic scenario. As such the number of street children is likely to increase. The above BIDS study predicts the number street children shall rise to 1,144,754 in 2014 and 1,615,330 in 2024. The street children face not only denial of basic rights such as safe shelter, food, health care, safe drinking water, education, guidance, security, recreation, but they are also subjected to

many risks and different forms of exploitation such as child labor, physical torture, sexual abuse, HIV/AIDS, and trafficking. Moreover, a large number of this susceptible segment becomes the victims of trauma, stigma and different types of mental disorder due to varieties of bitter experiences in their street life which in turn make them distrustful, diffident and distasteful towards life. A large criminal network takes advantage of street children in order to make profits, exploiting their vulnerability and ongoing struggle for survival. They are typically engaged in: hazardous low waged jobs, commercial sex work, smuggling and stealing, distribution of drug and weapons.[7]

The present study was a small effort to look into the related factors which are responsible for the endemicity of intestinal parasite in all over our country. In Bangladesh about 45% of the total population is under 15years of age. The children of this age group should be strongly encouraged to start proper sanitary practices at home or in their school or in their working place as if they are habituated to defecate at sanitary latrine and learn proper sanitary practices, it will continue throughout their life. A large number of studies on epidemiology of the Intestinal Parasites had been carried out in the past by several researchers in different parts of the country. All of them have reported very high prevalence of Intestinal Parasites in Bangladesh. The problem of this epidemic in Bangladesh is more acute as the density of population in our country is the highest in the world and the number people living and growing up in the slums are also huge. The percentages of the people infected with this disease are higher among the poor as they live in the unhygienic conditions. The proper understanding of the findings of this study, done in the schools run by the Ain O Shalish Kendra will be very crucial as it exposes the real picture of an even broader situation where several crore of our populations coexist with this dreadful infection. Any future course of action to stem the spread of this disease among the poorer section of the people can be derived from studies like this. It may also help to identify the achievements and weakness of the preventive measures taken for intestinal parasitosis.

Material and Methods

This was a cross sectional study conducted in Schools of Ain O Shalish Kendra selected randomly, one of the leading NGOs is working for the improvement in the field of Human Rights of Dhaka city from January to June 2008. A total of 125 students were selected by systemic sampling. For the study 125 boxes were distributed among the students. Though all of them very eagerly attended the preliminary sessions but only 81 of the students could actually bring the samples properly as the rest 24 either destroyed the formalin or broke the containers supplied for bringing their stool samples from their homes. This was also a reason for the comparatively smaller sample size. A questionnaire cum checklist was used as data collecting instrument. Pre

testing of the questionnaire was done before the finalization of data collecting instrument. Direct interview and observation by the data collector trained earlier on the process of data collection was the procedure of data collection. The nature of the study was explained to the students properly and assurance was given about the confidentiality. Those who were selected for bringing their stool samples were interviewed face to face. At the time of fill up everything was observed carefully. Every student was supplied with a plastic container containing 5ml of 10% formalin as to ensure the well preservation of the stools. The students were given an idea about the amount of stools required and how to collect them correctly. Stool collections were collected from the students from their schools. After collection they were brought to the laboratory of microbiology and mycology department NIPSOM, Mohakhali, Dhaka where with the help of expert technicians. stool samples were examined carefully with Lugol's iodine and normal saline and recorded in the prescribed result sheet. At the end of each day of data collection the editing of the filled up instrument and necessary correction was done for any omission or incorrectness. Data were analyzed by using SPSS data analysis Package.

Results

Table 1 shows that mean ± SD =10.2±1.8 years; Range = 6 to 15 years. The mean age of the students was 10.2±1.8 years ranging from 6 to 15 years. More than two fifths (43.2%) were in the age group 10-11 years followed by 29.6% in the age group less than 10 years and 27.2% in the age group 12 years and above. Data analysis indicated that highest percentage of children were engaged in household works followed collect waste material from dustibin16(19.8%), collect street paper 12(14.8%), garment works 12(14.8%), collect household garbage 7(8.6%), work in vegetable shop 6(7.4%), help mother's work 4(4.9%), supply food in the office 4(4.9%)and sale chips in cinema hall 3(3.7%). Mean ± SD =5.6±1.6; Range = 2 to 10. The mean family size of the respondents was 5.6±1.6 ranging from 2 to 10. It was found that 38(46.9%) had family size 6 and above followed by 37(45.7% had family size 4-5 and 6(7.4%) had family size 2-3.

Figure 1 shows that out of 81 children, 21(25.9%) were boys and 60(74.1%) were girls.

Figure 2 shows that Two third of the children's father were illiterate (67.9%) followed by 22.2% had primary level of education, 8.6% had below SSC level education and 1.2% had above HSC level education.

Table 2 shows that Less than one third 25(30.9%) of the children had knowledge on parasitic disease and rest of the children 56(69.1%) had no knowledge on parasitic disease. Out of 81 children, 63(77.8%) reportedly

mentioned that they had practice of hand washing before meal and after defecation followed by 6.2% mentioned that they had habit of hand washing before meal, after defecation, and before preparation of food (6.2%), before meal (6.2%), after defecation only (4.9%), before preparation of food (1.2%). Majority of the children mentioned that they washed hand with soap and water (97.5%) followed by only water (1.2%) and wash with ash (1.2%). Only 2(2.5%) of the children reportedly mentioned that they had habit of nail cutting by teeth and majority of the children had no such habit (97.5%). Two thirds (66.7%) of the respondents reportedly mentioned that they had habit of wearing shoes followed by 29.6% reportedly mentioned that they had occasional habit of wearing shoes. But 2.5% had no such habit. Majority of the children reportedly mentioned that they had habit of wearing shoes during defecation; very few mentioned that wearing shoes during nighttime not in daytime, but 7.4% reportedly mentioned that they had no habit of wearing shoes.

Figure 3 shows that regarding the transmission of parasitic disease, two third (67.9%) of the children had no knowledge. However, 13.6% of the children reportedly mentioned that it is transmitted due to habit of taking sweetened food followed by eat with dirty hand (12.3%), bathroom with bare foot (6.2%), dirty nail (4.9%), eat sugar (4.9%), remain dirty (2.5%), eat unwanted food (1.2%).

Table 3 shows that Half of the children living in the partially paucca house 42(51.9%) followed by tin house 28(34.6%), completely pucca house 7(8.6%) and 4(4.9%) living in jhupri. Regarding the sources of drinking water, majority of the children used tap water 79(97.5%). Data indicated that 37(45.7%) of the children used sanitary latrine and 44(54.3%) used non sanitary latrine. Only 14(17.3%) of the children reportedly mentioned that they had to use boiling water for drinking purposes.

Table 4 shows that Out of 81 children, 44.4% of the them were stunted that is height for age less than -2 z score and 39.5% of the children were underweight in that is z score less than -2. The overall nutritional status indicated that 43.2% of the children were normal and 56.8% were malnourished.

Table 5 shows that Stool examination of the children indicated that 70.4% of the children had no helminthic infection. However, 17.3% had AL, 14.8% had TT, 2.5% had giardiasis and 1.2% AD infestation. On the contrary, 71.6% of the children had no protozoal cyst and 19.8% had E. histolytica followed by 11.1% had E. coli and 3.7% had H.nana infection. Data analysis indicated that 48.1% of the children had no protozoal and helminthic infestations. It was

found that 22.2% had protozoal cyst and 23.5% had helminthic cyst and 6.2 % had both protozoal and helminthic infection. Majority of the children received treatment from school doctor (87.7%) followed by 6.2% from pharmacist and 4.9% from private hospital and 1.2% from MBBS doctor.

Table 6 shows that the frequency of the parasitic infestations was slightly higher among females (20.7%) than males (19.1%), but this difference was not statistically significant (p>0.05)

Table 7 shows that Data analysis found that parasitic infection was found to be high among the children with malnutrition (58.7%) compared to the normal children (42.9%), but the difference was not statistically significant (p>0.05).

Discussion

The present study shows that the mean age of the school children was 10.2 years. More than two fifths (43.2%) of the respondents were in the age group of 10-11 years. This is similar to the finding reported by Fashuyi [8] in Ondo where infestation was commoner among the 6-15 years old. Number of girls were 60 (74.1%) of the respondents and the boys were (25.9%) of the study population. Since it is specialized school for the poor almost all the students were engaged in different types of works to support their families and its is found from the study that the highest number (21%) of students were engaged in household works. Almost 47% of the respondents were from large families of 6 of members or more. Less than one third 25(30.9%) of the children had knowledge on parasitic disease and rest of the children 56(69.1%) had no knowledge on parasitic disease. Here in this study it seems that the children has lack of knowledge on parasitic disease which has impact on parasitic growth in the children. Out of 81 children, 63(77.8%) reportedly mentioned that they had practice of hand washing before meal and after defecation followed by 6.2% mentioned that they had habit of hand washing before meal, after defecation. In a study found that regarding hand washing practice 10.0% and 18.5% respondents were found to wash their hands with soap before meal and after defecation respectively [9]. It seems to be lower than this study which suggest that the respondents in this study were more aware of the hand washing practice, Majority of the children mentioned that they washed hand with soap and water (97.5%) followed by only water (1.2%) and wash with ash (1.2%). This also shows that the respondents used soap and water more than other form for hand washing. Only 2(2.5%) of the children reportedly mentioned that they had habit of nail cutting by teeth and majority of the children had no such habit (97.5%). Higher prevalence of parasitic infection was seen in those children who had not trimmed their nails during our observation (33.33% in comparison to 16.75% seen in children who had

trimmed their nails). Similar findings were also reported elsewhere.[10,11]. The study may differ from the finding but it may suggest that the respondents in this study may have higher prevanlence of parasitic infection due to not having habit of nail cutting. Majority (86.4%) of the children reportedly mentioned that they had habit of wearing shoes during defecation; In other study found that shoe wearer during toilet use were 81.4% [9]. It is seen in this study that the children had good habit of wearing shoe during defecation. Regarding the transmission of parasitic disease, two third (67.9%) of the children had no knowledge. However, 13.6% of the children reportedly mentioned that it is transmitted due to habit of taking sweetened food followed by eat with dirty hand (12.3%), bathroom with bare foot (6.2%), dirty nail (4.9%), eat sugar (4.9%), remain dirty (2.5%), eat unwanted food (1.2%). Here in this study it seems that the children have lack of knowledge on parasitic disease transmission which may have impact on parasitic growth in the children. Out of 81 children, 44.4% of the them were stunted that is height for age less than -2 z score and 39.5% of the children were underweight in that is z score less than -2. The overall nutritional status indicated that 43.2% of the children were normal and 56.8% were malnourished. The finding is lower than study done in India that 67.5 percent of the subjects were underweight, 62.8 percent were stunted while 26.5 percent were wasted. [12]. As the children knowledge regarding transmission of the parasitic disease were lower so the children were affected with the disease which justify the cause of such high malnourishment. But the other probable cause of malnourishment should also be excluded. In this respect further evaluation should be done. Stool examination of the children indicated that 70.4% of the children had no helminthic infection. However, in this study AL accounted for 17.3%, which is lower than the percentages reported in most of other countries,[13-16] which may due to the regular biannual deworming program of the Government of Bangladesh along with Vitamin A supplementation. In this study it is seen that 14.8% had TT, double infection with Ascaris and Trichuris are also commonly reported.[14]

In this study it was found that 19.8% had E. histolytica protozoal infection where as in other study also shows that E. histolytica was the most common protozoa infection[17]. Majority of the children received treatment from school doctor (87.7%) followed by 6.2% from pharmacist and 4.9% from private hospital and 1.2% from MBBS doctor. From here we can say that the children had good treatment access from the school. The frequency of the parasitic infestations was slightly higher among females (20.7%) than males (19.1%), but this difference was not statistically significant ($p>0.05$) Some studies showed higher prevalence of these infections among females [18-19] while others observed an increase in the prevalence of intestinal parasitic infection among the males [20] and others found an equality between both genders [20-22]. In general, the increased mobility of the male increases the risk of infection

among them, while female have more soil contact during growing vegetables and eat raw vegetable with prepared food more often than males. Our result illustrated an equal exposure of the both genders to parasitic infections due to sharing the same environmental conditions. In addition, gender did not influence the prevalence of the intestinal parasites infestations in our study. It was also found that parasitic infection was found to be high among the children with malnutrition (58.7%) compared to the normal children (42.9%), but the difference was not statistically significant ($p>0.05$). As the children that were more affected with the disease which justify the cause of such high malnourishment.

Conclusion

It is suggested that screening for parasite infestation is necessary as part of the general health care programme. For this reason, preventive measures should be implemented. These could include health education, public and good personal hygiene practices. Appropriate health education should be given to children and their parents concerning disease transmission, personal hygiene and safe drinking water.

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Table 1 Distribution of the respondents' sociodemographic conditions:

Variables	**Frequency**	**Percent**
Age in years		
<10	24	29.6
10-11	35	43.2
≥12	22	27.2
Total	81	100.0
Type of work	**Frequency**	**Percent**
Household work	17	21.0
Collect waste material from dustbin	16	19.8
Collect street paper	12	14.8
Garment works	12	14.8
Collect household garbage	7	8.6
Work in vegetable shop	6	7.4
Help mother's work	4	4.9
Supply food in the office	4	4.9
Sale Chips in Cinema hall	3	3.7
Total	**81**	**100.0**
Family size	**Frequency**	**Percent**
2-3	6	7.4
4-5	37	45.7
≥6	38	46.9
Total	81	100.0

Table 2 Distribution of the respondents by knowledge, personal hygiene and sanitary practices:

Variables	**Frequency**	**Percent**
Knowledge on parasitic disease		
Yes	25	30.9
No	56	69.1
Total	**81**	**100.0**
Knowledge on practice of hand washing	**Frequency**	**Percent**
Before meal and after defecation	63	77.8
Before meal, after defecation and before preparation of food	5	6.2
Before meal	5	6.2
After defecation	4	4.9
Before preparation of food	1	1.2
Do not know	3	3.7

Total	**81**	**100.0**
Material use for hand washing after defecation	**Frequency**	**Percent**
Wash soap and water	79	97.5
Only water	1	1.2
Wash with ash	1	1.2
Total	**81**	**100.0**
Habit of nail cutting by teeth	**Frequency**	**Percent**
Yes	2	2.5
No	79	97.5
Total	**81**	**100.0**
Habit of shoe wearing	**Frequency**	**Percent**
Always	54	66.7
Occasional	24	29.6
Never	2	2.5
During school time	1	1.2
Total	**81**	**100.0**
Practice of defecation by using shoe	**Frequency**	**Percent**
Wearing shoe	70	86.4
Bare foot	6	7.4
Wearing show during night not in days	1	1.2
Both wearing show and also bare foot	2	2.5
Occasionally bare foot	2	2.5
Total	**81**	**100.0**

Table 3 Distribution of the respondents by environmental condition (n=81)

Environmental condition	Frequency	Percent
Housing condition		
Jhupri	4	4.9
Partially pucca	42	51.9
Tin house	28	34.6
Pucca	7	8.6
Sources of drinking water		
Tube well	2	2.5
Tap water	79	97.5
Type of latrine use		
Sanitary	37	45.7
Non sanitary	44	54.3
Use of boiling water		
Yes	14	17.3
No	67	82.7

Table 4 Distribution of the respondents by nutritional status of the children (n=81)

Variables	Frequency	Percent
Height for age (stunting)		
Normal	45	55.6
Stunted	36	44.4
Total	81	100.0
Weight for age (underweight)		
Normal	49	60.5
Underweight	32	39.5
Total	81	100.0
Nutritional status		
Normal	35	43.2
Malnutrition	46	56.8
Total	**81**	**100.0**

Table 5 Distribution of the respondents by helminthic and protozoal infections (n=81)

Variables	Frequency	Percent
***Helminthic infestation**		
No infestation	57	70.4
AL	14	17.3
AD	1	1.2
TT	12	14.8
Giardia	2	2.5
***Protozoal cyst**		
No cyst	58	71.6
E. coli	9	11.1
E.hystolytica	16	19.8
H. nana	3	3.7
Combined helminthic and protozoal infections		
None	39	48.1
Protozoal cyst	18	22.2
Helminthic infection	19	23.5
Both	5	6.2
Total	**81**	**100.0**
Sources of treatment		
School doctor	71	87.7
Pharmacist	5	6.2
Pvt. hospital	4	4.9
MBBS doctor	1	1.2
Total	**81**	**100.0**

Multiple responses

Table 6 Distribution of the respondents according to relationship betwee parasitic infection and sex

Sex	Parasitic infection			
	None (n=39)		Yes (n=42)	
	No.	%	No.	%
Boy	11	52.4	10	47.6
Girl	28	46.7	32	53.3

Chi-square =0.203; df= 1; p>0.05

Table 7 Distribution of the respondents according to parasitic infection and nutritional status

Nutritional status	Parasitic infection			
	None (n=39)		Yes (n=42)	
	No.	%	No.	%
Normal	20	57.1	15	42.9
Malnutrition	19	41.3	27	58.7

Chi-square =1.997; df= 1; p>0.05

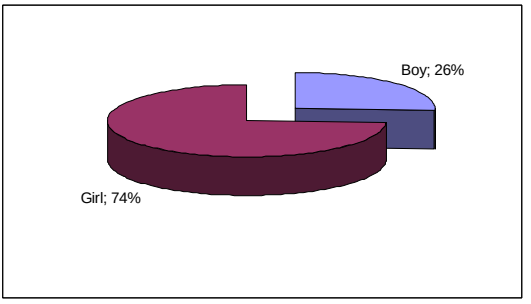


Figure 1 Distribution of the respondents by sex

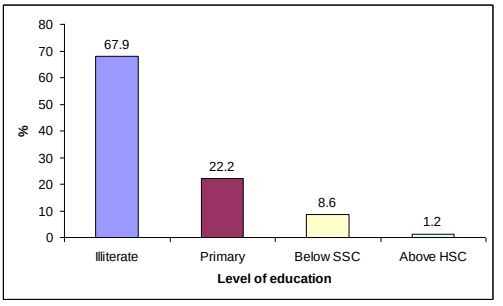
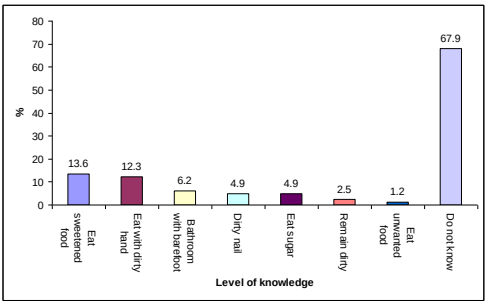


Figure 2 Distribution of the respondents by level of education



*Multiple responses

Figure 3 Distribution of the respondents by knowledge on transmission of parasitic disease (n=81)