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Introduction
Gastrointestinal parasites are parasites found in the gastrointestinal tract, and they are among the most common human infections which are distributed throughout the world with high prevalence rates in developing countries due to deficiency of sanitary facilities, unsafe human waste disposal system, inadequate lack of safe water supply, and low socio-economic status (Omudu, 2003) Wadhwa et al (2011) have shown high prevalence of gastrointestinal parasitic diseases in the cattle and buffaloes in India. People of all ages are affected by this cycle of prevalent parasitic infections (Stekeete, 2003), however, while a whole population will be geographically at risk, children are observed to disproportionately carry the greatest burden of infection (Brooker et al, 2006). This disproportion has behavioral, biological and environmental bases. Children tend to be more active in the infected environment and rarely employ good sanitary behaviors. Frequenty, these potential carriers are crowded together for large periods of time (e.g., schools, orphanages or slums), increasing the likelihood of transmission in orde to identify the presence of gastrointestinal parasitic infection, and to determine the impact of some factors such as age, sex, location (rural and urban) and nutritional habits of children and also the occupation of their parents, this cross sectional study was carried out on 132 stool samples of primary school children in Okwelle, Onuimo (rural) and Owerri municipal(urban), Imo State, Nigeria. Using direct wet mount techniques(using physiological saline and lugol’ iodine) to process the samples (faeces), 74(56.1) out of 132 samples collected were found positive for various gastrointestinal parasites with E. histolytica accounting 36.4%, Ascaris lumbricoides10%, Trichuris trichuria and Hookworm7.6%, Giardia intestinalis 4.5% and Strongyloides stercoralis 3.0% respectively. Cases of poly parasitism were also detected but no pupil had more than two parasite species. Infection was higher in male (64.8%) than female (44.1%), people living in the rural areas (58.5%) than those in the urban centers (48.0%), lower age group (76%) than higher age group (45%). It is concluded that sanitary measures and de- worming programs be conducted in primary schools especially those in rural areas to decrease the rate of intestinal parasite infection.

Keywords
Gastrointestinal, E. histolytica, Infection, Rural, Onuimo, Epidemiology, School, Urban, Infection.

ABSTRACT
In order to identify the presence of gastrointestinal parasitic infection, and to determine the impact of some factors such as age, sex, location (rural and urban) and nutritional habits of children and also the occupation of their parents, this cross sectional study was carried out on 132 stool samples of primary school children in Okwelle, Onuimo (rural) and Owerri municipal(urban), Imo State, Nigeria. Using direct wet mount techniques(using physiological saline and lugol’ iodine) to process the samples (faeces), 74(56.1) out of 132 samples collected were found positive for various gastrointestinal parasites with E. histolytica accounting 36.4%, Ascaris lumbricoides10%, Trichuris trichuria and Hookworm7.6%, Giardia intestinalis 4.5% and Strongyloides stercoralis 3.0% respectively. Cases of poly parasitism were also detected but no pupil had more than two parasite species. Infection was higher in male (64.8%) than female (44.1%), people living in the rural areas (58.5%) than those in the urban centers (48.0%), lower age group (76%) than higher age group (45%). It is concluded that sanitary measures and de- worming programs be conducted in primary schools especially those in rural areas to decrease the rate of intestinal parasite infection.

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dropping especially in the urban areas. Many residential building in the urban centers and commercial areas do not have toilet facilities and people defecate indiscriminately on the roadside, drainage gutters, etc. Heaps of refuse are left un- disposed for days to weeks in some parts of the urban centers like Owerri. Food vendors and snacks dealers amongst other edible commodities are commonly found displayed and sold near such un-disposed heaps of waste.

**Research Respondent**

The respondents used in this study were primary school pupils, aged 5 to 14 years selected from primary schools within Owerri Municipal Council and Okwelle-Onuimo Local Government. The respondents were randomly selected from two primary schools in each of the study areas. The headmasters/ headmistresses of the various schools were approached and objective of the study explained to them. Their consent and willingness to allow their pupils participate in the study were sought for. The class teachers of the various schools that gave their consent to participate in the study were used as field assistants to recruit their pupils and collect samples from them. A total of 150 respondents comprising of 60 from Owerri Municipal council and 90 from Okwelle were selected for the study.

**Test Samples**

The samples used for this study was early morning stool samples collected from the selected respondents.

**Instrument for Data Collection**

The instrument used in collection of data in this study is a structured questionnaire comprising of two sections; section A-socio-demographic data and section B-nutritional habit. Section A comprises of six questions while section B has seven questions.

**Pre - testing of instruments for data collection**

The questionnaires used for this study were pre-tested at Ihiagwa and Nekede in Owerri West Local Government Area. Ten primary school pupils from Ihiagwa and Nekede were selected and initial draft of the research questionnaires were administered to them. The difficulties encountered in completing the questionnaire and useful suggestions made by the pre-test field assistants were used to prepare the final questionnaire used for the study.

**Administration of Questionnaire**

The questionnaires were administered to the respondents by person to person contact. The field assistants administered the questionnaires to the selected pupils and assisted them to complete it. The completed questionnaires were collected on the spot after completion.

**Sterilization of Materials**

The materials for this study were sterilized using standard techniques as in Cheesebrough (2002), Obiajulu and Ozumba (2009). Glass wares (test tubes, beaker, etc.) were sterilized in the hot air oven at 160° for 1hr. Working areas (bench top and film cupboard) were cleaned with disinfectant (Purit) and covered with 75% ethanol. Sterile disposable hand gloves and facemask were worn intermittently to ensure aseptic condition. Commercially prepared disposable specimen containers (Seward) were used.

**Collection of Samples**

Disposable sterile containers bearing the respective index numbers, age, gender of respondents who have completed and returned their questionnaires were given to the field assistant who issued them to the pupils before dismissal of school and instructed them to use sterile swab stick provided to collect a little portion of their early morning feces the next day and put inside the specimen container.

The pupils were instructed to submit the collected samples to the field assistants on arrival to the school on day of sample collection. The collected samples were transported in a suitable plastic container to the Microbiology Laboratory of Federal University of Technology Owerri where they were analyzed within 3 hour of collection.

**Processing and Parasitological Examination of Samples**

Each sample was analyzed parasitologically for stool analysis using the direct wet mount technique as in Cheesebrough (2002), Obiajuru and Ozumba (2009). A little portion (about 0.5g) of each sample was emulsified in 1ml of physiological saline in a sterile test tube using disposable swab stick. The emulsified sample were properly labeled and covered with a plastic cap.

The physical (microscopic) appearance and nature of each stool samples were observed and recorded. Disposable sterile Pasteur’s pipette was used to collect a portion of emulsified sample of each research specimen. A drop was placed on a clean grease free slide and covered with a cover slip. It was placed on a microscope stage and examined microscopically using low power(x45) objectives. Organisms observed in each sample were recorded.

Another portion of each emulsified specimen was placed on a clean glass slide and a drop of Lugol’s iodine was added to it and covered with a cover slip. It was examine microscopically using low power(x10) and high power (x45) objectives.

**Analysis of Data**

The data obtained from the study were analysed statistically using simple percentage and chi-square analysis as in Philips (2002).

**Result**

Out of 150 pupils selected for the study, 134 (89.3%) completed and returned the questionnaire. 2 (1.5%) out of 134 that returned the questionnaire did not produce stool samples. 132 pupils submitted both stool samples and completed questionnaires and these were used for the study.

Of the 132 pupils used for the study, 68 (51.5%) were females and 64 (48.5%) were males. Out of 60 respondent selected in Owerri (urban) only 50 (83.3%) returned completed questionnaire and stool samples. Similarly, 82 (91.1%) out of 90 pupils selected at Okwelle (rural), returned completed questionnaire and stool samples.

**Prevalence of Intestinal Parasite**

The result of this study shows that out of 132 pupils examined, 74(56.1%) were infected with intestinal parasites.

**Gender related prevalence of infection**

Out of 64 male pupils examined, 44 (68.8%) were infected with intestinal parasite while 30 (44.1%) out of 68 female pupils examined were infected with intestinal parasite. Specifically, 18 (28.1%) of male pupils were infected with protozoa, 18 (28.1%) with helminthes parasite, while 8 (12.5%) with both protozoa and helminthes. Out of 68 female pupils, 18 (26.5%) were infected with protozoa parasite, 2 (2.9%) with helminthes and 10 (14.9%) had mixed infections of helminthes and protozoa.

Generally the prevalence of intestinal parasite was higher (68.8%) amongst males than in female pupils (44.1%). Analysis of the data using chi square showed significant difference (P < 0.05) in the prevalence of infection between male and female pupils.

Table 1 summarizes the gender related prevalence of intestinal parasites. The prevalence of intestinal protozoan parasite (27.3%) was higher than that of intestinal helminthes.
(15.2%). Similarly, the prevalence of single (helminthes and protozoa) intestinal parasitic infection (42.4%) was higher than that of mixed infection (both helminthes and protozoa) (13.8%). As shown, a total of 58 (43.9%) pupils had no intestinal parasite infection. These comprised of 20 (31.3%) males and 38 (58.9%) females.

**Age related prevalence of infection**

The result of this study shows that out of 82 pupils ages 5 to 8 years, 38 (46.3%) were infected by *E. histolytica, 8* (9.8%) by hookworm, 6 (7.3%) with *A. lumbricoides*, 4 (4.9%) by *G. intestinalis* or *T. trichuria* respectively and 2 (2.4%) with *Strongyloides stercoralis*.

Out of 28 respondent aged 9 to 12 years, 8 (28%) were infected by *E. histolytica, 4* (14.3%) by *A. lumbricoides* and *T. trichuria* respectively and 2 (7.1%) by *G. intestinalis* and hookworm respectively.

Out of 22 pupils aged above 12 years, 4 (18.2%) were infected by *Ascaris*, 2 (9.1%) by *E. histolytica, T. trichuria and Strongyloides* respectively. It can be observed that the prevalence rate increased significantly as a result of mixed infection (18).

Table 2 summarizes the age related prevalence of intestinal parasite in the study area. As shown, the most prevalent parasite was *E. histolytica* (36.4%) followed by *Ascaris* (10.6%), and the least prevalent parasite (3.0%) was *Strongyloides*. Analysis of the data using chi square showed significant difference (p<0.05) in the prevalence of intestinal parasite between the different age groups. Prevalence of infection was higher amongst the younger aged group (5-8 years), than that of the older age groups (9-12 years and above 12 years).

**Community Related Prevalence of Intestinal Parasite**

Out of 50 pupils examined from Owerri Municipal, 26 (52%) were infected with intestinal parasite. In Okwelle, 48 (58.5%) out of 82 pupils were infected with intestinal parasites. There were a total of 18 subjects with mixed infection made up of 6(12) from Owerri Municipal and 12 (14.6).

Table 3 summarizes the distribution of intestinal parasites among urban and rural communities studied. As shown 16 (32%) out of 50 pupils were infected with *E. histolytica* in Owerri, 8 (16%) with hookworm and 4 (8%) with *Ascaris* and *T. trichuria* respectively.

In Okwelle (rural), 32 (39.0%) pupils were infected with *E. histolytica, 10 (12.2%) with *Ascaris, 6 (7.3%) with G. intestinalis* and *T. trichuria* respectively, 4 (4.9%) with *Strongyloides* while 2 (2.4%) were infected with hookworm.

Analysis of the data using chi square shows significant difference (p<0.05) in the prevalence of infections between urban and rural communities. Prevalence of infection was higher (58.5%) in the rural than urban area (48.0%).

**Prevalence of gastrointestinal parasites base on parent’s occupation**

The result showed that out of 34 pupils whose parents were traders, 12 (35.3%) were infected by *E. histolytica, 6* (17.16%) by *A. lumbricoides*, 4 (11.8%) by *T. trichuria* and 2 (5.9%) by hookworm.

Out of 30 pupils whose parents were farmers 12 (40%) were infected by *E. histolytica, 6* (20%) by *A. lumbricoides*, while 2 (6.7%) were infected by *G. intestinalis, T. trichuria*, hookworm and *Strongyloides stercoralis* respectively.

Out of 24 pupils whose parents were civil servants, 4 (16.7%) were infected by *E. histolytica*, and 2 (8.3%) were infected by *G. intestinalis, T. trichuria and Strongyloides stercoralis* respectively.

Out of 44 pupils whose parents were artisans, 20 (45.5%) were infected by *E. histolytica, 6* (13.6%) by hookworm and 2 (4.5%) by *A. lumbricoides, G. intestinalis* and *T. trichuria* respectively.

Table 4 summarizes the occupational distribution of intestinal parasitic infection amongst primary school pupil in Imo State. As shown; infection was higher amongst pupils whose parents are artisans, followed by pupils whose parents were farmers, traders and civil servants.

**Comparative analysis of the effect of nutritional habits on the prevalence of intestinal parasite**

Table 5 shows the prevalence of gastrointestinal parasites based on the nutritional habits. Out of 56 pupils who usually eat fresh vegetables, 40 (71.4%) pupils were infected. Of these numbers, 20 (35.7%) were infected with *E. histolytica, 6* (10.7%) with *A. lumbricoides, 3* (5.3%) with *G. intestinalis, 1* with *Strongyloides stercoralis* while 5 (8.9%) with hookworm and *T. trichuria* respectively.

Out of 40 pupils who usually eat fruit at school, 27 (67.5%) were infected, of these 16 (35.7%) were infected with *E. histolytica, 2* (4.5%) with *G. intestinalis, 4* (9.1%) with *A. lumbricoides* and 2 (4.9%) with *T. trichuria, 2* (4.9%) with hookworm, 1 (2.5%) with *Strongyloides stercoralis*. Out of 20 pupils who eat fast foods (from local fast food vendors), 13 (65%) were infected with intestinal parasites. Of these, 7 (35%) were infected with *E. histolytica, 2* (10%) with *A. lumbricoides* and 1 (5%) with hookworm and 3 (15%) with *T. trichuria*. Fourteen (14) pupils out of 132 eats confectionaries as snacks at school, of these 11 (8%) were infected by gastrointestinal parasites. Of these numbers, 6 (46%) were infected by *E. histolytica, 2* (10%) with *A. lumbricoides, 2* (10%) with Hookworm while 1 (8%) with *S. stercoralis* while 1 (8%) with *G. intestinalis*. Among 2 pupils that usually eat local snaks, 1 (50%) were infected with *Strongyloides stercoralis*.

**Discussion**

This study investigated the prevalence and risk factors of gastrointestinal parasite infections in rural (Okwelle - Onuimo) and urban (Owerri municipal) communities of Imo state. It was hypothesized that boys would be at increased risk compared to girls and younger children would be at increased risk for gastrointestinal parasites compared to older children, since their behavior would make them more likely to come in contact with contaminated water, dirt, food, feces and sources of infection. It was also hypothesized that children in rural area were at increased risk of infection compared to children in the urban area. The prevalence of gastrointestinal parasite infection of human may be related to several human factors such as age, sex, occupation, method of defecation and habitats. The results revealed that out of 132 pupils examined 74 (56.1%) of pupils were having one or more of the following parasites present in their stool samples: *Entamoeba histolytical, Ascaris lumbricoide* *s, Trichuris trichiura, Giardia intestinalis, Strongyloides stercoralis*. The most frequently found parasite in the study was *E. histolytica* followed by *Ascaris lumbricoide*, *Trichuris trichiura*, hookworm, *Giardia intestinalis* and the least is *Strongyloides stercoralis*. This result is in line with other finding in the south-eastern Nigeria which recorded 55.2% prevalence(Woken et al, 2001). However, the higher prevalence of protozoa (especially *E. histolytica*) compared to helminthes might be due to the fact that cyst are more resistant to harsh weather than eggs of helminthes. High prevalence of intestinal parasite infestation is apt to occur in low socioeconomic conditions characterized by inadequate water supply and poor sanitation. The distribution of parasites among sex group showed that more males were infected than females.
### Table 1. Gender Related Prevalence of Gastrointestinal Parasites

<table>
<thead>
<tr>
<th>Sex</th>
<th>Number examined</th>
<th>Number infected (%)</th>
<th>Number uninfected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>64</td>
<td>18 (28.1)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>68</td>
<td>18 (26.5)</td>
</tr>
<tr>
<td>Totals</td>
<td>132</td>
<td>36 (27.3)</td>
<td>20 (15.2)</td>
</tr>
</tbody>
</table>

### Table 2. Age-Related Prevalence of Intestinal Parasites

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Numbers examined</th>
<th>Number infected (%)</th>
<th>Entamoeba histolytica</th>
<th>Giardia intestinalis</th>
<th>Ascaris lumbricoides</th>
<th>Trichuris trichiura</th>
<th>Hookworm</th>
<th>Strongyloides stercoralis</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-8</td>
<td>82</td>
<td>38 (46.3)</td>
<td>6 (7.3)</td>
<td>4 (4.9)</td>
<td>16 (19.5)</td>
<td>4 (4.9)</td>
<td>8 (9.8)</td>
<td>2 (2.4)</td>
</tr>
<tr>
<td>9-12</td>
<td>28</td>
<td>12 (42.8)</td>
<td>4 (14.3)</td>
<td>16 (57.1)</td>
<td>4 (14.3)</td>
<td>2 (7.1)</td>
<td></td>
<td>0 (0)</td>
</tr>
<tr>
<td>Above 12</td>
<td>22</td>
<td>10 (45.5)</td>
<td>4 (18.2)</td>
<td>2 (9.1)</td>
<td>4 (18.2)</td>
<td>2 (9.1)</td>
<td></td>
<td>0 (0)</td>
</tr>
<tr>
<td>Total</td>
<td>132</td>
<td>48 (36.4)</td>
<td>6 (4.5)</td>
<td>14 (10.9)</td>
<td>10 (7.6)</td>
<td>10 (7.6)</td>
<td>4 (3.0)</td>
<td>18 (13.6)</td>
</tr>
</tbody>
</table>

### Table 3. The distribution of gastrointestinal parasites among urban and rural communities

<table>
<thead>
<tr>
<th>Community</th>
<th>No. Examined</th>
<th>No. Infected (%)</th>
<th>Entamoeba histolytica</th>
<th>Giardia intestinalis</th>
<th>Ascaris lumbricoides</th>
<th>Trichuris trichiura</th>
<th>Hookworm</th>
<th>Strongyloides stercoralis</th>
<th>Mixed infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>50</td>
<td>16 (32.0)</td>
<td>6 (12.0)</td>
<td>4 (8.0)</td>
<td>2 (4.0)</td>
<td>2 (4.0)</td>
<td>6 (12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>82</td>
<td>32 (39.0)</td>
<td>6 (7.3)</td>
<td>10 (12.2)</td>
<td>6 (7.3)</td>
<td>2 (2.4)</td>
<td>4 (4.9)</td>
<td>12 (14.6)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>132</td>
<td>48 (36.4)</td>
<td>6 (4.5)</td>
<td>14 (10.9)</td>
<td>10 (7.6)</td>
<td>10 (7.6)</td>
<td>4 (3.0)</td>
<td>18 (13.6)</td>
<td></td>
</tr>
</tbody>
</table>

### Table 4. Parent’s Occupational Related Prevalence of Gastrointestinal Parasite

<table>
<thead>
<tr>
<th>Parents occupation</th>
<th>No. examined</th>
<th>No. of infection (%)</th>
<th>Entamoeba histolytica</th>
<th>Giardia intestinalis</th>
<th>Ascaris lumbricoides</th>
<th>Trichuris trichiura</th>
<th>Hookworm</th>
<th>Strongyloides stercoralis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trader</td>
<td>34</td>
<td>12 (35.29)</td>
<td>-</td>
<td>-</td>
<td>6 (17.65)</td>
<td>2 (5.88)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Farmer</td>
<td>30</td>
<td>12 (40.00)</td>
<td>2 (6.67)</td>
<td>6 (20.00)</td>
<td>2 (6.67)</td>
<td>2 (6.67)</td>
<td>2 (6.67)</td>
<td></td>
</tr>
<tr>
<td>Civil servants</td>
<td>24</td>
<td>4 (16.67)</td>
<td>2 (8.33)</td>
<td>-</td>
<td>2 (8.33)</td>
<td>-</td>
<td>2 (8.33)</td>
<td></td>
</tr>
<tr>
<td>Artisan</td>
<td>44</td>
<td>20 (45.45)</td>
<td>2 (4.55)</td>
<td>2 (4.55)</td>
<td>2 (4.55)</td>
<td>6 (13.64)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>132</td>
<td>48 (36.36)</td>
<td>6 (4.55)</td>
<td>14 (10.61)</td>
<td>10 (7.58)</td>
<td>10 (7.58)</td>
<td>4 (3.03)</td>
<td>18 (13.6)</td>
</tr>
</tbody>
</table>

### Table 5. The Effect of Nutritional Habits on the Prevalence of Intestinal Parasite

<table>
<thead>
<tr>
<th>Type of food</th>
<th>E. histolytica</th>
<th>A. lumbricoides</th>
<th>Hookworm</th>
<th>S. stercoralis</th>
<th>G. intestinalis</th>
<th>T. trichiura</th>
<th>No uninfected</th>
<th>No infected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresh vegetable(56)</td>
<td>20 (35.71)</td>
<td>6 (10.71)</td>
<td>5 (8.93)</td>
<td>1 (1.79)</td>
<td>3 (5.36)</td>
<td>5 (8.93)</td>
<td>16 (28.57)</td>
<td>40 (71.43)</td>
</tr>
<tr>
<td>Fruits(40)</td>
<td>16 (40.00)</td>
<td>4 (10.00)</td>
<td>2 (5.00)</td>
<td>1 (2.50)</td>
<td>2 (5.00)</td>
<td>2 (5.00)</td>
<td>13 (32.50)</td>
<td>27 (67.50)</td>
</tr>
<tr>
<td>Fast food(20)</td>
<td>7 (35.00)</td>
<td>2 (10.00)</td>
<td>1 (5.00)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3 (15.00)</td>
<td>7 (35.00)</td>
</tr>
<tr>
<td>Confectionaries(14)</td>
<td>5 (35.71)</td>
<td>2 (14.39)</td>
<td>1 (7.14)</td>
<td>1 (7.14)</td>
<td>-</td>
<td>-</td>
<td>3 (21.43)</td>
<td>11 (78.57)</td>
</tr>
<tr>
<td>Local snacks(2)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1 (50.00)</td>
<td>-</td>
<td>-</td>
<td>1 (50.00)</td>
<td>1 (50.00)</td>
</tr>
</tbody>
</table>
Similar results were reported by Narayan et al (2011) and Rufai et al. (2006) that more males than females were affected. This agrees with the finding of Ikon (1999) during an epidemiological study of gastrointestinal helminthes among pupils in Urban and rural communities in Nigeria. This high prevalence associated with males may be due to the fact that they are more often engaged in predisposing activities such as football and also playing in stream and ponds. The findings of this study shows that children under 5-8 years age group has higher prevalence of gastrointestinal parasites (76%) compared to the 9-12 and above 12 years age group which is 71% and 45% respectively, although the result is not significantly different. This work supports the report of Damen et al. (2011) that lower age group have higher prevalence rate of infection than older people in the northern part of Nigeria. This can be because pupils in this age group often spend more of their leisure time outdoors, playing and/or foraging in garbage dumping and eating discarded food remains on the street. They are also more often in contact with sand and eat indiscriminately with unwashed hands. Compared to lower aged group, the higher age group low prevalence of infection observed may be attributed to the fact that they become more hygiene-conscious about their look and hence are able to avoid as much as possible what will lead to one being infected. This is consistent with the finding observed in Kaduna (Luka et al., 2000) and Abia state (Ukpai et al., 2003).

As shown in the result, the prevalence of gastrointestinal parasite is higher in the rural communities (58.5%) compared to that of the urban communities (52%). Drinking unsafe water; association with domestic animal; playing in dirty environment; working and walking barefoot result to higher exposure of children to infective stage of gastrointestinal parasites. All this accounts for the high prevalence of these parasites in the rural communities.

The result also showed that the prevalence of infection was higher(80%) among pupils that buy food from fast food vendors, followed by those that usually eat fruits(62%), local snacks (50%), while the least prevalence are in those that eat confectioneries(43%). The high prevalence amongst pupils that eat fast food may be because the food was prepared under dirty environment, example cooking beside drainage gutters and near defecation areas, using spoilt ingredients and unsafe water which expose the food to gastrointestinal parasites.

Fruits can be eaten unwashed and also with dirty fingers. This contributes to the high prevalence among those that usually eat fruits. Compared to others, confectioneries are prepared under good environmental conditions, packaged with hygienic packets and also are prepared with high temperature which helps to eliminate most of the parasites. But these confectioneries could have been eaten with dirty finger which accounts for the infection rate. These are consistent with the result that of Ogbuagu et al. (2008). However, the effective treatment of most of these tropical parasitic diseases especially gastrointestinal infections depends on a whole lot of prompt diagnosis. The capability of rapidly diagnosing the disease and identifying its causative agent is critical to combat diseases and halt epidemics (Wadhwa et al., 2012 A). Recent technological developments have led to the proliferation of new, rapid diagnostic tests that hold promise for the improved management and control of infectious diseases (Wadhwa et al., 2013 and Wadhwa et al., 2014). Such new technologies include microfluidics (Wadhwa et al. 2012 B) and “Lab-on-Chip” (Liu et al., 2011 ) as examples of promising new technologies and innovations that can underpin development of laboratory-free diagnostic devices for these gastro-intestinal parasites in animal husbandry. The present data obtained from this study, can serve as baseline prevalence data for gastrointestinal parasitic infection amongst school fed children, which will be useful for the future assessment of the significance of prevalence value of gastrointestinal parasite in various age group and different sex.

**Conclusion and recommendation**

It is well known that the prevalence of gastrointestinal parasitic infections in children are generally high, especially, those of lower aged group and those from the rural communities. This can be attributed to the fact that these set of children usually stay outdoors, play in ponds and mud water, walking barefooted, which exposing them to contaminated soil and thereby increasing their risk of infection.

Also children who eat outside their home, those who buy food from local food vendors, and those who eat fruits and fresh vegetables; all stands a high risk of infection. This may be due to the manner of preparing food in dirty environment, not washing the fresh vegetable with clean water before eating, and also not washing hand after using the toilet and before eating. If these infections are left untreated, serious complications and even death may occur. Typical public-health interventions (such as the provision of clean water, community health education, observation of food hygiene, and maintenance of functioning sanitation systems) are essential to long-term control in a community should a top priority in our local communities.

It is therefore recommended that local health workers/officers should visit schools regularly (especially those in rural communities) for routine de - worming and health education to improve sanitary conditions like regular hand washing. Parents should be also informed about the sign, symptoms and prevention of these parasitic infections.

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**References**


