

## SURVEY OF HUMAN INTESTINAL PARASITIC INFECTIONS AMONG OUT-PATIENTS ATTENDING WUDIL GENERAL HOSPITAL, WUDIL, KANO STATE, NIGERIA

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### ABSTRACT

*A survey was carried out to determine the prevalence of human intestinal parasitic infection among patients attending Wudil General Hospital, Kano State from November 2011 to February, 2012. Formol ether concentration technique was employed for sample examination. Out of 80 patients examined, 57 (71.3%) were infected with one or more of the intestinal parasites. Patients aged between 11-19 years had the highest (87.5%) prevalence of intestinal parasite infection while patients aged between 50-59 years had the least (0.00%) prevalence rate of infection. These observed difference in relation to age was not statistically significant ( $P>0.05$ ). *Strongyloides stercoralis* was the most prevalent intestinal parasite among the population (25.3%) while *Trichuris trichura* had the least prevalence (3.03%). Males showed a higher prevalence of intestinal parasitic infection (75.5%) than females (60.9%). This was statistically significant ( $P<0.05$ ). Intestinal parasitic infection were highest among farmers and traders (100%) respectively, while civil servants had the least prevalence (42.9%) and this was found to be statistically significant ( $P<0.05$ ). Patients who depend on the river as their major source of drinking water recorded the highest (95.2%) prevalence rate while patients that depend on sachet water had the least (37.5%) prevalence rate of intestinal parasitic infection and this was not statistically significant ( $P>0.05$ ). The need for regular de-worming even without the constitutional abdominal ache, vomiting and diarrhea as well as hygienic food preparation and health education to encourage individuals to adopt behavioral change is recommended among others in this study.*

**KEYWORDS:** Intestinal parasite, out- patients, helminthes, protozoa, Wudil.

### INTRODUCTION

Intestinal parasitic infections cause greater form of morbidity and mortality in most endemic and developing countries of the world. It has been reported that these intestinal parasites are the most prevalent infection affecting approximately one quarter of the world's populations, mainly school children, due to their poor hygienic nature and poor sanitary condition coupled with their voracious eating habits (WHO, 1987). Intestinal parasite are usually transmitted when someone come in contact with infected faeces (WHO, 2005). People with intestinal parasitic infection are usually under nourished and weak, infected with viral, fungal or bacteria and have various types of chemical and metal poisoning. Human intestinal parasites can be present in any disease, in any person; at any age (WHO, 2004).

Intestinal parasites are responsible for many health problems because they secrete toxins and consume the vital nutrients from our bodies. They can irritate or exaggerate other health problems a person is experiencing. Everyone is at risk and under their mercy during parasitic infections (Cook, 1986).

More than one billion of the World populations including at least 400 million school children are chronically infected with *Ascaris lumbricoides*, *Trichuris trichiura* and the hookworms. In most cases, intestinal parasites have symptoms which are unpleasant to their host. When present in the body of their host they cause abdominal pain,

diarrhea, nausea, vomiting, gas or bloating, dysentery, rash, stomach ache, weight loss, allergies, anemia, constipation, fatigue, immune dis-function, nervousness, restlessness, etc.

Intestinal parasites have become a major health problem in many developing countries and the prevalence of infections and degree of factors predisposing to infection vary from one region to another. There is therefore, the need to carry out this study so as to determine prevalence of infection in the study area as well as to suggest possible ways of reducing havoc caused by these intestinal parasites.

The objectives of the research were to determine the rate of occurrence of intestinal parasite among out-patients attending Wudil General Hospital, to determine the prevalence between the age groups of patients in the study area, evaluate the prevalence of intestinal parasites by occupation, developmental status of the community, educational status, and drinking water source.

### MATERIAL AND METHODS

#### The Study Area

Wudil Local Government Area of Kano State is located 43Km South-East from the state capital. Wudil town is one of the important commercial towns in Kano State. It covers an area extending between latitude 11°37'N and latitude 11°56'N as well as between longitude 8°45'E and 8°57'E and has a population of 105,106 (NPC, 2006).

It has high commercial activities (weakly market) and the inhabitants are diverse in occupation ranging from the elite to traders and artisans with majority of its populace using farming as a source of income. Major crops produce are corn, rice, sugar cane, groundnut, vegetables and with some few people engaged in fishing activities (as such the town is famous because of the river), cattle rearing, pottery and traditional hand weaving (Olofin *et al.*, 2008). Well water and pipe borne water are their source of drinking water and river water is common among the surrounding communities.

#### Ethical consideration

Professional ethics were adopted in order to ensure smooth conduct of the research. Prior to the start of the research, letter of introduction was delivered to the Chief Medical officer of Wudil General Hospital explaining the purpose of the research. An informed consent was also sought from a cross-section of out-patients attending Wudil General Hospital before stool samples were collected from them.

#### Sample collection

Each patient was giving a clean, dry, well labeled specimen container with which the fecal samples were taken to the parasitology laboratory of Wudil General Hospital, Kano State for investigation. Patients were instructed to collect stool specimen and were told not to contaminate the sample with urine. Samples were immediately examined otherwise motile parasites such as *Entamoeba histolytica* and *Giardia lamblia* trophozoites may not be detected. Samples were handled with care.

In the course of the study, 85 patients were issued a specimen container, 80 returned their stool specimen for examination from November, 2011 to February, 2012. Questionnaires were also administered to each patient from whom personal information such as age, sex, source of drinking water and occupations were obtained.

#### Laboratory Investigation

Each sample was first examined for its consistency, color, and presence of blood, mucous, adult worms, proglottids of tape worms, with an applicator stick. Direct smear and formol ether concentration techniques according to WHO (2004) and Cheesbrough (2005) were used for the microscopic examination of each stool sample. Antigen testing was not performed; therefore the differentiation of *Entamoeba histolytica* from *Entamoeba dispar* was not possible.

#### Macroscopic Examination

Macroscopic examination was done to identify any parasitic worm or tape worm segment found in the specimen. The color of the specimen, consistency that is whether formed, semi formed,

unformed or watery and also the presence of blood, mucus and or pus was confirmed.

#### Formol Ether Concentration Technique

An applicator stick was used to emulsify 1g of feces in about 4ml of 10% formol water contained in a screw-cap bottle or tube. Another 3-4ml of 10% v/v formol water was added and mixed. The emulsified faeces were sieved and the sieved suspension was collected in a beaker. The suspension was then transferred into a conical centrifuge tube and 3-4ml of acetone was added and centrifuged for 5 minutes. The centrifuge was stopped and the sediment was mixed for one minute. With a tissue or pieces of cloth wrapped around the top of the tube, the stopper was loosened and the suspension was centrifuge immediately at 750-1000g for 1 minute. After centrifuging, the parasites will have sedimented to the bottom of the tube and the faecal debris will have collected in a layer between the ether and formol water.

The ether, faecal debris and formol water were discarded leaving the sediment. The tube was returned to its upright position and allowed the fluid from the side of the tube to drain to the bottom. The sediment was then mixed and a small portion was transferred on to a slide using an applicator stick. The glass slide was covered with cover slip. The preparation was then examine microscopically using 10x objectives. The condenser iris was closed sufficiently to give good contrast. Small cyst and oocyst were observed using 40x objective lens (Cheesbrough, 2005).

#### Statistical Analysis

Chi-square test was employed to determine the level of significance difference in relation to infection rates between different age groups, between sexes, different educational status, and different sources of drinking water as well as among different occupational groups.

#### RESULTS

Out of a total of 80 subjects examined, 57 (71.3%) were infected with one or more of the intestinal parasites (Table 1). The prevalence of intestinal parasites in relation to age showed that subjects within 11-19 years had the highest (87.5%) prevalence and the lowest (54.6%) prevalence was recorded among subjects between 20-29 years. This observed differences in prevalence by age was not statistically significant ( $P > 0.05$ ).

*Strongyloides stercoralis* was the most prevalent parasite amongst the population (25.3%) while *Trichuris trichiura* showed the least (3.03%) prevalence as shown in figure 1.

Table 2 showed that males recorded higher prevalence of intestinal parasitic infection (75.4%) than the females (60.9%).

The prevalence of intestinal parasitic infection in relation to educational status showed that illiterates had a higher prevalence of 83.0% while patients with tertiary educational had the least (25.0%) prevalence (Table 3), and this was not statistically significant ( $P>0.05$ ).

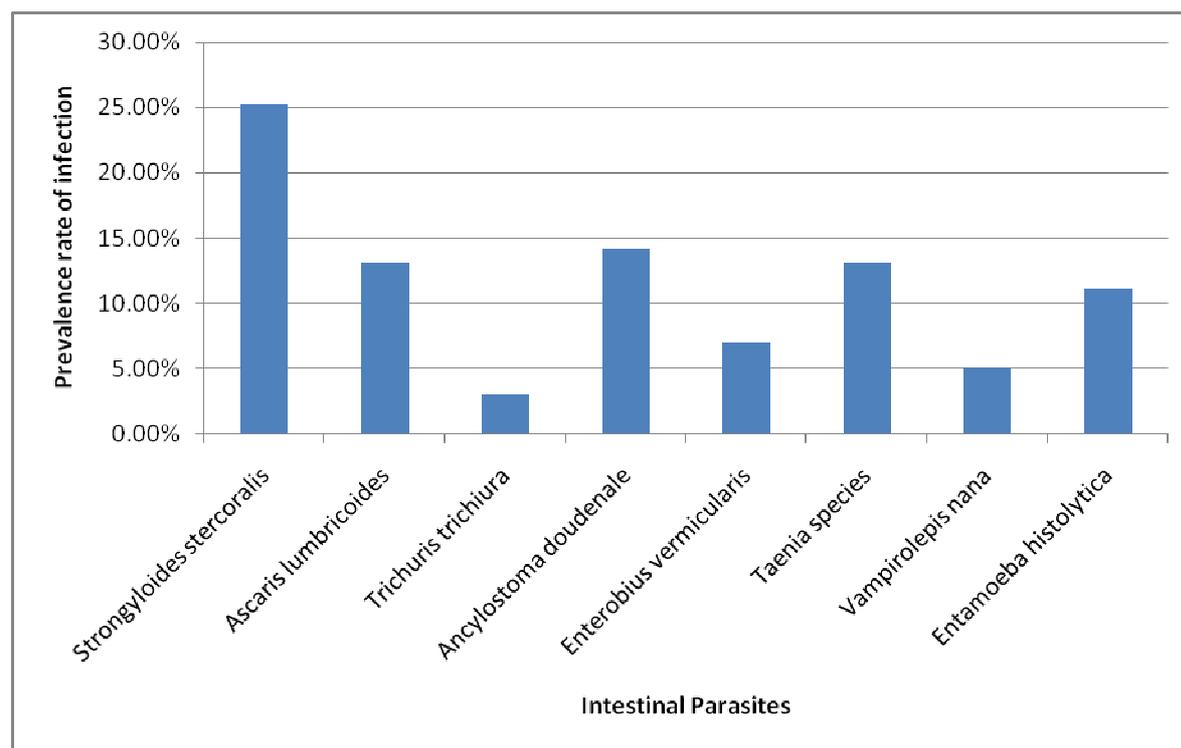
The distribution of intestinal parasitic infections based on the patients major source of drinking water showed that patients who depend on the river as their major source of drinking water recorded the highest level of prevalence (95.2%) while the patients that depend on pipe borne water and sachet water as major sources of

drinking water recorded the least prevalence (53.3% and 37.5% respectively) of intestinal parasitic infection (Table 4). This difference was not statistically significant ( $P>0.05$ ).

The prevalence of intestinal parasitic infection in relation to occupation showed that infection rate was highest (100%) among farmers and traders respectively while civil servants had the least (42.9%) prevalence of infection (Figure 2). The difference in the prevalence in relation to occupation was found to be statistically significant ( $P>0.05$ ).

**Table 1:** Prevalence of intestinal parasitic infection in relation to age among out-patients attending Wudil General Hospital, Kano State, Nigeria.

Age group	No. Examined	No (%) infected
<10	19	11 (57.9)
11-19	8	7 (87.5)
20-29	11	6 (54.6)
30-39	32	27 (84.4)
40-49	4	3 (75.0)
50-59	2	0 (0.00)
60 >	4	3 (75.0)
<b>TOTAL</b>	<b>80</b>	<b>57 (71.3)</b>



**Figure 1:** Prevalence of intestinal parasites among out- patients attending Wudil General Hospital, Kano State, Nigeria.

**Table 2:** Prevalence of intestinal parasitic infection in relation to sex among out- Patients attending Wudil General Hospital, Kano State, Nigeria.

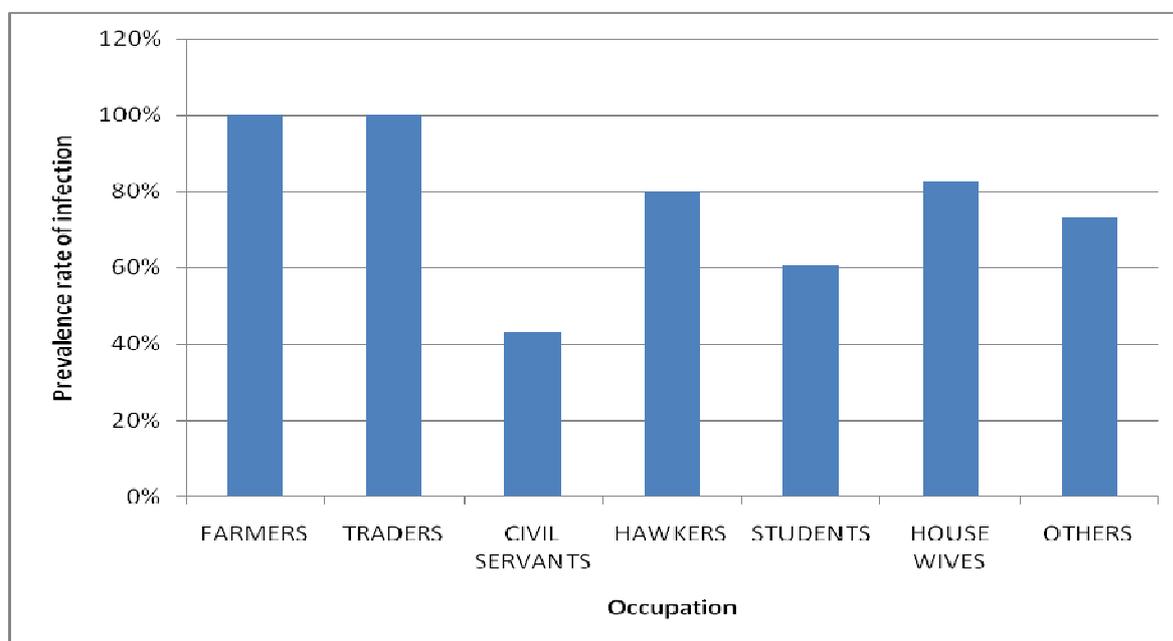
Sex	No. Examined	No (%) infected
Male	57	43 (75.4)
Female	23	14 (60.9)
<b>TOTAL</b>	<b>80</b>	<b>57 (71.3)</b>

**Table 3:** Prevalence of intestinal parasitic infection in relation to educational status of out Patients attending Wudil General Hospital, Kano State, Nigeria.

Education status	No. Examined	No (%) infected
Illiterate	47	39 (83.0)
Secondary	4	3 (75.0)
Primary	21	13 (61.9)
Tertiary	8	2 (25.0)
<b>TOTAL</b>	<b>80</b>	<b>57 (71.3)</b>

**Table 4:** Prevalence of intestinal parasitic infection in relation to source of drinking water among out-Patients attending Wudil General Hospital, Kano State, Nigeria.

Source of drinking water	No. Examined	No (%) infected
River water	21	20 (95.2)
Well water	21	18 (85.7)
Pipe borne water	30	16 (53.3)
Sachet water	8	3 (37.5)
Rain water	0	0 (0.00)
<b>TOTAL</b>	<b>80</b>	<b>57 (71.3)</b>



**FIGURE 2:** Prevalence of intestinal parasitic infection in relation to occupation among out-Patients attending Wudil General Hospital, Kano State, Nigeria.

## DISCUSSION

The result of this study clearly showed a high (71.3%) prevalence of infections among patients attending general hospital Wudil, Kano State. The result of this study markedly differed from that of Oguoma *et al.* (2008) and Ogomaka, *et al.* (2012) who recorded 38.6% and 35.4% respectively.

Some earlier reports however, in various parts of the country indicated values slightly higher than those observed in this study. There were prevalence reports of 73.8% in Ebonyi State by Ngele (2009), 80.0% in Abia State by Ukpai and Ubiaru (2011) and 85.7% in Lagos State by Idika . (2010). The closeness of these results could probably be due to the same factors of low

standard of sanitation and low socioeconomic status operating in these areas.

As observed from the results the overall prevalence of intestinal parasitic infection was highest between the ages of 11-20 years; even though the observed difference in prevalence by age was not statistically significant. This study does not conform with the work of Oguoma, *et al.* (2008) who reported highest prevalence between the ages <10-39 years and also it differs with the work of Ozurumba and Ukoh (2007) who reported that higher percentage was recorded among age groups between 21-30 and 31-40 years in Maiduguri. It was confirmed that intestinal protozoan parasites are dependent on age and greater severity of the infection is found in the younger children (WHO, 2005).

This could be attributed to different host responses and other related factors such as nutritional status (Adekunle, 2002).

The common intestinal parasites isolated in this study were *Strongyloides stercoralis* (25.3%), hookworm (14.1%), *Ascaris lumbricoides* (13.1%) and *Taenia specie* (13.1%). *Trichuris trichiura* recorded lower prevalence of 3.03%. *Trichuris trichiura* recorded the third most prevalent parasite with percentage prevalence of 19.4% in Delta (Mordi *et al.*, 2011). Ukpai and Ubiaru (2011) reported that *Strongyloides stercoralis* recorded the least (8.0%) prevalence in Abia State. Opara, *et al.* (2010) observed that *Ascaris lumbricoides* and hookworms are the most common intestinal parasites encountered. These results and those other works done by Nwaizugbo and Ajero (2007); Ameh *et al.*, (2010); Ezenwaka *et al.*, (2011); Mordi *et al.*, (2011); Ukpai and Ubiaru (2011) showed that parasites particularly hookworms and *Ascaris* are common throughout much of Nigeria. The relatively high prevalence of hookworm and *Ascaris lumbricoides* observed in this study agrees with previous findings in other parts of Northern Nigeria. Moreover, several other reports from some parts of tropical Africa have shown very high (>70.0%) infection rates of intestinal parasites (Dada *et al.*, 2005). Variations in prevalence rate of intestinal parasitic infection from different rural communities could be related to several factors including people's level of education, standard of personal and environmental hygiene and perhaps social habits. Moreso, some ecological factors such as temperature, relative humidity, rainfall, different diagnostic techniques employed by various workers could be responsible for observed differences in prevalence between communities (Onwuliri, *et al.*, 1993).

This study also showed that males had a higher prevalence of intestinal parasitic infections than the females. This may be due to the common feeding pattern in which a great number of men eat outside their homes while on daily activities to earn a living. Also male children are more active than females of the same age group there by exposing themselves to infected soils in farms and gardens during work. This observation disagrees with the work of Atu, *et al.* (2006) who observed a higher prevalence of intestinal parasites in females than in males.

The highest prevalence rate of intestinal parasitic infection in relation to occupation among the farmers and traders could possibly be due to the unhealthy practices of walking bare footed while farming and the rampant defecation in the farm lands and also the habit of traders eating outside their homes. Consequently, the least prevalence rate of the infections observed among the civil servants could be attributed to their level of awareness. This observation strongly agrees with the work of Oguoma *et al.* (2008), were he reported that farmers had the highest (60.9%)

prevalence of infection than other occupational groups among Nnewi community. Moreover, poor knowledge on health education practices on preventable diseases and cultural farming practices could be a reason for the high prevalence rate among the farmers in the study area.

The prevalence of intestinal parasitic infection in relation to educational status showed a strong association between prevalence of infection and level of education. This followed chronological pattern in the prevalence of infection ranging from the non- educated who recorded the highest level of intestinal parasitic infections to the Patients that attained the tertiary level of education who recorded the least prevalence of infections. This result corresponds with the findings of Oguoma *et al.* (2008) who reported that illiterates had the highest prevalence.

The study also revealed that subjects who depend on the river as their major source of drinking water recorded the highest level of prevalence than other sources: even though these was not statistically significant ( $P>0.05$ ). This could be due to the natural use of river water for different purposes with the antecedent contamination coupled with poor hygiene practices common amongst the people in this area. The prevalence of intestinal parasitic infection in relation to source of drinking water agrees with most workers such as Oguoma *et al.* (2008) and Mordi *et al.* (2011) among others.

### Conclusion and Recommendations

This study revealed a high level of intestinal parasites burden; a situation which is not conducive for mental, physical, and cognitive development of both children and adults. Both state and local government should as a matter of priority embark on measures to control the spread of intestinal parasites in Wudil community and its environs. In view of this therefore, it is recommended that:

1. There should be drug treatment for those already infected similar to the national immunization program to alleviate the sufferings of the already infected population; and prevent the parasites from passing into the environment and infecting others.
2. Sanitary improvements such as safe, efficient, and hygienic disposal of feces is important with a regular and effective use of water for hand washing after contact with stools.
3. Hygienic food preparation, and health education to encourage individuals to adopt behavioral change is advocated.
4. Adults and children should be encouraged to wear shoes because there are soil transmitted parasites that can pierce through the skin. Health inspectors should educate farmers on the importance of wearing shoes and washing hands in the farms.
5. De-worming should be done occasionally to eliminate the parasites, and

6. Actions to control intestinal parasitic infections should be integrated into school health programs. This integration is essential for the

success and sustainability of community health program.

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