**Chapter one**

**Introduction**

**1.1 Background of the Study**

Intestinal parasitic infections pose a significant burden on public health worldwide, particularly in regions characterized by poverty, inadequate sanitation, and limited access to clean water sources (Pullan *et al.,* 2014). These infections are caused by a variety of parasitic worms, such as *Ascaris lumbricoides, Trichuris trichiura,* and *hookworms*, as well as protozoa including *Giardia lamblia* and *Entamoeba histolytica* (Hotez *et al*., 2008). The transmission of these parasites occurs predominantly through the ingestion of parasite eggs or larvae present in contaminated soil, water, or food (Hotez *et al.,* 2009).

Among the vulnerable population groups affected by intestinal parasitic infections, school-age children, especially pupils, bear a significant burden. The World Health Organization (WHO) estimates that over 270 million school-age children are infected with soil-transmitted helminths, a group of intestinal parasites, globally (WHO, 2020). These infections impaire children's physical development, nutritional status, and cognitive functioning, ultimately affecting their overall health and educational outcomes (Nematian *et al*., 2004).

The prevalence of intestinal parasitic infections among pupils is influenced by various factors. In regions with inadequate sanitation facilities and poor hygiene practices, such as open defecation and limited access to clean water, the risk of infection increases substantially (Brooker et al., 2006). Furthermore, socioeconomic factors, including poverty, overcrowding, and low parental education levels, contribute to the persistence of these infections (Hotez *et al.,* 2009).

The consequences of intestinal parasitic infections in pupils extend beyond physical health. Malnutrition is a common outcome of these infections, as parasites compete for nutrients and impair nutrient absorption in the gastrointestinal tract (Stephenson *et al.,* 2000). Chronic infections can lead to stunted growth, micronutrient deficiencies, and anemia, negatively impacting children's overall well-being and cognitive development (Stoltzfus *et al*., 2003).

In the educational context, intestinal parasitic infections present significant challenges. Infected pupils may experience frequent absenteeism due to illness, leading to educational disruption and hindered academic progress (Brooker *et al.,* 2007). The physical symptoms associated with these infections, such as fatigue, abdominal pain, and diarrhea, can impair concentration and cognitive functioning, affecting learning outcomes (Hesham *et al*., 2014). Additionally, the social stigma attached to these infections may affect pupils' self-esteem and social interactions within the school environment (Albonico *et al.,* 2008).

To address the prevalence and impact of intestinal parasitic infections among pupils, localized studies are essential. Prevalence rates and species distribution vary across different geographical regions due to environmental, socio-economic, and cultural factors (Pullan *et al.,* 2014). Therefore, understanding the specific context and characteristics of intestinal parasitic infections in a given population is crucial for designing targeted intervention strategies and implementing effective preventive measures.

**1.2 Statement of the Problem**

Despite efforts to improve public health and sanitation conditions, intestinal parasitic infections remain a major health concern, especially among school-age children. Pupils are particularly susceptible to these infections due to their close contact with contaminated soil and water sources, inadequate hand hygiene practices, and limited knowledge about preventive measures. The prevalence of intestinal parasites in pupils can have serious consequences, including malnutrition, impaired growth, anemia, and reduced educational performance. Therefore, understanding the extent of the problem and identifying the specific parasite species prevalent in this population is essential for effective intervention strategies and improved health outcomes.

This study aims to determine the prevalence of intestinal parasites among pupils in four (4) selected primary school in Hong Local Government Area of Adamawa State. By identifying the specific parasite species and exploring associated factors, such as demographic and socio-economic variables, hygiene practices, and nutritional status, the study seeks to contribute to the existing knowledge on the burden of intestinal parasitic infections in this vulnerable population group. The findings will provide valuable insights for policymakers, educators, and public health professionals to develop evidence-based interventions that improve the health, well-being, and educational outcomes of pupils affected by intestinal parasitic infections.

**1.3 Aim and Objectives**

The aim of this study is to determine the prevalence of intestinal parasites among pupils in the study area. The specific objectives include:

1. To identify the different species of intestinal parasites, present in the studied pupils.
2. To evaluate if infection is related to age and sex.
3. To assess if infection is related to location of pupils.

**1.4 Significance of the Study**

This study will provide up-to-date information on the prevalence of intestinal parasites among pupils in the study area. The study will provide knowledge on the prevalence of intestinal parasites found in the study area. The findings can be used to create awareness among residents of the study area, policymakers, educators, and parents about the need of preventive measures and improve sanitation facilities in schools. Additionally, the study will identify the specific parasite species prevalent in the area, enabling targeted intervention strategies and appropriate treatment protocols to be developed.

**1.5 Scope of the study**

This study will focus on the prevalence of parasite in the study area.

# CHAPTER THREE

# MATERIAL AND METHOD

## 3.1 Study Area

Hong Local Government Area (LGA) is selected as the study area for several reasons. Hong Local Government Area is located in Adamawa State, Nigeria, and is characterized by its diverse population and geographical features. It is situated in the North Eastern part of the country, known for its unique socio-cultural dynamics and health challenges. Hong LGA covers a significant land area and is home to a substantial population, making it a suitable representation of the region. The LGA consists of both rural and urban communities, providing a diverse range of settings for the study. This diversity allows for a comprehensive understanding of the prevalence of intestinal parasites in different environments, including rural villages and urban areas.

## 3.2 Study Site

The primary schools in Hong LGA will be chosen as the study sites due to their accessibility and the availability of a large number of pupils within the target age group. The selection of primary schools will be done using a random sampling technique to ensure that the study population will be representative of the pupils attending schools in the LGA. Hong LGA is characterized by a mix of socio-economic backgrounds, ranging from low-income households to more affluent communities. This diversity in socio-economic status provides an opportunity to explore potential associations between economic factors and the prevalence of intestinal parasites among the pupils.

## 3.3 Study Population

A total of 200 stool samples from four (4) selected schools will be collected.

## 3.4 Sample collection

Prior to the commencement of the study, the schools will be visited and permission sought from the school authority.

The sample will be collected from four primary schools prior to the collection of the data the researcher met with the authority of the schools to be grant permission. Samples will be collected from two hundred (200) children of age ranging from 4-12 years. The names of schools, locations, age and sex of the pupils will be recorded. The samples will be transported to Federal Polytechnic, Mubi Laboratory for analysis.

## 3.5 Method of Analysis

In the laboratory the samples will be analysed using Formalin-ether concentration method.

1. Collection of Stool Sample.
2. Sample Preparation.
3. Fixation.
4. Homogenization.
5. Filtration.
6. Sedimentation.
7. Decantation.
8. Ether Addition.
9. Mixing.
10. Centrifugation.
11. Observation.

The result obtained will be recorded

## 3.6 Data Analysis

Data obtained from the study will be analysed using tables and sample percentages.

**References**

Albonico, M., Ramsan, M., Wright, V., Jape, K., Haji, H. J., Taylor, M. & Stephenson, L. S., Latham, M. C., & Adams, E. J. (2000). Malnutrition and parasitic helminth infections. *Parasitology*, 121, 23-38.

Albonico, M., Ramsan, M., Wright, V., Jape, K., Haji, H. J., Taylor, M., ... & Savioli, L. (2008). Soil-transmitted nematode infections and mebendazole treatment in Mafia Island schoolchildren. *Annals of Tropical Medicine & Parasitology*, 102(2), 111-120.

Brooker, S., Clements, A. C., & Bundy, D. A. (2006). Global epidemiology, ecology and control of soil-transmitted helminth infections. *Advances in Parasitology*, 62, 221-261.

Brooker, S., Miguel, E. A., Moulin, S., & Loucq, C. (2007). Worms at work: Long-run impacts of child health gains. *Journal of Economic Perspectives,* 21(1), 141-164.

Hesham, A. F., El-Nahas, H. A., Mekheimer, H. A., Barakat, R. M., & Morsy, T. A. (2014). Intestinal parasites among primary schoolchildren in Kafr El-Sheikh governorate, northern Egypt. *Korean Journal of Parasitology,* 52(6), 667-672.

Hotez, P. J., Bundy, D. A., Beegle, K., Brooker, S., Drake, L., de Silva, N. & Carabin, H. (2006). Helminth infections: Soil-transmitted helminth infections and schistosomiasis. *Disease Control Priorities in Developing Countries,* 2, 467-482.

Hotez, P. J., Brindley, P. J., Bethony, J. M., King, C. H., Pearce, E. J., & Jacobson, J. (2008). Helminth infections: The great neglected tropical diseases. *Journal of Clinical Investigation,* 118(4), 1311-1321.

Hotez, P. J., Brooker, S., Bethony, J. M., Bottazzi, M. E., Loukas, A., & Xiao, S. (2009). Hookworm infection. *New England Journal of Medicine*, 351(8), 799-807.

Nematian, J., Nematian, E., & Gholamrezanezhad, A. (2004). Ascaris lumbricoides as a probable cause of chronic urticaria: A case report. *Korean Journal of Parasitology,* 42(2), 115-117.

Pullan, R. L., Smith, J. L., Jasrasaria, R., & Brooker, S. J. (2014). Global numbers of infection and disease burden of soil transmitted helminth infections in 2010. *Parasites & Vectors*, 7(1), 37.

Stoltzfus, R. J., Chwaya, H. M., Tielsch, J. M., & Schulze, K. J. (2003). Epidemiology of iron deficiency anemia in Zanzibari schoolchildren: The importance of hookworms. *American* *Journal of Clinical Nutrition,* 78(4), 675-682.

World Health Organization (WHO). (2020). Soil-transmitted helminth infections. Retrieved from <https://www.who.int/news-room/fact-sheets/detail/soil-transmitted-helminth-infections>