**Original Research Article**

**Comparative Prevalence of Intestinal Helminths Amongst Some Internally Displaced Persons (IDPs) and Their Host Communities in Benue State, Nigeria.**

**ABSTRACT**

The Purpose of this study was to compare the prevalence of intestinal helminth infections between some Internally Displaced Persons (IDPs) and host communities in Benue State, Nigeria. Socio-demographic factors, awareness, and associated risk factors were also investigated. A cross-sectional study design was employed, 200 stool samples were collected from IDPs and host Communities respectively. The stool samples were analyze using both direct wet mount and formol ether concentration technique. A structured questionnaire was then administered to all 400 participant to investigate risk factors, between September, 2024 to March 2025. The highest prevalence of helminth infections was observed among IDPs in Daudu Camp 1 (42%), followed by Daudu Camp 2 (36%), Daudu host community (31%), and Abagana host community (26%). Although the infection rate was slightly higher in IDP camps compared to host communities, no significant difference was found between the locations (χ2=9.252; df=4; P=0.055). Analysis of socio-demographic factors revealed no significant relationship between infection rates and gender (χ2=0.287; df=4; P=0.592), age (χ2=10.810; df=16; P=0.821), occupation (χ2=21.547; df=20; P=0.158), or education level (χ2=7.815; df=12; P=0.799). However, significant associations were found with risk factors such as consumption of untreated water (χ2=15.587; df=4; P=0.004), open defecation (χ2=13.281; df=4; P=0.010), type of toilet used (χ2=21.565; df=12; P=0.006), and sharing of toilets (χ2=71.047; df=16; P=0.000). The most prevalent parasite was Ascaris lumbricoides (47.7%), with the highest infection rate observed in Daudu Camp 2 (61.1%). This was followed by Schistosoma mansoni (22.3%), Hookworm (12.3%), E. vermicularis (7.7%), and S. stercoralis (1.5%). A significant relationship between parasite load and location was identified (χ2=44.605; df=24; P=0.006).The study suggests that IDPs are at higher risk of helminth infections, with poor sanitation and open air defecation being key risk factors. These findings highlight the need for improved sanitation and health education in both IDP camps and host communities to reduce helminth infections.

*Keywords: intestinal helminths; internally displaced persons; host communities; prevalence.*

1. **INTRODUCTION**

Parasitic worms continue to pose significant health challenges globally. Among the most common parasitic infections, intestinal parasitic diseases particularly those caused by helminthes affect billions of people worldwide (Ahmed, 2023). In most natural environments, the large majority of mammals harbour soil-transmitted helminths (STH) that oftenlive as adults within the intestine for prolonged periods(1–2 years) (Zaiss and Harris 2016). It is estimated that around 3.5 billion individuals are infected, with children being disproportionately affected (Torgerson *et al.,* 2015). Although many intestinal parasitic infections may be asymptomatic, they can lead to significant digestive pathologies in some cases (Alelign *et al.,* 2024). The diversity of these parasites, along with their varying morphologies, life cycles, and modes of transmission, makes diagnosing and treating these infections complex and multifaceted.

These parasites deprive the host of essential nutrients and can cause physical harm such as tissue damage and increased susceptibility to secondary infections (Alelign *et al.,* 2024). Intestinal parasitic infections contribute to widespread morbidity and mortality, with a disproportionate impact on low-income populations in developing countries. In Sub-Saharan Africa, they not only represent a serious public health issue but also exacerbate socioeconomic burdens by contributing to malnutrition, stunted growth, and diminished educational attainment among children (Torgerson *et al.,* 2015).

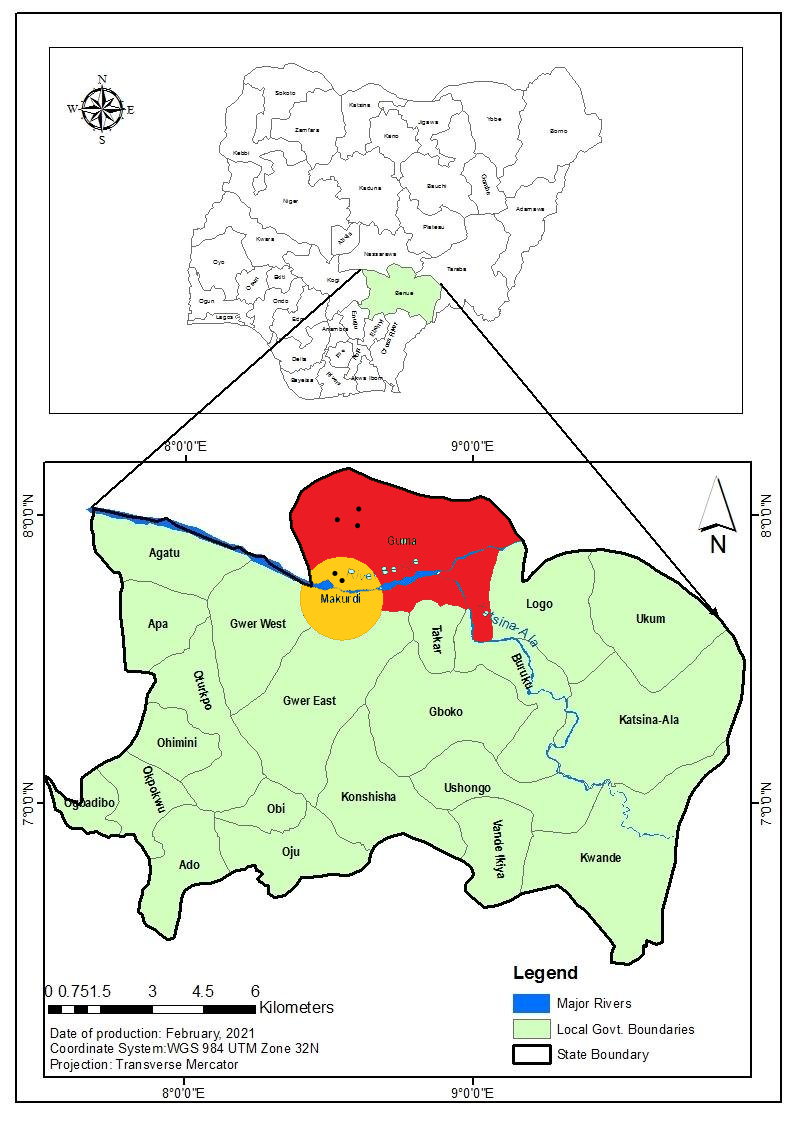
Transmission of intestinal helminths commonly occurs through contaminated food, water, and soil. In rural regions with inadequate sanitation and limited access to clean water, these infections remain prevalent. In Nigeria, for instance, the prevalence of helminth infections among children remains high. A 2018 study showed that 18,901 of the 34,518 Nigerian children aged 0–17 years examined across 19 states were infected with one or more species of soil-transmitted helminths (Karshima, 2018).

Additionally, human migration and conflict have emerged as key factors influencing helminth epidemiology. Whether internally displaced persons (IDPs) bring infections with them or become infected in host communities remains a topic of ongoing investigation. Overcrowding and poor sanitation conditions in IDP camps further exacerbate the risk of infection. A study of an IDP camp in Nasarawa State, Nigeria, found a 79.5% prevalence of gastrointestinal parasitic infections, emphasizing the vulnerability of displaced populations (Ayuba *et al.,* 2019).

**2.0 MATERIALS AND METHOD**

2.1 **Study Area**

This study was conducted in some IDP camps located in Makurdi and Guma Local Government Areas (LGAs) of Benue State and their respective host communities. Makurdi Local Government Area is located in North-Central Nigeria, with coordinates between latitude 7˚ 33' 00" N to 7˚ 47' 00" N and longitude 8˚ 27' 00" E to 8˚ 4'00" E (Benue State Government, 2023). The local government is bordered by Guma to the north, Gwer-east to the south, Gwer-west to the west, and Doma Local Government Area of Nassarawa State to the northwest (Benue State Government, 2023; National Population Commission, 2020). Guma Local Government, on the other hand, has a landmass of 2,882 square kilometers and is situated in the northern region of Benue State, with coordinates ranging from latitudes 06° 33' and 07° 03' North and longitudes 07° 60' and 08° 12' East (Benue State Government, 2023; Guma Local Government Council, 2023). These IDP camps were established as a result of the ongoing farmer-herder conflict in North-Central Nigeria, which has led to unprecedented migration patterns (International Organization for Migration, 2022). The Makurdi IDP camp is located in the Agan Council Ward, approximately 5 km from Makurdi toll gate, while the other camps are situated in Daudu, precisely in Mbawa Council Ward of Guma Local Government Area along the Makurdi-Lafia Expressway (Benue State Emergency Management Agency, 2023). The majority of the displaced populations in these camps are members of the Tiv-speaking tribe of Benue State (Tiv Development Association, 2021).



**Figure 1:** Map of Benue State showing the study area. (**Source:** Land, Survey and Solid Minerals Benue State).

**2.2 Study Design**

A cross-sectional study design was employed, 200 stool samples each were collected from IDPs and host Communities respectively. The stool samples were analyze using both direct wet mount and formol ether concentration technique. A structured questionnaires was then administered to all 400 participant to investigate risk factors.

**2.3 Sampling Locations**

The sample size covered a total number of three (3) camps in the selected location namely:

* Abagana (camp and host Community)
* Daudu (camp I and host Community)
* Daudu (camp II and host Community)

**2.4 Sample Size Determination**

A total number of 400 participants (200 each from both IDP camps and host communities) were examined for helminth infection. Opportunistic sampling technique was used to select participant from each camp, i.e. Only individuals who were available and presented themselves were sampled.

**2.5 Ethical Clearance**

Ethical clearance was obtained from the Ethical Committee of the Benue State University College of Health Sciences, Nigeria. This enabled us apply for permission at the Benue state ministry of Health and to the State Emergency Management Agency (SEMA) for clearance to carry out the study.

**2.6 Sampling Technique**

Opportunistic sampling technique was used to select participant from each camp and their communities. Samples were collected only from persons who consented to participate in the study. The study involved two phases which are; questionnaire administration and laboratory diagnosis.

**2.7 Sample Collection**

**Stool:** Properly labeled sterile containers which had plastic spatulas were distributed to participants, a portion of the stool sample were fetched using the plastic spatula and place in the sterile container immediately after defecation. All samples collected were transported to the Microbiology laboratory at the department of Biological Sciences, Benue State University, Makurdi. The stool samples were examined using standard examination technique for the identification of helminthes eggs or

**Questionnaire Administration:** Questionnaire was administered via direct interview especially at the IDP camps where most participants were not literate however those who were literate especially in the host community were given the questionnaire to fill by themselves. Information on the respondent’s knowledge about intestinal helminthes parasite, their perception and attitude towards the infection were gathered. Data on risk factors, such as water sanitation practices, hygiene behaviors, and previous deworming interventions was collected through the structure questionnaires.

**2.8 Laboratory Procedure**

Formol Ether Sedimentation and Direct Wet Mount procedure were used for Stool sample analysis**.**

**2.9 Data Analysis**

Descriptive statistics was used to summarize the prevalence of intestinal helminthes among IDPs and host communities. Chi-square test was employed to compare the prevalence between the IDPs and their Host Communities and also for association of risk factors and prevalence. SPSS (version 19.0) Statistical software was utilized for data analysis and results were presented in tables, figures and graphs.

**3.0 RESULTS AND DISCUSSION**

**3.1 Prevalence of Helminth Parasites amongst IDPs and Host Community**

The prevalence of helminth parasites amongst IDPs and host community in Benue State is presented in Table 1. The result showed the highest rate of helminth parasite infection among IDPs in Daudu Camp 1 with the prevalence of 42%. This was followed by IDPs in Daudu Camp 2 (36%), Daudu host community (31%) and Abagana host community (26%) respectively. It was generally observed that the rate of helminth parasites infection was slightly higher in the IDP camps as compared to the respective host communities. There was however no significant relationship between the rate of infection and the locations studied (χ2 = 9.252; df = 4; P = 0.055).

**3.2 Prevalence of Helminth Parasites amongst IDPs and Host Community in relation to Socio-demographic Factors**

The prevalence of helminth parasites amongst IDPs and host community on the basis of gender, age, occupation and education is presented in Table 2.

On the basis of gender, the highest rate of infection in Abagana camp was observed among the male respondents (40.6%), while the highest rate was observed among the female respondents in Abagana host community (30.3%), Daudu camp 1 (42.9%) and Daudu camp 2 (41.9%) respectively. Equal rate of infection (31%) was however observed in Daudu host community. The result further showed no significant relationship between the rate of infection in respective locations and sex (χ2 = 0.287; df = 4; P = 0.592).

On the basis of age, the highest rate of infection in Abagana camp was observed in respondents between 21-30 yrs (37.5%) while the least was observed in those between 11-20 yrs (30.8%). On the other hand, the highest rate of infection in respondents in Abagana community, Daudu camps 1 and 2, as well as Daudu host community was observed in participants that were 41> years with the infection rate of 30.8%, 100%, 57.1% and 44% respectively. There was however no significant relationship between the rate of infection and age in the study area (χ2 = 10.810, df = 16; P = 0.821).

The prevalence of helminth infection in relation to occupation, shows the highest rate of infection among the artisans (57.1%) in Abagana camp while no infection was observed among the civil servants sampled in the area (0.00%). In Abagana community, the highest rate of infection was observed among the civil servants (37.5%) while the least was among the artisans (16.7%). In Daudu camp 1, the highest rate of infection was among the farmers (46.4%), while no infection was observed among the civil servants and the artisans (0.00%). In Daudu camp 2, no infection was also observed among the civil servants and the artisans (0.00%), while equal infection rate of 40.0% was observed among the students and farmers. In Daudu host community, farmers had the highest rate of infection (39.6%), while the least was observed among the students (15.8%). No significant relationship was however observed between helminths infection and occupation in the study area (χ2 = 21.547; df = 20; P = 0.158).

The prevalence on the basis of education, the result showed higher rate of infection among the secondary school respondents in both Abagana camp and the host community (40.0%). The highest infection rate of 47.4% and 45.5% was observed in respondents with primary education background in Daudu camps 1 and 2 respectively, while respondents with no formal education had the highest rate of infection (43.8%) in Daudu host community. No significant relationship between the rate of infection and level of education was however observed with respect to the the studied locations (χ2 = 7.815; df = 12; P = 0.799).

**3.3 Risk Factors Associated with the Prevalence of Helminth Parasites in IDPs and Host Community**

The risk factors associated with the prevalence of helminth parasites in IDPs and host community in Abagana and Daudu is presented in Table 3.

The association of helminth parasites with the consumption of untreated water showed a positive relationship (χ2 = 15.587; df = 4; P = 0.004). The rate of infection was observed to be higher in respondents who consumed untreated water in Abagana camp (40%), Abagana host community (34.4%), Daudu camp 1 (42.9%) and Daudu host community (33.3%). Similarly, a significant association with open defecation was observed (χ2 = 13.281; df = 4; P = 0.010) with respondents who practice open defecation having higher rate of infection in Abagana camp (34%) and Daudu camp 1 (42.9%) respectively. A significant relationship with the type of toilet the respondents used was also observed (χ2 = 21.565; df = 12; P = 0.006) with those who used the bush having higher rate of infection in Daudu camp 1 (75.0%), Daudu camp 2 (63.0) and Daudu host community (40.7%). In Abagana Camp, those who used Pit latrine had the highest rate of infection (36.6%). Also in the study area, a significant relationship between the rate of infection and sharing of toilet with others was observed (χ2 = 9.876; df = 4; P = 0.043). The relationship was highly significant with the number of persons the toilets are been shared with (χ2 = 71.047; df = 16; P = 0.000) with those who shared the toilets with more than 10 persons having the highest rate of infection in Abagan camp (59.1%), Abagana host community (57.1%), Daudu camp 2 (42.9%) and Daudu host community (50.0%). No significant relationship was however observed with eating of raw and uncooked meat in the study area (χ2 = 12.276; df = 12; P = 0.424).

**3.4 Parasite Load among IDPs and Host Community**

The parasite load among IDPs and and the host community is presented in Table 4. The rate of infection with Ascarislumbricoides was observed to be the highest 62(47.7%) with more people infected in Daudu camp 2 11(61.1%). This was followed by Schistosomamansoni 29(22.3%) which infected respondents more in Abagana host community 8(30.8%). Hookworm had the occurrence of 16(12.3%) with the highest rate of infection in Daudu camp 1 (14.3%). E. vermicularis had an occurrence of 10(7.7%) with Daudu host community having the highest rate of infection (9.7%). S. stercolaris had the least occurrence of 2 (1.5%) with I each in Abagana host community and Daudu camp 2 respectively. A significant relationship between parasite load and location was observed in the study area (χ2 = 44.605; df = 24; P = 0.006);

**Table 1: Prevalence of Helminths parasites amongst IDPs and Host commmunities**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Male** | | **Female** | | **Total** | |
| **Location** | **No. examined** | **No. infected(%)** | **No. examined** | **No. infected(%)** | **No. examined** | **Prevalence (%)** |
| Abagana Camp | 32 | 13(40.6) | 68 | 21(30.9) | 100 | 34(34) |
| Abagana Host Community | 34 | 6(17.7) | 66 | 20(30.3) | 100 | 26(26) |
| Daudu Camp 1 | 22 | 9(40.9) | 28 | 12(42.9) | 50 | 21(42) |
| Daudu Camp 2 | 19 | 5(26.3) | 31 | 13(41.9) | 50 | 18(36) |
| Daudu Host Community | 42 | 13(31) | 58 | 18(31) | 100 | 31(31) |
| **Total** | **149** | **46(30.9)** | **251** | **84(33.5)** | **400** | **130(32.5)** |

χ2= 9.252; df= 4; P= 0.055

**Table 2: Prevalence amongst IDPs and Host Communities in Relation to Socio-demographics**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Abagana Camp** | | **Abagana Host Community** | | **Daudu Camp 1** | | **Daudu Camp 2** | | **Daudu Host Community** | |  |  |
| Parameters | **No. Examined** | **Infected** | **No. examined** | **Infected** | **No. examined** | **Infected** | **No.**  **Examined** | **Infected** | **No.**  **Examined** | **Infected** | χ2**- value** | **P- value** |
| Age |  |  |  |  |  |  |  |  |  |  |  |  |
| 1-10 | 18 | 6(33.3) | 21 | 5(23.8) | 9 | 4(44.4) | 10 | 4(40) | 23 | 8(34.8) | 10.810 | 0.821 |
| 11-20 | 26 | 8(30.8) | 24 | 7(29.2) | 15 | 5(33.3) | 14 | 4(28.6) | 22 | 5(22.7) |  |  |
| 21-30 | 16 | 6(37.5) | 18 | 4(22.2) | 5 | 1(20.0) | 9 | 2(22.2) | 17 | 5(29.4) |  |  |
| 31-40 | 12 | 4(33.3) | 11 | 2(18.2) | 8 | 5(62.5) | 3 | 0(0) | 13 | 2(15.4) |  |  |
| 41> | 28 | 10(35.7) | 26 | 8(30.8) | 6 | 6(100) | 14 | 8(57.1) | 25 | 11(44) |  |  |
| Total | **100** | **34(34)** | **100** | **26(26)** | **50** | **21(42)** | **50** | **18(36)** | **100** | **31(31)** |  |  |
| Occupation |  |  |  |  |  |  |  |  |  |  |  |  |
| Civil Servant | 5 | 0(0) | 6 | 3(37.5) | 0 | 0(0) | 2 | 0(0) | 8 | 2(25) | 21.547 | 0.158 |
| Traders | 11 | 5(45.5) | 13 | 4(30.8) | 12 | 5(41.7) | 6 | 2(33.3) | 21 | 8(38.1) |  |  |
| Student | 21 | 9(42.9) | 26 | 8(30.8) | 10 | 3(30.0) | 10 | 4(40.0) | 19 | 3(15.8) |  |  |
| Farmers | 56 | 16(28.6) | 52 | 10(19.2) | 28 | 13(46.4) | 30 | 12(40.0) | 48 | 17(39.6) |  |  |
| Artisan | 7 | 4(57.1) | 3 | 1(16.7) | 0 | 0(0) | 2 | 0(0) | 4 | 1(25.0) |  |  |
| Total | **100** | **34(34)** | **100** | **26(26)** | **50** | **21(42)** | **50** | **18(36)** | **100** | **31(31)** |  |  |
| Education |  |  |  |  |  |  |  |  |  |  |  |  |
| None | 28 | 9(32.1) | 17 | 4(23.5) | 15 | 6(40.0) | 17 | 5(29.4) | 16 | 7(43.8) | 7.815 | 0.799 |
| Primary School | 56 | 19(33.9) | 48 | 11(22.9) | 19 | 9(47.4) | 22 | 10(45.5) | 38 | 13(34.2) |  |  |
| Secondary school | 10 | 4(40.0) | 20 | 8(40.0) | 11 | 4(36.4) | 11 | 3(27.3) | 32 | 8(25.0) |  |  |
| Tertiary | 6 | 2(33.3) | 15 | 3(20.0) | 5 | 2(40.0) | 0 | 0(0) | 14 | 3(21.4) |  |  |
| Total | **100** | **34(34)** | **100** | **26(26)** | **50** | **21(42)** | **50** | **18(36)** | **100** | **31(31)** |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table 3: Prevalence of intestinal helminth in relation to risk factors** | | | | | | | | | | | | | |
|  |  | **Abagana Camp** | | **Abagana Host Community** | | **Daudu Camp 1** | | **Daudu Camp 2** | | **Daudu Host Community** | |  |  |
| Risk Factor | **Options** | **No. examined** | **Infected** | **No. examined** | **Infected** | **No. examined** | **Infected** | **No. examined** | **Infected** | **No. examined** | **Infected** | χ2**-value** | **P-value** |
| Source of Water | Yes | **5** | 2(40.0) | **32** | 11(34.4) | **21** | 9(42.9) | **20** | 7(35.0) | **42** | 14(33.3) | 15.587 | 0.004 |
|  | No | **95** | 32(33.7) | **68** | 15(22.1) | **29** | 12(41.4) | **30** | 11(36.7) | **58** | 17(29.3) |  |  |
|  | **Total** | **100** | **34(34)** | **100** | **26(26)** | **50** | **21(42)** | **50** | **18(36)** | **100** | **31(31)** |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Open air defecation | Yes | **100** | 34(34) | **87** | 18(20.7) | **42** | 18(42.9) | **48** | 16(33.3) | **91** | 28(30.8) | 13.281 | 0.010 |
|  | No | **0** | 0 | **13** | 8(61.5) | **8** | 3(37.5) | **2** | 2(100) | **9** | 3(33.3) |  |  |
|  | **Total** | **100** | **34(34)** | **100** | **26(26)** | **50** | **21(42)** | **50** | **18(36)** | **100** | **31(31)** |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Type of Toilet | Bush | **29** | 8(27.6) | **30** | 7(23.3) | **8** | 6(75.0) | **11** | 7(63.6) | **27** | 11(40.7) | 21.565 | 0.006 |
|  | Pit | **71** | 26(36.6) | **49** | 11(22.5) | **42** | 15(35.7) | **39** | 11(28.2) | **54** | 14(25.9) |  |  |
|  | Water Cistern | **0** | 0(0) | **19** | 6(31.6) | **0** | 0(0) | **0** | 0(0) | **19** | 6(31.6) |  |  |
|  | Others | **0** | 0(0) | **0** | 0(0) | **0** | 0(0) | **0** | 0(0) | **0** | 0(0) |  |  |
|  | **Total** | **100** | **34(34)** | **100** | **26(26)** | **50** | **21(42)** | **50** | **18(36)** | **100** | **31(31)** |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Do you share toilet with others? | Yes | **90** | 32(35.6) | **58** | 17(29.3) | **42** | 19(45.2) | **43** | 15(34.9) | **91** | 26(28.6) | 9.876 | 0.043 |
|  | No | **10** | 2(20.0) | **42** | 9(21.4) | **8** | 2(25.0) | **7** | 3(42.9) | **9** | 5(55.6) |  |  |
|  | **Total** | **100** | **34(34)** | **100** | **26(26)** | **50** | **21(42)** | **50** | **18(36)** | **100** | **31(31)** |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| How many persons share the toilet with you? | 2 | **0** | 0(0) | **9** | 3(33.3) | **0** | 0(0) | **0** | 0(0) | **6** | 4(66.7) | 71.047 | 0.000 |
|  | 5 | **5** | 0(0) | **36** | 4(11.1) | **7** | 4(57.1) | **8** | 3(37.5) | **57** | 16(28.1) |  |  |
|  | 9 | **10** | 2(20.0) | **24** | 3(12.5) | **13** | 6(46.2) | **12** | 5(41.7) | **11** | 3(27.3) |  |  |
|  | 10 | **19** | 6(31.6) | **17** | 8(47.1) | **23** | 8(34.8) | **23** | 7(30.4) | **20** | 5(25.0) |  |  |
|  | 10 & above | **66** | 26(59.1) | **14** | 8(57.1) | **7** | 3(42.9) | **7** | 3(42.9) | **6** | 3(50.0) |  |  |
|  | **Total** | **100** | **34(34)** | **100** | **26(26)** | **50** | **21(42)** | **50** | **18(36)** | **100** | **31(31)** |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| How often do you eat Raw and undercooked meat? | Always | **9** | 2(22.2) | **14** | 4(28.6) | **4** | 1(25.0) | **2** | 0(0) | **9** | 5(55.6) | 12.276 | 0.424 |
|  | Often | **55** | 17(30.9) | **49** | 13(26.5) | **28** | 14(50.0) | **31** | 10(32.3) | **47** | 11(23.4) |  |  |
|  | Sometimes | **25** | 10(40.0) | **29** | 7(24.1) | **13** | 5(38.5) | **13** | 7(53.8) | **30** | 9(30.0) |  |  |
|  | Rarely/Never | **11** | 5(45.5) | **8** | 2(25.0) | **5** | 1(20.0) | **4** | 1(25.0) | **14** | 6(42.9) |  |  |
|  | **Total** | **100** | **34(34)** | **100** | **26(26)** | **50** | **21(42)** | **50** | **18(36)** | **100** | **31(31)** |  |  |

**Table 4: Parasite load amongst IDPs and Host Community**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Location | No. Examined | Overall prevalence | *A. lumbricoides* | *H. nana* | Hookworm | *S. mansoni* | T. trichiura | *E. vermicularis* | *S. stercolaris* |
| Abagana IDP camp | 100 | 34(34.0) | 16(47.1) | 2(5.9) | 4(11.8) | 7(20.6) | 1(2.9) | 3(8.8) | 1(2.9) |
| Abagana host community | 100 | 26(26.0) | 12(46.2) | 1(3.8) | 3(11.5) | 8(30.8) | 0(0) | 2(7.7) | 0(0) |
| Daudu IDP Camp 1 | 50 | 21(42.0) | 9(42.9) | 2(9.5) | 3(14.3) | 5(23.8) | 0(0) | 2(9.5) | 0(0) |
| Daudu IDP camp 2 | 50 | 18(58.0) | 11(61.1) | 0(0) | 2(11.1) | 3(16.6) | 1(5.6) | 0(0) | 1(5.6) |
| Daudu Host community | 100 | 31(31.0) | 14(45.1) | 3(9.7) | 4(12.9) | 6(19.4) | 1(3.2) | 3(9.7) | 0(0) |
| Total | **400** | **130(32.5)** | **62(47.7)** | **8(6.2)** | **16(12.3)** | **29(22.3)** | **3(2.3)** | **10(7.7)** | **2(1.5)** |

χ2= 44.605; df= 24; P= 0.00

**3.5 Discussion**

This study revealed a significantly high infection rate among internally displaced persons (IDPs). The highest prevalence was found in Daudu Camp 1, with 42% of individuals infected, a trend consistent with previous studies in Nigeria and sub-Saharan Africa. IDP camps typically experience overcrowded conditions, poor sanitation, and limited access to clean water, which facilitate the spread of intestinal parasitic infections. Recent studies, including research by Ayuba *et al.* (2019) in northeastern Nigeria and Isma'l *et al.* (2024) in Katsina, also reported notably higher infection rates among IDPs compared to host communities. The study identified *Ascaris lumbricoides* as the most prevalent parasite, followed by *Schistosoma mansoni* and hookworm. This is consistent with findings from Oyewole and Simon-Oke (2022) and Ayuba *et al.* (2019), who also reported *Ascaris lumbricoides* as the dominant species in their studies.

Socio-demographic factors in helminth infections, including gender, age, occupation, and education, were also explored. There was no significant gender difference in infection rates, a result consistent with studies by Ayuba *et al.* (2019) and Pukuma *et al.* (2023). However, some African studies have reported higher infection rates among young females due to cultural practices. In terms of age, the study found higher infection rates among older adults (41 years and above), which contrasts with many studies where children and young adults are most affected. This could be due to prolonged exposure to environmental risk factors without adequate treatment, as suggested by Moe *et al.* (2022). Occupation also influenced infection rates, with farmers and artisans showing higher prevalence, aligning with findings from Michaud *et al.* (2014) and Baker *et al.* (2021), who observed that agricultural workers are more exposed to contaminated soil and water. Education, however, did not significantly impact infection rates, which is consistent with Moe *et al.* (2022), who noted that education alone does not necessarily reduce infection rates in rural settings.

Environmental factors, particularly poor sanitation, were key risk factors identified in this study. The consumption of untreated water, open defecation, and the type of toilet facilities were significantly associated with higher infection rates. These findings echo research by Ayuba *et al.* (2019) and Pukuma *et al.* (2023), who found that contaminated water and poor sanitation were major contributors to helminth transmission. Open defecation and the use of rudimentary toilet facilities, such as pit latrines, further increased the risk of infection, as seen in studies by Michaud *et al.* (2014) and Baker *et al.* (2021).

The study also highlighted the critical role of awareness in reducing helminth infections. Those unaware of helminths had higher infection rates, reflecting the findings of Pukuma *et al.* (2023), who stressed the importance of health education in preventing parasitic infections. However, no significant link was found between knowledge of transmission, symptoms, and prevention and infection rates, supporting Oyewole and Simon-Oke (2022)'s suggestion that environmental factors and access to healthcare may be more influential in reducing infections than awareness alone.

**4. CONCLUSION**

This study highlights key insights into the prevalence and risk factors of helminth infections among internally displaced persons (IDPs) and host communities in Benue State, Nigeria. IDPs, particularly in Daudu Camp 1 (42% infection rate), experienced significantly higher prevalence of helminths compared to host communities. Although location was not directly linked to infection rates, poor sanitation and limited access to basic amenities in IDP camps likely contributed to the higher prevalence. Socio-demographic factors such as gender, age, occupation, and education did not show strong associations with infection rates. However, certain groups, like farmers in Daudu camp and artisans in Abagana camp, had relatively high infection rates. Awareness of helminths was a key factor, with those lacking prior knowledge showing significantly higher infection rates, emphasizing the importance of public education on helminth transmission, symptoms, and prevention. Sanitation and hygiene were major risk factors for infection. The consumption of untreated water, open defecation, and the use of inadequate toilet facilities were strongly associated with higher infection rates. Respondents using shared toilets, especially those with more than 10 users, had significantly higher infection rates. This underscores the need for improved water quality, sanitation infrastructure, and hygiene practices. The study also identified *Ascaris lumbricoides* as the most prevalent helminth, followed by *Schistosoma mansoni* and hookworm, with varying prevalence across different locations. These findings point to the need for targeted interventions based on local parasite distribution. In conclusion, the study stresses the importance of addressing socio-demographic factors, improving sanitation and hygiene, and enhancing public awareness to reduce helminth infections. Long-term solutions should focus on improving living conditions for IDPs and host communities, alongside public health strategies and policies to combat helminthiasis in vulnerable populations in Benue State and similar areas.

Disclaimer (Artificial intelligence)

Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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