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***Research Article***

# Relationship Between the Prevalence of Intestinal Worms Among Butchers' And Their Clinical Characteristics

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**Abstract**

The meat industry in Port Harcourt, Nigeria, employs numerous butchers working in abattoirs, facing occupational hazards such as worm infections. This study aimed to investigate the relation between the prevalence of intestinal worms among butchers' and their clinical characteristics and recognize the multifaceted nature of this public health concern. A cross-sectional study was conducted among 356 butchers in major abattoirs in Port Harcourt metropolis between July to September 2023. The study's target group consisted of butchers who worked in any of the approved abattoirs in the Port Harcourt metropolitan area and who were at least eighteen years old. However, those who had received anti-helminthic treatment three months before the study and butchers who had not worked at the abattoir for at least six months were not included. A multi-stage sampling was used, and primary data were obtained from measurements, interviews, structured surveys, observations, and samples. Stool samples were collected and analyzed using the formal ether concentration technique. Chi-Square tests were employed to assess associations, with p-values $\leq 0.05$ considered significant. The results revealed a low prevalence of 5.6% and no significant association ($p > 0.05$) between clinical characteristics and the prevalence of intestinal worms among butchers. Recommendations include implementing comprehensive health education programs targeting butchers to improve awareness of intestinal worm infections and promote proper hygiene practices. In conclusion, while the prevalence of intestinal worms among butchers in Port Harcourt metropolis was low, their clinical characteristics showed no significant association with the prevalence, emphasizing the complex nature of this public health issue.

## 1. Introduction

The Port Harcourt metropolis, located in southern Nigeria, is home to a bustling meat industry, with numerous abattoirs serving the local population's meat consumption needs. Butchers, the frontline workers in these abattoirs, play a crucial role in the meat supply chain, from slaughtering animals to processing and selling meat products [1]. However, the occupational hazards inherent in their work environment pose significant health risks, including the potential for contracting intestinal worm infections. Butchers in the Port Harcourt metropolis, like their counterparts worldwide, are exposed to various occupational hazards that may impact their clinical characteristics [2]. These individuals often work close to animal carcasses, blood, and offal, increasing their risk of exposure to pathogens, including intestinal worms. Moreover, poor hygiene practices, inadequate sanitation facilities, and limited access to healthcare services further compound the risk factors

for intestinal worm infections among butchers in the region. The clinical characteristics of butchers are integral factors influencing their susceptibility to intestinal worms. Nutritional status, for instance, plays a crucial role in modulating immune function and overall health resilience. Butchers with poor nutritional status may exhibit compromised immune responses, rendering them more susceptible to infections. Additionally, dietary habits among butchers, such as consumption of undercooked meat or contaminated water, may further exacerbate the risk of intestinal worm infestations [3]. The prevalence of intestinal worms among butchers in Port Harcourt metropolis abattoirs is a pressing public health concern. Intestinal worm infections, including those caused by parasites such as *Ascaris lumbricoides, Trichuris trichiura,* and hookworms, pose significant health risks, ranging from gastrointestinal symptoms to systemic complications [4]. The prevalence of intestinal worms is often influenced by various factors, including environmental sanitation, personal hygiene practices, socioeconomic status, and occupational exposures. Abattoirs in Port Harcourt metropolis serve as critical hubs for meat processing and distribution, but they also represent potential hotspots for the transmission of infectious diseases, including intestinal worms. The conditions within these facilities, characterized by the presence of organic waste, inadequate waste management practices, and substandard hygiene protocols, create an environment conducive to the proliferation of parasites and other pathogens [5].

The focus of this study is to understand the relation between butchers' clinical characteristics and the prevalence of intestinal worms in the abattoirs of the Port Harcourt metropolis is paramount for addressing the public health challenges posed by these infections. By elucidating the risk factors and mechanisms underlying intestinal worm infestations among butchers, researchers, and public health authorities can develop targeted interventions to mitigate the burden of disease in this vulnerable population. Implementing strategies such as improved sanitation practices, provision of healthcare services, and health education initiatives can help safeguard the health and well-being of butchers. This will contribute to the overall improvement of occupational health standards in the meat processing industry of the Port Harcourt metropolis and by extension the state and country at large.

## 2. Methodology

### Study Area and Population

The research study was undertaken in Port Harcourt metropolis (Port Harcourt and Obio-Akpor local government areas), Rivers State, in major abattoirs which are geographically and spatially located in Okuru, Minapu, Terema, Mile 3, Egbelu, Aka and Rumuokoro market. A total of 356 (352 males and 4 females) butchers amongst different age group comprising of all as volunteers.

### Study Design

The study was a cross sectional study, with a multistage sampling method, undertaken between July to September 2023, among subjects present in major abattoirs in Port Harcourt metropolis, Rivers State. Abattoirs were stratified into the two local government areas in the Port Harcourt metropolis, five from Obio-Akpor LGAs and four from Port Harcourt LGAs, were selected using simple random selection. Eligible and willing volunteers were recruited until the desired sample size was reached.

### Inclusion Criteria

Three hundred and fifty six informed female and male working as butchers within Port Harcourt amongst all the age group who accepted and gave their consent by endorsing the consent form were recruited and included in the research.

### Exclusion Criteria

Individuals that were not butchers and butchers not resident in Port Harcourt were out rightly excluded and those who did not give their consent to the project were also excluded.

### Ethical Consideration

The study received ethical approval from the Ethics Committee of the University of Port Harcourt. Prior permission to conduct the study was granted by the respective Heads of each visited cluster within the abattoir. Informed Consent Procedure: Each participant provided written informed consent by signing a document after receiving detailed information about the study and its procedures. The informed consent form was translated into Pidgin and then back-translated into English to ensure accurate translation.

### Sample Collection

Stool samples were collected in labeled screw capped plastic containers for parasitological examination within one hour of collection. All stool samples were examined microscopically using the formal ether concentration technique which is considered to be the most-sensitive method for most intestinal helminths [6].

### Analysis of Data

Data obtained from the experiment were analyzed using SPSS software version 28 for all analysis. Results of the analysis were expressed in percentages, Chi-Square test was used to conclude the significance levels between the parameters, with the significance value set at less than or equal to 0.05.

## 3. Results

Table 1 shows a general prevalence (5.6%) of intestinal worms and prevalence of intestinal worms by types. *Ascaris lumbricoides* with the highest prevalence of 60% while Hook worm and *Trichuris trichiuria* with the lowest prevalence of 20% each.

**Table 1:** Prevalence of intestinal worms.

| | **Status** | **Frequency (n=356)** | **Percentage (%)** |
|---|---|---|---|
| Helminths Present | No | 336 | 94.4 |
| | Yes | 20 | 5.6 |
| Type of Helminths | AL | 12 | 60 |
| | HK | 4 | 20 |
| | T.T | 4 | 20 |

AL- *Ascaris Lumbricoides*, HK – Hook worm, T. T- *Trichuris Trichiura*

**Table 2:** Association between Butchers' Clinical Characteristics and the Prevalence of Intestinal Worms.

| | | Prevalence of Intestinal Worms | | | | |
|---|---|---|---|---|---|---|
| | | No | | Yes | | |
| (n=356) | Status | Frequency | Percentage (%) | Frequency | Percentage (%) | Chi-Square (p-value) |
| Pains ABD | No | 192 | 53.9 | 8 | 2.2 | 0.563 (0.453) |
| | Yes | 144 | 40.4 | 12 | 3.4 | |
| Diarrhea | No | 266 | 77.5 | 16 | 4.5 | 0.015 (0.904) |
| | yes | 60 | 16.9 | 4 | 1.1 | |
| Pallor | No | 266 | 77.5 | 16 | 4.5 | 0.015 (0.904) |
| | yes | 60 | 16.9 | 4 | 1.1 | |
| Anti Hel | No | 220 | 61.8 | 12 | 3.4 | 0.062 (0.803) |
| | Yes | 116 | 32.6 | 8 | 2.2 | |
| BMI | <18.5 (Underweight) | 28 | 7.9 | 4 | 1.1 | 2.007 (0.571) |
| | 18.5-24.9 (Normal Weight) | 60 | 16.9 | 0 | 0.0 | |
| | 25.0-29.9 (Over Weight) | 20 | 5.6 | 0 | 0.0 | |
| | >30.0 (Obese) | 228 | 64.0 | 16 | 4.5 | |
| | Mean ± SD (79.81 ±15.77) | | | | | |
| | CI (76.49,83.14) | | | | | |
| | Range (52-116) | | | | | |

*Statistically Significant ($p<0.05$)

Chi-test for association revealed that no clinical characteristics is significantly associated ($p>0.05$) with the prevalence of intestinal worms. This implies that there is no association between butchers' clinical characteristics and the prevalence of intestinal worms in registered abattoirs in Port Harcourt metropolis.

## 4. Discussion

This study shows that Chi-test for association revealed that no clinical characteristics are significantly associated ($p>0.05$) with the prevalence of intestinal worms among butchers in Port Harcourt metropolis. The lack of significant associations with clinical characteristics underscores the multifaceted nature of intestinal worms, it could also be because the number of those who have these intestinal worms to those who do not is very high and therefore cannot be unbiasedly compared. A variety of factors, including environmental, behavioral, and biological aspects can influence the acquisition of intestinal worms. It's crucial to recognize that the risk of intestinal worms may not solely depend on clinical factors but may involve a combination of factors. Some authors have disagreed with the above result whereby they reported a significant difference between the clinical characteristics and prevalence of intestinal worms [7]. Considering the symptoms, the results of their study have shown that there was a significant association between the presence of intestinal parasites and the presence of diarrheal stools. Diarrhea is one of the most reported symptoms due to intestinal parasites. *Entamoeba histolytica* can be the cause of severe dysentery, colitis, constipation, tenesmus, and extra-intestinal complications [8]. Another study by Bakari and his colleagues was also dissimilar to the result above stating that Abdominal pains, bloody stools, and pallor were significantly associated with intestinal helminthic infection [9]. The difference between these studies and this current study could be the wide age range involving both children and adults in the other studies. This study was only on adult butchers, while most other studies of intestinal worms were on non-butchers and school children. It is also most likely that the other studies included protozoa (like *Entamoeba histolytica*), other than intestinal worms, which are major causes of abdominal pain, diarrhea, and dysentery. The disparity in the results of other studies compared to this study could be because the sample size of 356 butchers may not be sufficient to detect significant associations, other than a larger one. It is also very possible that studies with statistically significant findings are more likely to be published than those with non-significant results, leading to a potential bias in the literature. Variability in data collection methods, laboratory techniques, or diagnostic criteria may contribute to inconsistencies in the results.

## 5. Conclusion

The prevalence of intestinal helminthic infection in this study was low and was insignificantly associated with the clinical status of the respondents. It was such that butchers with intestinal helminths were seen to be nourished and obese though not of statistical significance when compared with those with no helminths. Nevertheless, it is necessary to implement comprehensive health education programs targeting butchers to improve awareness of intestinal worm infections and promote proper hygiene practices.

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