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Research Article

Assessing The Relationship Between Socio-Demographic Factors and The Prevalence of Intestinal Worms Among Butchers In Port Harcourt Metropolis Nigeria

S.O. Enyinnaya[1*], K.E. Douglas[2], A. Bademosi[3], S.D. Lawson[1] and A.C. Okafor[1]

[1]*Department of Medical Microbiology and Parasitology, Faculty of Basic Clinical Sciences, College of Medical Sciences, Rivers State University, Port Harcourt, Nigeria*
[2]*Department of Preventive and Social Medicine, Faculty of Clinical Sciences, College of Medical Sciences, University of Port Harcourt, Nigeria*
[3]*Department of Community Medicine, Faculty of Clinical Sciences, College of Medical Sciences, Rivers State University, Port Harcourt, Nigeria*
[*]*Corresponding author: stellaoice@yahoo.com*

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Abstract

Background: Intestinal parasitic infections, particularly helminths, are a significant public health concern globally, with a notable prevalence among individuals in occupations with high exposure to animal products and unsanitary conditions, such as butchers in abattoirs.
Aim: To determine the relationship between butchers' socio-demographic factors and the prevalence of intestinal worms in Port Harcourt metropolis Nigeria.
Methodology: The target population recruited in the study were abattoir butchers including male and females aged 18 years and above in all selected abattoirs of the registered abattoirs in Port Harcourt, with inclusion criteria of registered butchers within the Port Harcourt metropolis who are 18 years and above, whereas, butchers who have received anti-helminthic 3 months before the study and those who have not worked at least 6 months in the abattoir were excluded. Multi-stage sampling was adopted in this research work. A pretested structured interviewer-administered questionnaire was used to collect information on socio-demographic characteristics (age, sex, ethnicity, marital status, level of education, average monthly income, number of living rooms and duration as a butcher, etc.). Participants were educated and given a sterile bottle to collect fecal samples aseptically the next day.
Result: The general prevalence of intestinal worms was 5.6%, *Ascaris lumbricoides* having the highest prevalence of 60% while Hookworm and *Trichuris trichiuria* had 20% each. Only gender was significantly associated ($p<0.05$) with the prevalence of intestinal worms, however, other factors such as age, religion, ethnicity, marital status, educational level, job experience and other jobs were not significantly associated.
Conclusion: Gender plays a significant role in the prevalence of intestinal helminthes among butchers in Port Harcourt Metropolis. *Ascaris lumbricoides* emerge as the dominant parasite, a persistent challenge in global public health.

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1. Introduction

Intestinal parasitic infections, particularly helminths, are a significant public health concern globally, with a notable prevalence among individuals in occupations with high exposure to animal products and unsanitary conditions, such as butchers in abattoirs [1]. These infections, which include common helminths like *Ascaris lumbricoides* (roundworm), *Necator americanicus* (hookworm), flukes, and *Trichuris trichiura* (whipworm), are closely linked to socio-demographic factors [2, 3]. Butchers, due to their frequent and direct contact with animal entrails, are at an increased risk of contracting these parasites, which can have substantial health implications [4].

More than 1.5 billion individuals around the world have intestinal helminth infections, mostly in low-resource environments [5]. *Ascaris lumbricoides*, hookworm *(Ancylostoma duodenale or Necator americanus)*, and *Trichuris trichiura*, are all present in about 800 million, over 450 million, and approximately 400 million persons worldwide, respectively [6]. It is believed that 200 million people worldwide are affected by intestinal schistosomiasis, of whom 160 million are in Sub-Saharan Africa [7]. Nigeria is one of the Sub-Saharan African nations with a high prevalence of intestinal helminths. According to research done in Nigeria's Abeokuta and Port Harcourt, which involved testing abattoir workers for parasite diseases, the prevalence of intestinal helminths ranges from 29.6 % to 44.2 % [8, 9] agreeing to a report that the majority of the world's tropical and subtropical regions are home to 15% of the host population and 70% of the worm population [8].

The socio-demographic factors influencing the prevalence of these infections include educational level, access to clean water, sanitation facilities, age, level of education, and personal hygiene practices [10–12]. In registered abattoirs, where meat processing is conducted under regulated conditions, the risk of infection may be mitigated by adherence to hygiene standards and regular health check-ups for the workers. However, in many developing regions, these standards are not strictly enforced, leading to higher rates of infection among butchers [13].

Helminth infections can be diagnosed in the laboratory through direct faecal examination technique under the microscope [14], the formal-ether concentration (FEC) approach [15], the flotation techniques [14], the Kato-Katz (KK) method [16], and via molecular techniques [17]. Proper hygiene and adherence to laws governing animal butchering and handling are few ways to prevent and control infections [18], whereas, treatment can be achieved through antihelminthic drugs [18].

This research aims to shed light on the prevalence of intestinal worms among butchers in registered abattoirs in Port Harcourt metropolis and the socio-demographic factors that affect their exposure and susceptibility to these infections. Understanding these dynamics is crucial for developing targeted interventions to reduce the burden of parasitic infections in this vulnerable occupational group.

2. Methodology

Study Area

Port-Harcourt metropolis is a fast-rising multi-ethnic and multi-lingual city with a crude oil-dependent economy [19]. The Port Harcourt metropolis is found in Rivers State between Latitude 4°55'N, Longitude 6°55'E, and Longitude 7°05'E. It is a city in the Nigerian Niger Delta. In Rivers State, the city is located at the River Bonny's mouth. It is situated between the Dockyard Creek/Bonny River and the Amadi Creek, 25 kilometers from the Atlantic Ocean [20]. It is located on average 12 meters above mean sea level. Figure 1 show that the Port Harcourt metropolitan includes both the Port Harcourt and Obio/Akpor local government areas (LGAs) [21]. In Port-Harcourt, there are several registered abattoirs. Some include Trans-Amadi (School Road), Rumuodumaya, Mile III, Okuru, Iwofe, Woji, Borikiri, etc. Each of these abattoirs kill an average of 80 animals each day, with an average of 100 employees per slaughterhouse. Herdsmen, butchers, and cleaners are among the employees [19].

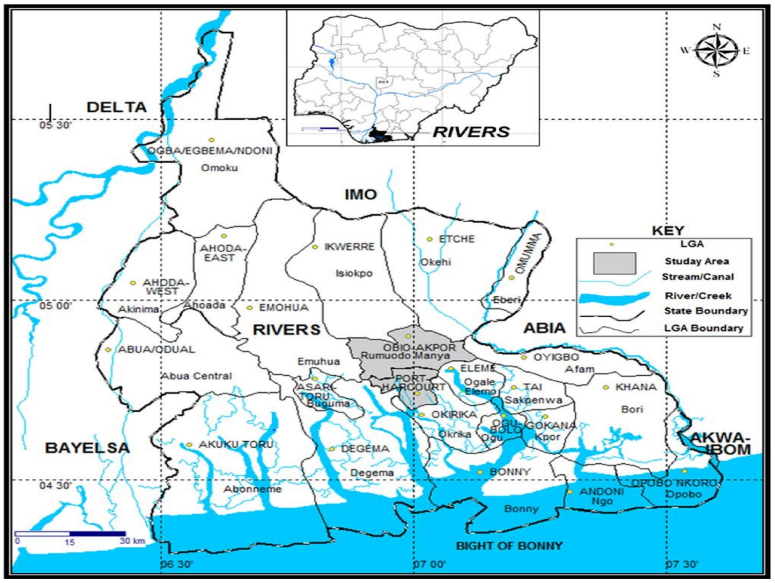

Figure 1: Map of Rivers State showing Port Harcourt metropolis. Source: GIS Note. GIS = Geographic Information System [20].

Study Design

This study was done using a descriptive cross-sectional design [22]. Abattoirs were selected from the two local government areas in Port Harcourt metropolis, nine (five from Obio-Akpor Local Government Areas and four from Port Harcourt Local Government Areas) abattoirs

Table 1: Sampling Frame.

Selected Abattoirs	Total no. of Butchers	No. of questionnaire distributed
OBIO AKPOR L.G.A		
Choba	57	45
Rumuokoro	65	40
Egbelu	40	35
Aka junction	40	35
U.O.E	30	25
Port Harcourt L.G.A		
Okuru	85	65
Minapu	70	57
Terema	45	30
Mile 3	35	24
TOTAL	467	356

were selected through simple random sampling. Eligible and consenting participants were consecutively recruited until the sample size was reached.

Study Population

The target population recruited in the study were abattoir butchers including male and females aged 18 years and above in all selected abattoirs of the registered abattoirs in Port Harcourt metropolis.

Inclusion Criteria

Abattoir butchers who were aged 18 years and above, and butchers in selected registered abattoirs in the Port Harcourt metropolis were included.

Exclusion Criteria

Butchers who received anti-helminthic drug 3 months before the study and butchers who have not worked for at least 6 months in the abattoir were excluded.

Sampling Technique

Multi-stage sampling was adopted in this research work.

Nature / Source of Data

In this study, primary data was used in carrying out the research. The primary data include interviews, observations, questionnaires, results from measurements and samples collected.

Data Collection and Instrument

This study developed and used a pretested structured interviewer-administered questionnaire. This instrument collected information on socio-demographic characteristics (age, sex, ethnicity, marital status, level of education, average monthly income, number of living rooms and duration as a butcher, etc).

Data Collection Procedure

This study recruited and trained four research assistants. The survey was carried out for two months and it took about 40 minutes to complete one questionnaire, physical examination, and take measurements. Participants were educated and given a sterile bottle to collect fecal samples aseptically the next day. Two research assistants visit one abattoir at a time, one filling out the questionnaire and the other taking measurement and doing a physical examination.

Parasitological Examination

Stool samples were collected in labeled screw capped plastic containers for parasitological examination within one hour of collection. All stool samples were re-examined microscopically using the formal ether concentration technique which is considered to be the most-sensitive method for most intestinal helminths [23].

Statistical Analysis

The data generated from the study was described and inferentially analyzed using Statistical Package for Social Science (SPSS) version 25.0 for Chi-square. The test was considered significant if p-value was less than or equal to 0.05.

Ethical Consideration

Ethical approval was gotten from the Ethics Committee of the University of Port Harcourt (UPH/CEREMAD/REC/MM88/024). Prior permission to conduct the study was granted by the respective Heads of each visited cluster within the abattoir.

3. Results

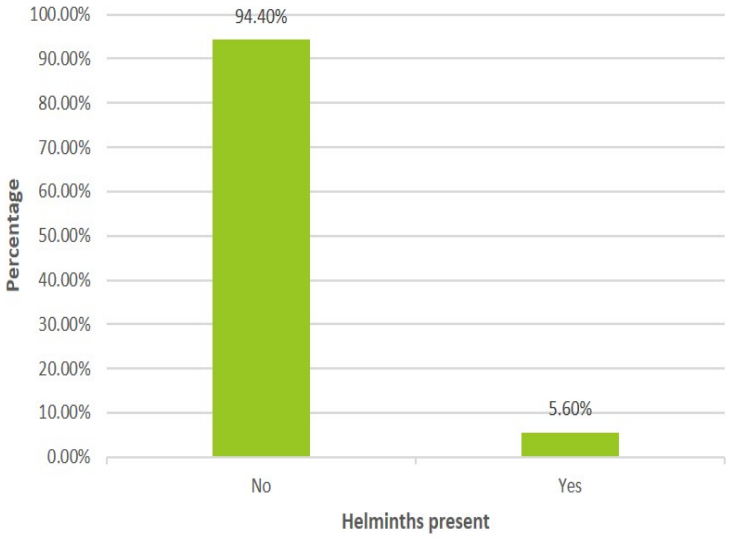

Figure 2: Prevalence of intestinal worms infection.

Figure 2 above shows that the general prevalence of intestinal worm is 5.60%

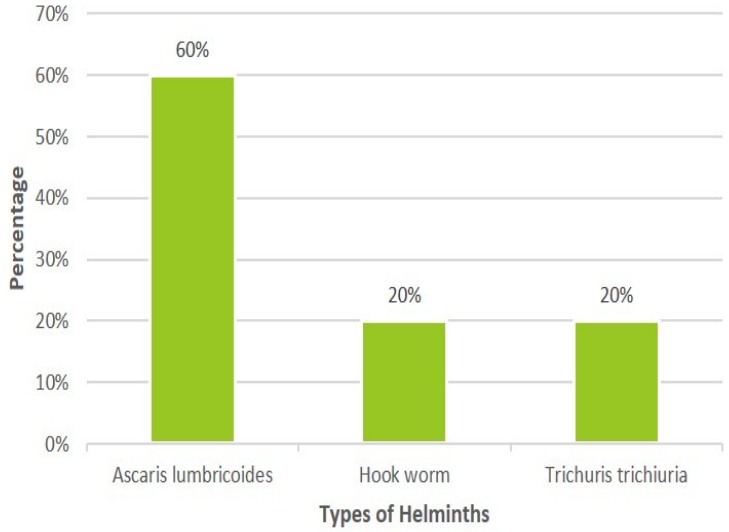

Figure 3: Prevalence of Intestinal worms infection by types.

Figure 3 above shows the prevalence of intestinal worms by types. *Ascaris lumbricoides* have the highest prevalence of 60% while Hook worm and *Trichuris trichiuria* have the least prevalence of 20% each.
In table 2, Chi square test for association revealed that only sex is significantly associated ($p<0.05$) with the prevalence of intestinal worms, however, other factors such as age, religion, ethnicity, marital status, educational level, job experience and other jobs are not significantly associated.

4. Discussion

This study shows a low prevalence (5.6%) of intestinal worms among butchers in registered abattoirs in the Port Harcourt metropolis. This is lower than the prevalence of 29.6% reported by [8], and 44.2% [9]. The low prevalence of intestinal worms among butchers in this study could be attributed to the increased public health awareness of parasitic helminths and their risk factors and the effect of drug hawkers

Table 2: Association between Butchers' Socio-Demographic Factors and the Prevalence of Intestinal Worms.

		Prevalence of Intestinal Worms				
	(n=356) **Status**	**No** **Frequency**	**Percentage (%)**	**Yes** **Frequency**	**Percentage (%)**	**Chi-Square (p-value)**
Age	29-39	220	61.8	4	1.1	5.326 (0.070)
	40-50	80	22.5	8	2.2	
	51-61	36	10.1	8	2.2	
Sex	Female	0	0.0	4	1.1	16.991 (0.000)*
	Male	336	94.4	16	4.5	
Religion	Christian	216	60.7	20	5.6	2.694 (0.101)
	Muslim	120	33.7	0	0.0	
Ethnicity	Hausa	112	31.5	0	0.0	7.445 (0.059)
	Igbo	128	36.0	20	5.6	
	Others	32	9.0	0	0.0	
	Yoruba	64	18.0	0	0.0	
Marital Status	Married	232	65.2	16	4.5	0.268 (0.605)
	Single	104	29.2	4	1.1	
Educational Level	Graduate	32	4.5	0	0.0	2.186 (0.335)
	Primary	88	24.7	0	0.0	
	Secondary	232	65.2	20	5.6	
Job Experience	1-5	20	5.6	0	0.0	1.950 (0.745)
	6-10	40	11.2	0	0.0	
	10-15	24	6.7	4	1.1	
	16-20	112	31.5	8	2.2	
	>20	140	39.3	8	2.2	
Other Jobs	No Job	232	65.2	16	4.5	0.748 (0.945)
	Farming	12	3.4	0	0.0	
	Craftsmanship	16	4.5	0	0.0	
	Business/Trade	60	16.9	4	1.1	
	Private Company	16	4.5	0	0.0	

*Statistically Significant ($p<0.05$)

(including anti-helminthics) within the abattoir as seen in most of the abattoirs. Another reason could be the increased awareness of regular hand washing brought about by the COVID-19 era.

The Chi-test for association revealed that gender is significantly associated ($p<0.05$) with the prevalence of intestinal worms, as there were more male than female butchers in this study. This statistical significance could be due to the higher proportion of males working as butchers in the southern region of this part of the world. This aligns with [8, 24]. who reported male dominance about butchers. Also, the 2010 analysis by the United States Women's Law Centre, a charity that promotes women's rights, found that 24.6% of butchers are female. According to the center, "nontraditional occupations" for women include butchers and meat cutters, along with other professions with a high male employment rate [25]. However, other factors such as age, religion, ethnicity, marital status, educational level, job experience, and other jobs done did not show significant association. The non-significance in relation to age may be explained by the fact that all study participants were adults. The factor could also play a role in protecting children from parasitic infection from helminths if the butchering occupation is limited to adult seeing that children are easily prone to infection in comparison to older persons according to Geary and Haque, [26, 27]. Intestinal parasites are contingent upon the age and severity of the illness and affect younger children more [28].

5. Conclusion

This study's findings provide insight into intestinal worms' prevalence among registered butchers in Port Harcourt metropolis. Encouragingly, the infection rate is notably lower than previous reports, likely due to heightened awareness and accessible treatment. *Ascaris lumbricoides* emerges as the dominant parasite, a persistent challenge in global public health.

Gender played a significant role, with more male butchers in this region, aligning with industry trends. This demands targeted interventions to ensure a safe working environment for all. Meanwhile, age and other demographic factors didn't show significant associations, indicating the importance of vigilance across all other socio-demographic factors. This can help reduce the risk of infections and promote overall health and well-being among workers.

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