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Assessment of Occupational Health Hazards Among Informal Solid Waste Pickers in Port Harcourt Metropolis, Rivers State, Nigeria

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ABSTRACT

This study provides a detailed assessment of occupational health hazards among informal solid waste pickers in Port Harcourt Metropolis, encompassing both Port Harcourt City LGA and Obio-Akpor LGA, both in Rivers State, Nigeria. The aim of this study is to assess the health hazards, level of awareness, attitude and safety practices and address associated medical and environmental concerns and enhance their overall well-being. By employing a survey approach, 357 out of 384 distributed questionnaires were effectively collected, resulting in a noteworthy response rate of 92.96%. These responses were analyzed using SPSS software and results presented in tables and graphs. The study explores perceptions of medical services, knowledge levels, attitudes, and safety practices, providing a nuanced understanding of waste pickers' interactions with healthcare and safety measures. The results from the survey on occupational health hazards in solid waste picking revealed a high awareness level, with 88% acknowledged physical hazards, 42.6% recognized chemical hazards, 48.5% identified biological hazards, 64.7% acknowledged ergonomic hazards, and 60.2% being aware of psychological health hazards. The Chi-square test was employed to test for the levels of association between categorical tables related to occupational activities and health hazards, leading to the rejection of the null hypotheses and emphasizing the imperative for targeted interventions. The study revealed a heightened awareness among waste pickers concerning physical, chemical, biological, ergonomic, and psychological hazards associated with their occupation. Consequently, recommendations included targeted interventions for hazard mitigation, improvement in healthcare accessibility, knowledge enhancement programs, and the promotion of a safety culture. This research validated global patterns of occupational health risks among waste pickers, providing actionable insights for stakeholders, and informing future interventions in both the specific context of Port Harcourt Metropolis and the broader discourse on vulnerable occupational groups.

Keywords: Occupational health hazards, Environmental hazards, Risk assessment, Hazard identification, Health and Safety, and Assessment

INTRODUCTION

Informal solid waste pickers are exposed to various health risks, including respiratory issues due to inhalation of dust and fumes, skin problems from direct contact with waste materials, and the potential transmission of infectious diseases (Dhibar, 2018). Waste pickers gather items that have been thrown out by others, such as hazardous electrical materials, plastics, paper, cardboard, cables, glass bottles, rubber, and sharp metals. They gather this debris from many locations, including open dumpsites, landfills, and roadways (WIEGO, 2020). Because they are exposed to a variety of infectious agents and poisonous chemicals that may cause sickness, they can be dangerous for their health (Baral, 2018). The prolong exposure to dust and particulate matter during waste picking can lead to respiratory problems like asthma and chronic obstructive pulmonary diseases (COPD) (Silva *et al.,* 2019). Contact with various waste materials can lead to skin problems such as rashes, dermatitis, and other allergic reactions, particularly when proper protective gear is not utilized (Eshun*et al.,* 2020).

In addition, unauthorised garbage pickers handle waste products carelessly and lack protective gear, which puts them at risk for occupational health and safety issues (Wilson *et al.*,2006).These conditions often result in injuries, respiratory problems, skin disorders, and gastrointestinal issues among waste pickers (Adewale, 2017). The pickers are economically obligated to their job in an effort to make a livelihood, even though they are frequently ignorant of the risks they confront (Cointreau, 2006).

There are several characteristics that informal rubbish pickers share throughout the poor globe. They are frequently among the most vulnerable members of society, belonging to marginalised groups that experience extreme poverty (Samson, 2010). (Medina 2007, 2008, Gunsilius 2010). According to WIEGO 2020, they often face considerable risks, and the majority of them operate in the unorganized sector (Wilson *et al.,* 2006) prohibiting individuals from taking use of formal employment's rewards and social advantages (International LabourOrganisation& WIEGO 2017).

In general, there are two kinds of scavengers in the city: itinerant pickers who visit different homes and remove usable stuff from dumpsters. The majority of the unemployed young males in this category have only a high school diploma (Agunwamba, 2003). Since individuals act alone and without collaboration or affiliation, it is unknown how many people participate in this type of scavenging. The second category includes scavengers who only work at the landfill, gathering recyclables as they are emptied from the disposal trucks. They are also made up of young, illiterate guys who commute every day from nearby slums and satellite towns to these dumpsites (Chukwunonye*et al.,* 2010).

Without a doubt, the majority of dump sites lack proper health and safety protocols, such as the usage of personal protective equipment (PPE) and hazard awareness, which might have a detrimental effect on the garbage pickers' health. Thus, there may be a negative impact on the garbage pickers' health. Many garbage pickers are more prone to get injuries and diseases that are uncommon among the general population because of wounds and contact with harmful substances including chemicals, dust, and germs. The socioeconomic factors of garbage pickers, including age, education level, income obtained, and number of workdays each week, have an influence on their health as well (Solomon *et al.,*2021).Many waste pickers in Port Harcourt Metropolis and environs face poverty, lack of access to clean water and sanitation, and limited education and job alternatives (Ezebilo*et al.,* 2019).

Study Area

Port Harcourt Metropolis (also known as Port Harcourt urban area) consists of Port Harcourt City and ObioAkpo LGA (Business Travel Nigeria, 2017). The current metro area population of Port Harcourt in 2023 is 3, 480,000, a 4.66% increase from 2022 (<a href='https://wwwmacrotrends.net/cities/22018/port-harcourt/popuplation'>PortHarcourt, Nigeria Metro). This numerical magnitude solidifies its status as one of Nigeria's most populous metropolitan areas. The cityscape extends across a vast expanse, covering approximately 1,900 square kilometers (734 square miles), contributing to its recognition as one of the largest metropolitan regions in the country (The Greater Port Harcourt Project, 2012). This expansive urban landscape encapsulates the vibrancy and diversity inherent in the city's socio-economic and cultural fabric.

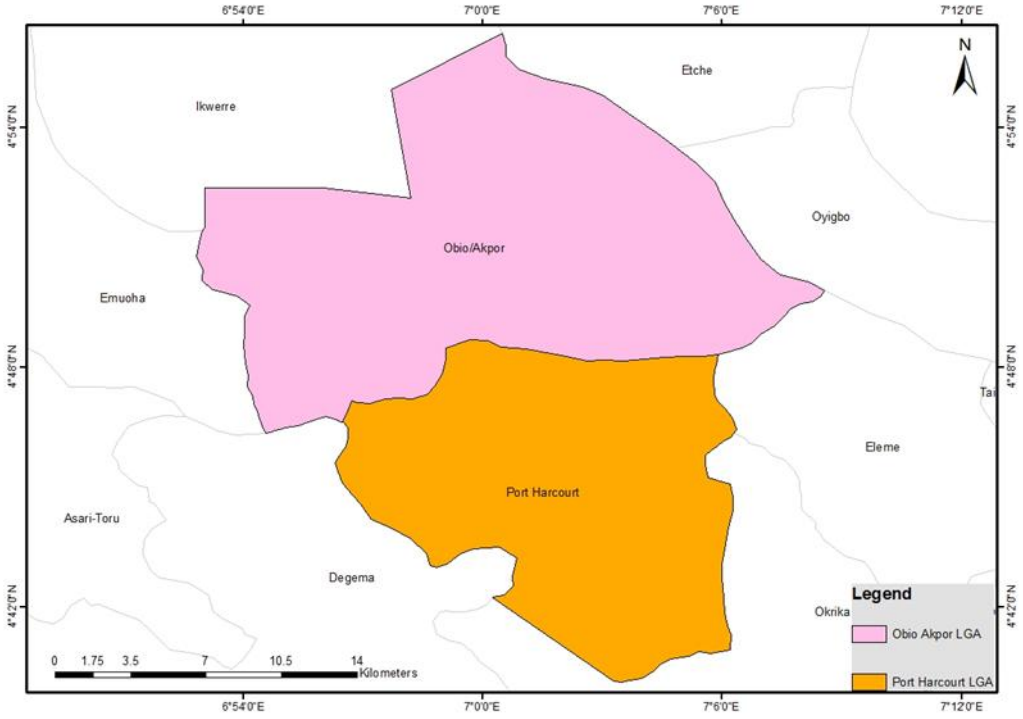

Figure 1: Map of Port Harcourt Metropolis showing Port Harcourt and Obio-Akpor LGAs.

MATERIALS AND METHODS

Research Design

The descriptive study design was used in this study in order to acquire information. According to Elendu (2010), survey design method is that which investigates, studies reports and describes events. The research further stated that the design could be public opinion survey, fact finding survey, studies and so on. Furthermore, the descriptive survey research design is used for the study or a group of persons to assess behavior, preferences, perception and opinions from a few member of the entire population, considered true representative of the entire group. Therefore, descriptive survey design was desirable since it used a representative sample of the population to enable the researcher to systematically collect, analyze and interprets data to describe the current situation in assessment of occupational health hazards among informal solid waste pickers in Port Harcourt Metropolis.

Instrument for Data Collection

The study researcher used primary data. A researcher-designed instrument titled Assessment of Occupational Health Hazards Questionnaire (AOHHQ) was used for data collection. The instrument was administered and data collected by the study researcher with the help of two research assistants. Three hundred and eighty-four (384) copies of the questionnaire were administered to the study respondents. The questionnaire consists of 25scaled questions and 7 demographic questions. Further, the questionnaire was designed to assess the 5 hypotheses relative to the study research questions.

Since the research instrument used was the questionnaire, it was designed using the 3-point Likertscale method. The questionnaire was designed in the following ways:

i) NO - 1

ii) NOT SURE - 2

iii) YES - 3

RESULTS

Out of the initially distributed 384 questionnaires, a substantial total of 357 were successfully retrieved, constituting an impressive response rate of 92.97% of the original sample size. This high retrieval rate enhances the reliability and representativeness of the collected data, indicating a robust engagement with the study. The inclusion of waste pickers from both Port Harcourt and Obio-Akpor LGAs ensured geographical diversity, potentially capturing a more comprehensive picture of the targeted population.

Table 1: meticulously delineates the socio-demographic characteristics of the study's respondents, offering a nuanced analysis through frequency and percentage quantifications.

Variable	**Frequency (n=357)**	**Percentage (%)**
Location/LGA of Residence		
Obio-Akpor	210	58.8
Port Harcourt	147	41.2
Gender		
Female	45	12.6
Male	312	87.4
Age Bracket		
18 – 25	79	22.1
26 – 35	132	37
36 – 45	80	22.4
46 – 55	52	14.6
56 Years	14	3.9
Marital Status		
Married	161	45.1
Single	190	53.2
Widowed	6	1.7
Level of Education		
OND/HND/BSC	38	10.6
Others	92	25.8
Primary	7	2
Secondary	220	61.6
Average Monthly Income		

Less than NGN20,000	20	5.6
NGN20,000 - NGN50,000	141	39.5
NGN51,000 - NGN100,000	139	38.9
Above NGN100,000	57	16
Years of Experience as a Solid Waste Picker		
Less than 2 years	29	8.1
2 - 5 Years	198	55.5
6 - 10 Years	96	26.9
Above 10 Years	34	9.5

Table 1: Socio-Demographic Characteristics of the Respondents On the Occupational Health Hazards

Table 2 illustrated the distribution of responses on occupational health hazards among a sample of 357 waste pickers.

Variable	**Frequency (n=357)**	**Percentage (%)**
Physical Hazards associated with solid waste picking such as piecing objects, falls and hit from falling objects and working under extreme heat can cause health problems		
No	28	7.8
Not Sure	15	4.2
Yes	314	88
Aware of the Chemical hazards associated with solid waste picking such as perception of chocking smell, and irritation of the skin and eye can result in illness		
No	97	27.2
Not Sure	108	30.3
Yes	152	42.6
Aware of the Biological hazards associated with solid waste picking such as improper handling of bacteria and fungi infectious materials can cause health issues		
No	93	26.1
Not Sure	91	25.5
Yes	173	48.5
Aware of Ergonomic hazards such as Musculoskeletal health problems resulting from lifting, pushing of heavy loads, sitting or standing for long time can cause health issues.		
No	32	9

Not Sure	94	26.3
Yes	231	64.7
Am aware of Psychological health hazards associated with waste picking such as abuse from the public and depression can result to illnesses		
No	29	8.1
Not Sure	113	31.7
Yes	215	60.2

Table 2: Distribution of Responses on Occupational Health Hazards

	NO	NOT SURE	YES	TOTAL	DF
Physical Hazards associated wit	28	15	314	357	8
	55.80	84.20	217.00		
Aware of the Chemical hazards a	97	108	152	357	8
	55.80	84.20	217.00		
Aware of the Biological hazards	93	91	173	357	8
	55.80	84.20	217.00		
Aware of Ergonomic hazards such	32	94	231	357	8
	55.80	84.20	217.00		
Am aware of Psychological healt	29	113	215	357	8
	55.80	84.20	217.00		
Total	279	421	1085	1785	1785
Chi-square	239.906				
p-value	0.000				

CellContents
Count
Expected count

Table 3: Chi-square Test for Hypothesis 1

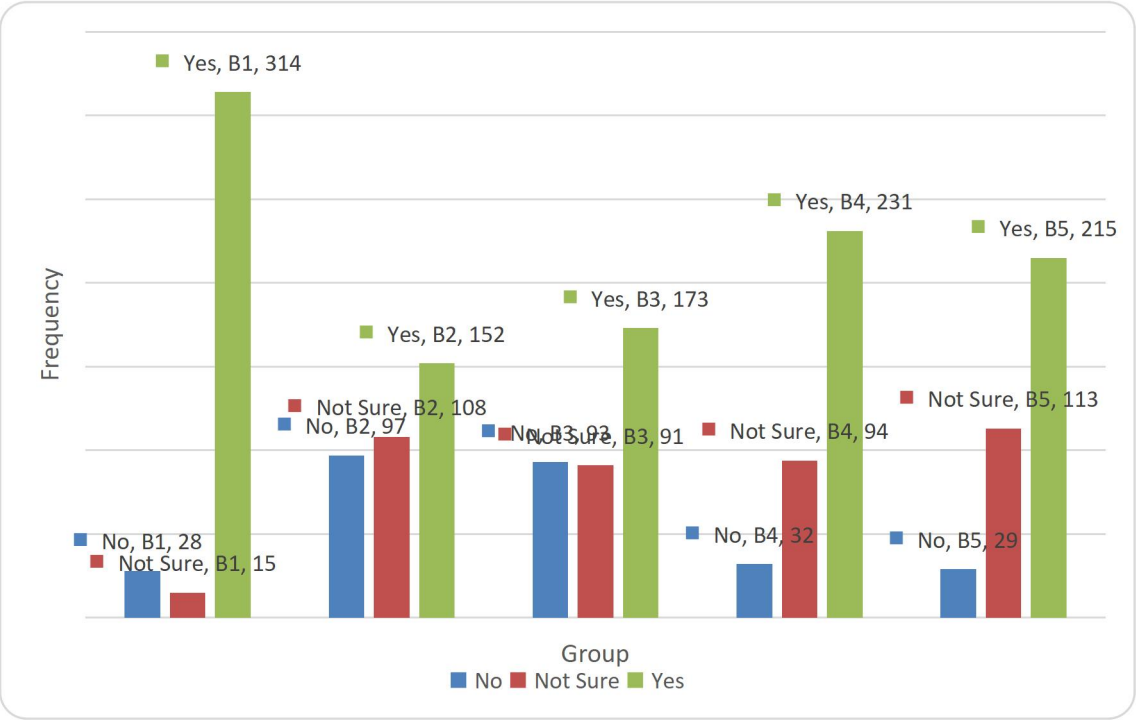

Figure 2: Graphical Distribution of Responses on Occupational Health Hazards

B1 = Physical Hazards associated with solid waste picking such as piecing objects, falls and hit from falling objects and working under extreme heat can cause health problems

B2 = Aware of the Chemical hazards associated with solid waste picking such as perception of chocking smell and irritation of the skin and eye can result in illness

B3 = Aware of the Biological hazards associated with solid waste picking such as improper handling of bacteria and fungi infectious materials can cause health issues

B4 = Aware of Ergonomic hazards such as Musculoskeletal health problems resulting from lifting, pushing of heavy loads, sitting or standing for long time can cause health issues.

*B5 = Am aware of Psychological health hazards associated with waste picking such as abuse from the public and depression can result to illnesses***.**

DISCUSSION

Table 2 elucidated the distribution of responses on occupational health hazards among the surveyed population of waste pickers, with a sample size of 357. The findings revealed a heightened awareness of physical hazards associated with solid waste picking, as significant 88% acknowledged the potential health problems arising from activities like piercing objects, falls, and exposure to extreme heat. Additionally, respondents exhibited varying levels of awareness regarding chemical hazards, with 42.6% recognizing the potential health impact of factors such as chocking smells and skin/eye irritation. Awareness of biological hazards is noteworthy, as 48.5% acknowledged the risks associated with improper handling of infectious materials. Moreover, a substantial 64.7% were aware of ergonomic hazards, understanding the potential musculoskeletal health problems stemming from activities like lifting heavy loads. The acknowledgment of psychological health hazards, such as abuse and depression, was also notable, with 60.2% recognizing the potential impact on overall well-being. These findings underscored the importance of understanding waste pickers ' awareness of occupational health hazards, providing valuable insights for targeted interventions and occupational health programs within the waste management sector. The result in Table 2 is confirmed in the graphical representation in Figure 1.

The chi-square test results for Hypothesis 1, which aimed to investigate the association between occupational activities of informal solid waste pickers and the presence of occupational health hazards in the study area, provided compelling evidence to reject the null hypothesis *($H0_1$)* in favor of the alternative hypothesis *(HA_1).* The chi-square value of 239.906 with 8 degrees of freedom indicated a statistically significant association across all categories of occupational health hazards, as evidenced by a p-value of 0.000, which is below the conventional significance level of 0.05. The substantial chi-square value reflected a strong association between the respondents' awareness of different types of health hazards (physical, chemical, biological, ergonomic, and psychological) and their occupational activities as waste pickers. This outcome implied that the occupational activities of informal solid waste pickers in the study area were indeed significantly linked to the presence of occupational health hazards.

CONCLUSION

This study successfully achieved its aim of assessing occupational health hazards among informal solid waste pickers in Port Harcourt Metropolis. The deployment of a survey method yielded a high response rate of 92.97%, with 357 out of 384 distributed questionnaires successfully retrieved. This substantial engagement enhances the reliability and representativeness of the collected data. The findings reveal heightened awareness of various hazards, including physical, chemical, biological, ergonomic, and psychological, among waste pickers. Significant associations were established between occupational activities and health hazards.

RECOMMENDATIONS

Following the findings, the following recommendations are made:

Targeted Educational Programs: Develop and implement targeted educational programs to address knowledge gaps identified in waste pickers regarding occupational health and safety. Focus on hazard identification, proper use of personal protective equipment (PPE), and safe waste disposal practices to empower waste pickers with essential information for safeguarding their health.

Healthcare Access Improvement: Collaborate with healthcare stakeholders to enhance access to medical services for informal waste pickers in Port Harcourt Metropolis. Tailoring healthcare services to the specific needs of waste pickers is essential for effective intervention. Economic Support for Safety Measures: Recognizing the economic barriers hindering consistent use of personal protective equipment (PPE), implement economic support mechanisms to make PPE more affordable and accessible for waste pickers. Integrated Occupational Safety Programs: Develop comprehensive and integrated occupational safety programs that consider the multifaceted risks identified, including physical, chemical, biological, ergonomic, and psychological hazards.

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