

Original Research Article

ASSESSMENT OF HEALTH AND SAFETY RISK AMONG WASTE SCAVENGERS IN ENUGU STATE, NIGERIA.

ABSTRACT

One of the most dangerous and dehumanizing activity in many developing countries is waste scavenging, an act of selecting possible useful or materials from waste materials especially at waste dump sites for purposes of making a living. This act exposes waste scavengers to several occupational health risks and hazards ranging from cuts, needle stick injury, and exposure to particulate matter, disease causing organisms, contaminated food and water, unhygienic working environment, among other health hazards. In Nigeria, population growth has resulted in an uncontrolled increase in waste creation, making it impossible for waste management organizations in various states to cope. Thus, increasing the number of waste scavengers who use waste picking as a daily source of income and a routine vocation to reduce the unemployment gap has increased. This study was therefore performed to assess health and safety risk among waste scavengers in Enugu state, Nigeria with a view to identifying health conditions associated with waste scavengers in state. This research adopted a descriptive cross-sectional approach in sampling 396 wastes scavengers across the s three senatorial districts of Enugu state. A multistage and random sampling technique with instruments of questionnaires as well as risk assessments of the dumpsites were used to achieve the research objectives. Findings revealed that most of the respondents were exposed to all types of hazards with (79.8%) prevalence of physical hazard, (52.3%) prevalence of biological hazard, (61.6%) prevalence of chemical hazard, (60.6%) prevalence of psychological hazard and (95.7%) prevalence of ergonomic hazard. Due to exposures to broken glasses, needles, nails, metals, bottles, trips and falls, dust, machinery, computer equipment, woods, faeces, used condoms, food wastes, decaying materials, insects, rats, snakes, battery, poisoning from insecticides, decaying materials, chemical substances, lifting heavy bags of picked solid waste materials such as metals and plastics. Study recommends the use of PPEs by scavengers and enforcement of the use by government to ensure their exposures to some of these hazards are reduced. Also, recommends collaboration of Government with health workers to organize frequent health education and promotion to educate the waste scavengers on various types of health hazards

Keywords: Waste scavengers, safety risk, hazards, PPE

1. INTRODUCTION

Waste scavengers play an important, but usually unrecognized role in the waste management system of Nigerian cities (Olukanni & Akinyinka, 2012). These activities require no form of skills and serve as a source of income for a growing number of poor people in the cities. The waste scavengers mainly search through piles of unwanted goods to recover easily recyclable materials such as glass, metal and plastic, which they sell to scrap dealers, who then process the waste and sell it on either to be recycled or to be used directly by the industry. Most studies report that waste scavengers constitute disadvantaged and vulnerable segments of the population (Nzeadibe, Anyadike, & Njoku-, 2017).

Waste scavenging is probably one of the most dangerous and dehumanizing activity in many developing countries (Nzeadibe et al., 2017). Waste scavengers usually work in filthy environments, under some unfavorable weather conditions and have to search through hazardous and non - hazardous waste without hand gloves, nose or face masks, properly covered clothes or shoes (Wachukwu, Mbata, & Nyenke, 2010). Sometimes, they eat the filthy food remnants they find in the garbage bins or in the dumping ground. Rag pickers are self-employed having no legally tenable employer employee relationship either with the municipalities or the recycling industries to which they contribute. Being unprotected manual workers, they are not recognized and do not enjoy any form of social security or legislative protection.

In Nigeria, geometric increase in population has resulted in uncontrolled increase in generation of waste which made it difficult for waste management agencies in various states to handle. Perhaps, these resulted in the increase number of waste scavengers who engage in waste picking as daily source of earning as well as routine occupation to close unemployment gap. This increase in waste generation also serve as a source of raw material for recyclable industries. In some civilized nations, they tend to recycle all their waste with ease which is not achievable in the economic nation like Nigeria with poor industrialization that were affected by economic policies of government and other factors like poor power generation, economic sabotage and failure to enforce policies that promote effective waste management.

1.1 Statement of Problem

In developing country like Nigeria, the rate of urbanization come with unplanned event to handle an increasing rate of generation and disposal of waste which over the time overwhelm the environmental activities of the cities thereby causing flooding, erosion, encroachment, air and water pollution. There is microbial degradation of these solid waste that results in breakdown of organic component to inorganic nature by the microbial organisms as result of improper disposal, these components can serve as nutrient to the organisms that can cause dissemination of diseases that can harm the human and animal living within the vicinity. Waste pickers are victims of social imbalance that was necessitate not by choice but as result of will for survival due to some factors like poverty, joblessness, growing amount of waste and financial gain in recyclable materials compelled this group of people to engage in this scavenging profession in the developing countries.

1.2 Aim

The aim of this study is to assess health and safety risk among waste scavengers in Enugu, Nigeria.

1.3 Objectives

1. Determine the prevalence of health hazards among waste scavenging in Enugu, Nigeria.
2. Assess the level of safe practices among waste pickers in Enugu, Nigeria
3. Assess the behaviour of waste scavengers towards health and safety

1.4 Research Questions

1. What is the prevalence of health hazards among waste scavenging in Enugu Nigeria?
2. What is the level awareness of health hazards associated with waste scavenging in Enugu, Nigeria?
3. What is the attitude and behaviour of waste scavengers towards health and safety?

1.5 Significance of the Study

This study will provide information on the number of dumpsites in the area investigated and applicable health care challenges as well as health conditions associated with waste pickers in Enugu state. Findings and recommendation of study if well implemented, will enable the government at all levels take suitable measures to eliminate or reduce drastically, the health risks being faced by waste Pickers in Enugu State and Nigeria at large.

2. METHODOLOGY

2.1 Study Area

This study was carried out in Enugu, the capital of Enugu State in Nigeria. Enugu is one of the 36 states of Nigeria. It is in southeastern Nigeria. Its capital and largest city is Énugwú, from which the state derives its name (Garry & Rubino, 2001; Egbokhare, & Oyetade, 2002). Enugu state is in Nigeria's geopolitical zone of the south east. It's 6°30' north of the Equator and 7°30' east of the Latitude. It shares borders with Abia and Imo in the south; Ebonyi in the east; Benue in the north-east; Kogi in the north-west; and Anambra State in the west. It has a land area of 7,161 km² (2,765 sq mi) and is the 29th largest of Nigeria's 36 states in terms of land size. Enugu State enjoys pleasant weather throughout the year.

Enugu State is divided into three senatorial districts. Igbo-Etiti, Igboeze North, Igboeze South, Nsukka, Udenu, and Uzo-Uwani are the six local government areas that make up Enugu North Senatorial District in Enugu State (Oluokun, 2018). Enugu East Senatorial District covers five local government areas of Enugu North, Enugu South, Isi Uzo, Nkanu East and Nkanu West. Enugu West Senatorial District in Enugu State is made up of five local governments of Aniniri, Awgu, Ezeagu, Oji River and Udi (Wigodo, 2020). Enugu is noted for coal production and the prevalence of several cottage industries generating waste for waste pickers

2.2 Research Design

The study used a descriptive cross-sectional type of design to collect data from the different dump sites across the three senatorial districts of Enugu state. Study made use of an instrument of a questionnaire in getting response from the respondents. The instrument was structured with close ended questionnaire consists of 5 sections, A, B, C, D, E and F. Each section of the questionnaire evaluated the variables in the study objectives.

Research instruments were validated by distributing the questionnaires to the supervisor and other academicians in the field of occupational health to assess the face and content validity of the instrument and their comments were either validated or modified for the study before

administration. The reliability of the instrument was determined by test-retest method. Data was analyzed using Statistical Package for Socioal Sciences (SPSS) version 25. Descriptive statistics such as frequency distributions, percentages, means and standard deviations were conducted to describe the socio demographic characteristics of the respondents and inferential statistics will be performed such as chi-square test of associations and (logistic regression) to determine factors. The P -value $\leq .05$ was considered statistically significant

2.3 Sampling Technique

Study employed a multistage sampling technique involving three stages namely identification of dump site, selection of dumpsites and selection of scavengers. 44 waste scavengers from each of the nine (9) active dumping sites across the three senatorial districts were selected totaling 396 scavengers. The sample size was obtained using the mean descriptive studies sample size determination formula, as given below:

$$n = \frac{Z^2 pq}{e^2} \text{ (Scott, 2013)}$$

Where;

n = Sample size to be obtained

Z = 1.96 at 95% Confidence Interval

e = margin of precision (5%)

P = 37.2% of the waste pickers with good level of practice of safety (Gebremedhin et al., 2016).

$q=100-P$

2.4 Concept of Health Hazards

A hazard is a substance, a state, or an event that has the potential to endanger the natural environment or have a negative impact on human health, such as pollution, storms, or earthquakes. It is defined as any single or combination of harmful chemical, biological, or physical agents found in the environment due to anthropogenic processes.

2.4.1 Biological hazards Biological hazards are infectious agents or products of infectious agents that cause human disease, and biological agents are any microorganism, cell culture, or human endoparasite, including any that has been genetically modified, that can cause infection, allergy toxicity, or otherwise pose a risk to human health, per the Centers for Disease Control and Prevention. People can be exposed to biological dangers at work if they come into touch with laboratory cell cultures, soil, clay, and plant materials, organic dusts, food, as well as garbage, wastewater, and sewage (Diwe et al., 2016).

2.4.2 Psychosocial Hazards Solid waste handlers have a low social status and their livelihoods are characterized by poverty, starvation, malnutrition, low educational level, physical and emotional abuse, limited access to health care facilities, as well as precarious living arrangements (Binion & Gutberlet, 2012). The social stigma and marginalization that prevails at their work place cause unnecessary stress. They also face occupational threats, such as being harassed or bullied. Some develop traces of minor psychiatric disorders like anxiety and depression.

2.4.3 Physical hazards These are environmental hazards that can cause harm with or without contact and are substances or conditions that threaten our physical safety. Fires, explosive materials, temperature (hot or cold), noise, vibration, radiation, spills on floors and unguarded machines are some examples of physical hazards. They can cause harm with or without contact. Waste collectors are exposed to extremes of temperatures (cold during

rainy season and heat during the dry season), noise and vibration generated from the garbage trucks and radiation from radioactive wastes (Eyles & Baxter, 2016; Shuvai, 2017).

2.4.4 Ergonomic hazards. A physical component in the environment that damages the musculoskeletal system is known as an ergonomic hazard. Repetitive movement, manual handling, workplace/job/task design, unpleasant workstation height, and improper body alignment are all examples of ergonomic risks. Ergonomics is the study of how to design a workplace, its equipment, and the work environment for maximum comfort, efficiency, safety, and productivity.

2.4.5 Chemical Hazards: These environmental hazards involve dangerous chemicals. Chemical hazards can be classified per their health and physicochemical risks and dangers. Health hazards include skin irritants, carcinogens or respiratory sensitizers that have an adverse effect on a worker's health because of direct contact with or exposure to the chemical, usually through inhalation, skin contact or ingestion. Chemical hazards and toxic substances pose serious health hazards.

2.5 Safety Practices

Safety practices are specifically laid down methods outlining standard procedures for performing a task with reduced risk to people, equipment, materials, environment and processes. They are the rules for dealing with security. After completing a hazard assessment, safe work practices are developed that closely represent the most typical actions in the company's kind or sector of construction (Eli et al., 2018). Some basic safety practices are: use of proper goggles, use of protective clothing, use of proper gloves, use of proper boots and use of proper hand washing technique.

3. RESULTS AND DISCUSSION

Table 1 below reveals that most respondents 215(54.3%) are of the age 20-29, majority 388(98.0%) participants are male and most 355(89.6%) are of the Igbo tribe. Many respondents 356(89.9%) are Christians, 209(52.8%) respondents had secondary level of education, 280(70.7%) participants were single and more 341(86.1%) respondents earned above #2000 as range of income.

Table 1: Socio-Demographic Characteristic of the Respondents

Variables	Frequencies (n=396)	Percentage (%)
Age		
10-19	50	12.6
20-29	215	54.3
30-39	78	19.7
40-49	40	10.1
≥50	13	3.3
Gender		
Male	388	98.0
Female	8	2.0
Tribe		
Igbo	355	89.6
Hausa	38	9.6
Others	3	.8

Religion		
Christianity	356	89.9
Islam	37	9.3
Other	3	0.8
Level of education		
Primary	118	29.8
Secondary	209	52.8
Tertiary	64	16.2
None	5	1.3
Marital status		
Single	280	70.7
Married	110	27.8
Widower	5	1.3
Cohabiting	1	.3
Range of income		
N 500- N1000	10	2.5
N 1001- N1500	17	4.3
N 1501- N 2000	28	7.1
Above N 2000	341	86.1

Table 2: Summary of the Level of Health Hazards

Variables	Frequencies (n=396)	Percentage (%)
Physical Hazard		
Yes	316	79.8
Biological Hazard		
Yes	207	52.3
Chemical Hazard		
Yes	244	61.6
Psychological Hazard		
Yes	240	60.6
Ergonomic Hazard		
Yes	379	95.7

Table 2 reveals that all 396(100.0%) respondents do not wear protective clothes while at work, wear safety boots, use face mask, use safety goggles, use helmets, and make use of hand gloves because they do not have. The table also shows that majority 384(97.0%) do not use light source at night, among those who used light source at night many11 (91.7%) uses it occasionally and all 384(100.0%) did not use light source because they do not have. The result of the table indicated that most 254(64.1%) participants have not received tetanus toxic vaccination and all 396(100.0%) respondents have not received hepatitis B and Covid 19 vaccination

Table 3: Practice of Safety Precaution

Variables	Frequencies (n=396)	Percentage (%)
Do you wear protective clothes while at work		
No	396	100.0
If no, why		
I don't have	396	100.0
Do you wear safety boots		
No	396	100.0
If no, why		
I don't have	396	100.0
Do you use face mask		
No	396	100.0
If no, why		
I don't have	396	100.0
Do you make use of safety goggles		
No	396	100.0
If no, why		
I don't have	396	100.0
Do you make use of helmets		
No	396	100.0
If no, why		
I don't have	396	100.0
Do you make use of hand gloves		
No	396	100.0
If no, why		
I don't have	396	100.0
Do you use light source at night		
Yes	12	3.0
No	384	97.0
If yes, light source at night		
Always	1	8.3
Occasionally	11	91.7
If no, light source at night why		
I Don't Have	384	100.0
Have you received tetanus toxic vaccination		
Yes	142	35.9
No	254	64.1
Have you received hepatitis B vaccination		
No	396	100.0
Have you received Covid19vaccination		
No	396	100.0

Table 2 reveals that all 396(100.0%) respondents do not wear protective clothes while at work, wear safety boots, use face mask, use safety goggles, use helmets, and make use of hand gloves because they do not have. The table also shows that majority 384(97.0%) do not use light source at night, among those who used light source at night many11 (91.7%) uses it occasionally and all 384(100.0%) did not use light source because they do not have. The result of the table indicated that most 254(64.1%) participants have not received tetanus toxic vaccination and all 396(100.0%) respondents have not received hepatitis B and Covid 19 vaccination

Table 4: Assessment of Level of Practice of Safety Precaution

Variables	Frequencies (n=396)	Percentage (%)
Poor	261	65.9
Good	135	34.1

UNDER PEER REVIEW

4. CONCLUSIONS

Findings reveal that more than half of the participants were exposed to physical hazards, biological hazards, chemical hazards, psychological hazards with ergonomic hazards being the most prevalent. Also, the study found that most of the respondents had poor awareness of health hazards and poor level of attitude towards precautionary measures such as lack of use of Personal Protective Equipment PPE.

5. RECOMMENDATION

Management of dumpsites should establish rules that will ensure the use of proper PPE by scavengers.

Government should make laws regulating the activities of scavengers within its territory

Management of dumpsites should collaborate with health workers to organize frequent health education to promote the education of waste scavengers on various types of health hazards.

Scavengers should adopt safe practice during scavenging such as using PPE.

Scavengers made should be encouraged to avail themselves the opportunity to acquire more knowledge of preventive measures that will improve their practice of safety precaution.

REFERENCES

- Binion. E and Gutberlet. J. The effects of handling solid waste on the wellbeing of informal and organized recyclers: a review of the literature. The Community-based Research Laboratory, University of Victoria, British Columbia, Canada. 2012
- Diwe, k., Uwakwe, K., Iwu, A., Duru, C., Merenu, I., Ogunniyan, I., ...Ndukwu, E. Knowledge, Attitude and Safety Practices amongst Public and Private Solid Waste handlers in a South Eastern State, Nigeria. *IOSR Journal of Environmental Science, Toxicology and Food Technology*, 2016;10(7), 65-71.
- Egbokhare, F. O., & Oyetade, S. O. *Harmonization and standardization of Nigerian languages*. CASAS. 2002; 106. ISBN 978-1-919799-70-4.
- Eli, P., Alabere, I., & Douglas, K. Occupational hazards and safety practices of refuse collectors in Obio/Akpor Local Government Area of Rivers State. *Asian Journal of Medicine and Health*, 2018;13(3), 1-9.

Eyles, J., & Baxter, J. *Environments, risks and health: social perspectives*. Routledge. 2016

Garry, J., & Rubino, C.R.G. *Facts about the world's languages: an encyclopedia of the world's major languages, past and present*. H.W. Wilson. 2001; 328. [ISBN 978-0-8242-0970-](https://doi.org/10.1007/s11482-012-9171-0)

4

Nzea dibe, T. C., Anyadike, N. C., & Njoku-, R. F. *A Mixed Methods Approach to Vulnerability and Quality of Life Assessment of Waste Picking in Urban Nigeria*.

(December).2017; <https://doi.org/10.1007/s11482-012-9171-0>

OI ukanni, D. O., & Akinyinka, M. O. *Environment , Health and Wealth : Towards an Analysis of Municipal Solid Waste Management in Ota , Ogun State , Nigeria*. 2012; 138–145.

Oluokun, A. *PDP Primaries: Enugu East senatorial election declared inconclusive over shortage of ballot papers*. 2018. *The NEWS*. Retrieved 2020-06-07.

Shuvai, C. Occupational safety and health hazards associated with solid waste management in Bindura, Zimbabwe.2017

W achukwu, C. K., Mbata, C. A., & Nyenke, C. U. The Health Profile and Impact Assessment of Waste Scavengers_Rag Pickers in Port Harcourt.pdf. *Journal of Applied Sciences*.2010

Wigodo, I. *Enugu East Makes Choice for Senate*". 2020. Retrieved 2020-06-07.