

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. 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 the state. This research adopted a descriptive cross-sectional approach in sampling 396 wastes scavengers across the 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 serves 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 wastes 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, Nigeria.

1.6 Scope of the study

The research is focused on assessing the health implications of the activities in waste dump sites and landfills on waste Pickers within the three senatorial districts of Enugu state Nigeria. Study was however limited by time given the short duration and nature of the doctoral programme.

2. METHODOLOGY

2.1 Study Area

This study was carried out in Enugu state, one of the 36 states of Nigeria between July and September, 2021. 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 6o30' north of the Equator and 7o30' 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.

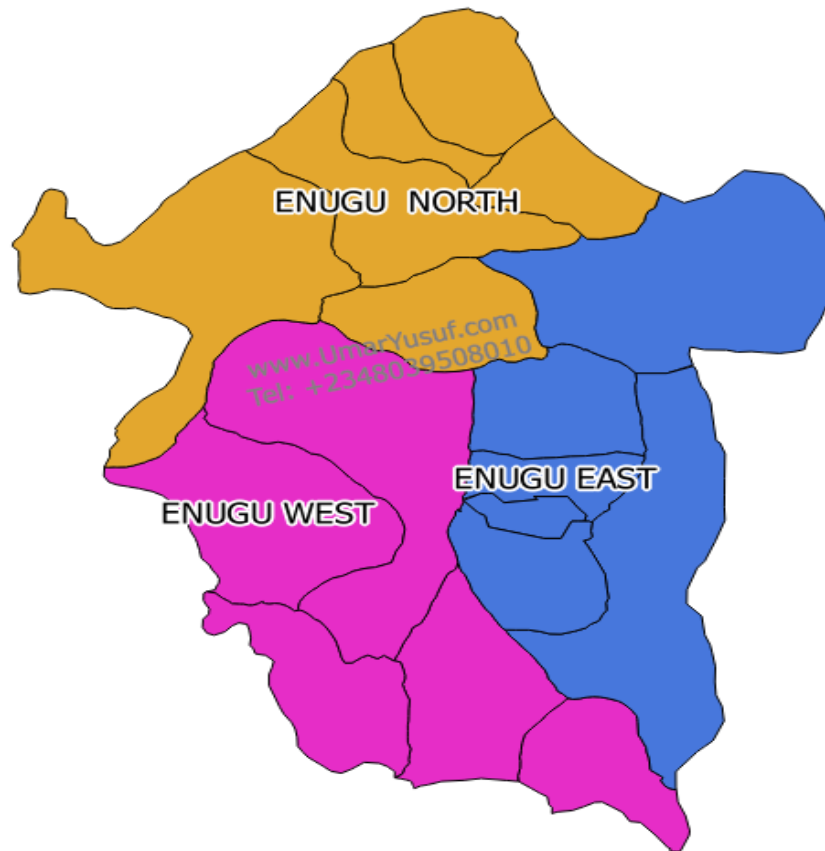


Figure 1: Map of Enugu State showing the senatorial zones

Enugu State is divided into three senatorial districts. Igbo-Etiti, Igboeze North, Igboeze South, Nsukka, Udeni, 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 Social 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 ≤ 0.05 was considered statistically significant

2.3 Sampling Technique

Study employed a multistage sampling technique involving three stages namely identification of dumping sites, 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. This means that three (3) dumping sites were selected from each of the three senatorial districts and from each dumping sites, 44 waste scavengers were picked. 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 risk. 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

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 per day

Table 1: Socio-Demographic Characteristic of the Respondents (Researcher)

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/day		
N 500- N1000	10	2.5
N 1001- N1500	17	4.3
N 1501- N 2000	28	7.1
Above N2000	341	86.1

Table 2: Summary of the Level of Health Hazards (Researcher)

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 (Researcher)

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 3 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 (Researcher)

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

The table 4 shows (65.9%) poor level of practice of safety precaution.

4. DISCUSSIONS

In this study, the findings indicates that all the participant do not regularly wear protective clothes, wear safety boots, use face mask, use safety goggles, use helmets, and make use of hand gloves during scavenging. This study found that majority of the respondents do not use light source at night, among those who used light source at night almost all use light occasionally and all those that do not use light source reported that they do not have. Also, less than half of the participants had received tetanus toxic vaccination while none of the participants had received hepatitis B and Covid 19 vaccination. More than half (65.9%) of the respondents had poor level of practice of safety precaution. Findings in this similar to the findings by Al-Khatib et al. (2020), who reported poor use of safety tools as well as hygiene practices which were necessary safety precautions for their kind of occupation. Al-Khatib et al. (2020) found that as much as 98.3% of the scavengers did not wear masks while handling the waste products, 96.3% did not wear safety uniforms and 89.6% of them did not wear protective gloves while working. It was also reported that 66.4% of the respondents did not wear the required shoes while working and 41.0% did not wash their hands with disinfectants.

The study indicates that the occupational health and safety of the waste scavengers was constantly deteriorating mainly due to the informal nature of their work. They were reported to be suffering in the current situation with majority having no access to potable water, sanitation, and hygienically appropriate places to sleep and have meals which are all crucial in ensure the practice of the necessary safety precautions. Findings in this study is in keeping with findings by Thirarattanasunthon et al., (2012), who found that less than half of the respondents used PPE all the time, 48% used them sometimes and 7% of the scavengers never used PPE while working. Similarly, Schenck et al. (2019) reported that there was a poor usage of personal protective equipment by the scavengers working at the landfills.

The findings in this study is affirmed by the findings a study carried out at a dumpsite (Awotan solid waste dumpsite) in Ibadan, Nigeria, indicated that none of the waste pickers/scavengers used mouth and nose masks which are necessary personal protective equipment necessary to prevent the occurrence of health problems among the waste scavengers. Only few of the participants in that study used protective gloves and booths (Awopetu et al., 2014). Another study conducted by (Adeyi & Adeyemi, 2019) among dumpsite waste managers and scavengers in Lagos, Nigeria reported a similar finding that (4.0%) of the respondents used aprons and nose covers indicating poor practice of safety measures. However, none of them used protective gloves nor rubber boots. They documented that and nose masks were used by only 8% of the respondents and 1% apiece used gloves and aprons. None of them used rubber boots while working at the dumpsites. There is similarity between findings in this study and findings by Yusuf et al. (2018) who made the following findings that majority of the scavengers did not have knowledge of personal protective equipment and did not use the necessary standard precautions necessary to prevent the occurrence of health problems while working. Conversely,

Gebremedhin et al., (2016) reported high level of practice of safety precaution, most of the respondents adhered to the various safety precautions as well as use required personal protective equipment including rubber boots, mouth and nose masks, protective gloves amongst others. From the findings in this study, it can be deduced that more than half of the respondents had poor level of practice of safety precaution

UNDER PEER REVIEW

5. 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.

6. 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.

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APPENDIX

QUESTIONNAIRE ON HEALTH IMPACT OF HUMAN SCAVENGING AMONG WASTE PICKERS IN ENUGU STATE

I am a student in out research on the above-named topic. Please respond as sincerely and truthfully as possible to the questions outlined below. All information provided will be treated as confidential and would be used only for the department of Occupational Health and Safety University of Port Harcourt carrying the purpose of this research. Thank You.

NWOSU OSITA

SECTION A: SOCIO-DEMOGRAPHICS

Kindly respond appropriately to the following by ticking or writing as appropriate in the space provided.

Age

Gender (1) male [] (2) Female []

Tribe: (1) Igbo [] (2) Hausa [] 3 Yoruba []

Religion: (1) Christianity [] (2) Islam [] (3) Other

Level of educational: 1) Primary [] (2) Secondary [] (3) Tertiary [] (4) None []

Marital Status: (1) Single [] (2) Married [] (3) Divorced []

(4) Widowed/widower [] (5) Cohabiting

Range of Income: (1) 500-1000 (2) 1001-1500 (3) 1501-2000 (4) Above 2000

SECTION B: OCCUPATIONAL HISTORY

How long have you been picking waste in dump site?

<1 1-5years 6-10years 11-15years ≥16 hours

Do you work every day? (a) Yes (b) No

In typical day how many hours do you spend on picking waste?

<1 1-hours 6-10 hours 11-15hours ≥16 hours

Have you ever had injury while picking waste? (a) Yes No

If yes, which part of your body did you have the injury?

Have you ever been sick as a result of picking waste? (a) Yes (b) No

Do you suffer from any illness before you started this work? (a) Yes (b) No

If yes, which type of illness?

Malaria (a) Yes (b) No

Typhoid fever (a) Yes (b) No

Cough (a) Yes (b) No

Pneumonia (a) Yes (b) No

Rhinitis (a) Yes (b) No

Diarrhoea (a) Yes (b) No

SECTION C: SOCIAL/ LIFESTYLE HISTORY

1. Do you consume tobacco? (a) Yes No

2. If yes to question (1) what type of tobacco do you consume?

(a) Cigarette (b) Snuff (c) Others (specify).....

3. Do you consume alcohols? (a) Yes No

4. Have you ever being drunk? (a) Yes No

8. Do you go to club? (a) Yes No

9. Do you belong to social/ cultural group? (a) Yes No

SECTION D: PREVALENCE OF HEALTH HAZARDS

Physical Hazard

Are you exposed to noise and vibrations? YES NO

Have you ever been sick while working as refuse collector?

YES NO

Do you work in cold and hot hours of the day? YES NO

Do you work on the road while traffic flows? YES NO

Have you experienced falls while working due to slippery or moving vehicles

YES NO

Chemical & Biological Hazards

Have you been exposed to choking smell while working? YES NO

If yes, what do you think you have been exposed to?

3. Are you exposed to bites while working? YES NO

If yes, which insect are you commonly exposed to?

Do you encounter rodents and creeping reptiles while working? YES NO

Ergonomics Hazards

Do you lift any heavy objects that could cause harm and body pains? YES NO

Does the work require overly twisting and bending of waist? YES NO

Have you experienced any eye problem in the course of doing the job?

YES NO

Psychological Hazard

Do you receive verbal abuse from your superior, colleagues and public? YES

NO

Have you experienced bully or aggression from other employees within the company? YES

NO

How many hours do you work in a day? 1-3 4-6 7-9 10 and above

SECTION E: LEVEL OF AWARENESS OF HEALTH HAZARD

Are you aware of the hazardous nature of your job?

YES NO

If YES, identify the type of hazard that you know

Physical

Chemical

Biological

Ergonomic

Psychosocial

Do you know if exposure to the hazards can cause health problems YES NO?

Do you know that broken bottles and sharps are hazards YES NO

Perception of choking smell is an indication of chemical hazards YES NO

Are you aware that creeping insects and human wastes have potential to cause harm? YES

NO

Do you know that noise and vibration from garbage trucks can cause harm?

YES NO

Are you aware that working under extreme heat can result in illness? YES NO

Do you know that irritation to the skin or eyes could be due to exposure to harmful chemical substances YES NO?

Do you know that unidentified materials could be explosives and could cause serious harm YES NO

Bacterial and viral diseases could be due to improper handling of infectious waste? YES NO

Do you know that abuse from the public is a form of psychosocial hazard?

YES NO

SECTION F: LEVEL OF PRECAUTIONARY MEASURES

How many times do you bath in a day (1) once (2) twice (3) thrice?

Do you take your bath every day(a) Yes (b)No

Do you wash your hand before eating? (a) Yes (b)No

Do you seek for lifestyle advice on healthy behaviors? (a) Yes (b)No

What type of waste do normally pick from the refuse dump

How often do you visit the refuse dump sites? (1) daily (2) few times in a week (3) weekly

Have you attempted to stop waste picking? (a) Yes (b)No

Do you consume fruits and vegetables every day? (a) Yes (b)No

How many times do you eat food in a day? (1) once (2) twice (3) three times (4) more than three times

How many times do you wash your work cloth (1) everyday (2) few times a week (3) weekly (4) monthly (5) never

What do you do when you have physical injury.....

SECTION G: PRACTICE OF SAFETY PRECAUTIONS

Do you wear protective cloths while at work? (a) Yes (b)No

If YES, (a) always (b)most times (c) sometimes (d) Always (e) occasionally

If NO, why? (a) I don't have (b) Negligence (c) Discomfort

Do you wear safety boots? (a) Yes (b)No

If YES, (a) always (b)most times (c) sometimes (d) Always (e) occasionally

If NO, why? (a) I don't have (b) Negligence (c) Discomfort

Do you use of nose mask? (a) Yes (b)No

If YES, (a) always (b)most times (c) sometimes (d) Always (e) occasionally

If NO, why? (a) I don't have (b) Negligence (c) Discomfort

Do you use of safety goggles? (a) Yes (b)No

If YES, (a) always (b)most times (c) sometimes (d) Always (e) occasionally

If NO, why? (a) I don't have (b) Negligence (c) Discomfort

Do you use of helmets? (a) Yes (b)No

If YES? (a) always (b)most times (c) sometimes (d) Always (e) occasionally

If NO, why? (a) I don't have (b) Negligence (c) Discomfort

Do you use of hand gloves? (a) Yes (b)No

If YES, (a) always (b) most times (c) sometimes (d) Always (e) occasionally

If NO, why? (a) I don't have (b) Negligence (c) Discomfort

Do you use light source at night? (a) Yes (b)No

If YES, (a) always (b) most times (c) sometimes (d) Always (e) occasionally

If NO, Why? a) I don't have (b) Negligence (c) Discomfort

Have you received vaccination to prevent tetanus toxoid (TT) and Hepatitis B

TT? (a) Yes (b)No

Hepatitis? (1) (a) Yes (b)No

SECTION H: HEALTH CONDITIONS AND INJURIES

Please indicate if you have been exposed to any of this health conditions

Are you being exposed to any health condition (a) Yes (b) No

If yes please choose any of this (choose multiple)

You have had any of these musculoskeletal diseases?

Back pain (a) Yes (b) No

Fracture (a) Yes (b)No

Muscle pain (a) Yes (b)No

Joint pain (a) Yes (b)No

Difficulty in breathing (a) Yes (b)No

You have had any of these skin diseases?

Skin rash (a) Yes (b) No

Purities (a) Yes (b) No

Scabies (a) Yes (b)No

Nail infections (a) Yes (b)No

Indicate if you have had injuries or cut on?

Hand (a) Yes (b) No

Body (a) Yes (b) No

Foot (a) Yes (b) No

Head (a) Yes (b) No

Other body parts (Specify).....

Indicate if you have screened for;

(1) Hepatitis (2) Cervical Cancer (3) Prostate Cancer

Indicate if you have received vaccination against; (1) Hepatitis (2) Cancer

Thank you for participating.

UNDER PEER REVIEW