



Occupational Health Hazards Associated with Road Sweepers in Port Harcourt Metropolis

¹Kina Kpugi Vivian ²Jonathan Tamunoibiteim. ³Opurum Goodnews C. ⁴Mboi Stanley S. ⁵Dike Blessed O.P. ⁶Amadi Chinyere N

^{1,2,3&6} Department of Environmental Health Technology, Rivers State college of Health Science and Management Technology Nigeria

⁴ Department of dental surgery Technician Rivers State college of Health Science and Management Technology Nigeria

⁵ Department of Medical imaging Technology Rivers State college of Health Science and Management Technology Nigeria

ABSTRACT

Road sweepers are responsible for keeping the roads and surrounding environment clean. They are exposed to numerous occupational health hazards such as; physical, chemical, biological, psychosocial and ergonomic. Symptoms may include; sunburn, respiratory issues, headache, breathlessness and loss of hearing from exposure to noise. This study was aimed at assessing the occupational health hazards associated with road sweepers in Port Harcourt Metropolis. The population area were 3 major city areas; Aba Express Way, Olu Obasanjo Road, Ikwerre Road. The research design was a descriptive cross-sectional study involving 250 road sweepers. Data was collected using structured questionnaire and interview. The data was analyzed using percentage formula method. From the study the major percentage of road sweepers were female, (66%) while 34% were male. It was observed that 95(38%) of the sweepers belong to the age range of 36 and above, 85(34%) belong to 26-35 years, 70 (28%) belong to 18-25 years. The result shows that 59 (23.6%) of the respondent were exposed to motor accident, 61 (24.4%) were exposed to high inhalation of dust, 50 (20%) exposed to high temperature, 67 (26.8%) are exposed to smoke from vehicle, and 13 (5.2%) were exposed to psychological problem. The study also discloses that the road sweepers were not provided with personal protective equipment. In conclusion, this study reveals that road sweepers are exposed to several occupational health hazards and disease. Therefore the employers should ensure the provision of PPEs in order to prevent the effects of these health hazards on the road sweepers.

Keywords: Occupation, Health, Hazard ,Port Harcourt .

Introduction

Dust includes the most commonly found harmful particles in the atmosphere, and street sweepers are exposed to a combination of soil, sand and gravel dust particles, vehicle dust, bioaerosols and plant particles. In some studies, sneezing, coughing, eye irritation, lung tissue swelling, asthma and throat infections were found to be more prevalent among individuals exposed to occupational dust. Moreover, the symptoms associated with impaired lung function may lead to occupational lung diseases (Ewis etal 2013) . The long and continuous inhalation of non-industrial dust by street sweepers has been reported to be one of the critical factors in the development ofChronic Obstructive Pulmonary disease, resulting inobstructive ventilator patterns. When compared with other health hazards, respiratory problems are more prevalent among street sweepers. Moreover, the effects of occupational dust exposure on the reduction of pulmonary function has been confirmed. The lung diseases seen in street sweepers are often due to the deposition of harmful dust particles that are inhaled while sweeping. Most of the time, workers reported passenger fatigue, and gradually the symptoms become more intense and present during the workday, tend to build conditions that may cause the onset of Musculoskeletal Disorders (MSDs) due to imposition of physical exertion such as walking, running, carry heavy loads, lowering and rising sharply associated with poor posture and other. The interest in this topic stems from concerns about the occupational risks to which cleaning agents are subject in the performance of their functions, among which are the musculoskeletal disorders that can trigger long-term disabilities that may keep them from work indefinitely. In a study on sweeping practice and knowledge about occupational safety and health hazards among street sweepers of Shyamoli area in Dhaka city concluded that among the most of respondent faced Problem during work, most of them don't have any idea about hygiene and most respondents do not use protective equipment. In another study in Calabar, Nigeria, Street sweepers in Calabar do not observe internationally recommended precautionary measures against inhalation of dust, e.g. wearing of facemasks and watering of streets to minimize inhalation of dust Johnson and John (2020) .

Aim of the study

The objectivesofthisstudy is toevaluatetheoccupational health hazards associated with road sweepers in Port Harcourt.

RESEARCH QUESTION

In other to carry out this research the following questions need to be ask based on the objective of this study, they include:

- What are the occupational health hazards associated with road sweeping occupation?

- What is the prevalence of the identified occupational health hazards among the street sweepers in Port Harcourt Metropolis?
- What are the preventive and control measures of the identified health hazard?
- Does the street sweeper have any knowledge or training on related occupational health hazards?
- What are the equipments and personal protective equipments used in the course of carrying out their duties?
- How often do the street sweepers go for medical examination?

RESEARCH METHODOLOGY

The research work involved an investigation to identify specific occupational health hazards associated with road sweeping. To achieve the aim of this research work the chapter presents research design and procedure in collecting information which is described below.

RESEARCH DESIGN

The research design adopted is a descriptive cross-sectional study among street sweepers in Port Harcourt. The research design for this study was survey method. This was achieved through field observation, use of structured questionnaire and interview analysis. The data used was collected through the administration of questionnaires to randomly selected street sweepers in Port Harcourt Metropolis. 250 questionnaires were distributed and all were retrieved.

POPULATION OF STUDY

The target population was street sweepers working in Port Harcourt metropolis, employed by the Rivers State Sanitation Authority in Port Harcourt. Selected area was used for the study with randomly selected road sweepers as shown in the table below:

Population Distribution In Selected Areas

Table 3.1: Population distribution in selected areas

S/NO	SELECTED AREAS	NUMBER OF SELECTED WORKERS
1	Aba Express Way	110
2	Olu Obasanjo Road	60
3	Ikwere Road	80
	Total	250

AREA OF STUDY

The study area is Port Harcourt city and it is among the fastest growing city in Nigeria, situated in the South-South of Nigeria. Port Harcourt city is an area where much of street vendors, shop sales, craft men, demolition and construction of big buildings are located which indicates high movement of people from different parts of the country, rural and urban areas looking for social-economic means of making money. Due to movement of people and car traffic both associated with much production of waste and more car traffic which results to fumes and aerosol, bio-aerosol and dust which may be contributing to increasing among road workers of respiratory health symptoms among road sweepers who are exposed to this hazard every day without proper and appropriate PPEs to protect them from health hazards.

SAMPLE AND SAMPLING TECHNIQUES

To obtain a reliable sample for this study, three zones were selected that formed the focus of this study. To actually determine the sample size for the study two persons were selected from the three zones making a total of six to determine the probability of success and failure. The method of yes and no were used. The results show the probability of success has four while failure has two. This Christensen formula was used:

$$N = \frac{Z^2(pq)}{Z^2}$$

Where N = Sample size determination
 z = standard value for a given significant = 1.96²
 P = probability of success
 Q = probability of failure
 S² = Standard level of significant = 0.05
 Probability of Success = 4/6 = 0.067
 Probability of failure = 2/6 = 0.33

$$N = \frac{1.96^2(0.67 \times 0.33)}{0.05^2}$$

$$= \frac{0.84937776}{0.0025}$$

$$= 339.75$$

INSTRUMENT DESIGN

The instrument of design was achieved through field observation, use of structured questionnaire and interview analysis. The data used was collected through the administration of questionnaires to randomly selected street sweepers.

METHOD OF DATA COLLECTION

To get the relevant information for the study the following data collection process was used:

Observation and visit: This research involved going to the selected area for the study to observe and understand the various health hazard associated with road sweeping in order to comprehend the best control measures for the hazards.

Interview: Interviews were conducted with the road sweepers to get the necessary information from them needed for the study.

Questionnaire: Two hundred (250) questionnaires were printed and distributed to the road sweepers in the selected areas. All questionnaires were filled and collected back from the subjects and used for the study.

METHOD OF DATA ANALYSIS

The data obtained was examined and analyzed using the simple percentage method. The formula for calculation is:

$$\frac{X}{T} = \frac{100}{1}$$

WHERE X= Number of respondents

T= Number of Questionnaires

RESULTS

The data collected in this study are presented in table which shows the response from the source of data collection. As determined from the sample size a total of two hundred and fifty (250) questionnaires comprises of closed ended question with optional answers, however two hundred and forty were properly filled and collected. Analysis was done based on the different research objective and question.

RESEARCH QUESTIONS

Section A

Table 4.1 What is sex?

SEX	NUMBER OF RESPONDENT	PERCENTAGE OF RESPONDENT
Male	85	34%
Female	165	66%
Total	250	100%

Table 4.1 above shows that 85 (34%) respondents are male while 165 (66%) are female respondent.

Table 4.2: What is your marital status?

MARITAL STATUS	NUMBER OF RESPONDENT	PERCENTAGE OF RESPONDENT
Single	80	32%
Married	130	52%
Divorced	20	8%
Separated	20	8%
Total	250	100%

Table 4.2 show that 80 (32%) of the respondent are single, 130 (52%) of the respondent are married, 20 (8%) are divorced and 20 (8%) of the respondent are separated.

Table 4.3: Which of the age bracket do you belong to?

AGE	NUMBER OF RESPONDENT	PERCENTAGE OF RESPONDENT
18-25	70	28%
26-35	85	34%
36 and above	95	38%
Total	250	100%

Table 4.3 above shows the age distribution of respondent in the study area. It is observed that 95 (38%) of the population belong to the age bracket of 36 and above, 85(34%) of the population are of the age bracket of 26-35, 70 (28%) of the respondent belong to the age bracket of 18-25 years respectively.

Table 4.4: What level of education were you able to attain?

LEVEL OF EDUCATION	NUMBER OF RESPONDENT	PERCENTAGE OF RESPONDENT
Primary	90	36%
Secondary	70	28%
Tertiary	15	6%
Non Formal	75	30%
Total		

Table 4.4 above shows the educational level of respondents. In the table 90 (36%) of the respondent have attained primary educational level. 70 (28%) attained secondary level of education. 15 (6%) attained tertiary level of education and 75 (30%) fall in the non-formal educational level category.

Table 4.5 what is your occupation?

OCCUPATION	NUMBER OF RESPONDENT	PERCENTAGE OF RESPONDENT
Trading	95	38%
Bricklayer	53	21.2%
Farming	54	21.6%
Tailor	48	19.2%
Total	250	

Table 4.5 above shows the occupation of respondents. In the table 95(38%) of the respondents are traders. 53(21.2%) are bricklayers. 54 (21.6%) are farmers, 48 (19.2%) are tailors.

SECTION B

OCCUPATIONAL HISTORY OF RESPONDENT

Table 4.6: What is their monthly income?

MONTHLY INCOME (NAIRA)	NUMBER OF RESPONDENT	PERCENTAGE OF RESPONDENT
10,000	70	28%
15,000	50	20%
20,000	60	24%
30,000	70	28%
Total	250	100%

The table above shows the monthly income of the road sweepers. 70 (28%) of the sweepers receive 10000 naira as salary, 50 (20%) receive 15000, 60 (24%) receive 20000, 70 (28%) receive 30000.

Table 4.7: What is the period of employment (years)?

PERIOD OF EMPLOYMENT (YEARS)	NUMBER OF RESPONDENT	PERCENTAGE OF RESPONDENT
1-3 years	90	36%
4-6 years	95	38%
7-10 years	65	26%
Total	250	100%

The table shows period of employment of the road sweepers. 90 (36%) reported they have being employed for 1-3 years, 95 (38%) reported 4-6 years, 65 (26%) reported 7-10 years.

Table 4.8: What is the sweeping time?

SWEEPING TIME	NUMBER OF RESPONDENT	PERCENTAGE OF RESPONDENT
4-6am	50	20%
4-7am	55	22%
5-7am	65	26%
6-8am	80	32%
Total	250	100%

The table above shows the sweeping time of the road sweepers. 50 (20%) of the sweepers reported they work between 4-6am, 55 (22%) reported between 4-7am, 65 (26%) reported between 5-7am, 80 (32%) reported between 6-8am.

SECTION C

Table 4.9: What method should be practice that can suit road sweepers?

METHODS USED IN SWEEPING	NUMBER OF RESPONDENT	PERCENTAGE OF RESPONDENT
Manual sweeping with broom	159	63.6%
Mechanical sweeping	91	36.4%
None of the above	None	None
Total	250	100%

Table shows that 159 (63.6%) of the respondent use manual sweeping with broom. 91 (36.4%) used mechanical sweeping respectively.

Table 4.10: Are there hazardous condition that the Port Harcourt Metropolis road sweepers exposed to?

OCCUPATIONAL HAZARDS	NUMBER OF RESPONDENT	PERCENTAGE OF RESPONDENT
Motor accident	59	23.6%
Inhalation of dust	61	24.4%
Exposure to high temperature	50	20%
Exposure to smoke from vehicle	67	26.8%
Psychological Problem	13	5.2%
Total	250	100%

The Table above shows that 59 (23.6%) the respondent are exposed to motor accident. 61 (24.4%) are exposed to high inhalation of dust. 50 (20%) exposed to high temperature. 67 (26.8%) are exposed to smoke from vehicle, While 13 (5.2%) are exposed to psychological problem.

Table 4.11: What type of cases have been reported since 2011-2019

CASES REPORTED	NUMBER OF RESPONDENT	PERCENTAGE OF RESPONDENT
Road accidents during duty/ death	82	32.8%
Death due to lung issues or heart problem	58	23.2%
Injuries sustained while working	110	44%
Total	250	100%

The table above shows the types of cases reported from 2011- 2019, 82 (32.8%) respondent said its road accident during duly/death, 58 (23.2%) respondent said it is death due to heart/lungs problem 110(44%) respondent said it is injures sustain at work

Table 4.12: Which Disease is Common among Road sweepers in Port Harcourt?

COMMON DISEASES	NUMBER OF RESPONDENT	PERCENTAGE OF RESPONDENT
Asthma	40	16%
Conjunctivitis	70	28%
Pneumoconiosis	65	26%
Tuberculosis	75	30%
Total	250	100%

The table above shows the common disease among road sweepers in Port Harcourt. Asthma was reported in 40(16%). Conjunctivitis was reported in 70 (28%). Pneumonia was reported in 65 (26%) and tuberculosis was reported in 75 (30%).

Table 4.13: What safety devices are provided for the sweepers?

TYPES OF SAFETY DEVICE PROVIDED FOR THE SWEEPERS	NUMBER OF RESPONDENT	PERCENTAGE OF RESPONDENT
Face mask	100	40%
Gloves	45	18%
Safety Boots	40	16%
Safety Goggles	30	12%
Reflector	35	14%
Total	250	100%

The table above shows the types of protective devices that are provided for road sweepers. 100 (40%) of the respondent reported they do not use total face mask. 45(18%) of respondent not using gloves, 40 (16%) not using safety boots, 30 (12%) respondents not using safety googles, and 35(14%) of the respondent not using reflector.

Table 4.14: What safety measures should be adopted to control these hazards?

SAFETY MEASURES	NUMBER OF RESPONDENT	PERCENTAGE OF RESPONDENT
Conduct preplacement medical exams	30	12%
Conduct periodic medical examinations	75	30%
Organize training and workshop for the road sweepers	80	32%
All of the above	65	26%
None of the above	Nil	Nil
Total	250	100%

The able above shows the safety measures adopted for hazard control. 30 (12%) of the sweepers responded to the need to conduct preplacement medical exams, 75 (30%) responded to conducting periodic medical examinations, 80 (32%) stated the need to organize training and workshop for the road sweepers, 65 (26%) responded to all the above suggestions.

Table 4.15: Are the safety device provided utilized effectively?

EFFECTIVE UTILIZATION OF SAFETY DEVICE	NUMBER OF RESPONDENT	PERCENTAGE OF RESPONDENT
Agreed	78	31.2%
Disagreed	132	52.8%
Indecisive	29	11.6%
No of safety device to be utilized	11	4.4%
Total	250	100%

The table above shows the effective utilization of safety device provide for the sweepers. 78(31.2%) agreed, 132 (52.8%) disagreed, 29 (11.6%) were indecisive and 11 (4.4%) responded no of safety device to be utilized.

Table 4.16: Which of the safety measures do sweepers in Port Harcourt use?

SAFETY DEVICES SEEN ON SWEEPERS	NUMBER OF RESPONDENT	PERCENTAGE OF RESPONDENT
Face mask	75	30%
Hand gloves	59	23.6%
Coverall	55	22%
None of the above	61	24.4%
Total	250	100%

The table above shows safety devices seen on road sweepers in Port Harcourt. Face mask was seen on 75 (30%), hand gloves was seen on 59 (23.6%), coverall was seen on 55 (22%), 61 (24.4%) reported not seeing any safety device on the sweepers.

Table 4.17: What are the treatment measures given to the road sweepers by the authority in charge?

TREATMENT MEASURES GIVEN	NUMBER OF RESPONDENT	PERCENTAGE OF RESPONDENT
Sick leave	220	88%
Health Insurance	0	0%
None of the above	30	12%
Total	250	100%

The table above shows the treatment measures given to the road sweepers by the authorities in charge. 220(88%) responded they go on sick leave in case of accident or if they are sick, 0 responded to not having health insurance from the authority when they are sick/accident occurs, 30 (12%) responded to none of the above treatment measures.

DISCUSSION

This chapter is centered on the discussion of the finding of the study according to the research question. It is strictly based on the findings, implication, conclusion and recommendations given appropriately. Street sweepers play a key role in maintaining the cleanliness of roads in any city. This study assessed the occupational hazards, health problems and level of utilization of PPEs among this occupational group in Port Harcourt, Nigeria.

In this study, Table 4.1, 4.2 and 4.3 shows the sex, marital status and age of 250 road sweepers in Port Harcourt. The results shows that 85 (34%) respondents are male while 165 (66%) are female respondent. Table 4.2 show that 80 (32%) of the respondent are single, 130 (52%) of the respondent are married, 20 (8%) are divorced and 20 (8%) of the respondent are separated. Table 4.3 above shows the age distribution of respondent in the study area. It is observed that 95 (38%) of the population belong to the age bracket of 36 and above, 85(34%) of the population are of the age bracket of 26-35, 70 (28%) of the respondent belong to the age bracket of 18-25 years respectively. The result is similar to the research carried out by Olafimihanet *al.*, 2020 in Illorin and by Johnson and John, (2020) in Uyo on the occupational hazards and health problems among street sweepers. The result shows that majority of the road sweepers are female is due to the fact that in Nigeria, sweeping, even in households is traditionally more commonly carried out by females. But with the increasing level of unemployment, any available paying job opportunity is attractive to job seekers irrespective of the sex or cultural inclinations.

From this research Table 4.4 shows the educational level of respondents. In the table 90 (36%) of the respondent have attained primary educational level. 70 (28%) attained secondary level of education. 15 (6%) attained tertiary level of education and 75 (30%) fall in the non-formal educational level category. Table 4.5 shows the occupation of respondents. In the table 95(38%) of the respondents are traders. 53(21.2%) are bricklayers. 54 (21.6%) are farmers, 48 (19.2%) are tailors. The table shows the monthly income of the road sweepers. 70 (28%) of the sweepers receive 10000 naira as salary, 50 (20%) receive 15000, 60 (24%) receive 20000, 70 (28%) receive 30000. The table shows period of employment of the road sweepers. 90 (36%) reported they have being employed for 1-3 years, 95 (38%) reported 4-6 years, 65 (26%) reported 7-10 years. The table shows the sweeping time of the road sweepers. 50 (20%) of the sweepers reported they work between 4-6am, 55 (22%) reported between 4-7am, 65 (26%) reported between 5-7am, 80 (32%) reported between 6-8am. The result in accordance to the research carried out by Johnson and John, (2020) in Uyo on the occupational hazards and health problems among street sweepers.

Several hazards have been identified to be associated with street sweeping. The Table 4.10 shows that 59 (23.6%) the respondent are exposed to motor accident. 61 (24.4%) are exposed to high inhalation of dust. 50 (20%) exposed to high temperature. 67 (26.8%) are exposed to smoke from vehicle, While 13 (5.2%) are exposed to psychological problem. The table 4.12 shows the common disease among road sweepers in Port Harcourt. Asthma was

reported in 40 (16%). Conjunctivitis was reported in 70 (28%). Pneumonia was reported in 65 (26%) and tuberculosis was reported in 75 (30%). The result is in agreement with similar research carried out by Olafimihan *et al.*, 2020 in Illorin; Johnson and John, (2020); Munubi, 2017.

In order to mitigate the effects of many of these hazards, it is important that sweepers use PPEs. The table 4.13 above shows the types of protective devices that are provided for road sweepers. 100 (40%) of the respondent reported they do not use total face mask. 45 (18%) of respondent not using gloves, 40 (16%) not using safety boots, 30 (12%) respondents not using safety goggles, and 35 (14%) of the respondent not using reflector. Unfortunately, use of PPEs in the present study was not optimal. The use of reflector jackets by street sweepers improves their visibility by oncoming motorists thereby reducing their proneness to road traffic accidents. The use of reflector jacket therefore ought to be a compulsory requirement for the sweeping job. Some of the other PPEs were not in use at all in the present study. None of them owned or used both goggles and boots. This, therefore, would easily expose them to eye problems and injuries from broken bottles and nails respectively. A similar study among street sweepers in Calabar, Nigeria reported that only 19% of workers used personal protective devices (PPD), while only 1% used protective goggles while at work (Etim *et al.*, 2019). The workers are meant to be trained and provided with PPE by their employers. Majority of those who were provided PPE items in the present study used them. Similar studies reported that sweepers were not provided with PPE (Munubi, 2017; Kabir *et al.*, 2015). The implication of this is that many of the sweepers would not be protected from the hazards that different parts of their bodies are exposed to on daily basis while carrying out their duties. Also, as no safety training was organized for any of the sweepers, many of them may not have fully understood the importance of each PPE.

CONCLUSION

Sweepers in Port Harcourt were exposed to several hazards while at work. The sweepers were in the constant habit of not wearing PPE at all, this further expose them to hazards. The availability and use of PPEs were low. Consequently, they faced several health challenges. It is recommended that training and adequate provision of PPEs be ensured by employers in order to mitigate the effects of the hazards encountered by road sweepers. An increase in the number of sweepers assigned to the respective roads is also recommended in order to reduce the work load on each sweeper and consequently reduce exposure to the hazards associated with this occupation.

RECOMMENDATION

Having carefully researched and study the topic: control of occupational health hazards among road sweepers in Port Harcourt metropolis, the researcher therefore make the following recommendations:

- ❖ The employers of road sweepers should provide safety equipment as to prevent uncertain happenings.
- ❖ Regular monitoring so as to ensure the safety equipment provided for workers.
- ❖ Pre-placement test and periodic medical examination as to ascertain the fitness of the employees of occupational contract disease.
- ❖ Health education is necessary so as to boost the standards of health behavior among worker
- ❖ A stern law for the motorists who will accidentally knock down a road sweeper.
- ❖ Motorists should slow down when approaching road sweepers.

SECTION A

Please fill in the space provided and tick correctly the answer that seem correct in your opinion in the boxes provided

1. What is your sex?

(a) Male (b) Female

2. What is your marital status?

(a) Single (b) Married (c) Divorce (d) Separated

3. Which of the age bracket do you belong to?

(a) 15-24 (b) 25-34 (c) 35 and above

4. What level of education were you able to attain

(a) Primary level (b) Secondary level (c) Tertiary level (d) Non-formal education

5. What is your occupation?

(a) Trading (b) Tailor (c) farming (d) Bricklayer

SECTION B

6. What method should be practiced that can suit road sweepers?

- (a) Manual sweeping with broom
- (b) Mechanical sweeping with vehicle
- (c) None of the above

7. Are there hazards conditions that the Port Harcourt metropolis road sweepers exposed to?

- (a) Accident frequency (motor)
- (b) High inhalation of dust
- (c) Exposure to high temperature/vehicle smoke
- (d) Psychological problems

8. What type of cases have been reported since 2010-2016

- (a) Road accident during duty/death
- (b) Death due to heart/lungs problem
- (c) Injuries sustain at work

9. Which disease is common among road sweepers in Port Harcourt?

- (a) Asthma (b) Conjunctivitis (c) Pneumoconiosis (d) Tuberculosis

10. What safety devices are provided for the sweepers?

- (a) Face mask (b) Coverall wears (c) Hand gloves (d) Safety boot

11. What safety measures should be adopted to control these hazard?

- (a) Pre-placement medical test
- (b) Periodic medical examination
- (c) Regular in house education of road sweepers
- (d) All of the above
- (e) None of the above

12. Are the safety devices provided utilized effectively?

- (a) Agree (b) Disagreed (c) Indecisive (d) No safety devices to be utilized

13. Which of the safety devices do road sweepers in Port Harcourt metropolis really seen with?

- (a) Body/road sign (b) hand gloves/coverall
 (c) Nose and face mask (d) None of the above

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