

Assessment of Occupational Health Hazard of Street Sweepers in Ilorin Metropolis, Kwara State, Nigeria

O.S Olafimihan, M.I Ogunruku, O.E. Odipe*

Department of Environmental Health Science, School of Allied Health and Environmental Science, Kwara State University, Malete, Nigeria

**Corresponding Author*

Abstract— Street sweepers are behind the enhancing traffic safety for removing harmful pollutants. The job of street sweepers is a vigorous task which exposes workers to many hazards and health problems. Street sweepers are exposed to a variety of health risk factors on working environment such as dust volatile organic matter, bio-aerosols and mechanical stress, which caused them to develop certain occupational disease. Street cleaners are exposed to diverse occupational health hazards which can be; physical, chemical, biological, psychosocial and ergonomic hazards, signs of which may include; rash, sunburn, heat stress, headache, breathlessness, skin cancer and temporary loss of hearing or permanent hearing loss from exposure to noise. This study, which is aimed at assessing the occupational health hazards the street sweepers are exposed to, 100 street sweepers working in 3 major Local Government of Ilorin Metropolis, Kwara State, Nigeria were studied, the street sweepers work on the major road in these LGAs, the survey designed study makes use of interview as well as the use of structured questionnaires in gathering the used data which were presented in tables. Major percentage of the street sweepers were female, (88%) while only 12% were male, with different age ranges, 3% were between the age of 10 years to 20 years, 21 to 30 years makes up 25% of the population, 49% of the population falls between the age of 31 years and 40 years old and 23% are 41 years old and above. 73% of the respondents has no training on waste handling while 27% claimed to have undergone training on waste handling, 41% of the street sweepers said they have training on how to clean and 59% has no training. 77% of the respondents claimed to have knowledge on the hazards associated to their occupation, while 23% has no knowledge whatsoever on the hazards associated with their occupation. These and more were revealed about the street sweeping job in Ilorin Metropolis in relation the hazards associated with the job. Conclusions were made based on the results future study recommendations were discussed as well.

Keywords: Street sweepers, occupational hazards, occupational health, health challenge, Ilorin Metropolis.

I. INTRODUCTION

The beauty of any city environment is closely tied to its good sanitary condition and as reflected by the appearance of the streets. The daily increase in both human and vehicular traffic arising from uncontrolled rural-urban migration into cities has overwhelmed city streets with dirt, pollution and accidents. Nigerian cities are reputed to be some of the dirtiest in the world; one factor that contributed to the dirty state of the cities is the unwholesome conditions of major streets. The solid waste being deposited on the streets

by commuters and street users creates a negative visual impression on visitors and indirectly affects the economy of city government and city residents. Dirty streets are great hindrances towards attracting businesses to towns and cities. Street sweepers play an important role in maintaining the health and hygiene in the communities [8]. The role of street sweepers therefore cannot be overemphasized.

Street sweeping has now become a popular solid waste management strategy in Nigerian state capitals and major towns. Street sweepers and cleaners are employed to rid the cities of all forms of dirt either in the drainages or on the roads. Street sweeping is a set of activities concerning the cleanliness of the street (pavements and adjoining edges of roads and grassed and planted areas). It involves litter-picking, the removal of graffiti and fly-posting. This is done with the aim of creating healthy and aesthetically pleasing urban environments [14].

Street sweeping is an increasingly popular outdoor occupation in major cities of Nigeria and has contributed to creating jobs for the lower class citizens. Presently, street sweepers are a common sight in many cities in Nigeria [8], including Ilorin in Kwara State. They play an important role in maintaining the health and hygiene of communities.

Street sweepers play important roles in environmental health by maintaining the cleanliness of the streets; however, these individuals are exposed to many risks.

Unfortunately, the socioeconomic status and educational levels of street sweepers are low, and less attention is paid to their health. 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. During pulmonary ventilation, tiny particles are deposited in the lower parts of the respiratory [6].

Due to the condition of their work environment, street sweepers and garbage collectors are exposed to a variety of risks or hazards that lead to notable morbidities. They are mainly exposed to dust, biodegradable trash, bio-aerosols, volatile organic matters and mechanical stress, which make them susceptible to a wide range of occupational diseases. Many reports showed that the commonly detected morbid

conditions in those workers include diseases of the respiratory system, eye problems, accidents, injuries, infections and skin problems [12]. The severity and onset of these health challenges may differ based on duration of exposures.

However, the street sweeper work involves occupational hazards for which they are exposed during the work process. Thus occupational health of this working class, therefore the health/disease process, requires attention in respect of studies for public health interventions. The interest in this topic stems from concerns about the occupational risks to which street sweepers 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. At the same time, we realize that this labor category needs special attention with a greater investment, in order to minimize and combat work-related diseases that are clearly preventable if taken measures to these health problems [2]. Unfortunately, this labour category is not given any attention as regards their wellbeing by their employers both the private consulting firms and the government.

At present, in developing countries, unlike industrialized countries, street sweepers manually collect generated wastes with little or no protection, thus having direct contact with injurious substances at the workplaces.⁶ These workers are chronically exposed to diverse occupational hazards leading to health problems. Occupational hazards among street sweepers are a cause for concern. Such occupational hazards could be physical, chemical, biological, psychosocial or ergonomic hazards [8].

The problem associated with street sweeping occupation is rising in developing countries, Nigeria inclusive, due to several reasons, of which is rapid urbanization. In addition, occupational safety and health measures taken to prevent sweeper's morbidities are not applied in most developing countries, which in turn predispose them to the development of respiratory illnesses, for example, chronic obstructive pulmonary diseases. The seriousness and complexity of this problem arise from the fact of limited resources, technologies, low socioeconomic standard and low educational level. Other morbidities include hazards of infection, cut wounds, traffic accidents and exposure to a high level of noise especially in crowded areas. Cardiovascular and eye diseases are also common among street sweepers [11]

Given the above, the questions arise: What are the occupational health hazards associated with street sweeping occupation? What is the prevalence of the identified occupational health hazards among the street sweepers in Ilorin Metropolis? 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? This study which assesses the occupational health Hazards of street sweepers in Ilorin metropolis, Kwara State, Nigeria is a

descriptive study which exposes the lacking in the occupation as well as challenges faced by the street sweepers.

II. LITERATURE REVIEW

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. 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 of Chronic Obstructive Pulmonary disease, resulting in obstructive 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 [6].

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 [2].

Personal protective equipment, commonly referred to as "PPE" it is the equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses it includes gloves, uniform, respirators, hard hats, safety glasses, high visibility clothing, and safety footwear. 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 [10]. 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. It is likely therefore, that chronic inhalation of dust will affect their health and lung function in particular [11]

In most developing countries, street sweepers and waste collectors are therefore, dealing manually with mixed

hazardous wastes with substantially increased occupational health impacts. Waste management practice in this part of the world has been largely focused on the issues of collection and disposal with little or no attention paid to the health status of street sweepers and waste collectors [1]. Injury is any physical damage to body parts of the worker either by accident or by environmental pressure of the work place. It is likely that sweepers get cuts and wounds while handling waste containing sharp objects. Similarly, as waste dumped areas are sometimes surrounded by animals like dogs, there is likelihood of the dogs biting them. In addition, since the sweepers work in unhygienic environment, sometimes handling heavy objects, they may develop health related problems related to hand, skin, skeleton, muscles, eyes, lungs and stomach. The dust particles might also cause allergic diseases like skin rashes, cough, sneezing, red eye, runny nose and shortness of breath [5].

Apart from the social marginalization that these workers face, there is insufficient health care, and this makes them more prone to specific health problems due to their occupation which include respiratory system problems, cardiovascular diseases, musculoskeletal disorders, infections, skin problems and gastrointestinal problems. Various socioeconomic factors such as poverty, lack of education, poor housing conditions and poor diet affect medical problems of those workers [7].

III. METHODOLOGY

Research Design

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 Ilorin Metropolis. 100 questionnaires were distributed and all were retrieved.

Data Analysis

The study uses percentage, pie charts, Graphs, Bar chart, table, frequency counts and mean in tables for presentation analysis and interpretation of data. The analysis of the data collected will be based on descriptive statistics SPSS 23.0 software.

IV. RESULTS AND DISCUSSION

Of the 100 street sweepers who were studied and were also the respondents, 3% of them were between the age of 10 to 20 years, 25% between 21 and 30 years, 49% between the age of 31 and 40 years and 23% accounted for the age of 41 years and above .

Also, 88% of the studied street sweepers were female while 12% were male. The educational backgrounds of the respondents were also looked into, 65% of the respondents are non-literate, 18% had education up to primary school, 14%

has secondary school level education and 36% has tertiary education.

The respondents also has varying durations in years they have spent on the job of street sweeping, 3% has been on the job for a duration of less than a year, 53% has been a street sweeper between 1 to 5 years, 22% has been on the job for about 6 to 10 years and 22% has been on the job for over 15 years.

The daily period of exposures also vary among the street sweepers, 8.2% of the street sweepers studies work for about 1 to 3 hours daily, 87.6% works for 4 to 6 hours daily and 401% works for 7 to 9 hours daily.

Table 1: showing responses on the knowledge and awareness of street sweepers of Occupational Health hazards

Questions	Response	Frequency (%)
Any training on waste handling?	Yes	27
	No	73
Any knowledge on work hazard or occupational health hazards?	Yes	77
	No	23
Knowledge of occupational health hazards	Good	10.4
	Fair	57.1
	Poor	32.5
Any Training on cleaning	Yes	41
	No	59
Training on?	How to clean the environment	61
	How to stay safe	39
Duration of training	1 week	72.5
	2 weeks	7.5
	1 months	20

In table 1, the knowledge and awareness of street sweepers were tested, 27% of the street sweepers responded affirmatively to have undergone training on waste handling while 73% said they have no training on waste handling. 77% claimed to have knowledge of occupational health hazards while 23% has no knowledge of occupational health hazards, where 10.4% has a good knowledge of occupational health hazards, 57.1% has a fair knowledge and 32.5% has a poor knowledge of occupational health hazards. Respondents were also asked if they had any training on cleaning, 41% answered Yes to the question, while 59% said they do not undergo any training on cleaning, out of the 41% that answered affirmatively to the questions on cleaning training, 61% said they were trained on how to clean the environment, and 39% was trained on how to stay safe in their workplace. 72.5% said their training lasted for 1 week, 7.5% said they were trained for 2 weeks and 20% were trained for 1 month.

The table above showed the level of awareness of street sweepers to occupational health and occupational health hazards. The result above is in contrast and agreement with the study of assessing the knowledge and preventive practices about occupational health hazard among street sweepers in Delhi, India, among the respondents of about 164 which were studied, 36.6% claimed to have been trained while 63.4% did not receive any form of training on occupational health and safety, it was said that the knowledge about occupational hazards among trained respondents are more compared to untrained respondent. Major population of the street sweepers were also noted to have the understanding of adverse effect of their occupation on their health and well-being, this is in contrast with what we have in Ilorin, Nigeria where the only knowledge the street sweepers has is how to clean the environment and how to stay safe and majority of those that claim to have a knowledge on occupational health only has a fair knowledge [10]. In another study conducted in Egypt in 2009 on awareness of street sweepers on awareness and knowledge of occupational health hazards and diseases as related to their jobs, it was noted the majority of the respondents but not completely were aware about occupational diseases and hazards and dangers relating to the job [12]. In a similar research conducted in Calabar, Nigeria all the respondents, 150 street sweepers claimed they have no training on health and safety [8], which is similar to what we have in Ilorin.

Table 2: showing responses to questions on tools used and personal protective wears available

Questions	Response	Frequency (%)
What equipment do you use	Broom, packer and rake	53
	Broom and packer	13
	Broom	34
Length of broom used	10-20cm	3
	21-30cm	2
	31-40cm	18
	41-50cm	13
	51-60cm	22
	61cm and above	42
Who provide the equipment	self	75
	Government	9
	Others	16
Any Personal Protective Equipment?	Yes	52
	No	48
What type of PPE?	Nose mask	13.5
	Overall	65.4
	Hand gloves	21.2

Table 2 is showing respondents reactions to the tools they use in carrying out their activities and the personal protective equipments made available to them.

53% of the respondents claimed to be using brooms, packer and rake in their street sweeping job, 13% use only broom and packer while 34% use broom alone in sweeping without packer and rake. Checking for the length of the brooms they use, 3% has a brooms of about 10 to20cm, 2% has brooms of 21-30cm, 18% has brooms of 31 to 40cm , 13% has brooms of about of 41 to50cm,22% has brooms of 51 to 60cm and 42% has brooms of 61cm and above.

75% of the respondents claimed the equipments they use in street sweepings are sourced for by themselves, 9% said their employer, which is the state government provide the equipment used in cleaning and 16% claimed the equipment used were provide by others like non-governmental organizations.

While asked if they have or use any personal protective equipment, 58% answered Yes to the question while 42% answered No.

13.5% of the respondents use nose masks only while 65.4% uses overall only and 201.2% use hand gloves.

In Calabar, the research on the length of brooms used there was categorized as long and short, where only 4% of the respondents were using short brooms and 96% were using long brooms. Also as against he result above where only 3 PPEs were identified and been used by different street sweepers, in Calabar 31% of the respondents were using Apron, 60% hand gloves, 57% face mask and 98% reflectors [8].

In a similar study conducted on street sweepers in Ado Ekiti, the state capital of Ekiti state, the street sweepers were asked about the adequacy of their tools, 8.7% said its adequate, 35% said its fairly adequate, 56.3% said its ot adequate [14].

Also, in Edo State Nigeria a study was conducted on the Street sweepers, [3], they also use different PPE, where 63% of the respondents used only Nose mask, 6.5% use goggles, 6.5% use hand gloves 13.4% use boots and 4.4% use apron and majority of the respondent has the knowledge of the use and importance of PPE to their job.

Comparing the results with results of similar research from other country, in India, a study showed that 56.1% of the respondent to the study use cap, 53.7%use face mask, 86% uses aprons and reflector while 80.5% uses boots and 19.5% use gloves [10].

Table 3: showing Health Related questions from the Street Sweepers

Questions	Response	Frequency (%)
Do you undergo medical health Examination?	Yes	38
	No	62
Any major health issues related to your work?	Yes	94
	No	6
Do you suffer Cough?	Yes	62
	No	38
Do you suffer Dyspnea ?	Yes	51
	No	49
Do you suffer Gastro intestinal infection?	Yes	59
	No	41
Do you Cold?	Yes	83
	No	17
Do you suffer Dermatological disorder	Yes	70
	No	30
Do you suffer hearing disorder	Yes	66
	No	34
Who is responsible for your treatment?	Self	92
	Government/Employer	8

Table 3, represents responses from the street sweepers on issues relating to their health based on the work they do. The respondents were asked if they go for or undergo any form of medical examination, 38% of the respondents answered affirmatively, Yes while 62% said they don't.

94% of the respondents claimed to have health issues related or that can be attributed to their job, while 6% said they have no health related issues.

After identifying various illness that may be associated with the occupations, the respondents were asked if they have any of the illnesses while describing the sign and symptoms of each. 62% of the respondents suffer from cough, while 38% said they do not suffer from cough. 51% of the respondents have suffered or suffer from Dyspnea, while 49% said they don't have such illness. 59% of the respondents agreed to have had episodes or have gastro intestinal infections, while 41% of the populations said they do not have gastrointestinal infection. When asked if they suffer from cold, 83% agreed Yes, while 17% said No. 70% of the respondents also said Yes when asked if they have any dermatological issues, while 30% said No. The respondents were also asked if they have hearing disorder or have suffered from it in time passed, 66% said yes and 34% said NO.

The presence of illnesses and disorders associated with their jobs led to the question who of who is responsible for the treatment of the occupational health issues they suffered from, 92% of the respondents claimed they care for themselves

when they come down with any illness related to their jobs, while 8% claimed the state government or their employer takes care of them.

In another study the prevalence of cough among street sweepers is 54.9% of the respondents totaling 102, while sneezing, wheezing, nose irritation and breathlessness is 63.7%, 32.4%, 36.3% and 31.4% respectively [13]. Also, another study in Ado Ekiti, Nigeria, on street sweepers 91.3% of the studied population, suffer from cold and catarrh while 83.5% suffer from cough, even 46.6% of the respondents were asthmatic [14]. The result from this research is also in agreement to the study on street sweepers, where 68% of the population agreed to having cough, 52% agreed to Dyspnea and 56% to Wheezing in Iran [6]. A study in Ethiopia, noted that street sweepers suffer different health issues related to their job, at the time of study, 33.5% of the respondents were suffering from Gastro intestinal problems, 58.4% were suffering from Respiratory problem, 25.5% of the population are having dermatological disorders [5]. In agreement to this result is also the result of the study from Egypt on street sweepers, where out of the 138 respondents, 13.8% claimed to have suffered and suffering from skin or dermatological disorders, 21.7% responded Yes to Gastro intestinal infection [1].

V. CONCLUSION AND FUTURE SCOPE

The study revealed the demographic information of the street sweepers, use of PPE, training and knowledge of occupational Health Hazards by the street sweeping, and the health status or health challenges of street sweepers in Ilorin Metropolis, Kwara State Nigeria. There is poor knowledge and awareness of health hazards related to the occupation of street sweepings, also, training is low, for those that claimed to have undergone training, they were only on how to stay safe from road accidents and how to clean the environment, no proper training on the importance of the use of PPE and dangers associated with their occupations, compared to their contemporaries from other countries who sure has basic need knowledge of the occupation and hazards associated with it. The lack of adequate equipments and PPEs, has also contributed to the exposure of the street sweepers to different ailments attributed to their occupations. All the identified health issues related to their occupations can be prevented through the use of PPE.

It is therefore, concluded that the people that falls within the work class as street sweepers as been neglected, the society see them as a group with no values despite the value their work contributes to the society, this neglect has made them vulnerable and exposed to different health problems. In Ilorin Metropolis, Kwara State, Nigeria, the street sweepers here are not spared from the neglects and vulnerabilities to different health challenges like dermatological disorders, cough, cold, dyspnea etc.

This can be attributed to the lack of training about the job and lack of provision of adequate equipments and PPEs.

It's therefore, important to start seeing this group of vulnerable people as one that need trainings and should be adequately provided with the needed equipments and PPEs. This will limit the exposure of the street sweepers to adverse conditions in their job that will lead to health challenges. Adequate pre and post employment trainings of street sweepers are also an integral part of how to protect them.

In further studies, its imperative to do a laboratory analysis of blood samples and saliva of street sweepers to ascertain the disease causing agents that can be detected as well as any form of non communicable disease causing agents present in their system.

REFERENCES

- [1] AA, Ewis, Mohamed ES, Rahma MA, Hifnawy TM, and Arafat AE. "Occupational health-related morbidities among street sweepers and waste collectors at Beni-Suef, Egypt." *Egyptian Journal of Occupational Medicine* 37, no. 1 (2013): 79-94.
- [2] do Nascimento Araújo, Luzia Vilma Pereira, Ana Larissa Lopes Barbosa, Kerolayne Camila, Souza Almeida, Tamires Guedes Vieira, Maria Tereza Perazzo, André Luiz Dantas Bezerra et al. "Prevalence of musculoskeletal symptoms in urban cleaning agents." *International Archives of Medicine* 9 (2016).
- [3] Erah, Francis O., P. E. Edeawe, I. N. Omorogbe, J. T. Onyebujoh, E. O. Ohwovoriolè, and A. Bamidele. "EFFECT OF DUST ON THE RESPIRATORY HEALTH OF STREET SWEEPERS IN BENIN CITY, EDO STATE, NIGERIA." *ANNALS OF MEDICAL AND SURGICAL PRACTICE* 3, no. 2 (2018): 71-79.
- [4] Etim, Bassey A., Chigozie I. Echih, Chidiebere P. Echih, Jeff Ajewole, and Taiwo Oyeniya. "Awareness and practice knowledge of ocular health safety among street sweepers in Calabar, South-South, Nigeria." *Nigerian Journal of Medicine* 28, no. 3 (2019): 281-286.
- [5] Gebremedhn, Mulu Gebresslassie, and Prakasam Vadakkedath Raman. "Socio economic and health status of street sweepers of Mekelle city, Ethiopia." *Waste Management* 103 (2020): 251-259.
- [6] Habybabady, Raheleh Hashemi, Hannaneh Nasibi Sis, Fatemeh Paridokht, Fatemeh Ramrudinasab, Ali Behmadi, Bentolhoda Khosravi, and Mahdi Mohammadi. "Effects of Dust Exposure on the Respiratory Health Symptoms and Pulmonary Functions of Street Sweepers." *The Malaysian Journal of Medical Sciences: MJMS* 25, no. 6 (2018): 76.
- [7] Hassan, O., H. Abed, E. Araby, and N. Fayed. "Adverse dermatologic and respiratory health problems among street sweeper's workers: a comparative study." *Egyptian J. Occupation. Med.* 43, no. 1 (2019): 111-127.
- [8] Johnson, Ofonime Effiong, and Ukeme Anthony John. "Occupational hazards and health problems among street sweepers in Uyo, Nigeria." *Occupational hazards* 13, no. 2.
- [9] Nku, C. O., E. J. Peters, A. I. Eshiet, O. Oku, and E. E. Osim. "Lung function, oxygen saturation and symptoms among street sweepers in Calabar, Nigeria." *Nigerian journal of physiological sciences* 20, no. 1 (2005): 79-84.
- [10] Patel, Vijay Shankar, and Utsuk Datta. "Assessment of Knowledge and Preventive Practices about Occupational Health Hazard among Safai Karmchhari of Municipality in Delhi." *EPIDEMIOLOGY INTERNATIONAL* 3, no. 4 (2020).
- [11] Priyanka, V. Patil, and R. K. Kamble. "Occupational health hazards in street sweepers of Chandrapur city, central India." *International Journal of Environment* 6, no. 2 (2017): 9-18.
- [12] Rahma, Mervat, Ashraf Ewis, and Tamer Hifnawy. "Awareness of Occupational Health Hazards among Street Sweepers and Garbage Collectors at Beni-Suef City, Egypt: A Cross-Sectional Study." *Journal of High Institute of Public Health* 39, no. 4 (2009): 654-668.
- [13] Stambuli, Prisca. "Occupational respiratory health symptoms and associated factors among street sweepers in Ilala municipality." PhD diss., Muhimbili University of Health and Allied Sciences, 2012.
- [14] Wahab, Bolanle, and Busuyi Ogunlola. "The nature and challenges of street sweeping in Ado-Ekiti." *African Journal for the Psychological Studies of Social Issues* 17, no. 3 (2015): 145-153.