

AWARENESS AND PRACTICE KNOWLEDGE OF OCULAR HEALTH SAFETY AMONG STREET SWEEPERS IN CALABAR, SOUTH-SOUTH, NIGERIA.

¹Etim Bassey A., ²Echieh Chigozie I., ³Echieh Chidiebere P., ⁴Ajewole Jeff, ⁵Oyeni Taiwo.

¹Department of Ophthalmology, University of Calabar and University of Calabar Teaching Hospital, Calabar, Cross River State, Nigeria

^{2,4}Department of Ophthalmology, University of Calabar Teaching Hospital, Calabar, Cross River State, Nigeria

³Department of Surgery, University of Calabar, Teaching Hospital, Calabar, Cross River State, Nigeria

⁵Department of Community Medicine, University of Calabar Teaching Hospital, Calabar, Cross River State, Nigeria

ABSTRACT

BACKGROUND: Street sweeping is an increasing popular outdoor occupation in major cities of Nigeria. These workers are chronically exposed to diverse occupational and environmental sources of ocular hazards, that they may not be aware of. This may impair their adoption and compliance with the requisite safety practices. This study was aimed at assessing levels of awareness, knowledge, and practice of ocular safety among street sweepers in Calabar, Southern Nigeria.

MATERIALS AND METHOD: The study was a cross sectional study among one hundred and fifteen (115) street sweepers in Calabar Urban Development Authority, Nigeria over a period of three months. A systematic random sampling method was used to select respondents eligible for the study and a pretested semi-structured interviewer administered questionnaire was used to obtain data. Data obtained was analysed using statistical package for social sciences version 20 (Armonk, NY: IBM Corp.).

RESULTS: One hundred and fifteen (115) subjects were studied, with mean age of 41.8 ± 10.4 years, and female to male ratio of 1:0.03. Seventy percent had good knowledge of ocular health safety; while 68% were aware of the occupational hazards associated with the job. Less than a quarter (19%) of workers used personal protective devices (PPD). Only 1% of the total who used PPD wore protective goggles while at work.

CONCLUSION: Good knowledge and a high level of awareness on ocular health safety was seen among street sweepers. However, there was poor utilization of personal protective devices especially protective goggles among the workers which will increase their risk to occupational hazards.

RUNNING TITLE: Awareness and practice knowledge of ocular health safety

KEYWORDS: Ocular health safety, street sweepers, Calabar.

NigerJmed2019: 281- 286

© 2019. Nigerian Journal of Medicine

INTRODUCTION

Occupational eye hazards are becoming a major concern for public health ophthalmologists. Occupational eye injuries have been reported to have eminent economic consequences not only on the industry but also on the worker and families.¹ Because of the grave impact associated occupational eye hazards, the International Labor Organization (ILO) recommends that employers of labor ensure eye safety of all employees in the work environment by providing eye and facial protection whenever necessary to protect against environmental hazards such as dust, ultraviolet radiation,

chemical, heat and flying objects.² In most developed countries, the concept of prevention and control to minimize or eliminate risks at work places is prioritized. However, in many developing countries, significant health, and safety concerns still exist in workplaces.³ The involvement of workers in occupational safety and health activities in small, medium and large scale industries will help to promote and support safe practice among the work force.⁴

Street cleaning ranks among the oldest practice used by governments to ensure a clean environment within the urban centers. Street sweepers play important roles in keeping the cities clean. Their work entails removal of debris from streets, collecting solid waste, disposing and recycling waste materials. Street sweeping is an increasingly popular outdoor occupation in major

Correspondence to: Dr Etim Bassey A
Department of Ophthalmology,
University of Calabar and University of Calabar Teaching Hospital,
Calabar, Cross River State, Nigeria
Email: baseti2002@yahoo.com

cities of Nigeria such as Abuja, Lagos, Ibadan, Enugu, Uyo and Calabar.⁵ In Calabar, the capital city of Cross River State, street sweepers clean up the roads and pavements daily with the use of short or long handled brooms and dustpans, consequently, they are chronically exposed to dust, volatile organic compounds bio-aerosols and other biological agents as well as ultraviolet radiation which can affect the health of their ocular surface. Several studies have shown a link between chronic exposure to environmental elements such as dust, bioerosols, ultraviolet radiation as risk factors for the development of varied ocular diseases namely, pterygium, pingueculum, and allergic conjunctivitis.^{6,7,8} In addition, environmental irritants like paved road dust found on the surface of the streets may worsen symptoms in individuals with dry eye disease.

Industrialized countries have significantly reduced occupational health effects on street sweepers by applying standardized waste management processes. However, in developing countries, the health-related issues of solid waste management still need to be addressed. By casual observation and in a documented study, street sweepers in Calabar do not observe internationally recommended precautionary measures against the inhalation of dust.⁹ Work related ocular health safety and health hazards are a major public health concern for street sweepers and are under-researched especially in low and middle income countries. Therefore, this study seeks to evaluate the level of knowledge and awareness of ocular safety among street sweepers in Calabar metropolis.

MATERIALS AND METHOD

The study was carried out in Calabar the capital of Cross River State, Nigeria. Calabar Metropolitan city is divided into 2 local government areas namely, Calabar Municipal and Calabar South. Calabar is located within the tropical rain forest zone of Nigeria and has an area of 406km² and a population of 371,022 at the 2006 census. It is made up of two Local Governments Areas, namely: Calabar Municipality with a population of 179,392 and Calabar South with a population of 191,630. Majority of the inhabitants speak and understand

simple English language. The main occupational groups are civil servants, traders, farmers and fishermen.

The study was carried out within three months and comprised of 115 streetsweepers (about 30% of the population of street sweepers in Calabar metropolis). These street sweepers were recruited from the Calabar Urban Development Authority (CUDA) a public private partnership responsible for the provision of environmental cleaning services in the state.

A systematic random technique was used to recruit street sweepers into this study. The sample interval of three (3) was calculated using the formula $K = N/n$.¹⁰ [where K=sample interval, N=population size (400) n=sample size (115)]. The sampling interval was calculated by dividing the number of the street sweepers on the nominal roll of Calabar Urban Development Authority (CUDA), four hundred (400) by the sample size of 115. The first study participant meeting the criteria for recruitment and consenting to participate was randomly selected from the first three numbers of the sampling frame (the street sweepers on the nominal roll of CUDA). Subsequently, every eligible third participant was selected until the desired sample was obtained.

Ethical clearance for the study was obtained from the Health Research Ethical Committee (HREC) of the University of Calabar Teaching Hospital. A written informed consent was obtained from the respondents and an interviewer administered questionnaire was used to obtain data on socio-demographics, work history, ocular symptoms, awareness, perception of occupational hazards and use of protective devices by participants. Data was analyzed using Statistical Package for Social Sciences version 20 (Armonk, NY: IBM Corp.) for frequencies, mean, and standard deviation.

RESULTS

A total of 115 street sweepers participated in the study. The mean age was 41.78 ± 10.39 years (range from 18-60years). Majority were females 112(97.4%) while 3(2.6%) were males and 57(49.6%) of them attained a minimum of secondary school education. 46(40%) have been doing this job for 1-5years. (Table 1)

Table 1: Sociodemographic characteristics of respondents

Variable	Street Sweepers (n=115) Freq.(%)
Age (years)	
<=20	1(0.9)
21-30	14(12.2)
31-40	44(38.3)
41-50	34(29.6)
51-60	19(16.5)
>60	3(2.6)
Mean Age ±SD	41.78 ± 10.39
Gender	
Male	3(2.6)
Female	112(97.4)
Level of education	
None	3(2.6)
Primary	40(34.8)
Secondary	57(49.6)
Tertiary	15(13.0)
Duration of years on the Job	
1-5 years	46 (40.0)
6-10 years	31(27.0)
11-15 years	24(20.9)
16-20 years	13(11.3)
21-25 years	0(0)
26-30years	1(0.9)
>30years	0(0.0)

Level of awareness amongst the Study population on the effects of environmental elements on the eye.

In this study, the level of awareness of respondents on the effect of environmental elements on the eye was assessed using four research questions on important domains such as hazard associated with job, eye disorders or complaints like tearing, pains and redness that can result from the job; and prevention of ocular infection by effective hand washing and blindness resulting from improperly managed eye disease. An aggregate score was then used to grade level of awareness depending on the responses to each of the questions asked. A score of 1 was allotted when the response was 'YES' while a score of 0 was allotted when the response was 'NO' to each of the questions asked. This is summarized as shown in tables 2a and 2b

Table 2a: Awareness score of respondents on the effects of environmental elements on the eye

No of responses with 'YES'	Aggregate Score	Level of awareness	Categories of awareness
0	0	No Awareness	Unaware
1	1	Low Level	Aware
2	2		
3	3	High Level	
4	4		

Table 2b: Levels of awareness of effects of environmental elements on the eye

CLASS OF WORKERS	LEVELS OF AWARENESS			TOTAL (%)
	No awareness (%)	Low level (%)	High level (%)	
Street sweepers	9 (7.8)	38 (33.0)	68 (59.2)	115 (100)

Knowledge of protective devices and its use amongst respondents

About 81(70.4) of street sweepers showed good knowledge on the use of protective devices to reduce eye disease. However, 34(29.5%) of street sweepers showed poor knowledge. (Table 3)

Table 3. Knowledge of protective devices and its use amongst respondents

Knowledge of protective devices and its use among respondents	Street sweepers (n=115) (%)
Good knowledge	81(70.4%)
Poor knowledge	34(29.5%)

Twenty-two (19%) the of 115 street sweepers used protective devices, while 93(80.6) did not use protective devices when they were on duty (Figures 1 and 2)

Figure 1: Pie chart showing the use of protective devices among street sweepers. (n=115)

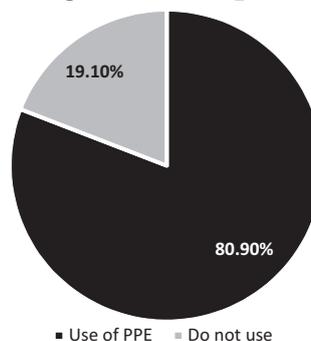
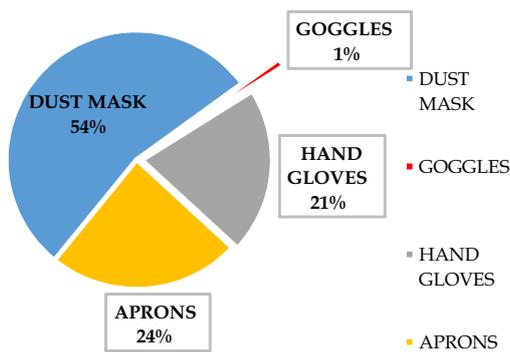


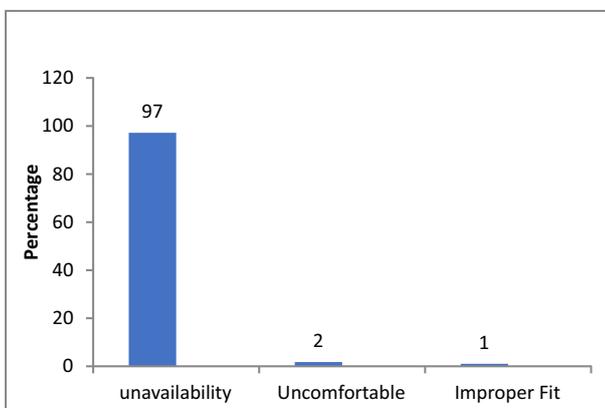
Figure 2: Pie chart showing the various types of protective devices used among street sweepers. (n=115)



Assessing Factors Discouraging Use of Protective Devices for the eyes.

One hundred and twelve (97%) respondents were of the opinion that they did not use protective devices for the eyes because they were not provided by their employers, 2(2%) said the reason was because the protective devices for the eyes were uncomfortable while 1(1%) said the reason was because the protective device fits poorly. (Figure 3)

Figure 3: Common factors discouraging use of protective devices for the eyes. (n=115)



DISCUSSION

This study seeks to evaluate the level of awareness to environmental irritants as well as assess the knowledge and practice of occupational ocular safety among street sweepers in Calabar metropolis. Most participants in the study were middle aged people. The age group distribution of workers in this study is similar to other studies done in sub-Saharan Africa amongst small and medium scale outdoor workers.^{11,12,13} This could be from the fact that most people in this age group are the active working class and require income for the upkeep of their families. There were more females

than males with about 97.4% of the workers comprising females. This is not surprising because of the socio-cultural beliefs in this region where females are involved in menial occupation compared to their male counterparts. This finding is similar to other studies that found out that more females were involved in indoors and outdoors sweeping jobs.^{3,8,13} Besides, sweeping is believed to be in the domains of women and housewives in most developing countries.

The awareness level of occupational ocular hazards was high among over half of the respondents. The reason for such finding in this study could be that the street sweepers were directly and daily exposed to several environmental elements such as dust, fumes and pollens with resultant minor ocular symptoms like tearing, itching and redness which must have constituted some worries to them, and therefore recognized the exposures as hazardous. This is in contrast to the study in Dhaka Bangladesh, where most of the participants were unaware of the occupational safety and health risk associated with sweeping.³ This has implication for employers of labor since eye health education is important in maintaining a healthy ocular status of workers in various industries. If workers are not aware of occupational ocular hazards, meaningful engagements with their employers through their labour unions will be feeble on the need to provide ocular PPD. This will result in workers taking more risk in their line of duties with eventual increase in ocular morbidity.

Despite the fact that a higher percentage of street sweepers were aware of the ocular hazards associated with their work and also had good knowledge about PPD, the utilization of personal protective device (PPD) among street sweepers in this study was low (19.1%). The most commonly used PPD was dust mask (54%) and the least personal protective device used was goggles (1%), leaving the eyes unprotected in a large majority against environmental elements. However, this study revealed that a significant number of the respondents did not use any kind of PPD. Surprisingly, an overwhelming majority (97%) of the respondents did not use ocular PPD because they were not provided by their employers while the remaining few had a wrong attitude that these protective devices were not convenient. This

finding underscores the need for strong policies and implementation of workers right and safety at workplace for employers of labour especially in a developing country like Nigeria. In line with this study, previous studies have found poor compliance and lack of regularity in the utilization of safety measures among different categories of workers especially in developing countries owing to lack of firm policies on occupational health and safety.^{2,4,12} It is interesting to note that while several studies^{12,14-16} have stressed the importance of the use of eye protective devices in addition to other PPD in various risk associated jobs, some studies^{8,17} among street sweepers noted that none of the street sweepers used any PPD during work. The reasons for not using any PPD was attributed to irregular supply of these devices and lack of motivation to use them. In a study in Ethiopia, outdoor waste collectors who did not use PPD were almost three times more likely to be injured compared to those who wear protective devices.¹⁸

Furthermore, in contrast to our findings, Palve et al in Mumbai in their study, noted that a significant proportion (84.6%) of sweepers used some form of protective devices; gloves being the most commonly used personal protective device (88.8%) for waste handling in a hospital.¹⁹ Their reason for the high usage rate of PPD was due to availability and enforcement compared to our studies where PPD including goggles were not available or grossly inadequate leaving the street sweepers to acquire them privately based on their own discretion.

CONCLUSION

Street sweepers should be made aware of protective and preventive measures of maintaining good eye health through eye health education. These workers should also be encouraged to wear protective eye devices such as goggles to reduce exposure to dust. Employers of labor in the waste management industry should be responsive to the needs of providing a safe work environment for the employees, in addition to the provision of an adequate supply of protective eye wears which will go a long way to reduce occupational exposure to dust and other environmental elements.

Based on these findings, we recommend that the use of protective eye devices be promoted, provided and enforced by employers of Labor for city cleaning to reduce occupational eye health

hazards. In addition, automated street sweeping should be encouraged to reduce exposure to environmental elements such as dust, bioaerosols and ultraviolet radiation.

Acknowledgment

We acknowledge the support of CUDA for accepting this study to be carried out among its employees. We are also grateful to the participants for allowing us obtain data from them.

Conflict of interest: None

REFERENCES

1. Ho CK, Yen YL, Chang HC, Shen YY, Chang YY. Epidemiologic study on work related eye injuries in Kaohsiung, aiwan. *Kaohsiung J. Med. Sci.* 2007; 23:463-469
2. Neale R. Personal Protective Equipments. *ILO construction occupational safety and health.* 2007: 7-10.
3. Kabir A, Farhana N, Akter F, Jesmin S, Ali A. Sweeping practices , perceptions and knowledge about occupational safety and health hazards of street sweepers in Dhaka city , Bangladesh : a qualitative inquiry. *Int J Community Med Public Heal.* 2015;2(3):237-43.
4. Podgórski D. Workers' Involvement—A Missing Component in the Implementation of occupational Safety and Health Management Systems in Enterprises. *Int J Occup Saf Ergon.* 2005;11(3):219-31.
5. Wahab B, Ogunlola B. The nature and challenges of street sweeping in Ado-Ekiti. *African J Psychol Study Soc Issues.* 2014;17(3):145-67.
6. Itiyafa N, Uhumwangho OM, Edema OT, Dawodu OA, Omoti AE. A comparison study of conjunctiva disorders in Technical and administrative sawmill workers in Nigeria. *Malaysian J Med Sci.* 2011;18(3):43-8.
7. Omoti A, Waziri-Erameh J, Enock M. Ocular disorders in a petroleum industry in Nigeria. *Eye.* 2008;22:925-9.
8. Sabde YD, Zodpey SP. A Study of Morbidity Pattern in Street Sweepers : A Cross-sectional Study. *Indian J community Med.* 2008;33(4):224-8.
9. Nku CO, Peters EJ, Eshiet AI, Oku O, Osim EE. Lung function , oxygen saturation and symptoms among street sweepers in Calabar-Nigeria. *Niger J Physiol Sci.* 2005;20:79-84.
10. Adwok J. Probability sampling- A guideline for qualitative health care research. *Ann Afri Surg.* 2015;12(2): 95-99
11. Kwasi Abu, E., Boadi-Kusi, S., Owusu-Ansah, A. & Darko-Takyi, C. Ocular health & safety assessment

- among mechanics of the Cape Coast metropolis, Ghana. *J. Ophthalmic Vis. Res.* 2016;(2): 78-83.
12. Uhumwangho, O. M., Njinaka, I., Edema, O. T., Dawodu, O. A. & Omoti, A. E. Occupational Eye Injury Among Sawmill Workers in Nigeria. *Asian J. Med. Sci.* 2010; 2: 233-236.
 13. Wahab, B. & Ogunlola, B. The nature and challenges of street sweeping in Ado-Ekiti. *African J. Psychol. Study Soc.* 2014; 17: 145-167.
 14. Achigbu, E. O, Ezepue, U. F. Prevalence and Severity of Pterygium Among Commercial Motorcycle Riders in South Eastern Nigeria. *Ghana Med. J.* 2004; 48(3): 153-157.
 15. Kumah, D. Ben, Onumah, B. & Asare-Bediako, B. Conjunctival Disorders Among Fire Service Personnel in the Kumasi Metropolis , Ghana. *M J Ophthal.* 1(1):002.
 16. Ajayi IA, Adeoye AO, Bekibele CO, Onakpoya OH, Omotoye OJ. Awareness and utilization of protective eye device among welders in a southwestern Nigeria community. *Ann Afr Med.* 2011; 10: 294-299
 17. Ewis, A., Rahm, M. & Mohamed, E. Occupational health-related morbidities among street sweepers and waste collectors at Beni-Suef, Egypt. *Egypt. J. Occup. Med.* 2013; 37: 79-94.
 18. Bogale, D. & Tefera, W. Assessment of occupational injuries among Addis Ababa city municipal solid waste collectors : a cross-sectional study. *BMC Public Health.* 2014; 14: 1-8.
 19. Palve, N. N., Shidhaye, P. R., Chaturvedi, R. M., Pandit, D. D. & Giri, P. A. Study of morbidity pattern and occupational hazards in sweepers working at a municipal teaching hospital in Mumbai. *Int. J. Community Med. Public Heal.* 2014; 1: 24-30.