



Problems Of Utilization Of Personal Protective Equipment Among Refuse Collectors In Port Harcourt Metropolis, Rivers State

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ABSTRACT

Human activities generate a lot of waste especially within the urban areas due to its density in population which can be reuse or not. This study was carried out to investigate problems of utilization of Personal Protective Equipment (PPEs) among refuse collectors in Port Harcourt Metropolis, Rivers State. The study was guided by four objectives, four research questions and three hypotheses. A descriptive cross-sectional survey research design was adopted for this study with the population which consisted of all refuse collectors in Port Harcourt Metropolis. A sample size of 250 refuse collectors in Port Harcourt Metropolis was used for the study which was selected using stratified and simple random sampling technique. A self- developed and structured questionnaire was used for data collection and analysis was done using descriptive statistical tools such as mean and standard deviation to answer the research questions while regression analysis used to test the null hypotheses of the study at 0.05 level of significance. The result of the study showed that problems of utilization of Personal Protective Equipment (PPEs) among refuse collectors in Port Harcourt Metropolis were unavailability of PPE, discomfort, level of ignorance, inappropriate size of PPE, and insufficient personal protective equipment. It was concluded that there are problems of utilization of Personal Protective Equipment (PPEs) among refuse collectors in Port Harcourt Metropolis, Rivers State. Based on the findings, it was recommended among others that the Rivers State Waste Management Agency should make personal protective equipment available for workers by given them new ones every week for their job and refuse collectors should overlook the discomfort from the personal protective equipment and ensure they use it since it is for their protection.

Keywords: Refuse Collectors, Personal Protective Equipment, effective utilization, Waste

INTRODUCTION

Human activities generate a lot of waste especially within the urban areas which is known as municipal waste. This can be in several forms such as solid, liquid or gaseous. Municipal solid waste (MSW) consist of disused items that are discarded by people section of the solid waste generated by a family is called refuse, which includes left-over food, broken glass, empty cans, scrap papers, and other spoiled goods. Human activities create waste and it is the way these waste are handled, stored, collected and disposed that constitute risk to the environment and to public health (Rhema et.al 2009).

According to Kuijer et. al (2004), refuse collection is a hazard-laden job. Such hazards include injuries from sharp object such as broken glasses, serrated edges of tin cans, knives protruding as bags are lifted or swung and hypodermic needle. These needles might be carrying other people's blood possibly, contaminated with a number of viruses. Street sweeping and waste collection exposes these workers to a variety of risk factors such as dust bioaerosol, volatile organic matter and mechanical stress, which make

them susceptible to certain occupational diseases. In waste collection, Solid waste collectors throughout the world are exposed to occupational health and accident risks related to the content of the materials they are handling, emissions from those materials, and the equipment being used. They have high occupational health risks, including risk from contact with human faecal matter, papers that may have become saturated with toxic materials, bottles with chemical residues, metal containers with residue pesticides and solvents, needles and bandages from hospitals, and batteries containing heavy metals.

Furthermore, they are exposed to exhaust fumes of waste collection trucks traveling to and from disposal sites and dust from disposal operations, all do contribute to occupational health problems (Sarkar, 2003).

Lubin et al (2011) stated that a waste collector, also known as a garbageman, trashman, dustman or binman is a person employed by a public or private enterprise to collect and dispose of municipal solid waste (refuse) and recyclables from residential, commercial, industrial or other collection sites for further processing and waste disposal. The waste collector's job involves repetitive motion awkward working positions, forceful hand exertion, and frequent manual handling. Hence, the job requires the use of Personal Protective Equipment (PPE).

However, there are Problems Associated with Utilization of Personal Protective Equipment among Refuse Collectors such as;

Unavailability and Effective Utilization of Personal Protective Equipment Among Refuse Collectors which has contributed negatively to the safety of workers across the world especially among professionals who work in high risk environment. Most studies revealed that majority of workers will ensure to utilize PPE if made available (Fouad and Ahmed, 2018). However, in most working environment, there seem to be poor availability of PPE for workers use. Nowakowski et al (2020) reported that approximately 80% of local governments in the Silesian region have applied special measures for handling and collection of waste PPE. However, only 13% of waste collection companies have applied special collection schedules for the waste generated at quarantine collection points due to the high costs of changing collection schedules, providing additional vehicles, and paying for more labour. This has been made possible because there was availability of PPEs for use among workers. This evidence summarized that the most helpful method in supporting waste PPE collection would be automatic PPE dispensers with waste PPE collection options and waste bags of a designated colour.

Secondly, Discomfort and Effective Utilization of Personal Protective Equipment among Refuse Collectors has been related to something that disturbs one's comfort. Discomfort has always been a problem of the utilization of PPE among workers especially refuses among refuse collectors. Most refuse collectors are known for using only hand gloves during refuse collection forgetting that they also need the application of full PPEs. The most important factor has been traced to most of complaining of discomfort each time they put on PPE. Fan et al (2020) on a study on the barriers to using personal protective equipment observed that the difficulties outlined by workers for not utilizing PPEs included inappropriate PPE sizes, the design of the PPE and its complexity of use, doubts related to the quality and effectiveness of PPE, potential risks during doffing, space layout between clean and contaminated area, and poor comfort with PPE use.

Thirdly, Level of Ignorance and Effective Utilization of Personal Protective Equipment Among Refuse Collectors is also a factor as the word "ignorant" is an adjective that describes a person in the state of being unaware or even cognitive dissonance and other cognitive relation, and can describe individuals who are unaware of important information or facts (Nottelmann, 2015), ignorance can appear in three different types: factual ignorance (absence of knowledge of some fact), object ignorance (unacquaintance with some object), and technical ignorance (absence of knowledge of how to do something). Schieman and Gabriele (2008) added that ignorance can have negative effects on individuals and societies, but can also benefit them by creating within them the desire to know more. For example, ignorance within science opens the opportunity to seek knowledge and make discoveries by asking new questions. Though this can only take place if the individual possesses a curious mind. This indicates that refuse collectors can have problems with using PPEs if they are ignorant about the use and benefits that PPEs gives. The study of Konya, Akpiri and Orji (2013) showed that 72% non-compliance of PPE among refuse collectors were as

a result of them being ignorant about the importance of PPEs. Hence, there is need for proper education and training among refuse collectors.

Fourthly, Inappropriate Size of PPE and Effective Utilization of Personal Protective Equipment Among Refuse Collectors basically referred to any size of personal protective equipment that is usually bigger than the body size of an individual. However, when worn on the body, may not actually size the wearer. It may be too large that it can fall off or may be too small that it becomes tight for the wearer. Hence, it becomes very discomforting for the worker to use during the discharge of duty. Inappropriate size of PPE has contributed to workers not utilizing PPEs during operations. The study of Fan et al (2020) on the barriers to using personal protective equipment showed that one problem that contributed to poor use of PPE was inappropriate PPE sizes. This also indicates that appropriate size may come in gloves, apron, safety boots, eye goggles etc. Hence, workers may only utilize PPE effectively when they have the appropriate sizes for use.

Lastly, Insufficient PPE and Effective Utilization of Personal Protective Equipment among Refuse Collectors has contributed to non-use of PPE among refuse collectors especially in developing nation of the world. For example in most Africa Countries, there are reports that most workers do not utilize PPE due to its insufficiency. Nowakowski et al (2020) in their study on the disposal of personal protective equipment during the COVID-19 pandemic is a challenge for waste collection companies and society: a case study in Poland showed that approximately 80% of local governments in the Silesian region have applied special measures for handling and collection of waste PPE. This is to ensure that PPEs are readily made available for use among professionals. Results also indicated the most helpful method in supporting waste PPE collection would be automatic PPE dispensers with waste PPE collection options and waste bags of a designated color.

Aims and Objectives

This study investigated Problems Of Utilization OF Personal Protective Equipment Among Refuse Collectors in Port Harcourt Metropolis Rivers State.

1. investigate unavailability as a problem of utilization of personal protective equipment among refuse collectors in Port Harcourt Metropolis, Rivers State.
2. determine discomfort as a problem of utilization of personal protective equipment among refuse collectors in Port Harcourt Metropolis, Rivers State.
3. ascertain the level of ignorance on the uses PPE as a problem of utilization of personal protective equipment among refuse collectors in Port Harcourt Metropolis, Rivers State.
4. determine inappropriate size of PPE as a problem of utilization of personal protective equipment among refuse collectors in Port Harcourt Metropolis, Rivers State.

Research Questions

1. To what extent does unavailability of personal protective equipment constitute a problem of utilization of PPE among refuse collectors in Port Harcourt Metropolis, Rivers State?
2. To what extent does discomfort of personal protective equipment constitute a problem of utilization of PPE among refuse collectors in Port Harcourt Metropolis, Rivers State?
3. What extent does ignorance on the uses of personal protective equipment constitute a problem of utilization of PPE among refuse collectors in Port Harcourt metropolis, Rivers State?
4. To what extent does inappropriate size of PPE constitute a problem of utilization of personal protective equipment among refuse collectors in Port Harcourt Metropolis, Rivers State?

Hypotheses

There is no significant relationship between unavailability and problem of utilization of personal protective equipment among refuse collectors in Port Harcourt Metropolis, Rivers State.

Ho2: There is no significant relationship between discomfort and problem of utilization of personal protective equipment among refuse collectors in Port Harcourt Metropolis, Rivers State.

Ho3: There is no significant relationship between the level of ignorance and problem of utilization of personal protective equipment among refuse collectors in Port Harcourt Metropolis, Rivers State.

Ho4: There is no significant relationship between inappropriate size and problem of utilization of personal protective equipment among refuse collectors in Port Harcourt Metropolis, Rivers State.

METHODOLOGY

The study was carried out in Port Harcourt Metropolis in Rivers State which comprises of Port Harcourt City Local Government Area, Obio/Akpor Local Government Area and part of Eleme, Oyigbo and Ikwerre Local Government Areas. Port Harcourt Metropolis was founded in 1912 by Lord Frederick Lugard, governor of both the Northern protectorate and Southern Nigeria. A descriptive cross-sectional survey research design was adopted for this study. Descriptive cross-sectional design was used in the research because it described, investigated explained and analyzed events or phenomenon of a set of population in their natural settings with no intention to manipulate any variable. The population of the study consisted of all the refuse collectors in Port Harcourt Metropolis. The population of refuse collectors was estimated population of 463 refuse collectors (Rivers State Waste Management Agency, 2021).

The sample size of 250 was used for this study. The cluster sampling technique was adopted to select 25 refuse collection centers in Port Harcourt Metropolis while simple random sampling technique was used to select 10 refuse collectors from each of the 25 refuse collection centers. The instrument used for data collection for this study was a self-developed and structured questionnaire titled “Problems of Utilization of Personal Protective Equipment Questionnaire” (PUPPEQ).The instrument was validated by the researcher’s supervisor and three other experts in the Department of Human Kinetics, Health and Safety Studies, Faculty of Natural and Applied Sciences, Ignatius Ajuru University of Education and others in related field and had reliability coefficient of 0.86 after the pretest. Data collected were analyzed with the aid of Statistical Products for Service Solution (SPSS) version 25.0. Descriptive statistical tools such as mean and standard deviation to answer the research questions while regression analysis used to test the null hypotheses of the study at 0.05 level of significance.

RESULTS

The results of the study are presented below in Tables

Research Question One: *To what extent does unavailability of personal protective equipment constitute a problem of utilization of PPE among refuse collectors in Port Harcourt Metropolis, Rivers State?*

Table 4.1: Extent to which unavailability of personal protective equipment constitute a problem of utilization of PPE among refuse collectors in Port Harcourt Metropolis

Table 4.1: Extent to which unavailability of personal protective equipment constitute a problem of utilization of PPE among refuse collectors in Port Harcourt Metropolis

SN	Items	Mean	Std Dev.	Decision
1	Personal protective equipment are always not available for use	3.05	.81	HE
2	Don't use personal protective equipment because they are readily not available	3.18	.59	HE
3	Would use personal protective equipment during waste collection if provided	3.14	.78	HE
Grand mean		3.12	0.72	HE

Criterion mean = 2.50. Key: HE = high extent, LE = low extent

Table 4.1 showed the extent to which unavailability of personal protective equipment constitute a problem of utilization of PPE among refuse collectors. The result showed that the grand mean of 3.12 ± 0.72 was greater than the criterion mean of 2.50 indicating that unavailability of PPE constitute a problem of PPE utilization. Thus, to a high extent unavailability of personal protective equipment constitute a problem of utilization of PPE among refuse collectors in Port Harcourt Metropolis, Rivers State.

Research Question Two: *To what extent does discomfort of personal protective equipment constitute a problem of utilization of PPE among refuse collectors in Port Harcourt Metropolis, Rivers State?*

Table 4.2: Extent to which discomfort of personal protective equipment constitute a problem of utilization of PPE among refuse collectors in Port Harcourt Metropolis

SN	Items	Mean	Std Dev.	Decision
1	Had difficulty using personal protective equipment because they give problems when worn	2.87	1.05	HE
2	Not always comfortable when I wear personal protective equipment	3.00	.86	HE
3	Personal protective equipment makes it difficult to work effectively	2.94	1.04	HE
4	Some personal protective equipment are too tight for use during work	2.90	.61	HE
5	PPE inconveniences that is why workers don't use it	2.72	.98	HE
Grand mean		2.89	.91	HE

Criterion mean = 2.50. Key: HE = high extent, LE = low extent

Table 4.2 showed the extent to which discomfort of PPE constitute a problem of utilization of PPE among refuse collectors. The result showed that the grand mean of 2.89 ± 0.91 was greater than the criterion mean of 2.50 indicating that discomfort of PPE constitutes a problem of PPE utilization. Thus, to a high extent discomfort of personal protective equipment constitute a problem of utilization of PPE among refuse collectors in Port Harcourt Metropolis, Rivers State.

Research Question Three: *What extent does ignorance on the uses of personal protective equipment constitute a problem of utilization of PPE among refuse collectors in Port Harcourt metropolis, Rivers State?*

Table 4.3: Extent to which ignorance on the uses of personal protective equipment constitute a problem of utilization of PPE among refuse collectors in Port Harcourt Metropolis

SN	Items	Mean	Std Dev.	Decision
1	Personal protective equipment makes it easy for workers to carry out their work	2.99	.59	HE
2	Personal protective equipment protects workers from infections	2.97	.73	HE
3	Personal protective equipment protects workers form occupational hazards	3.08	.71	HE
4	Personal protective equipment does not have any role in disease prevention	2.80	1.12	HE
5	Workers can carry out their duties based on working experience without using Personal protective equipment	2.82	.78	HE
Grand mean		2.93	.78	HE

Criterion mean = 2.50. Key: HE = high extent, LE = low extent

Table 4.3 showed the extent to which ignorance on the uses of PPE constitute a problem of utilization of PPE among refuse collectors. The result showed that the grand mean of 2.93 ± 0.78 was greater than the criterion mean of 2.50 indicating that ignorance on the uses of PPE constitutes a problem of PPE utilization. Thus, to a high extent ignorance on the uses of PPE personal protective equipment constitute a problem of utilization of PPE among refuse collectors in Port Harcourt Metropolis, Rivers State.

Research Question Four: *To what extent does inappropriate size of PPE constitute a problem of utilization of personal protective equipment among refuse collectors in Port Harcourt Metropolis, Rivers State?*

Table 4.4: Extent to which inappropriate size of PPE constitute a problem of utilization of PPE among refuse collectors in Port Harcourt Metropolis

SN	Items	Mean	Std Dev.	Decision
1	Personal protective equipment that are not ones size is difficult to use	2.99	.59	HE
2	Some personal protective equipment are too big for me to use during work	2.97	.73	HE
3	Inappropriate size of personal protective equipment causes accident during work	3.08	.71	HE
4	Personal protective equipment that are not designed appropriately is not good for us	2.80	1.12	HE
5	Uses PPE because the sizes are either too big or too small			
Grand mean		2.93	.78	HE

Criterion mean = 2.50. Key: HE = high extent, LE = low extent

Table 4.4 showed the extent to which inappropriate size of PPE constitute a problem of utilization of PPE among refuse collectors. The result showed that the grand mean of 2.93 ± 0.78 was greater than the criterion mean of 2.50 indicating that inappropriate size of PPE constitutes a problem of PPE utilization. Thus, to a high extent inappropriate size of PPE personal protective equipment constitute a problem of utilization of PPE among refuse collectors in Port Harcourt Metropolis, Rivers State.

DISCUSSION OF FINDINGS

The findings of the study were discussed below:

The result in Table 4.1 showed that the grand mean of 3.12 ± 0.72 was greater than the criterion mean of 2.50 indicating that unavailability of PPE constitutes a problem of PPE utilization. The result in Table 4.8 above showed that there was a high positive relationship between unavailability and problem of utilization of personal protective equipment ($r = 0.79$) and 62% of the variance in the problems of personal protective equipment was due to unavailability ($R^2 = 0.62$). The finding of the study is expected thus not surprising because a worker cannot use what he does not have, and some workers might not be willing to go the extra mile to by PPE for themselves because of financial constraints. The finding of this study is in line with that of Kretchy et al. (2020) which showed that, workers did not use personal protective equipment because PPE were probably not available. This similarity found might be due to the homogeneity of the study population.

The result in Table 4.2 showed that the grand mean of 2.89 ± 0.91 was greater than the criterion mean of 2.50 indicating that discomfort of PPE constitute a problem of PPE utilization. The result in Table 4.9 above showed that there was a high positive relationship between discomfort and problem of utilization of personal protective equipment ($r = 0.97$) and 94% of the variance in the problems of personal protective equipment was due to discomfort ($R^2 = 0.94$). This finding is also expected thus not surprising because wearing personal protective equipment is so inconveniencing and discomforting as it produces heat and does not allow workers to do their work freely sometimes thus, some find it discomforting to use. The finding of this study is akin to that of Fan et al. (2020) which showed that, workers did not use personal protective equipment because of the complexity of its use which is associated with discomfort. The finding of this study is also in line with that of Vidua et al. (2020) which showed that, the most common problems associated with using personal protective equipment among refuse collectors, was excessive sweating (100%), suffocation (83), breathlessness (61%), fatigue (75%), headache due to prolonged use (28%), and pressure mark on the skin at one or more areas on repeated use (19%) which are all indicative of discomfort associated with using personal protective equipment. This similarity found might be due to the homogeneity of the study population.

The result in Table 4.3 showed that the grand mean of 2.93 ± 0.78 was greater than the criterion mean of 2.50 indicating that ignorance on the uses of PPE constitute a problem of PPE utilization. The result in Table 4.10 above showed that there was a high positive relationship between level of ignorance and problem of utilization of personal protective equipment ($r = 0.97$) and 93% of the variance in the problems of personal protective equipment was due to level of ignorance ($R^2 = 0.93$). The finding of the study is expected thus not surprising because a worker cannot use what he does not know anything about. The finding of this study is akin to that of Konya et al. (2020) which showed that, 2% non-compliance of PPE among refuse collectors were as a result of them being ignorant about the importance of PPEs. The similarity in the study design could be explained for the similarity found between the studies.

The result in Table 4.4 showed that the grand mean of 2.93 ± 0.78 was greater than the criterion mean of 2.50 indicating that inappropriate size of PPE constitutes a problem of PPE utilization. The result in Table 4.11 above showed that there was a high positive relationship between inappropriate size and problem of utilization of personal protective equipment ($r = 0.97$) and 95% of the variance in the problems of personal protective equipment was due to inappropriate size ($R^2 = 0.95$). The finding of this study may not be doubted because wearing and under-size or over-size for work is hazardous as it can lead to fall or discomfort.

In line with Fan et al. (2020) whose study on the barriers to using personal protective equipment observed that the difficulties outlined by workers for not utilizing PPEs included inappropriate PPE sizes, the design of the PPE and its complexity of use. The similarity in the study design could be explained for the similarity found between the studies.

The result in Table 4.5 showed that the grand mean of 3.04 ± 0.76 was greater than the criterion mean of 2.50 indicating that insufficient PPE constitute a problem of PPE utilization. The result in Table 4.12 above showed that there was a high positive relationship between insufficiency and problem of utilization of personal protective equipment ($r = 0.97$) and 95% of the variance in the problems of personal protective equipment was due to insufficiency ($R^2 = 0.95$). The finding of this study could also not be doubted because wearing personal protective equipment incompletely is almost the same with not wearing it, this makes insufficient PPE a problem of its utilization. The finding of this study is comparable to that of Gumasing and Sasot (2019) which revealed that insufficient PPE contributed to poor use among workers. Furthermore, the finding of the study corroborates that of Markalio (2008) which added that when PPEs are not sufficient for use, workers will only make use of what they have. The similarity found between the prevent study and the previous ones is attributable to the similarity in the study designs.

CONCLUSION

Based on the findings of the study, it was concluded that, the problems of utilization of Personal Protective Equipment (PPEs) amongst refuse collectors in Port Harcourt Metropolis, Rivers State were unavailability of PPE, discomfort, level of ignorance, inappropriate size of PPE, and insufficient personal protective equipment.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations were made:

1. The Rivers State Waste Management Agency should make personal protective equipment available for the workers by given them new ones every week for their job.
2. Refuse collectors should overlook the discomfort from the personal protective equipment and ensure they use it since it is for their protection.
3. The employers of refuse collectors should take time to teach the workers on daily basis on the benefits of using PPE before sending them out for work; this will help their ignorance about PPE.
4. The government should also show concern in the safety of refuse collectors by supplying sizeable personal protective equipment for them.

5. Refuse collectors should avoid non-utilization of their personal protective equipment due to inappropriate size by ensuring that they make the sacrifice of shaping it to their size and then, use it consistently.

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