

**Perceived Occupational Hazards of Sanitation Workers in Hydrocarbon-Oil Producing and Servicing Companies in Rivers State, Nigeria**

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**Abstract**

It is not arguable that sanitation workers in hydrocarbon-oil producing and servicing companies in Rivers State, Nigeria are bound to suffer from severe occupational hazards while doing their work, given the kind of surroundings they work in. What is more interesting here is how some of them perceive what constitute their hazards at work. The probability that their awareness of what their occupational hazards were, may in the long run define their safe acts while doing work, makes this study a necessity. A descriptive survey research design was chosen in this study. Out of 1000 sanitation workers, including their supervisors who were sampled as part of the population for this study through a preliminary investigation survey, from the 26 oil companies, 250 sample size was contrived, comprising 200 sanitation workers and 50 sanitation supervisors. A validated questionnaire instrument was used and a reliability coefficient of 0.9 was obtained using Spearman's ranking order. A research question and null hypothesis were posed for this study. The findings of the study indicated that the sanitation workers were highly exposed to physical objects injury, machine injury, and inhalation of hydrocarbon from generators and automobiles. They were also heavily exposed to chemical hazards from insecticides, pesticides, herbicides and contacts with washing solvents and toxicants. Although, they were also exposed to cigarette odour and smoke from offices, electric shock, mosquitoes and snake bite which ranked low in their perceptions. On the whole, the null hypothesis showed that there was no significant difference between the perceptions of the sanitation workers and their supervisors on the types of occupational hazards facing the workers was accepted, at 0.05. It was recommended conclusively, that provision and implementation of sound occupational health and safety policies to this set of workers should be made by the stakeholders on their awareness.

*Keywords:* occupational hazards, sanitation workers, hydrocarbon oil producing, servicing companies.

**INTRODUCTION**

Back in the years, in the colonial and post-colonial eras in Rivers State, members of the hinterlands in rural communities, out of panic and ignorance misconstrued what the term environmental sanitation is. Most of them went about cutting down the surrounding trees and burning bushes in fear of prosecution by the statutory sanitation officers, especially, prior to the designated sanitation days. These acts are unsafe and non-environment friendly. Nwakile et al. (2017) defined the word sanitation as the policy and practice of protecting health through hygienic measures. These imply that sanitation is an act and a process. To keep the surrounding spick and span is also known as sanitation to an extent.

However, a more advanced meaning of sanitation is that it is the practice and process of preventing disturbances, harm, damage, diseases or loss through creating appropriate orderliness and hygienic measures in an environment. It involves keeping the surrounding substances orderly and clean in order to save lives and property, through establishing principles, policies and laws as the case may be.

Anamali et al. (2019) asserted that one of the greatest problems facing developing countries is sanitation due to inadequate facilities, poor funding, and poor implementation of policies as well as wrong lifestyle. This means that sanitation work is as hazardous as it is risky. Onumbu (2022) rightly stated that occupational hazards are conditions, circumstances or substances in a work environment which have the potential of causing disturbances harm or loss to the worker or his property or both of them. Schulte et al. (2018) emphasized that occupational hazards involve short term and long-term dangers or risks associated with unhealthy workplace environment. This means that the effects of improper practice of work may not be felt at the short-term or immediately. International Labour Organization (ILO) (2018) declared that occupational hazards pose health and safety risks and have negative impact on the economy, which accounts for roughly a 4% loss in global annual gross domestic product (i.e \$2.8 trillion annually).

Sanitation workers who work in organizations like hydro-carbon oil producing and servicing companies engage in such tedious tasks as sweeping the premises and offices and garages or engine rooms, lawn mowing, field cutting, spraying of insecticides, pesticides, fungicides, herbicides, washing of drainages, cleaning of gutters, toilets, work-shops, mopping, and others. These tasks exposes them to certain health challenges like acute respiratory problems due to inhalation of dusts, fumes and other gases or chemicals; burns, electrocution, hearing loss from noisy machines and engines; skin abrasion, lesion and necrosis, toxicity, pierce and cut injuries, trips, slips and falls, bruises, contaminated wears and skin from ticks, lice, some, other pests and pathogens: if appropriate preventive measures are ignored.

Hence, it has been observed by some scholars that some sanitation workers are alternate vectors or contaminants of family health and neighbourhood health. Some may carry pathogens and some pests on their skins and clothes and transmit same to the homes if they did not wash-off at the close of work. Levy and Wegman (1981) have observed that many pesticides accumulate in body fat and the liver, creating potential long-term health effects. They added that most pesticides are readily absorbed through the skin, posing great risks for those in direct contact with them.

It has been observed by Hricko (1994) that sanitation workers are bound to be exposed to industrial fumes from vehicles, lorries, and power generators. They continued by stating that these machines of course, emit certain poisonous compounds like benzene, toluene, oxylene, mlp-xylene, trimethyl, lead, ethyl-benzene, carbonmonoxide, aldehydes, and others. Mann et al. (2001) lent their support to the above when they stated that benzene can enter the indoor air because of vehicle emissions and other sources such as smoke. It could be noted herein that most of the above stated substances have the potentiality of causing severe adverse health effects on prolonged exposures in which case they could bring about health challenges to the sanitation workers such as haematotoxicity, genotoxicity and carcinogenicity. Occupational Asthma may result out of prolonged exposure to incineration smoke by the sanitation employees.

Biologically speaking, sanitation workers may contact infectious hepatitis A and B, Giardia lamblia, tuberculosis and skin dermatophytes through contact with flies and toilet materials. Outdoor workers like sanitation employees, are at risk of vector-borne diseases. Onumbu (2008) quoted Murray and Zentner (1985) to have found out that cigarette smoke, as an air pollutant, caused increased carbon monoxide content in the blood of sanitation workers when inhaled for a long time.

Of course, you know that most foreigners in the multinationals seldom obey “No Smoking” rules in their offices, despite the safety signals. Hence, some sanitation workers in these organizations face a risk of effects of second-hand smoke effects of cigarettes which are cancerous on-exposure.

Exposures to latex, cleaning and disinfecting agents are in the opinion of Arif and Delclos (2012) possible cause of asthma to health-care workers like sanitation employees. Psycho-social and ergonomic hazards to this class of low socio-economic group of workers cannot be ruled out. Hence, Barielnen and Abraham (2019) posited that people perform better when they are physically and emotionally able to work and have the willingness to work. Stress-burden on the sanitation workers due to heavy work-loads may not be ruled out too. If appropriate safety policies, laws, inducements and supervisions are applied to the workers, there may be improved safe work practices among the sanitation workers.

Even though Amani et al. (2017), reported that awareness is not only a necessary condition for the development of health behaviour; they concluded by stating that the more the level of

awareness of the risks in a job will result in the more health behaviours. This latter position is made apparent by Onumbu and Elechi (2022) when they opined that knowledge of occupational hazards is a likely determinant of the workers' attitude towards the management of these hazards and possible prevention of the same. Since Jain and Rao (2015) have declared that safety of self and others is the responsibility of each employee, it is therefore on this premise that the perceived occupational hazards of the sanitation workers by themselves should be studied so as to determine if it may affect their safety practices.

**Various Classes of Occupational Hazards of Sanitation Workers and their Effects to Health**

	<b>Classes of Hazards</b>	<b>Types of Effects or Harm</b>
1.	<b>Physical hazards:-</b> These are non-machine oriented hazards which are incurred in cause of one's physical contacts or motions at work. E.g. building architectural designs and materials noise, fire, electricity, attacks, assault etc.	Knife cuts, auditory damage, lack of hearing, snake-bite, fall, trip, slip, collision, struck-by or against, heat, burns, cold-bite, cold-stroke, heat-stroke, strain, bruises, feverishness, deformity, stress ionizing radiation, death.
2.	<b>Mechanical hazards:-</b> These come from relationship with active machines i.e machine in motion, by the worker e.g cloth-washing machine mower, air suction pump, generators, grinding machines, and filing machines, etc.	Cuts, bruises deformity, severe wounds or death.
3.	<b>Biological hazards:-</b> These emanate from pathogens, herbs pests, pets, wild animals and livestock; and are plants and animals in nature	Malaria, snake-poison, (bite), dermatitis, dermatoses, tuberculosis, hepatitis, dengue fever, bronchitis, asthma, pneumoconiosis, emphysema, gardiasis, cancer, sting poison etc.
4.	<b>Chemical hazards:-</b> They are from chemical substances and are corrosive or toxic in nature e.g. pesticides, fungicides herbicides, insectides, paints, solvents, petrol, engine oil, fumes and particulates, dangerous gases etc.	Burns, cancer, tumors, skin lesions respiratory problems, skin denaturing, asphyxiation, death etc.
5.	<b>Psycho-socio logical hazards:-</b> They emanate from leadership and management failures at work and human relations with colleagues. E.g. job security, job status, conditions of services, threats and harassment, etc.	Feeling of frustration, inferiority complex, social stigma, fear, poverty, worry, anger, lack of motivation, emotional disturbances, etc.
6.	<b>Ergonomic hazards:-</b> Theses are positions of man to work and this approaches to work instruments	Limb pains, waist pain, lumbargo, fatigue, muscle-spasm, cramp, numbness, disfiguration, heart-attack, slumping.

### **Statement of the Problem**

Based on the nature of work they perform, sanitation workers are bound to face severe hazards and health threats. In most organizations in Nigeria, sanitation workers are health-care givers, majority of who are less-educated and uninformed low-income earners. It is believed that conscious, regular conscientization and sensitization on their occupational hazards and preventive practices may help improve compliance to safe work habits among the sanitation workers. In the light of the above, the problem of this study is to investigate the perceived occupational hazards of sanitation workers in hydro-carbon-oil producing and servicing companies in Rivers State, so as to make necessary recommendations and add to the pool of existing knowledge.

### **Aim and Objective**

The aim of this study is to know if the sanitation workers are conscientized and aware of the risks and hazards involved in their practices, which could inform their attitude to safety at work. The objective of this study is to determine the sanitation workers opinion on the type of hazards they encounter while doing work.

### **Research Question**

What are the perceived occupational hazards of sanitation workers in hydrocarbon oil producing and servicing companies in Rivers State?

### **Research Hypothesis**

A null hypothesis was adopted for this study as below: there is no significant difference between perceptions of the sanitation workers and their supervisors on the types of hazards sanitation workers are exposed to, at 0.05 level of significance.

### **Delimitations of the Study**

This study does not include petroleum products distribution filling stations and sanitation workers in offshore rigs or plat-forms.

### **Theoretical Frame Work**

Safety culture by Efficient Safety Supervision model of Providence, A. (2012) which emphasized that people are more willing to accept the restrictions that some precautions bring if they are consulted and feel involved. This model advised that organizations embarking on construction projects should have a clear policy on the management of health and safety. This model is adopted in this study to understand why the sanitation workers perceived their hazards the way they do, in relation to the supervisors' encouragement.

### **Materials and Methods**

**Research Designs:** Descriptive survey research design was used to describe the events as they were.

**Population of the study:** Population of this study was made up of 1000 sanitation workers and their employers who were found out through pre-liminary investigation survey by making use of some resource persons who worked in these companies. The companies are as 26 in number according to the exploratory preliminary survey, due to inadequacy of data bank. The hydro-carbon oil producing and servicing companies include the premises and work sites of these corporate organizations, including but not limited to Shell Petroleum Development Company (SPDC), Exxon/Mobil and Elf Petroleum Nigeria Limited (EPNC), Nigeria Agip Oil Company (NAOC), Nigerian National Petroleum Corporation (NNPC), Port Harcourt and others, based on the size and land-scape design of their office premises and sites. This number is tentative because most sanitation works are contracted out and the contractors at times exhibit the powers of "hire and fire" to this class of non-unionized low income earners, based on the revelations.

**Sampling and Sampling Techniques**

The sample size of this study is 200 sanitation workers and 50 supervisors, which represent 25% of the target population. The disproportionate random sampling technique was used in selecting the sanitation practitioners and their employers in each of the companies; hence the sample population became 250 employees.

**Variables:** The satisfactory variables are the responses from the sanitation workers and their supervisors in the companies on types of occupational hazards sanitation workers faced.

**Instrument for Data Collection:** A composite questionnaire is the basic research instrument utilized for the study and it is titled perceived occupational hazards of sanitation workers in Hydrocarbon Oil Producing and Servicing Companies in Rivers State (POHSHWOPSCRS).

The questionnaire is in two parts – part one for the sanitation workers and part 2 for their supervisors. The questionnaire is a close-ended type which is contrived from modified Likert’s Model of fashioning a questionnaire; as follows:

- Strongly Agree (SA) = 4 points
- Agree (A) = 3 points
- Disagree (D) = 2 points
- Strongly Disagree (SD) = 1 point

Content validity of the instrument was got from perusal and contributions made by some experts in this field who are senior academics from University of Port Harcourt, Nigeria.

**Reliability of the Instrument**

The split half method of measuring reliability was adopted by administering the questionnaires randomly to selected ten (10) respondents outside the main population. The items results, which were divided into two parts were correlated and tested for reliability. A correlation coefficient of 0.9 was obtained using the Spearman’s Ranking Order. This shows that the instrument was reliable.

**Method of Data Analysis**

The obtained data from the responses were organized in numerical terms and used to get the descriptive statistical result. The group means, grand mean, mean set and rank order were used to present answers to the research question. The grand mean is the average of the means of the two groups’ responses on each of the analyzed items.

$$\text{Grand mean} = \frac{x_1 + x_2}{2}$$

A group mean score in each of the items that was below the mean set was considered an unfavourable response while that which was from the mean set is 2.50 (constant) for each item. This was got by finding the average of the 4 score weights 4, 3, 2 and 1.

The t-test formula was used to constitute the inferential statistical analysis of the null hypothesis that was posed from the research question.

Formula for t-test =  $x_1 + x_2$

While  $SDX = \sqrt{\frac{S_1^2 + S_2^2}{n_1 + n_2}}$

$x_1$  = mean of group 1     $x_2$  = mean of group 2

SDX = Standard error of difference

S<sub>1</sub> = Standard deviation 1

S<sub>2</sub> = Standard deviation 2

n<sub>1</sub> and n<sub>2</sub> = number of cases or sample sizes for samples 1 and 2

**Presentation and Analysis of Data**

Data obtained from the field were analyzed as follows:

**Research Question 1**

What are the perceived occupational hazards of sanitation workers in these hydrocarbon Oil Producing and Servicing Companies in Rivers State?

**Table 2:** This shows the mean analysis of the perceptions of sanitation workers and their supervisors respectively on the types of hazards the sanitation workers were exposed to.

S/N	Items Cluster 1	Sanitation Workers		Supervisors			
		x	Rank order	x	Rank order	GM	Rank order
1.	Exposed to machine or any other physical object, accident or injury	3.10	2 <sup>nd</sup>	3.96	2 <sup>nd</sup>	3.55	2 <sup>nd</sup>
2.	They are exposed to second-hand cigarette odour or smoke from staff rooms	1.55	7 <sup>th</sup>	2.20	6 <sup>th</sup>	1.875	7 <sup>th</sup>
3.	They are exposed to hydrocarbon smoke from the power generator and motor vehicle while at work	3.40	4 <sup>th</sup>	2.80	5 <sup>th</sup>	3.10	4 <sup>th</sup>
4.	They are exposed to chemical splash accident	3.50	3 <sup>rd</sup>	3.00	4 <sup>th</sup>	3.25	3 <sup>rd</sup>
5.	Have come in contact with any of the following solvents at work-glues, paints, oil sprays, fumes or vanishes?	3.00	5 <sup>th</sup>	3.00	4 <sup>th</sup>	3.00	6 <sup>th</sup>
6.	Sanitation staff are exposed to dusts	4.00	1 <sup>st</sup>	4.00	1 <sup>st</sup>	4.00	1 <sup>st</sup>
7.	Do you bath immediately after work before going to the house?	1.00	9 <sup>th</sup>	1.92	7 <sup>th</sup>	1.46	9 <sup>th</sup>
8.	Are you exposed to snake bite?	2.00	6 <sup>th</sup>	1.00	8 <sup>th</sup>	1.50	8 <sup>th</sup>
9.	Use of insecticides, herbicides or pesticides while at work could be harmful?	3.00	5 <sup>th</sup>	3.06	3 <sup>rd</sup>	3.03	5 <sup>th</sup>
10.	Has electric shocked you while at work before	1.24	8 <sup>th</sup>	1.00	8 <sup>th</sup>	1.12	10 <sup>th</sup>
	Total N		200			50	

Legend      x̄ = Mean  
                  N = Number of respondents  
                  GM = Grand Mean

**Table 2** depicts that by the perceptions of both the sanitation workers and their supervisors, the sanitation workers were mostly exposed to dusts while doing their work. This item ranked first in the opinions of both groups of respondents with the means at 4.00 in both groups. This is followed by the opinions that the sanitation workers are also exposed to machine or any other physical object accident or injury and chemical splash while doing their work.

This is because based on their mean values, these opinion items ranked 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup>, respectively from the table. With the mean set already put at 2.50 it does follows that other opinion items in the table whose means are below 2.50 are not well favoured by the two groups of respondents. From the table, item number 7 was not categorically a type of occupational health case



of workers but is a community health problem; hence it ranked the least from the list. The grand mean of the items that were favoured most by the responses almost tallied in ranking order with those of the separate groups except in those that are far below the mean set.

**Hypothesis 1.** There is no significant difference between the perceptions of the sanitation workers and those of their supervisors on the types of occupational hazards the former are exposed to at 0.05 level of significance.

The calculated t-test value of the mean responses from the perception of sanitation workers and their supervisors to the types of occupational hazards the former were exposed to, provided basis for taking decision on the hypothesis; see the table below.

**Table 3:** A t-test value of the responses of sanitation workers and their supervisors to the perceived types of occupational hazards the sanitation workers were exposed to.

Cluster 1	Subjects	$\bar{x}$	N	df	S.D	t-crit (table)	t-cal	Level of sign.	Result
Types of occupational hazards the sanitation workers are exposed to	Supervisors	2.59	50	248	17.57				Accepted
	Sanitation workers	2.58	200		34.00	1.96	0.07	0.05	

**Keys**

- $\bar{x}$  = mean
- N = Number of respondents
- Sd = Standard Deviation
- t-crit = Critical or table t value
- t-cal = Calculated t test value

The calculated t value of 0.07 at 0.05 significant level is less than the table t-value of 1.96.

**The Decision Rule:** is that we reject the null hypothesis if the t-calculated is greater than the t-critical, otherwise, we do not reject the null hypothesis (Ho). The hypothesis 1 is therefore accepted as postulated. We therefore uphold the statement that “there is no significant difference between the perceptions of the sanitation workers and their supervisors on the types of occupational hazards the former were exposed to.

**Discussion of Findings**

On the types of occupational hazards, the study revealed that the occupational workers in hydrocarbon oil producing and servicing companies in Rivers State perceived that they were exposed to machine and physical object injury, hydrocarbon smoke inhalation from automobiles and generators, and chemical splash impacts. Exposure to insecticides, pesticides or herbicides was also perceived as harmful by the respondents. On the other hand, exposure to cigarette odour and smoke in the offices, bathing immediately before going to their homes, exposure to snake bite, and electric shock ranked low in their perceptions. This is because their mean responses ranked below the mean set of 2.50. However, not all of the respondents had low perceptions on those items.

The study further revealed that there is no significant difference between the perceptions of the sanitation workers and their supervisors on the types of occupational hazards the former were

exposed to, because, their perception responses were almost related across the grand mean of 2.50. The decision rule is that the hypothesis is therefore accepted as postulated, because the t-calculated is not greater than the t-critical from the table, 0.07 and 1.96 respectively at 0.05 level of significance.

The result of this study corresponds with the positions of Hricko (1994) and Mann et al. (2001) who averred that machines from work place emit certain dangerous hydrocarbons which contain some toxic compounds that are harmful to the workers. The study also indicated that many of the workers were not taking their bathes or changing their work-wears before going to their homes, in line with the report of Murray and Zentner (1985) in Onumbu (2008).

In agreement with the result of this study, Ofonime and Ukeme (2020), studied occupational hazards, health problems and utilization of PPE among street sweepers in Uyo, Nigeria, they revealed that out of 150 street sweepers in Uyo, about 141 (94.0%) reported that dusts were their hazard and cold 129 (86%), mosquitoes 74 (49.3%) and prolonged bleeding 149- (99.3%), were their common hazards. Also the result of Chinda et al. (2022) on occupational hazards of sanitation workers in Port Harcourt metropolis, Rivers State, Nigeria, revealed that there was high exposure of the workers to some chemical hazards, with average mean rating of  $2.76_{-}^{+}$  1.040. These results are relatively related in agreement with the present study.

## **CONCLUSION**

The level of awareness of these sanitation workers must have affected their level of perception of types of hazards in their work. Performance as regards safety procedures' compliance by these workers would be improved if both their supervisors and the sanitation workers are given regular orientations on exposure to hazards and their implications to health and safety of this set of workers.

## **RECOMMENDATIONS**

1. Sanitation workers in these hydro-carbon oil producing and servicing companies should have sound occupational health and safety policy guidelines peculiar to their type of work which must be rehearsed to them by their supervisors at work.
2. Casualizing and contracting sanitation work in these companies bring about some elements of poor motivation at work which in themselves are hazardous to the employee. Their condition of service should be upgraded to making them full staff of the companies.
3. Adequate provision of relevant personal protective equipment (PPE) should be provided to the sanitation workers and there should be strict enforcement of compliance to using them at work by those responsible for that.
4. Management should encourage unionization of the sanitation workers so as to bring to light, proper under-standing and practice of safe acts among the sanitation workers through peer review.

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