

Research Paper

Examining the Occupational Safety and Health Hazards encountered by Municipal Waste Collectors in Murewa Rural District Council of Zimbabwe

Kudakwashe Intauno¹, Leon Poshai²

¹ University of Duisburg-Essen, Essen Akademisches Auslandsamt. Germany.

² Midlands State University. Gweru, Zimbabwe.

Article History

Received:
14.05.2023

Revised:
22.06.2023

Accepted:
05.07.2023

*Corresponding Author:

Kudakwashe Intauno

Email:
kkintauno@gmail.com

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Abstract: The failure of Zimbabwean local authorities to implement contemporary waste management technology, combined with refuse management incapacity exposes handlers of solid waste to work-related diseases and accidents. The study sought to use Murewa Rural District Council (RDC) as a case study and a mixed-method that triangulated qualitative and quantitative research methodologies was employed as a method of inquiry. The study established that, in Murewa, there is an irregular garbage collection schedule which results in piles of uncollected refuse on roadsides, street corners and other undesigned areas. The illegal dumping of refuse and overflowing of garbage bins have become an eyesore in Murewa Township Centre. The people employed to clean this mess are often ill equipped to clean the garbage in hygienic ways as they often use their bare hands to shovel the garbage from dumpsites and overloaded bins into the refuse collection trucks. In doing this, these workers are exposed to biological hazards such as bacteria, fungi, viruses, parasites and cysts. To minimise the associated hazards, the study suggests, among other things, that the Murewa Rural District Council should improve workplace safety and health for employees by modifying workplace and process design and by adhering to the hazard identification and risk assessment methodology.

Keywords: Health Hazards, Murewa Rural District Council (RDC), Occupational Safety, Solid Waste Workers, Waste Management.



1. Introduction

The topic of occupational safety and health risks associated with waste management has become a pertinent issue in the twenty-first century, where sustainable development dominates policy discourse and practice. Waste collectors in underdeveloped countries are at danger of accidents and occupational ailments such as musculoskeletal, tiredness, respiratory, gastrointestinal, and hearing issues. Due to the shortage of protective clothing such as gloves, face masks and gumboots, these workers are also exposed to physical toxins, as well as exhaust fumes and odours emanating from the rotten waste and decomposing garbage. Augmently, most often, in developing countries, refuse go uncollected for several weeks and this creates a health hazard to residents and to waste collectors themselves [1].

Municipal governments in many developing countries apply low-cost solutions to solid waste management because of financial limitations to buy requisite solid collection kits and this exposes waste handlers to health and occupational risks [2]. This situation is applicable in Zimbabwe where local authorities struggle to provide waste handlers with the requisite equipment and clothing which exposes them to numerous work-related illnesses and injuries. For example, past research on solid waste handlers in the City of Gweru conducted by Emeru et al. [3] revealed how these workers are exposed to biological hazards such as bacteria and fungi emanating from the waste collection truck cabins. The same study also revealed that solid waste collectors in Gweru are prone to obstructive and restrictive respiratory disorders, vital hepatitis and high prevalence of musculoskeletal disorders because of the hazardous environment that they work in.

Similarly, in Murewa, refuse is seldom collected in time as council often take several weeks before sending out garbage trucks to different residential locations and solid waste collection points. Because of these delays, people in different parts of Murewa end up dumping garbage in undesignated sites which creates a health hazard in the communities. More so, overloaded refuse containers and illicit dump sites have become an eyesore in Murewa. Sometimes, solid waste collection workers are seen cleaning these areas, putting their health at risk since some of them do not have a complete set of protective clothing. Resultantly, solid waste collection workers are exposed to toxins that emanate from decomposing solid and liquid waste. The rotting litter produces bacteria, fungi, virus, parasites and cysts that may not be visible to the human eye, yet they constitute a substantial threat to the health of the cleaners and solid waste collection personnel. These workers are vulnerable to ergonomic hazards as they do not have the proper protective equipment for handling the hazardous waste. Some of them are given daily targets by their supervisors. For example, they may be told to clear a certain number of illegal dump sites. Also, some solid waste collection workers do not know the importance of having protective clothing and the implications of handling solid waste with their bare hands. This situation subjects them into the various risks associated with direct contact with solid and liquid waste.

Solid waste collectors constitute an integral component of the safety of communities as they from time to time ensure that the environment is habitable. In their efforts to make the environment habitable, solid waste collectors are subjected to a number of hazards. Yet, the specific impact of these hazards to the health of solid waste collectors has not been sufficiently exposed in the context of rural district councils in Zimbabwe. In light of the research gap, this article examines the various occupational safety and health hazards associated with municipal solid waste in Zimbabwe by drawing insights from Murewa rural district council. The article further proposes the measures that can be adopted to address the challenges to proper solid waste management in Zimbabwean local authorities.

2. Literature Review

Worldwide, it is estimated that over seven thousand and five hundred (7,500) individuals die every day, one thousand (1000) from workplace accidents and six thousand and five hundred (6,500) from illnesses related to the workplace, with Africa having the highest death rate at sixteen point six (16.6) per hundred thousand (100,000) workers [4]. Due to their high economic and human costs, occupational diseases and injuries are a major problem in developing countries. These casualties are often high amongst solid waste handlers who collect, transport and dispose waste regularly. The high frequency of occupational health hazards amongst solid waste handlers in developing countries is caused by budgetary limitations to procure personal protective equipment (Melaku and Tiruneh, 2020). Solid waste handlers are often exposed to infectious diseases and fatal occupational accidents because they do not have protective working equipment [5].

According to Dlamini et al. [6], poor solid waste management around the world put up to 5.5 million people at risk of contracting diseases that could lead to death. Jerie and Tevera (2014) also observes that over 100 individuals die each year as a result of diseases caused by improper solid waste management. Every day, paper, tin, bottle, garments, glass, metals, e-waste, and hazardous compounds such as paints and aerosol spray are generated [7]. The majority of the garbage created is food waste, with paper, plastics, and ceramics accounting for tiny amounts of the waste produced [8].

Solid waste, for instance, is mostly organic, has a high moisture content, and attracts flies and rodents due to its colour. This is why collection should be frequent and consistent, and it is critical to have an effective system of selective collection at the source, as well as proper protective equipment, to reduce biological threats to collectors. Regular solid waste collection can curb the hazards it poses to human health and the potential it has to contaminate the environment. Sadly, as noted by Mafume, Zendera, Mutetwa and Musimbo [9], in developing countries there are limited resources channelled towards waste collection and general unwillingness in the procurement of better equipment to collect waste resources and largely improve the safety and health of waste collectors. Vehlow [10] asserts that one of the main challenges for developing countries worldwide is their inability to safeguard the environment and people from the dangers posed by ineffective solid waste management. However, in spite of these alarming health risks and dangers, there is still very little scholarly production in this area by researchers, particularly in the case municipalities within rural jurisdiction in Zimbabwe, one of the developing nations; thus, this research aimed to fill this gap in the literature.

3. Methodology

The section describes the research methodology which encapsulates the research approach, the research design, target population, sampling techniques, data collection methods, data presentation and analysis methods as well as the ethical considerations upheld in this study. This research uses the mixed methods methodology which combines qualitative and quantitative methods in generating and analysing data. Combining the qualitative and quantitative methodologies enabled the generation of comprehensive data to understand the occupational safety and health hazards associated with municipal waste management in Zimbabwe from both the an interpretive and statistical perspective. First, the qualitative research methodology allowed the researchers to get more information about the issue of solid waste related hazards through interactive interviews with solid waste collection employees. The qualitative methodology enabled the collection of self-reported insights on the hazards associated with the profession of solid waste collection in Zimbabwe. The quantitative methodology enabled the researchers to use closed-ended questionnaires to collect numerical data for conducting statistical tests to establish the correlations between the nature of hazards and waste types.

The study employed a descriptive case study design as the strategy of inquiry. Murewa Rural District Council was chosen as a case study because, as a rural-based local authority in Zimbabwe, it provides a clear perspective of refuse collection challenges and the associated health hazards and their deleterious effects. This case provided a reflective social laboratory for understanding solid waste collection hazards from the perspective of rural district councils as an analysis from this dimension has been overlooked by past scholars who analysed this issue from the lens of urban council. The target population in this study composed of council waste collection truck drivers, council waste collectors and street cleaners, council management and health analysts. The location of study included Murewa Central Business District (CBD) and residential locations surrounding the CBD. Solid waste collection workers were selected because they are the ones who come into direct contact with the refuse material during waste collection, transportation and disposal. Their experiences enabled the researchers to understand and analyse the invisible risks. These participants also provided insights into the potential solutions to lessen the risks that they are exposed to because they directly involved in street cleaning, collection, transportation and waste disposal. In addition, council management was also targeted to gain an understanding of the management's commitment and efforts to reduce the occupational and safety hazards that solid waste collectors are subjected to. A health analyst's was also included in the sample in order to gain expert knowledge on the health impacts of solid waste to the community and those involved in collecting the refuse. The experience and knowledge of the health analyst also assisted in the identification of hazards and providing possible ways to reduce the exposures from the hazards and to inculcate an accident preventive culture at the workplace.

The target population exhibits a variety of traits and the study adopts a mixed methodology hence both probability and non-probability sampling methods were used in selecting participants. First, the researchers used a combination of convenience sampling and simple random sampling to select fifteen

(15) solid waste collection workers and fifteen (15) street cleaners. In addition, purposive sampling was used to select two (2) waste collection truck drivers, one (1) health analyst and two (2) Murewa council officials involved in solid waste management. The total sample comprised of thirty-five (N=35) participants. All the 35 participants were selected based on their knowledge and experience on of the solid waste collection processes in Murewa Rural District Council.

Both primary and secondary data were collected in this research. Primary data were collected through in-depth informant interviews, closed-ended questionnaires and non-participatory observations. From the target sample, closed ended questionnaires were administered to ten (10) solid waste collection workers and ten (10) street cleaners. Key informant interviews were conducted with the remaining fifteen (15) participants. Interview questions to key informants in the category of council waste collectors were experience oriented as they focussed on understanding the hazards and risks they when collecting refuse or cleaning waste from the streets. Interviews with council officials (part of council decision makers) were focussed in understanding the measures they are taking to ensure that occupational health and safety policies and standards are adhered to by the council to ensure that the waste collection workers do are not subjected to hazardous situations when doing their job. The time of participation was determined by the participant's schedule. For example, some participations requested that the researchers interact with them when after or before work, and the researchers complied. The researchers also conducted field observations to gain a site view of the various dump sites in the studied area. Observations were also done to confirm the claims made by the solid waste collectors and street cleaners during the interviews. Primary data was also corroborated with the data collected through reviews of secondary sources such as the Occupational Safety Health Convention, 155 of 1981 as well as the Pneumoconiosis Act [Chapter 15:08].

Primary data collected from the interviews and field observations were analysed using qualitative content analysis and thematic analysis and presented in a report through a qualitative discussion. The data from the questionnaires were analysed using descriptive statistics with the aid of the Statistical Package for Social Science (SPSS) and the results were presented in the form of tables, pie charts and bar graphs. From the conception of the study project to the presentation and reporting, ethical considerations were taken into account. First, the researchers informed the Murewa Rural District Council's Human Resources department of their intention to conduct the research and approval was granted before engaging the different participants. The researchers stressed confidentiality issues to the respondents and assured them that their responses would be treated in privacy. The interview and questionnaire questions were created in such a way that the respondents did not put their names on the scripts, keeping the information private. All secondary data sources consulted were acknowledged accordingly.

4. Findings and Discussion

This section thematically presents the research findings from the study in subsequent subsections using tables, pie charts, and graphs. This study's findings were also compared to existing literature. The chi-square test was used to establish an accurate and robust research by identifying associations from the quantitative data generated in this study. In the ensuing section, the types or categories of waste collected in Murewa RDC and their association hazards. Later, solutions for addressing these hazards are proposed.

4.1. The Main Forms of Hazardous Waste Exposed to Solid Waste Workers in Murewa RDC

The study revealed that the main types of hazardous waste exposed to solid waste collection workers in the Murewa RDC food waste (36%), sanitary waste (24%), papers and plastics (20%), hazardous waste (12%), and glass and metal 8% (Table 1). According to questionnaire responses, 24% of respondents witnessed sanitary waste, which included soiled pads and diapers contaminated with human excrement. According to some of the respondents, open defecation is often practiced near waste grounds, which according to Mehlum and Aarhus [11] increases the levels of worm infection in solid waste and the occurrence of diarrhoea. Thus, solid waste workers in Murewa RDC are highly prone to contracting diarrhoea because they are exposed to open defecation. In addition, improper solid waste disposal, such as pathological and infectious waste, poses a direct threat to employees and must be managed in a highly specialized manner to ensure that no further harm is inflicted on the environment.

Table 1. Types of solid waste handled by the solid waste workers

		Examples of Waste Handled			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Food Waste	9	36.0	36.0	36.0
	Glass & Metal	2	8.0	8.0	44.0
	Hazardous Waste	3	12.0	12.0	56.0
	Plastic & Papers	5	20.0	20.0	76.0
	Sanitary	6	24.0	24.0	100.0
	Total	25	100.0	100.0	

The improper disposal of hazardous waste creates health risks to both humans, other living organisms and their environment [12]. Consonant to this observation, 8% of those who answered the questionnaire said they frequently find glass and metal objects. Since glass and metal wastes are typically sharp, solid waste collectors in Murewa RDC are at risk of cuts and pricks. These cuts and pricks can spread tetanus, HIV as well as the Hepatitis B virus [13] [14]. Furthermore, 12% of respondents who responded to questionnaires indicated that the main health risks come's from collecting hazardous waste, which includes paint tins from house construction because. Such waste is common because Murewa RDC is still developing and known as a Growth Point. Other hazardous waste also comes from pesticides and herbicides as well as empty bottles from the surrounding communal space where horticultural projects are undertaken by small scale commercial farmers.

The study also revealed that food waste, as shown by 36% in table 1, breeds and feeds disease vectors, making it harmful. From field observations, flies were observed around garbage bins and waste dumps, causing annoyance to workers and maybe aiding in the transfer of faecal oral illnesses. Similarly, cockroaches are commonly found in solid waste and are assumed to have an additional role in disease transmission, as do mosquitos, which spawn in waste and transmit diseases such as malaria to humans. This clearly demonstrates that solid waste collecting job is detrimental to one's health, and that action is required to separate hazardous waste and safeguard people involved. Filed observations also revealed that the waste content varied with the location of waste receptacles, with food waste found in domestic bins, temporary garbage collection sites or bays, and the market place. Plastics were largely found in retail malls, residential streets, illegal dumpsites, and garbage collecting areas. Similarly, it was discovered that solid waste, such as sanitary waste, is being combined with food waste, papers, and plastics, indicating that there are currently no waste separation procedures in the Murewa RDC. As a result, sustainable waste management measures such as recycling, reuse and reduction are limited, yet necessary.

4.2. The Nature of Occupational Hazards Exposed to Solid Waste Workers in Murewa RDC

The study revealed that the solid waste workers are exposed to different hazards like ergonomic, biological, chemical and psychosocial hazards. These dangers have an impact on the workers' general well-being and performance at work as they are often susceptible to contaminating different kinds of diseases. Figure 1 below depicts the many forms of dangers that affect solid waste workers in Murewa Rural District Council.

Figure 1 illustrates that ergonomic hazards affect 48% of solid waste collection workers who responded to questionnaires. Ergonomic hazards often arise as a result of gathering and sorting processes, which include lifting and twisting motions, resulting in musculoskeletal injuries. Ergonomic hazards constitute the largest proportion among all hazards. The study revealed that due to the heavy physical workload, refuse collectors are at a greater risk of musculoskeletal issues. Waste collection is a task that necessitates repetitive physical activity such as heavy lifting, carrying, and repetitive movement work such as shovelling. It also involves moving empty and full bins and containers from one place to the other through either pushing or pilling them and all these processes involve static muscle contraction which creates risks to musculoskeletal problems to the workers. The Murewa RDC solid waste workers also claimed that the country's high fuel prices and scarcity cause garbage bins to be full and waste bays to overflow since the compactor or tractor cannot collect rubbish for weeks or months. This causes workers to work under pressure when they return to work in order to reach their work targets. The interviewed workers revealed that they had not received ergonomics training, and as a result, they fail to concentrate on correct lifting methods when carrying

the heavy loaded bins, and they are also subjected to repetitive movements when shovelling the piled heaps of waste in the area's numerous waste bays. Habitually, lifting, twisting and dumping big waste bags can exceed recommended safety guidelines leading to higher risks to ergonomic hazards.

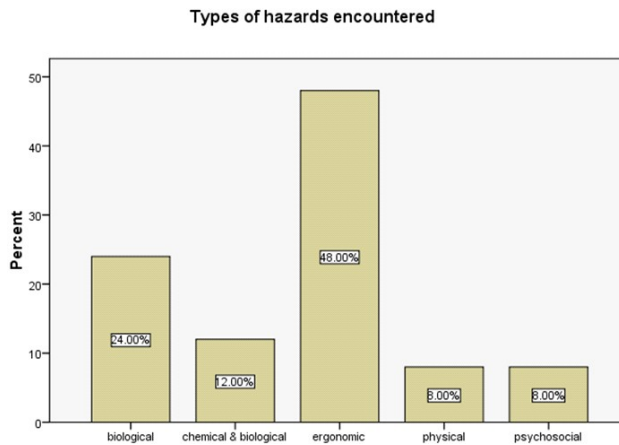


Figure 1. The Types of Hazards Faced

Furthermore, Figure 1 shows a 24% increase in biological dangers encountered by solid waste workers. Solid waste attracts rats and insects, both of which can act as disease vectors. Past research on solid waste management has also solid waste also increase the population of insects such as flies, bugs and cockroaches which also increase odours in the community [12]. This research reveals that fermenting organic matter created by uncollected waste breeds disease carrying insects in solid dump sites in Murewa RDC. Some of the reasons for the delays in collecting refuse include fuel shortages and vehicle breakdowns, and this makes Murewa Rural District Council solid waste workers more vulnerable to biological dangers. This problem is most prevalent in the rainy season as the runoff carries refuse in the form of faecal pathogens from one place to the other. The story therefore reveals that solid waste collectors are susceptible to several health infections because they are regularly exposed to bacteria and viruses from the waste they handle. Some of the health infections they are subjected to include diarrhoea, contact dermatitis infections, skin infections, and respiratory diseases. Some interviewed solid waste workers also revealed that they experience eye and nose irritation, severe headaches, influenza and upper respiratory tract irritation because of the continuous exposure to decomposing solid waste.

Biological and chemical hazards such as herbicides, insecticides and pesticides impact's 12% of the total solid waste collection workers who participated in this research as indicated in Figure 1. This discovery resonates with the Jerie [12] who argues that some hazardous residues are a major danger to the solid waste workers when swallowed, inhaled or get into contact with the person's skin. Furthermore, as shown in the bar graph above, 8% of the respondents reported physical dangers when handling sharp objects. Sharp objects injure Murewa Rural District Council solid waste employees, and the cuts wounds become the source of illnesses such as hepatitis B, fungus, or parasites. Past researches also revealed that solid waste workers risk contracting infections such as tetanus if they are not vaccinated after getting into contact with rusty metal fragment and wires [12] [15].

Furthermore, according to the questionnaire answers, psychological dangers account for 8% of the total. The findings also revealed that workers frequently faced stress as a result of the public's purposeful dumping of rubbish on the streets after they had cleaned it up. Some solid waste collection employees in the Murewa RDC admitted to using narcotics (drugs) to boost their strength and to overlook the unpleasant odours at dump sites and bins. These results are consonant with the discoveries by Magaji and Dakyes [16] who revealed that some solid waste collectors use drugs to stimulate their strength to deal with the unpleasant situations they face when doing their job.

4.3. Level of Awareness to Solid Waste Management Risks in Murewa Rural District Council

The pie chart in Figure 2 depicts Murewa RDC's solid waste management staff level of awareness about workplace safety. The chart also demonstrates that 24% of solid waste workers stated that their

job is unsafe, while 76% stated that their job is safe. This demonstrates that while some respondents were aware of occupational dangers at work, the majority have limited knowhow of occupational health and safety standards.

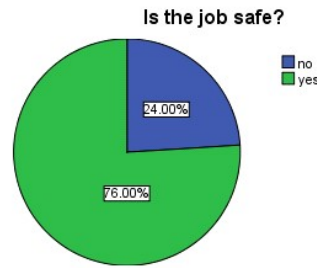


Figure 2. Awareness Level of Respondents

While some workers can identify the concerns related to health and safety, they did not know the overall impact that these hazards have on their long-term health status. However, with these results it shows that the workers are not fully aware of the risks associated with their job as compared to the office workers.

4.4. The Occupational Injuries Affecting the Solid Waste Management Workers in Murewa Rural District Council

Primary data in Table 2, indicates that 28% of respondents are suffering from back problems, 16% acknowledged to having diarrhoea, and another 16% complained of strains and sprains. In terms of skin infections, 12% of solid waste workers reported having skin infections as a result of hazardous material handled at work. Solid waste management labour exposes workers to health risks such as respiratory infections and headaches, which account for 8% of the total. The major concern, however, is that due to lack of medical insurance these workers do not seek immediate medical attention. These workers indicated that they cannot afford medical aid insurance because their salaries are low.

Table 2. Types of Injuries/Illnesses Encountered

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Back Pains	7	28.0	28.0	28.0
	Chest Pain	1	4.0	4.0	32.0
	Cuts & Pricks	2	8.0	8.0	40.0
	Diarrhoea	4	16.0	16.0	56.0
	Headaches	2	8.0	8.0	64.0
	Respiratory Infection	2	8.0	8.0	72.0
	Skin Infection	3	12.0	12.0	84.0
	Strains & Sprains	4	16.0	16.0	100.0
	Total	25	100.0	100.0	

Table 2 also shows that 4% of respondents had experienced chest problems as a result of manual sorting chores that frequently entail reaching, lifting, and twisting, as well as inhaling foul odours. These observations resonate with the findings by Tshivhase et al. [17] who discovered that chest and sinus problems amongst solid waste collection workers are on the rise because these workers continuously breath unpleasant dust and odours from dumpsites.

4.5. The Causes of Injuries and Illnesses to Solid Waste Management Workers in Murewa Rural District Council

The Table 3 below indicates the causes of the injuries and illnesses, with 28% being contact with objects in waste. Contact with objects in waste mainly causes diseases like skin infections, diarrhoea, hepatitis B and tetanus to mention a few. Lifting is shown by 24% being the second highest proportion whereby the refuse collectors in Murewa RDC are involved in a lot of manual work as they

carry plastic and metal bins with waste thereby affecting their well-being. In a related study conducted in the United Kingdom, Lissah et al. [18] observed that accidents such as cutting and trios due to lifting and moving solid waste bins are prevalent amongst solid waste collection workers. Handling of waste collection cans and related materials subjects' workers to several occupational injuries. These observations are also consonant with the findings by Tshiyhase et al. [17] who discovered that solid waste collection is a physically demanding occupations that make the workers susceptible to several injuries.

Table 3. Causes of Injuries/Illnesses

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Awkward postures	3	12.0	12.0	12.0
	Contact with objects in waste	7	28.0	28.0	40.0
	Contact with waste equipment	4	16.0	16.0	56.0
	Lifting	6	24.0	24.0	80.0
	Repetitive movements	3	12.0	12.0	92.0
	Thermal conditions	2	8.0	8.0	100.0
	Total	25	100.0	100.0	

Table 3 shows that 12% is repetitive movements, these are as a result of repeated action that is done when they shovel rubbish on different waste bays in the residential areas. The waste collectors' injuries/illnesses are also caused by thermal conditions indicated by 8%. Solid waste management work in Murewa RDC is conducted in an outdoor environment hence exposing workers to excessive heat which has a probability of causing headaches, heat stress, sun burns and fatigue as well as excessive cold resulting in cold stress and reduced activeness. Awkward postures are also shown by 12% this was largely revealed by the tractor driver and compactor driver who are mainly involved in reversing activities thus leaving them in situations they have to turn their necks in awkward postures when they are trying to reach waste dumps or bays.

4.5.1. Association between Examples of Waste and Type of Hazards

The research uses the Chi-square test of significance to determine the relationship between waste and type of hazard. The null and alternate hypotheses tested were as follows:

H1 – The type of waste and the nature of the hazard are closely connected.

H0 – There is a disconnection between the type of waste and nature of hazard.

Table 4. Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	70.000 ^a	16	.000
Likelihood Ratio	49.481	16	.000
N of Valid Cases	25		

*a. 25 cells (100.0%) have expected count less than 5.
The minimum expected count is .16.*

The Chi-square tests indicate that $0.000 < 0.05$, accept H1. This demonstrate that there is a linkage between the type of waste and the nature of the hazard that solid waste collection workers are prone to experience. Thus, it can be noted that the nature of hazards that a solid waste collection worker is subjected to depends on the type of waste they handle.

4.5.2. Testing the Association between the Types of Injuries Encountered and Types of Hazards

The study also used the Chi-square test to ascertain the nexus between the type of injuries experienced by solid waste collection workers and the nature of the hazard they encounter. In this regard's, the hypotheses tested for this purpose were:

- H0 – The is no connection between the nature of the hazards and types of injuries/illness*
H1 – The types of injuries/illnesses and are associated with the nature of the hazards

Table 5. Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.000E2 ^a	28	.000
Likelihood Ratio	67.668	28	.000
N of Valid Cases	25		

*a is 40 cells (100.0%) have expected count less than 5.
 The minimum expected count is .08.*

The Chi-square output shows that there is a strong association between the injury or illness type and the type of hazard that a solid collection worker's is exposed to. Thus, the study noted that due to the statistical significance shown in the Chi-square, it can be ascertained that the injuries and illnesses experienced by solid waste collection workers in Murewa RDC are linked to the hazardous environments in which they work in daily. The solid waste collected by these workers is therefore a primary risk to their safety and health well-being.

4.5.3. Testing the Relationship Between Years of Working Experience and Frequency of Injuries

The study used the Chi-square to determine the significance of the association between a worker's experience and the regularity of frequency of injuries they encounter. The hypothesis tested for this purpose were as follows:

- H0 – There is no association between the frequency of work-related injuries and the worker's experience.*
H1 – The frequency of work-related injuries is linked to the worker's experience.

Table 6. Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	44.107 ^a	20	.001
Likelihood Ratio	40.457	20	.004
N of Valid Cases	25		

*a is 33 cells (100.0%) have expected count less than 5.
 The minimum expected count is .12.*

Since a statistical significance of 0.001 which is less than 0.05 was observed, the study accepts H1 which then establishes that there is an association between frequency of accidents and injuries encountered by solid waste workers in Murewa RDC and their experience on the job. This implies that by being more experienced on the job, a solid waste collection worker is less likely to encounter may injuries and accidents because they would have accumulated more experience on the hazards that are common to their job. This also suggest that those who are less experienced are at more risk to be involved in accidents and to sustain injuries.

4.6. Measures in Place to Reduce Injuries or Illnesses by the Murewa Rural District Council

To reduce occupational risks, the Murewa RDC employs methods such as providing PPE to their employees and providing them with milk. Figure 3 below shows how Murewa RDC provide PPE as a

measure, which is represented by 68% of the respondents, and 32% of the respondents disclosed that they are sometimes given milk to prevent health threats that influence the respiratory system.

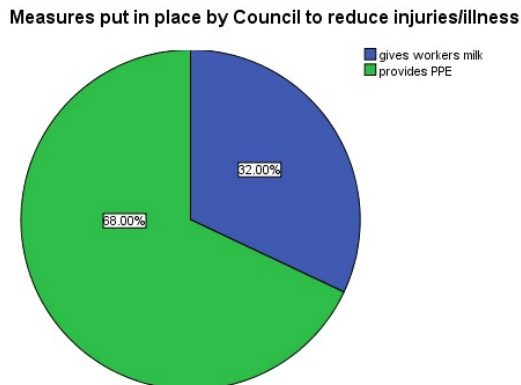


Figure 3. Measures implemented by the Council

4.7. The use of PPE by Solid Waste Management Workers at Murewa Rural District Council

Murewa RDC solid waste workers use PPEs to varying degrees owing to different factors. In figure 4 below, the variations in PPE use in the Murewa RDC is presented as percentiles.

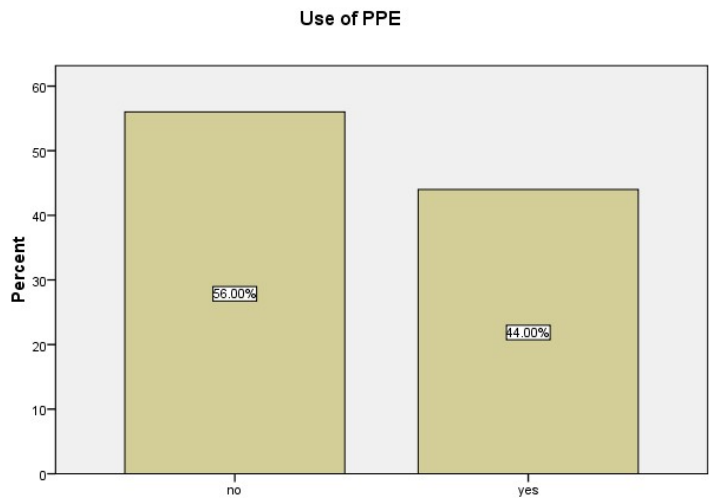


Figure 4. PPE Use Frequency

Figure 4 depicts survey results from 56% of respondents who did not use PPE. As waste handlers revealed that if they use them, they incur various sorts of bodily discomfort. To demonstrate low usage of PPEs 44% of respondents stated that they use PPE to protect their health. The study also revealed that some of the workers who use PPEs do not know how to use them because of lack of PPE use training. The study also reveals the most vulnerable waste handlers are as a result of the Rural District Council not actively assuring appropriate supply of PPE, ensuring that given PPE are intact and functional, and that they are also appropriately used. Other past researchers like Made et al. [19] have also demonstrated that when employees do not use PPEs, they are susceptible health risks such as respiratory diseases, burns, wounds, hepatitis, dermatitis as well as snake bites. In the current study, solid waste collection workers in Murewa RDC indicated that their management is not fulfilling their obligation to provide them with suitable and sufficient PPEs as stipulated under Statutory Instrument 68 of 1990. In an interview with a health, it was revealed that while PPEs are the last line of defence

to protect worker from risks, councils in Zimbabwe are not properly meeting their mandate of ensuring that these are provided in time for the workers to be protected from the various health and occupational health hazards that are associated with their work.

4.8. The Possible Ways Proposed by Solid Waste Workers to Reduce Occupational Hazards

Questionnaire respondents were asked to suggest improvements to the current Occupational Safety and Health situation in Murewa RDC. Almost 28% of the respondents suggested that the council supply them with suitable PPE. This indicates that some Murewa RDC solid waste collection workers are aware of the benefits of utilizing PPE because they are aware of the hazards of handling waste without the PPEs. A quarter of the workers suggested that they expect to be provided milk to help them manage their chest problems. This means that a significant proportion of workers are unaware of the threats to their health and safety related with their profession, as well as the preventative measures. The other 20% of the respondents suggested that the Council provide them with sanitary facilities such as hand sanitizers or washing soap after work. The other group of workers (28%) thought they should be reimbursed for medical expenses because they chose self-medication. In addition, 12% of respondents requested that the council conduct refresher courses as well as provide activities such as sports to relieve work stress and exercise their bodies for fitness.

Table 7. Showing the Suggested Measure by Employees

	Intervention	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Give us milk	3	12.0	12.0	12.0
	Pay medical bills	7	28.0	28.0	40.0
	Provide adequate PPE	7	28.0	28.0	68.0
	Provide sanitary facilities	5	20.0	20.0	88.0
	Refresher courses	3	12.0	12.0	100.0
	Total	25	100.0	100.0	

Furthermore, the commitment to implement the Occupational Safety and Health Policy especially by the top management can ameliorate occupational hazards among solid waste workers in Murewa RDC. Data gathered through open-ended questionnaires and interviews revealed that there is clear lack of commitment to fully implement the Occupational Safety and Health (OSH) Policy at Murewa RDC by the top management. The findings of this study point's to the conclusion that there is low prioritization of occupational safety and health issues amongst solid waste workers in Zimbabwean rural district councils. The study indicates that the implementation of OSH policies and regulations is a secondary issue in Zimbabwean RDCs as the budgeted funds were transferred to other needs in the waste management department. It was also cited that there is no standing Safety Health and Environment (SHE) committee and a practitioner (Safety Health and Environment Officer) in the organisation and also high financial constraints in implementing an OSH Policy. In this regard, one interview respondent (Respondent B) highlighted that:

“The implementation of the Occupational Safety and Health Policy, whose successful implementation depends on top management's full commitment, can reduce the occupational hazards faced by waste employees. The Murewa Rural District Council's administration should direct the required resources toward OSH Policy implementation if they are concerned about the welfare of their personnel.”

In tandem with respondent B, Respondent A noted that:

“It is sad that we did not do enough to protect our waste management staff from the risks related with the nature of their work. As much as the Council is working hard to overcome budgetary obstacles, it is difficult to overlook the necessity of executing statutory requirements that compel council to prioritize the occupational safety and health well-being of our waste management staff, which we have been lacking as an organization.”

It seems RDCs in Zimbabwe are not fully compliant to the International Labour Organisation (ILO) principles of promoting safe, humane, and health working environments through providing the

necessary conditions to ensure OSH. The working conditions of RDC solid waste collection workers is a demonstration of lack of compliance with the OSH Convention adopted in 1981 (Convention 155) and recommendation 164, which applies to an accident and injury-free working environment. While public organizations are encouraged to implement measures to promote the principles of SI 68 of 1990, which states the duties of the employer, who must establish a safety committee, provide OSH training during working hours, ensure the provision of information, instruction, and supervision to protect the worker, this seems to be a far-fetched goal in Zimbabwe as experiences from Murewa demonstrated.

This is largely because the Murewa RDC lacks all of the above-mentioned duties as an employer, leaving workers vulnerable to a hazardous working environment. SI 68 also includes regulations that provide for worker compensation and timeous submission of injury claims to National Social Security Authority (NASSA) in cases of occupational accidents and injuries. However, the study reveals that the Council lacks any documented accident reporting procedures and instead refers injured workers to a local clinic on their own. The department does not have an emergency preparedness and response strategy, which includes first aid facilities. The instrument also includes the worker's responsibilities, such as reporting any hazards that the worker is aware of and having medical examinations at the times and locations specified.

In addition, the Pneumoconiosis Act [Chapter 15:08] which applies to workers in dusty occupations, is a crucial piece of legislation regarding solid waste disposal. All workers are required by the Act to have medical examinations, which include pre-employment, periodic, and exit medical examinations. As a result, Murewa RDC solid waste workers must comply with these regulations, as the Act provides for employee compensation if they suffer pneumoconiosis. Pneumoconiosis is a common and incurable lung infection amongst solid waste collection workers as it is caused the regular inhalation of organic or inorganic dust. It is one of the deadly OSH threat amongst solid waste collection worker in Murewa RDC.

5. Conclusion

The intensity of OSH hazards remains high amongst solid waste collection workers in Zimbabwe as the Murewa RDC case as typified. Waste collection workers will continue to be exposed to all forms of waste-related illnesses if suitable risk-mitigation measures are not implemented on time. The fact that waste collection methods are carried out using labour-intensive systems, causing workers to suffer significant physical loads is worrying as this often results in musculoskeletal disorders. There is also a great deal of reliance on the usage of PPE, which has been shown to be ineffective due to inappropriate application, inconsistent supply, and insufficient materials, causing workers not to use it constantly to maintain safety, which is opposed to S1 68 of 1990. This displays a lack of awareness of waste workers' safety and health issues, as PPE merely acts as a barrier, not an elimination of the threat. The provision of full body cover to all solid waste collection workers remains essential. As a result, according to the study, it is critical to regularly provide waste management training to council staff responsible for waste collection in order to eliminate the hazards. Furthermore, the Council must develop a health check measure, such as pre-placement and periodic medical examinations, for solid waste workers to have an early detection of their health problems so that, in the event of ailment identification, they may be responded to as soon as possible. In addition, the Murewa RDC ought to consider hiring more personnel in order to reduce the workload on their limited staff in the waste collection department.

The limitation of this study is that it was conducted in only one Rural District Council which may make it difficult to extrapolate the findings to the rest of the country. Future studies could focus on at least two districts in each province in Zimbabwe to establish a comprehensive picture of the OHS hazards in Zimbabwean local authorities through a cross sectional survey.

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