



Unveiling The Safety Disparity: Knowledge VS Practice in Waste Scavenging in Yola North Urban Area, Nigeria

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ABSTRACT

Waste scavenging is an important activity in developing countries aiding resource recovery and poverty reduction. Despite knowing the dangers posed by the activity, the waste scavengers' occupational safety is to some extent compromised due to poor utilization of Personal Protective Equipment (PPE). This study investigated the disparity between knowledge and practice of waste scavengers regarding occupational risks and safety measures in Yola urban area, through surveys and interviews with 405 participants across 55 dealers' depots. The study findings discovered 375 waste scavengers recognized the potential hazard associated with scavenging job, out of which only 41 were actually using PPEs regularly. While 30 claimed ignorant of the potential risks of the activity. This therefore categorized waste scavengers into three distinct groups in Yola urban area viz: "Safe Scavengers" who possess the knowledge of dangers of scavenging and use one or more PPE regularly 41 (10.12%); "Knowledgeable non-PPEs users" who have the knowledge but do not use PPE 334 (82.47%); and "Unaware non-PPEs users" lacking both knowledge and PPE usage 30 (7.41%) mostly children. Null hypotheses were formulated where significant difference observed between Knowledgeable non-users and safety practice ($p=0.016$). On the other hand, no significant difference found between Safe Scavengers and safety practice ($p=0.053$); as well as Unaware non-users and safety practice ($p=0.060$). Pie chart clearly shows the knowledge/practice gap and three distinct group of the scavengers. Recommendation proposed involvement of scavengers' middlemen and waste management authorities in developing comprehensive strategies that promote a culture of safety, provide training on safety practices, and ensure the availability of appropriate protective gear to narrow down the gap.

Keywords: Waste scavengers, PPEs, Knowledge, Practice, Gap, Yola

1.0 INTRODUCTION

Waste scavenging plays an important role in resource recovery and poverty alleviation, especially in poor African countries. The process of waste scavenging involves the collection, purchase, and recovery of usable materials from waste (Keylla *et al.*, 2024). The people who scavenge are called waste scavengers. They can also refer to as waste pickers, waste salvagers, waste reclaimers or recyclers (Kodia *et al.*, 2023), estimated about 20 million worldwide (Rava Zolnikov, 2023).

Earlier studies narrate how waste scavenging helps recover raw materials for recycling enterprises which in turn creates jobs for the people. For instance, (Omotosho, 2020) sees waste scavenging as a means of livelihood in southwestern Nigeria. Ali & Yusuf (2021) also discover 40% of artisans and small-scale industries in Onitsha, southeastern Nigeria receive 48% of their raw materials from scavenging materials.

Ali & Yusuf (2021) emphasized that about 86% of waste scavengers generate more than ₦20,000 monthly in Warri, (South-Southern Nigeria) surpassing the minimum wage scale in the Nigeria at that time. Gulasan,

(2019) sees waste in an artistic point of view; the author stressed that the artists are integral to the process of waste to wealth in a unique and amazing way in ensuring environmental sustainability in Nigeria. Samotu *et al.*, (2014) research work, among many has provided another way of converting commercial wastes, especially empty water sachets into composite material for automobile application in Nigeria. (Familusi *et al.*, 2019) worked on converting cassava peel ash as replacement for cement also in Nigeria. Moreover, Muktar (2011) finds out that contribution of scavengers towards economic growth in Kano (North-western Nigeria) is significant, He went ahead to conclude that scavenging provides employment to youth that are hitherto not employed.

In the same vein, Magaji, (2020) study in Gwagwalada Abuja (North-central), also lamented that waste scavenging and recycling provide both income and reusable product for the poor, and in many cases reduces stress and importation of raw materials in the country (Nigeria) However, Kadafa *et al.*, (2013) worked on organic waste materials from cities of Nigeria, thus identified potentials of the organic waste as substitute to chemical fertilizer, in addition to the reduction of the

large quantity of solid waste for final disposal, reducing air pollution and ground water leachate and also employment generation for more income are also among the benefits of waste to wealth found by the study.

However, despite the dual role play by the waste scavengers, the waste scavengers' occupational safety remains a major challenge due to the poor safety practices and inadequate utilization of Personal Protective Equipment (PPE) (Kodia et. al., 2023 & Olanrewaju, 2023). In many waste scavenging activities, individuals are exposed to various occupational hazards such as sharp objects, hazardous chemicals, smoke and infectious waste items and musculoskeletal injuries (Bonini-Rocha, 2021, Faraja et al., 2023 AND Auta, 2020). While knowledge of these risks is critical, it is equally important to understand whether waste scavengers effectively apply their knowledge to ensure their safety by utilization of PPE which is the key preventive measure in minimizing occupational hazards. with their job has been confirmed by earlier studies (e.g., Uthman et al., 2017; Kodia et. al., 2023; and Nzeadibe, 2019). However, their inconsistent use of personal protective equipment (PPE) for safety indicates a discrepancy between their knowledge and practice regarding occupational risks and safety. It is against this background that this study aimed to investigate the extent of the gap between waste scavenger's knowledge and practices as well as the

factors that lead to this gap. By examining the factors contributing to this gap, insights can be gained to inform stakeholders, policies and interventions designed to ensure safety of waste scavengers.

2.0 MATERIALS AND METHODS

2.1 Study Area

The study was conducted in Yola urban area, in the North-eastern region of Nigeria, located between 9° 12" and 9° 20" north of the equator, longitude 12° 20" and 12° 28" of the greenwich meridian at an elevation of 616m above sea level. The urban area has a population of 307, 505 inhabitants (National Population Commission, 2022). The urban area became refuge for migrants from neighboring towns of Borno state such as Chibok, Gwoza, Kwanduga and also Mubi, Michika, Madagali of southern Adamawa state that were conquered by Bokoharam few years ago. The influx of migrants increased reliance on informal activities especially waste scavenging, as it doesn't require any skill, qualification or startup capital. Another important factor is the challenge of out-of-school children, Yola north ranked ninth in Nigeria. 478,412 as at 2022 (UNESCO 2022), which is largely formed by Almajiris (Qur'anic itinerant students) and the migrants. The urban area has 11 wards viz, Ajiya, Alkalwa, Doubeli, Gwadabawa, Karewa, Limawa, Jambutu, Luggere, Rumde, Nassarawo and Yelwa.

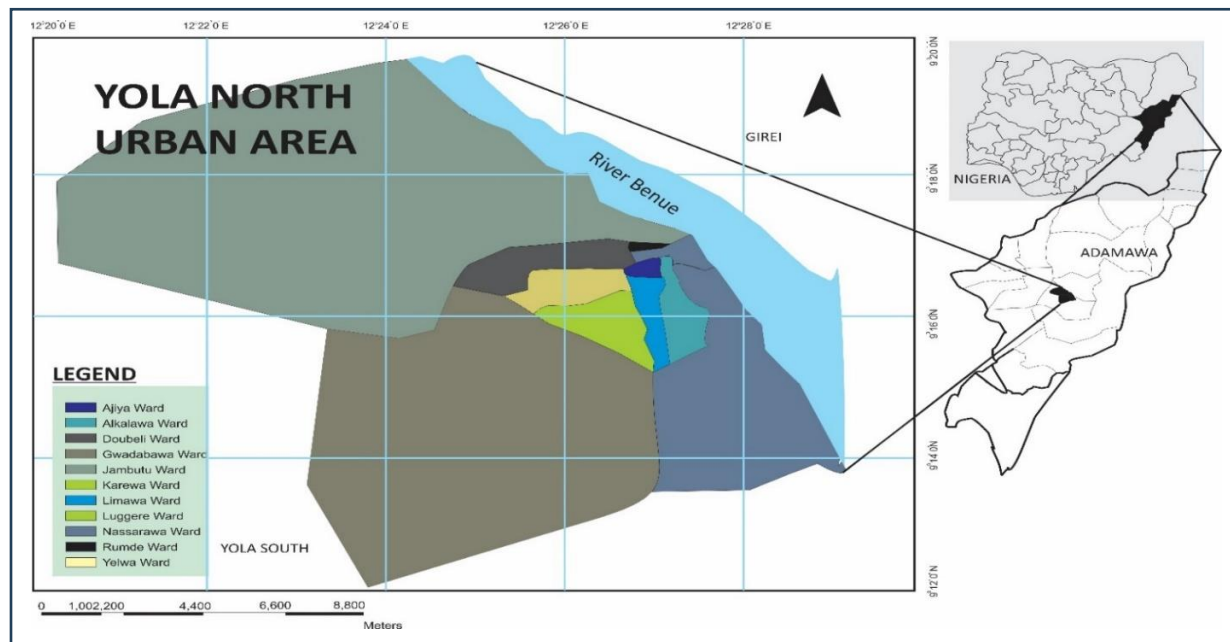


Figure 1: Map of the Study Area

The waste management systems challenge in Yola urban area is not different from what seen in other cities of Nigeria, e.g., Kodia et al (2023) in Maiduguri, Ali & Yusuf (2021) in Bauchi Chukwunonye & Clive (2012) in

Abuja; Nzeadibe & Anyadike (2012) in Aba; Kofoworola (2007) in Lagos; Maigari (2014) in Kano and Ferranato & Torrenta, (2019) in developing countries. The system reflects low levels of public



awareness and poor institutional/regulatory framework for sustainable solid waste management. By virtue, the system encourages scavenging activities by exposing waste items in open dumpsites, uncompleted buildings, drainages and even in the streets, readily available for salvage. Even though it is somehow beneficial to both economy and the environment, it should have been in a more organize system.

The study adopted mixed-methods approach, which includes surveys and interviews, to collect both quantitative and qualitative data from a representative sample of waste scavengers in Yola urban area. Quantitative analysis provides an overview of the knowledge levels, safety practices, and PPE utilisation among waste scavengers. While qualitative insights help in identifying the barriers and challenges faced by waste scavengers in implementing safety practices and PPE utilization.

2.2 Sample and Sampling Procedure

Waste scavengers are hard to reach people due to their mobile nature, making it difficult to be located at specific time and dumpsites (Ali & Yusuf, 2021). This necessitates the researchers to targeted the places where waste scavengers sell the collected recyclables, known as middlemen shops. Middlemen act as intermediaries in the recycling chain, buying and storing waste recyclables before transferring them for final recycling.

Stratified and simple random sampling approach were adopted in selecting 55 middlemen shops out of 117 recognized middlemen from the scavengers' union. The selection was based on the type of recyclables they purchased, such as plastic bottles, rubber, metal items (such as aluminum and cables) and carton boxes. Within these shops, 405 waste scavengers were randomly sampled. The visits to the sampled locations were conducted between 3pm and 6pm, when waste scavengers arrived at the middlemen shops to sell their recyclable items.

2.3 Data Analysis and Tool

Mean standard deviation was used in evaluating knowledge of the waste scavengers on health and safety

risks of their occupation using SPSS. This was achieved using 5-point likert rating scale, where an item with the mean response of:

5.00 – 4.50 was considered as Strongly Agree

4.49 – 3.50 Agree,

3.49 – 2.50 Neutral,

2.49-1.50 Disagree and

<1.50 Strongly Disagree

Subsequently, chi-square statistical tool was used at p-0.05 value to find the association between knowledge of the waste scavengers on occupational risk and safety practice in the dumpsites. The results were presented in tables, charts and text.

3.0 RESULTS AND DISCUSSION

The findings presented in table 1 indicate all the respondents were male. This shows that waste scavenging is a male dominated occupation in the study area, which could be attributed to the culture of the people in the Northern Part of Nigeria prohibiting women from participating in more hazardous and labour demanding Occupation (Kodia et. al., 2023). The finding is in agreement with other studies in different parts of the world that revealed scavenging as male dominated occupation (Nzeadibe, 2019, Asim, *et al.*, 2012; Rockson, *et al.*, 2013, Taiwo *et al.*, 2022; Nuhu *et al.*, 2022, Kodiya *et al.*, 2023). The findings also revealed that Underaged children and teenagers form most of the waste scavenging workforce (62.96%). This is a cause for concern as most of these children don't go to school at all and are continuously being exposed to occupational hazards. It was observed that significant numbers of the waste scavengers are uneducated (45.93%) and lack the basic skills to work in formal sectors, leaving them with no better alternative than to engage in waste scavenging for survival. Also, 53.58% of them work for more than 8 hours a day and 66% worked 7 days a week. This is hazardous and not in line with the international Labor Organization practice and EU Directives that stipulates 48 hours as the ideal worktime per week with a maximum of 8 hours per day. The implication of this finding is presumed that prolonged duration of work in awkward postures may cause muscular-skeletal discomfort such as backache, fatigue and overstretching of muscles and joints



Table 3.1: Waste scavengers' socio-demographic and Occupational characteristics

Characteristic	Frequency	%	Characteristic	Frequency	%
Sex			Working Experience		
Male	405	100.00	1 year below	151	37.28
Female	0	0.00	2-5 years	124	30.62
<i>Total</i>	<i>405</i>	<i>100.00</i>	6-10 years	96	23.70
Age			11 and above	34	8.40
18 and below	255	62.96	<i>Total</i>	<i>405</i>	<i>100</i>
19-29	121	29.88	Working Season		
30-39	19	4.69	All Seasons	217	53.58
40 and above	10	2.47	Dry season	176	43.46
<i>Total</i>	<i>405</i>	<i>100</i>	Rainy Season	12	2.96
Educational Level			<i>Total</i>	<i>405</i>	<i>100</i>
None	186	45.93	Working Hours		
Primary	166	40.99	1-5 Hours	176	43.46
Secondary	53	13.09	6-11 Hours	220	54.32
Tertiary	0	0.00	12 and above Hours	9	2.22
<i>Total</i>	<i>405</i>	<i>100</i>	<i>Total</i>	<i>405</i>	<i>100</i>

3.1 Knowledge of Occupational Hazards among Waste Scavengers

The knowledge of waste scavengers concerning OHS in work place is presented in Table 3.1, the study revealed that majority (92.47%) of the waste scavengers in the study area demonstrated a high level of knowledge regarding the risks and hazards associated with waste scavenging. The high percentage of waste scavengers demonstrating knowledge of these dangers is encouraging from a safety perspective. This knowledge is an important step in promoting occupational safety and implementing appropriate preventive measures and also targeted interventions to improve the safety practices and well-being of waste scavengers. The reported 92.47% knowledge in this study is higher than observed in a related study in Ilorin that reported 57.3% of the scavengers had knowledge of the work-related hazards associated with their occupation (Uthman *et al.*, 2017).

Table 3.2: Knowledge of Occupational Hazards among Waste Scavengers

SN	Knowledge on Occupational Risk	Mean	%
1	Contacts or bites by Rodents and Vectors cause Infectious diseases or even kill instantly	4.93	98.5
2	Puncture by sharp object can lead to blood borne diseases such as HIV, Hepatitis, tetanus infections etc.	4.91	98.2
3	Waste associated fauna such as Dogs, Feral cat and snakes can bite or even kill	4.88	97.6
4	Contact with human & animal faeces cause diseases e.g Hepatitis, Typhoid, Cholera etc	4.49	89.8
5	Lifting of heavy loads, alternate bending and trekking cause musculoskeletal disorder	4.62	92.4
6	Risk of picking poisonous containers mixed with solid waste	4.44	88.7
7	Avoiding contact with biological wastes	4.89	97.8
8	Consequence of eating/taking of remnant food/can drinks from dumpsite	4.88	97.6
9	Liquid runoff water from decomposing waste known as leachate can cause pathogens or bacteria that lead to sickness	4.83	96.6
10	Exposure to waste smoke/chemicals (Methane gas) through inhalation cause long-time respiratory illness such as pneumonia	4.01	80.39
11	Accident cause by refuse truck can harm or even kill	4.84	96.7
12	Underneath dumpsite fire can cause serious injury (Fire hazard)	4.93	98.5
13	Attacks by mad people in the dumpsites and its legal implication	4.91	98.2
14	Taking shower after working hours	4.93	98.5
15	Hand washing before having meal/or using spoon	4.61	92.1
16	Changing cloth after working hours	2.99	59.8
Total		74.09	1481.39
Average		4.63	92.59

Source: Field work, 2024

3.2 The Use of Personal Protective Equipment (PPE) Among Waste-Scavengers

It was observed in this study that there is low and inconsistent use of PPE's as only a fraction (10.19%) of waste scavengers regularly uses some form of protective gears against the hazards. The results also revealed that 13.79% of waste scavengers reported using PPE sometimes, while 19.86% indicated rare utilization of protective equipment. Slightly more than half (56.16%) of the waste scavengers do not use any form of PPE at all. The reason for not using the PPE was mainly attributed to discomfort and poor economic condition in the country that have played a major role in the availability and affordability of all these important protective gears and equipment. The high percentage of scavengers not using PPEs reflects a significant gap in occupational safety practices, putting these individuals at an increased risk of encountering hazards and potential health problems associated with the scavenging activities. This finding contrasts with the results of previous studies conducted by Uthman *et al.* (2017) in Illorin and Marahatta *et al.* (2017) in Kathmandu Metropolitan urban area, which reported PPE utilization rates of approximately 33.2% and 45.8% respectively among waste scavengers.

Table 3.3: The Utilization of Personal Protective Equipment among Waste Scavengers

PPE	Regularly	Sometimes	Rarely	Never	Total
Hand gloves	43	64	87	211	405
Safety Boot	87	69	87	162	405
Push cart	21	44	61	279	405
Nose Mask	19	34	94	258	405
Grabber	32	76	35	262	405
Protective cloth	0	3	12	390	405
Sorting Fork	87	101	187	30	405
Total	289	391	563	1592	
Average Use	41.29(10.19%)	55.86(13.79%)	80.43(19.86%)	227(56.16%)	

Source: Field work, 2023.

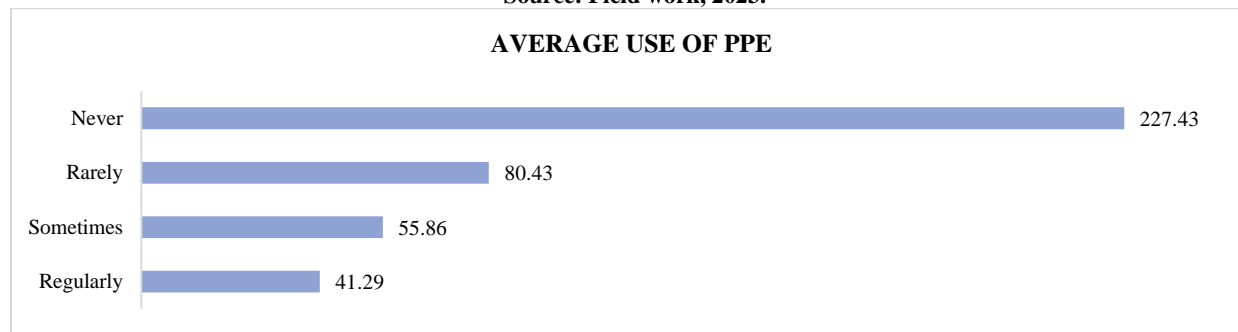


Figure 1.2: Average use of PPE

3.4 Existing Gap Between Waste Scavengers' Knowledge on Occupational Risks and Safety Practices with PPE Utilization

With respect to the existing gap between scavengers' knowledge of hazards and PPE Utilization, the result showed that majority (92.59%) of the waste scavengers are aware of the occupational hazards associated with their job but only 10.12% use one or more PPEs regularly (*see table 3.3*). The implication of this finding is presumed that despite knowing the dangers associated with scavenging, scavengers are less concerned about taking measures against occupational hazards. This indicates that waste scavengers in urban Yola have varied approaches to occupational hazards and safety and therefore this study categorized scavengers into safer scavengers, knowledgeable non-PPE users and Unaware non-PPE users. Safer Scavengers in this study refers to those who possess knowledge about occupational risks and use PPE, consist of only 10.12% of the scavengers. Knowledgeable non-PPE users refer to scavengers who are aware of occupational risks but do not utilize PPE, and they form the majority (82.47%) of this study. Furthermore, Unaware non-PPEs users comprise of waste scavengers who lack knowledge of occupational risks and consequently do not use PPE (7.41%).

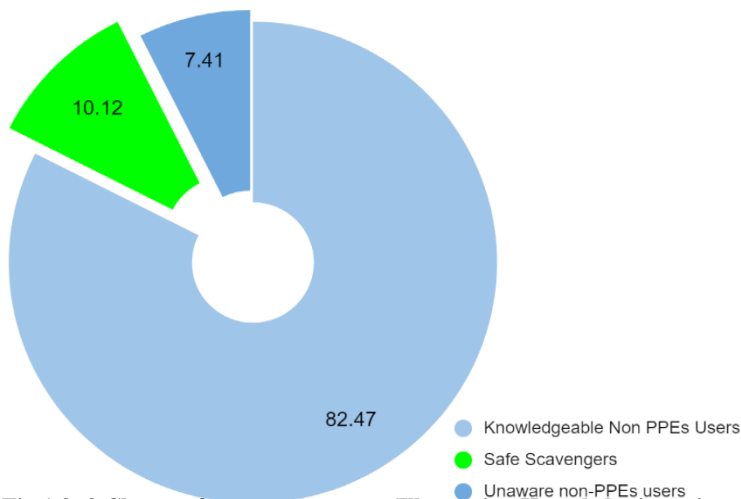


Fig 1.3: 3 Classes of waste scavengers (Illustrating Knowledge/practice gap)

Table 3.4: Knowledge of waste scavengers on occupational Hazards versus PPE Utilization

Variables	X ²	d.f	P value
Unaware non-users of PPEs Scavengers	649.22	1	0.060
Knowledgeable non-users of PPEs Scavengers	189.96	1	0.016
Safe Scavengers	246.11	1	0.053

Source: Field Work 2023

Chi square test was performed to determine the influence of knowledge of occupational hazards on use of PPE. The result revealed that there is no significant association between Unaware non-users of PPE Scavengers and Use PPE ($p=0.060$). Similarly, no significant association was found between Safe Scavengers and use of PPE ($p=0.053$). However, a significant association was found between Knowledgeable Non-users of PPE Scavengers and Use of PPEs ($p=0.016$). Specifically, the chi square results showed that knowledge is not a determinant of PPE Utilization among scavengers in the study area. This might be attributed to the reported high knowledge of occupational hazards with corresponding low utilization of PPEs in the study area.

4.0 BARRIERS TO BRIDGING THE KNOWLEDGE AND PRACTICE GAP

Extract from the interview session, discovered how waste scavengers' perceptions varies on occupational risk and safety practice. According to the study, numerous contributing factors widen the gap between knowledge and practice of occupational risk and safety among waste scavengers. These includes:

- i. Cultural and Superstitious Beliefs: Waste scavengers views may be influenced by cultural beliefs or superstitions regarding scavenging activities as some among the scavengers see work related mishap as supernatural phenomena or attack by Dumpsites

Djinns, especially during the day time. This is why some of the scavengers go for break from 12 noon to 3pm. While some attributed injuries and diseases to the will of God; they believe that no safety attempt will make them free from injuries but the creator's protection. A similar finding by Nzeadibe *et al.* (2012) reported in aba that most of the waste pickers do not believe that the health and safety problems are related to their occupation, but rather the influence of witchcraft from their communities. Chimere *et al.* (2017) found a comparable result across Ibadan, Lagos, and also Aba (however, on e-waste informal workers). Other reasons from some of the scavengers include:

- ii. Negligence and Complacency is rampant among the scavengers, as they become accustomed to working in hazardous situations; mostly, without suffering immediate negative consequences, they began to think superiority in the job and nothing will happen to them. Some even laugh when the interviewer interact with them about potential hazards and consequence of poor safety compliance in the workplace.
- iii. Non-comfortability in using safety gears: some of the scavengers were complaining of discomfort when wearing safety protectives as such they prefer working in dumpsites without any.



- iv. Poverty and Financial Constraints: Some of the waste scavengers show interest in using PPE even though they can't afford to purchase them or seek for proper medical care. Due to their poor socioeconomic conditions, which include meagre income and limited resources, frequently make it impossible for them to prioritised or invest in their own safety.
- v. Lack of Enforcement and Regulation: The study discovered non-involvement of authority or any stakeholder in the enforcement of safety compliance among the waste scavengers. This poor enforcement mechanisms and regulatory monitoring adds to the expansion of the knowledge and practice gap. Waste scavengers may not prioritize or be held accountable for applying safety precautions in the absence of defined instructions and enforcement of safety standards.
- vi. Social Stigma and Marginalization: Waste scavengers are frequently subjected to social stigma and marginalization, which can limit their access to resources, knowledge, and support systems. Lack of social support and appreciation for their labor may deter rubbish scavengers from seeking information on occupational hazards and safety practices. They also lack self confidence in public which could attribute to their perception on how people see them. Even during the interaction with the interviewer, they tend show unwilling to interact freely.

5.0 CONCLUSION AND RECOMMENDATIONS

In conclusion, this study revealed the disagreement between knowledge and practices of occupational health and safety among waste scavengers in Yola North, Nigeria. Despite a substantial portion of waste scavengers demonstrating knowledge of the occupational risks and safety measures associated with the scavenging activities, the regular utilization of Personal Protective Equipment (PPE) remains alarmingly low (less than 3%). The findings of the study revealed some of the factors that lead to poor adherence to safety measures among the waste scavengers which includes: cultural beliefs, negligence and complacency, financial constraints, social stigma and marginalization among others.

Addressing these underlying factors is important to ensure safety among the waste scavengers. This can be achieved through involvement of scavengers' middlemen, waste management authorities, government agencies, and non-governmental organizations in developing comprehensive strategies that promote a culture of safety, provide training on safety practices, and ensure the availability of appropriate protective gear. By closing the gap, safety conditions of the waste scavengers can be enhanced by reducing the risk involved in the

occupation such as injuries, illnesses, and long-term health consequences.

Further monitoring and research efforts will be important to evaluate the effectiveness of interventions, track changes in knowledge and practice, and continuously improve occupational safety in the waste scavenging sector. Finally, the goal should be to create a safer and healthier working environment for waste scavengers, enabling them to sustain their livelihoods while minimizing occupational risks.

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