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Segregation, Storage and Collection of Solid Waste in a Tertiary Hospital in Nigeria: The Oauthc, Ile-Ife, Experience

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Abstract:

- ***Background***

Healthcare waste (HCW) is an inevitable byproduct of providing health services. Healthcare solid waste may generate irredeemable hazards to hospital personnel, society and impair the quality of life of the community if not properly handled. HCW can also cause contamination, pollution, unnecessary carbon emissions and waste of resources.

- ***Objective***

To examine the segregation, storage and collection solid waste generated in Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC).

- ***Method***

Both Primary and Secondary data were collected for this study. Primary data were collected through interview and questionnaire administration. Systematic sampling technique was used to select 60 students, 13 staffs, 43 cleaners, 8 contractors and a management staff for questionnaire administration. Data obtained were analyzed using frequency distribution, pictorial analysis, and factor analysis.

- ***Result***

Findings established that solid waste components generated in the hospital were not segregated in line with the directive of the World Health Organization. The study established that storage facilities were located in close proximity of the users. The study also revealed that waste receptacles colour coding system was not implemented in the wards except virology department.

- ***Conclusions***

The study therefore concludes that the effectiveness of health care solid waste management depends on the facilities and equipment, human resources capacity and frequency of waste collection and disposal.

Keywords: *Waste, Solid Waste, Healthcare Waste, Segregation, OAUTHC.*

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I. INTRODUCTION

Waste is a complex mixture of various substances, and it is generated daily. It is considered as unavoidable by-product of man's developmental activity (1). Waste could occur in four different forms: solid, liquid, gaseous and radioactive (2). solid waste as described by State of Vermont Agency of Natural Resources Department of Environmental Conservation (3) is any tangible and non-free flowing unwanted materials or substance that results from human activities such as domestic, industrial, commercial and agricultural operations. The sources of solid waste are dependent on the socioeconomic and technological levels of a society (4). Sources of solid waste include but are not limited to household or domestic, commercial, industrial, process or manufacturing, construction, and demolition.

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Others may also include agricultural, mining, radioactive, institutional, and most importantly, health care. The focus of this study is on healthcare waste.

Healthcare waste is all waste generated by healthcare facilities, medical laboratories, and biomedical research facilities, as well as waste from minor or scattered sources (5). Waste generated by health-care activities includes a broad range of materials, from used needles and syringes to soiled dressings, body parts, diagnostic samples, blood, chemicals, pharmaceuticals, medical devices, and radioactive materials (6). Besides, it includes the same types of infectious or hazardous waste originating from minor and scattered sources, including waste produced in the course of healthcare undertaken in the home (7). Healthcare solid waste is a special category of waste because it often contains materials that may be harmful (8; 9). The waste produced in the course of healthcare activities carries a higher potential for infection and injury than any other type of waste (10). The waste can cause ill health to those exposed to it such as hospital personnel, society, and the environment (11), if not properly managed.

The appropriate hospital solid waste management (HSWM) is of great importance due to its public health risks and potential environmental hazards. The goal of the hospital solid waste management process is to establish a pathway for the management, reduction, and elimination of biological and chemical problems due to the nature of this waste (12). The HSWM practices cover all processes from the point of identification of waste to the place of disposal (13). HSWM includes all activities involved in waste generation, segregation (separation of HCWs according to their category and labelling waste containers), collection (proper protective equipment and waste transporting utility supply), storage (secured and adequate temporary waste storage space allocation), transportation, treatment, and final disposal and monitoring of all types of waste generated in the Health Care facilities (HCFs).

The healthcare facilities that are established to restore and maintain the community health is also threatening the well-being of the people, through improper management of solid waste generated by the system (14). Healthcare solid waste can generate irredeemable hazards to hospital personnel, society and can also contribute to environmental degradation. Despite the possible danger that healthcare solid waste posed, rational management has not been introduced in healthcare facilities in developing countries most especially in Nigeria. Hence, this study seeks to consider the existing peculiarity in examining the segregation, storage and collection of solid waste generated in Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC) in order to assist in planning for the appropriate healthcare solid waste management system.

II. PREVIOUS EFFORTS

Review of the past studies in developing countries, especially in Africa, shows that hospital solid waste management practices are not effective. Many scholarly investigations, including those conducted by Adeyemo et al. (15) and Babanyara et al. (16), acknowledge that the problem exists. However, they predominantly limit their analysis to identifying "poor attitude" or "lack of training" as contributory factors, neglecting to thoroughly examine the specific systemic and logistical impediments that operate within complex setting like OAUTHC. There is no in-depth qualitative investigation of the root causes of this paradox within specific departments of a large teaching hospital. The internal collection route processes, timing, intermediate storage facility environment, and ergonomics of handling are all vastly under-researched. How often is waste collected from the wards? What is the hygiene status and design of the central storage facility? Is the trolley system working? Work like Longe and Williams (17) provides a general outline but not this level of detailed, operational data. There is disparity in the literature regarding whose category of staff is most responsible for the failures of HCWM. According to some research, waste handlers (cleaners and porters) are the weakest link because they are poorly trained and have low literacy (18). Others suggest that it is the initial failure of the clinical staff (doctors and nurses) who generate the waste and are also responsible for the initial segregation but fail to do it in the right manner, thereby contaminating the entire waste stream (19). Therefore, the objective of this study is to examine the sorting, storage and collection of solid waste generated (SWM) in OAUTHC, Ile-Ife in order to assist in planning for the appropriate and efficient hospital solid waste management system.

III. METHODOLOGY

The investigation employed a combination of both primary and secondary data sources. A total of three distinct sets of questionnaires were distributed for the purpose of the research. The initial set was directed towards the cleaning staff, the second set was intended for the Department of Environmental Health, while the third set was disseminated among students residing in hostels and personnel residing in the residential quarters.

A multistage sampling methodology was implemented for the research. The preliminary stage entails the stratification of the study area into three distinct units: residential zones; medical facilities; and waste management divisions. The residential unit comprises student hostels and staff accommodations. The medical unit includes wards, clinics, and medical departments, while the Waste Management unit encompasses the environmental health and sanitation division, along with laboratory and ward attendants (cleaners).

The reconnaissance survey indicated that there exist 146 rooms within the three student hostels and 64 housing units allocated for staff in the residential quarters. In the subsequent stage, a systematic sampling approach was utilized to select 20 percent of the rooms and buildings in which students and staff reside, which were designated for the administration of the questionnaires.

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The sampling frame for the study encompasses 146 rooms, 64 housing units, 156 cleaners, and one management staff member. However, the sample size consists of 60 students, 13 staff members, 43 cleaners and one managerial individual were selected during the survey period.

Secondary data was procured from wards, and the head of the Department of Environmental Health. The information gathered includes the total number of beds in each ward (where applicable), rooms in the hostel, buildings in the staff quarters, and the cleaners and contractors responsible for waste management. A map of Nigeria illustrating Osun State and the Ife Central local government area was also acquired from the Osun State Ministry of Lands and Physical Planning (Figure 1). Additionally, the map of OAUTHC was obtained via Google Maps showing in Figure 2.

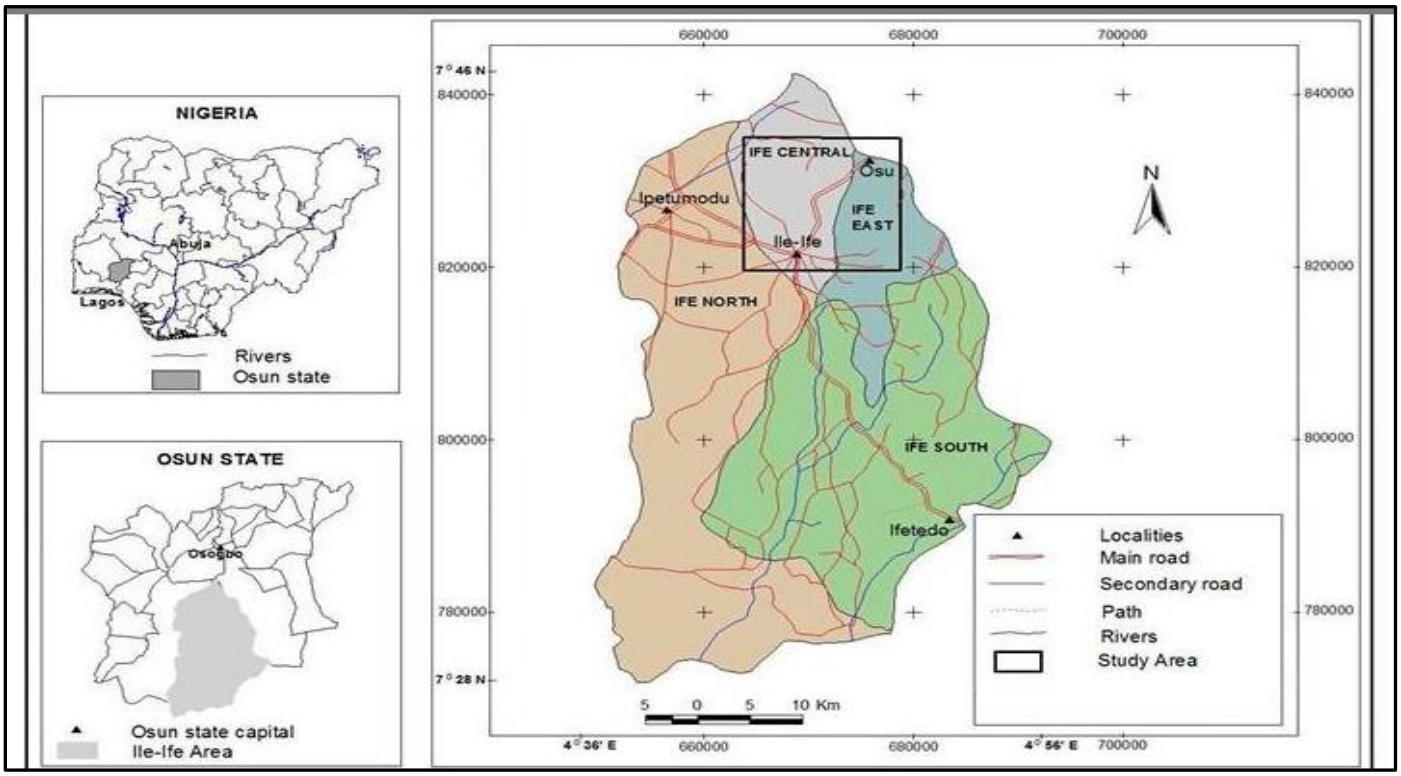

Fig1 Map of Nigeria showing Osun State, and Ife Central Local Government Area Source: Osun State Ministry of Lands and Physical Planning.2024

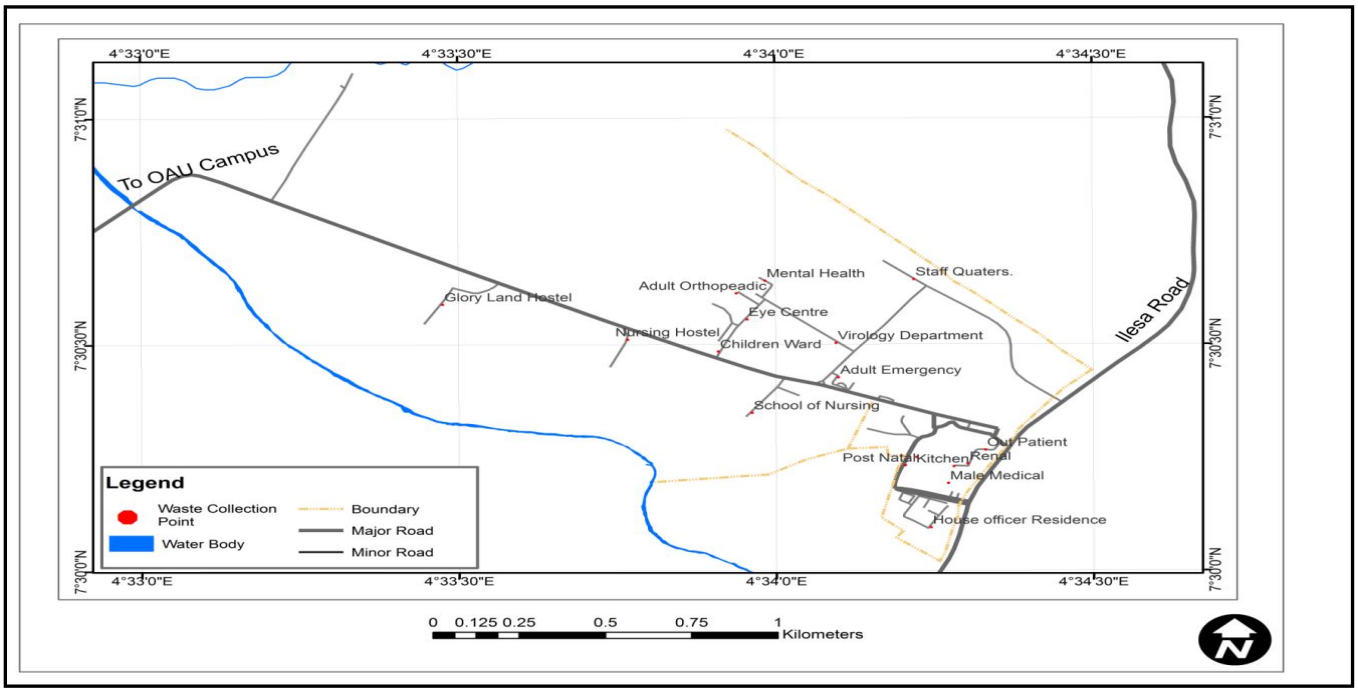

Fig 2 Map of OAUTHC Ile-Ife, Showing Different Units in the Hospital
Source: Google Map 2024

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IV. RESULTS

This section discusses the results derived from the survey conducted through administration of questionnaire directed at students, staff, cleaners, and environmental health Officer in OAUTHC Ile-Ife. The subsequent section examines the methodology employed for the sorting, storage, and collection of solid waste within the study area.

Displayed in Table 4.1 are the perspectives of respondents concerning the degree to which solid waste is typically segregated at the source in various wards, clinics, student accommodations, and staff living quarters.

Therefore, in order to ascertain how often the waste were sorted in students' hostel and staff quarters in OAUTHC, their agreement level was quantified utilizing the Likert scale illustrated in Table 4.1. The level of agreement recorded were 1.37 and 2.0 for students' hostel and staff quarters respectively. The implication of this finding is that waste segregation was not practiced within the residential areas. Conversely, waste generated in the wards was segregated at the source. The medical waste produced in the wards was categorized into two distinct groups (General and Sharps). In the virology department, however, waste was classified into four categories (Highly Infectious, Infectious, General, and Sharps). This outcome aligns with the findings of Oke (20) in Nigeria, Ketlogetswe et al. (21) in Botswana, Taghipour & Mosaferi (22) in Iran, and Patil & Shekdar (23) in India, wherein the practice of waste segregation was found to be inadequate. According to the aforementioned authors it was a common practice for both infectious and non-infectious solid waste to be mixed together before initial collection.

Table 1 Solid waste segregation practice in OAUTHC

Variable	**Students' Hostel**			**Staff Quarters**	
	Frequency	***Rating***	***SWV***	***Frequency***	***SWV***
Very often	-	5	-	-	-
Often	1	4	4	1	4
Occasionally	1	3	3	3	9
Seldom	17	2	34	4	8
Not at all	41	1	41	5	5
Total	**60**		**82**	**13**	**26**

SWV - Summations of the weight value

Therefore

$$\text{RII} = \frac{SWV}{\sum_{i=1}^{5} P_i}$$

For Students' hostel RII= 82/60 = 1.37

And Staff Quarters will be RII = 26/13 = 2.0

➢ *Solid Waste Storage*

This section delineates the methodologies for the storage of solid waste implemented at OAUTHC. Presented in Tables 2, 43, and 4 are the available solid waste storage facilities, the geographical placements of these facilities, and the distances at which the storage facilities were placed. From the analysis in Table 5.2, findings established that uncovered dust bins and plastic baskets were the predominant waste storage receptacles within the student hostels. These receptacles accounted 31.7% and 20.0% respectively. In contrast, within the staff quarters, 38.5% of the storage containers were uncovered plastic dust bins or covered plastic dust bins. Additionally, it was determined that 34.9% and 46.5% of the storage facilities utilized in the wards consisted of covered plastic dust bins and plastic drums respectively. It is apparent that uncovered plastic dust bins, covered plastic dust bins, and plastic baskets constituted the primary receptacles employed for waste storage.

Table 2 Storage Receptacles used in OAUTHC

Solid waste Storage Facilities	**Students Hostel**	**Staff Quarters**	**Wards**
Plastic dust bin without a cover	19(31.7%)	5(38.5%)	15(34.9%)
Plastic dust bin with a cover	6(10.0%)	5(38.5%)	20(46.5%)
Plastic drums	5(8.3%)	0(0.0%)	5(11.6%)
Metal dust bin without a cover	2(3.3%)	1(7.7%)	3(7.0%)
Metal drums	3(5.0%)	1(7.7%)	0(0.0%)
Polythene bags	4(6.7%)	0(0.0%)	0(0.0%)
Plastic baskets	12(20.0%)	1(7.7%)	0(0.0%)
Plastic/metal container that has spoilt.	6(10.0%)	0(0.0%)	0(0.0%)
We don't store waste	3(5.0%)	0(0.0%)	0(0.0%)
Total	**60(100%)**	**13(100%)**	**43(100%)**

Findings presented in Table 3 elucidates that the waste storage receptacles were strategically positioned in close proximity to the premises to facilitate convenient accessibility. Confirming was the fact that, 50% of the students in the hostel

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established that the storage facility was located in front and inside their building. Conversely, 76.5% of the staff residing in the quarters asserted that the storage facilities were located directly in front of their respective buildings. A mere 51.2% of the cleaners assigned to the wards acknowledged that the storage facilities were positioned in close proximity to the ward premises.

The research also utilized a five-point Likert scale to assess the proximity of the storage facility to its users. The respondents articulated their perceptions utilizing a five-point Likert scale comprising Very close, Close, Just close, Not close, and Not at all close. According to the findings, the degree of closeness was quantified at 4.0 for the students' hostel and 4.08 for the staff quarters, as illustrated in Table 5.4. The results substantiate that the storage facilities were adequately positioned in close proximity to the users within the study area.

Table 3 Location of Storage Facilities in OAUTHC

Location of Storage Facilities	**Students Hostel**	**Staff Quarters**	**Wards**
In front of the building	30(50.0%)	10(76.9%)	22(51.2%)
Inside the building	24(40.0%)	3(23.1%)	17(39.5%)
At the back of the building	6(10.0%)	1(7.7%)	4(9.3%)
Total	**60(100%)**	**13(100%)**	**43(100%)**

Table 4 Placement of Storage facility within the OAUTHC

Variable	**Students' Hostel**			**Staff Quarters**	
	Frequency	***Rating***	***SWV***	***Frequency***	***SWV***
Very close	19	5	95	4	20
Close	24	4	96	6	24
Just close	15	3	45	3	9
Not close	2	2	4	-	-
Not at all	-	1	-	-	-
Total	**60**		**240**	**13**	**53**

SWV - Summations of the weight value

Therefore

$$\text{RII} = \frac{SWV}{\sum_{i=1}^{5} P_i}$$

For Students' hostel RII = 240/60 = 4.0

And Staff Quarters will be: RII = 53/13 = 4.08

Findings from the study established that, storage facilities as a key element in Solid waste. The results derived from the research indicated that storage facilities, as a fundamental component in Solid Waste Management (SWM), were present within the OAUTHC. Furthermore, these facilities were strategically situated in close proximity to the users distributed across the three distinct sections (student hostels, staff quarters, and wards) within the specified study area (Refer to Table 4).

➢ *Solid Waste Collection*

This section delineates the methodologies employed in the collection of solid waste within the OAUTHC. Table 5 elucidates the practices concerning solid waste collection at OAUTHC. Within this section, the correlation between satisfaction levels derived from the methodologies and practices of waste collection was discussed. It was established that 16.7% of students residing in the hostel reported that the collection vehicle arrives to retrieve their waste three times daily. In the staff quarters, 30.8% of staff confirmed that waste was consistently collected three times daily. Data obtained from the wards revealed that 62.8% of the cleaning staff acknowledged that the waste collection vehicle retrieved three times daily. The collection of waste produced within the wards occurs in three distinct shifts throughout the day. This waste collection practice is conducted every morning, afternoon, and evening; consequently, the findings indicate that a significant majority of respondents from both the student hostel and staff quarters affirmed that the waste generated was collected on a daily basis. The primary concentration of the waste collectors was on the wards of OAUTHC, attributable to the substantial volume and sensitivity of the waste generated within this particular area of study.

Table 5 Solid Waste Collection Practice in OAUTHC

Solid waste Collection Period	**Students Hostel**	**Staff Quarters**	**Wards**
Thrice per day	10(16.7%)	4(30.8%)	27(62.8%)
Once daily	37(61.7%)	9(69.2%)	16(37.2%)
Once every two or three days	9(15.0%)	0(0.0%)	0(0.0%)
Once weekly	4(6.7%)	0(0.0%)	0(0.0%)
Total	**60(100%)**	**13(100%)**	**43(100%)**

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The investigator's direct observation indicated that the waste receptacles utilized within OAUTHC varied. A significant number of the examined bins lacked lids. There was an absence of any systematic colour coding to denote the specific type of waste designated for disposal in each particular bin, with the sole exception being the virology department. The waste receptacles did not exhibit any distinguishing signage or identifying marks. The employment of signage, educational posters, and colour-coded bins is crucial for the effective segregation of waste. Hagen et al. (24), in their investigation of infectious waste management in a Saudi Arabian hospital, have similarly highlighted the necessity of providing signage, educational posters, and colour coding as essential tools for the promotion of effective segregation of healthcare waste (HCW). The waste bins were not adequately lined with appropriate polythene prior to usage. The practice of applying disinfectant to the waste receptacles was not consistently implemented within OAUTHC.

Segregation of sharps was conducted within the wards. No additional forms of waste segregation were observed at any level, apart from within the virology department. Temporary storage of waste is facilitated in receiving waste bins, which are emptied on a daily basis or more frequently, contingent upon the rate of waste generation. Waste is collected daily by sanitation personnel for direct disposal from the storage bins.

Table 6 Rating of Waste Collection Timing

Variable	**Students' Hostel**			**Staff Quarters**		**Wards**	
	Frequency	***Rating***	***SWV***	***Frequency***	***SWV***	***Frequency***	***SWV***
Very good	9	5	45	1	5	19	95
Good	14	4	56	8	32	15	60
Fair	25	3	75	3	9	9	27
Bad	9	2	18	1	2	-	-
Very bad	3	1	3	-	-	-	-
Total	**60**		**197**	**13**	**48**	**43**	**182**

SWV - Summations of the weight value

Therefore

$$\text{RII} = \frac{SWV}{\sum_{i=1}^{5} P_i}$$

For Students' hostel: RII = 197/60 = 3.28

Staff Quarters: RII = 48/13 = 3.69

Wards : RII = 182/43 = 4.23

Presented in Table 6 is the analysis of how respondents rated the timing of solid waste collection. It was established that the timing for waste collection in the OAUTHC wards was generally considered good, with an average index score of 4.23. This suggests that waste managers are usually available at the right times to collect the waste generated in those wards. However, students living in the hostel had a different perspective, rating the timing of waste collection as fair, with an average index of 3.28. It is clear that students would like the waste managers to be more prompt in collecting the waste from the hostel.

Further analysis of this study confirmed the level of satisfaction with the interval of waste collection in OAUTHC. The respondents expressed their views using five (5) Likert scale of very satisfied, Satisfied, just satisfied, Unsatisfied and Not at all satisfied. Their views were measured through an index called Respondent Satisfaction (RSI). The closer the RSI of an attribute is to five, the higher the assumed residents' satisfaction. The procedure for arriving at this index is shown in Table 4.7.

The findings revealed that the RSI scores were 4.46 for the wards, 3.58 for the students' hostel, and 3.15 for the staff quarters. This indicates that residents in the wards were the most satisfied with the waste collection intervals. This is particularly important since waste generated in wards, units, and laboratories can lead to environmental pollution if not collected promptly. Keeping waste in these areas for extended periods poses risks to both staff and patients in the hospital, making regular disposal essential. On the flip side, staff living in the OAUTHC quarters reported the least satisfaction, likely because the amount of solid waste generated there is lower compared to other areas within OAUTHC.

According to the study, the response satisfaction levels (RSI) were 4.46 for the wards, 3.58 for the students' hostel, and 3.15 for the staff quarters. This indicates that people in the wards felt the most satisfied with the frequency of solid waste collection in the area. The reason for this is that waste generated in the wards, units, and laboratories can harm the environment if left unattended for long period. Keeping waste around for extended periods poses risks to both staff and patients in the hospital. It is therefore, crucial to dispose of it regularly. On the flip side, staff living in the OAUTHC quarters reported the least satisfaction.

This suggests that the amount of solid waste produced in the staff quarters is lower compared to other areas within OAUTHC. The waste composition in the residential area was primarily domestic waste. The lower volume of waste generated in the staff quarters also affected how often the waste manager was called upon in that area.

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Table 7 Satisfaction Level of Waste Collection within the OAUTHC

Variable	**Students' Hostel**			**Staff Quarters**		**Wards**	
	Frequency	***Rating***	***SWV***	***Frequency***	***SWV***	***Frequency***	***SWV***
Very satisfied	10	5	50	-	-	26	130
Satisfied	30	4	120	5	20	11	44
Just satisfied	10	3	30	5	15	6	18
Unsatisfied	5	2	10	3	6	-	-
Not at all	5	1	5	-	-	-	-
Total	**60**		**215**	**13**	**41**	**43**	**192**

SWV - Summations of the weight value

Therefore

$$\text{RII} = \frac{SWV}{\sum_{i=1}^{5} P_i}$$

For Students' hostel: RII = 215/60 = 3.58

Staff Quarters: RII = 41/13 = 4.08

And Wards: RII = 192/43 = 4.46

In Figure 3 and Table 4.8, presented the solid waste collection points at OAUTHC. These points highlight various locations throughout the hospital that are specifically set up for waste collection. Typically, wards, clinics, or departments around these designated areas drop off the waste produced by their respective units at these centers.

Table 8 Locations for Waste collection points, incinerators and Dump site at OAUTHC

No	**Wards/Departments/Sections**	**Latitude**	**Longitude**
1	Dump Site	07.51837	04.55557
2	1st Incinerator	07.51790	04.55526
3	2nd Incinerator	07.50730	04.56868
SOLID WASTE COLLECTION POINTS			
4	Gloryland Hostel	07.50981	04.55791
5	Nursing Hostel	07.50851	04.56830
6	Adult Emergency	07.50711	04.56830
7	Staff quarters	07.51072	04.57029
8	Virology dept.	07.50838	04.56824
9	Mental health	07.51067	04.56638
10	Orthopaedic	07.51021	04.56563
11	Eye clinic	07.50927	04.56587
12	Children wards	07.50807	04.56515
13	House of Residence	07.50158	04.57072
14	School of Nursing	07.50581	04.56603
15	Haematology	07.50417	04.57035
16	Labour ward	07.50387	04.57005
17	Male medical	07.50321	04.57118
18	Kitchen	07.50383	04.57133
19	Renal	07.50393	04.57169
20	Out-patient	07.50444	04.57216

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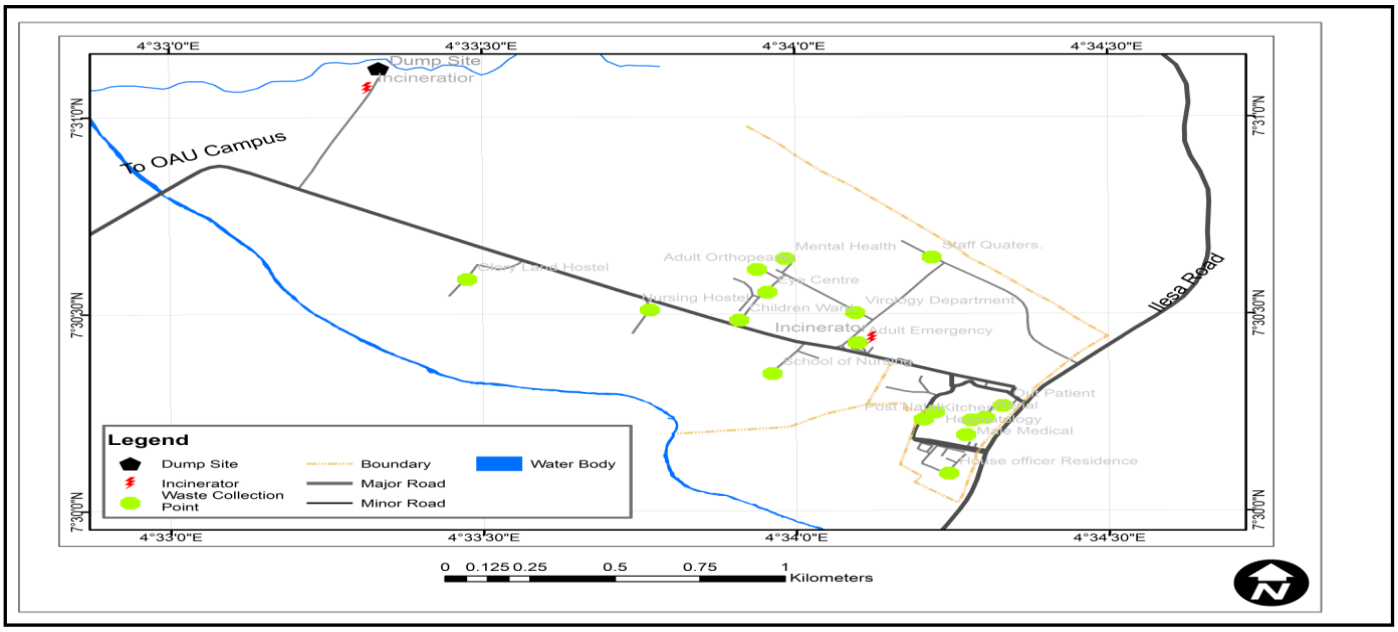

Fig 3 Map of OAUTHC Ile-Ife showing dumpsite, incinerator and waste collection point
Source: Cooperative Information Network (COPINE), OAU, Ile-Ife 2024

V. SUMMARY OF FINDINGS

The study looked into how solid waste is sorted, stored, and collected at the Obafemi Awolowo University Teaching Hospitals Complex in Ile-Ife, Nigeria. It also evaluated the human and material resources available for solid waste management (SWM) practices in the area.

During data collection, it was found that most wards at OAUTHC sorted their solid waste into two main categories: general waste and sharps. However, the virology department took a different approach, classifying their waste into four distinct types. Meanwhile, the solid waste from the residential quarters was categorized simply as general waste.

The research revealed that medical waste in the wards was properly segregated into general and sharp waste before it was collected and disposed of. In contrast, the virology department had a more detailed system, separating their waste into highly infectious, infectious, general, and sharps categories. Unfortunately, in the residential areas, such as staff quarters and student hostels, waste was not sorted at all, with most of it being domestic in nature.

As for storage facilities at OAUTHC, they mainly consisted of uncovered waste receptacles, covered dustbins, and plastic baskets. These storage options were conveniently located near the users. Interestingly, 50% of respondents from the student hostels and 76.5% from the staff quarters reported that waste storage materials were situated right in front of their buildings. Additionally, 51.2% of the cleaners in the wards mentioned that waste storage facilities were close to the ward premises.

It turns out that the color-coding system for waste receptacles was not put into practice in the wards, except for the virology department. There was no signage or any kind of marking to distinguish the waste bins from each other. Additionally, the bins weren't lined with the right polythene before use. Regular disinfection of the waste receptacles wasn't a common practice at OAUTHC. It was found that the waste containers or storage receptacles were insufficient at OAUTHC. The available storage options weren't environmentally friendly. In some wards, plastic buckets were being used as storage receptacles. Most of these waste containers didn't even have lids.

VI. RECOMMENDATION

Segregation of the waste generated at the source: It is crucial to segregate waste right at the source, especially when it comes to healthcare waste. By properly separating solid waste in hospitals, it will significantly reduce the volume of infectious waste, which tends to be costlier to manage. If infectious waste comes into contact with other types, all will be classified as infectious, which means it requires extra care in handling. Therefore, every hospital should be required to follow the internationally recommended standards for managing hospital waste.

- *Use of Symbol and Color Coding:*

When it comes to marking waste, using symbols and color coding is essential. Bags and containers for infectious waste needed to be marked with Biohazard symbol clearly. It is important to have the right containers with specific color codes in every ward to avoid mixing different types of waste. Implementing these segregation practices will lead to a cleaner waste stream that can be managed safely, easily, and cost-effectively.

- *Provision of Standard Storage Facilities:*

Hospitals should provide adequate standard storage facilities in all necessary areas. Any worn-out or outdated waste receptacles should be replaced, and the storage containers must be cleaned and disinfected regularly to help prevent the spread of diseases. It is also vital to ensure that

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there are no leaks from these receptacles. These receptacles should be secured to keep unauthorized individuals from accessing it.

- *Provision of Equipment Needed for Managing Healthcare Waste:*

There is need to invest in more trucks for waste collection to serve as backups for the existing vehicles. Healthcare waste must be transported in specially designated vehicles that are cleaned and disinfected regularly. Medical waste should also be moved in suitable, dedicated, leak-proof containers to ensure safety and compliance. These containers should be clearly marked and regularly cleaned. It should be a lidded container.

- *Training of Personnel:*

Training personnel effectively is crucial for managing healthcare waste properly. Hospitals need to implement regular training and educational programs for all staff members. This includes not just the hospital managers and administrative personnel, but also nurses, nurse assistants, cleaners, porters, auxiliary workers, and waste handlers. It's essential that this training emphasizes the roles and responsibilities of healthcare workers within the broader waste management program. Every staff member and waste handler should receive thorough training at the start of their employment, with ongoing updates to their knowledge and skills. This training is vital for raising awareness about health, safety, and environmental issues. Workers must understand the potential risks linked to healthcare waste and the critical importance of consistently using personal protective equipment. Training can take various forms, such as attending conferences, seminars, and workshops to enhance their understanding of hospital waste, its associated risks, and sanitation practices. It should also be practical and conducted periodically.

Other important aspects include administrative controls like adjusting job schedules and rotating workers. Engineering controls are also necessary, which may involve substituting equipment, changing processes to safer methods, mechanization or computerization, and regularly upgrading and maintaining equipment. Medical controls are equally important, encompassing physical examinations during the hiring process and periodically thereafter, regular immunizations, health talks, and continuous medical monitoring with periodic evaluations of safety measures.

VII. CONCLUSION

The study examined how solid waste is sorted, stored, and collected in the area. It found that solid waste was not being separated according to the guidelines set by the World Health Organization (WHO). Interestingly, the use of colour coding and signage to distinguish different types of waste was only seen in the Virology Department. Waste was regularly transported from collection points to the dump site, where an open dumping system was used for disposal.

Additionally, the study revealed that factors like the availability of storage and collection facilities, the number of patients, transportation, and both human and material resources all play a role in how solid waste is managed at OAUTHC Ile-Ife. The findings clearly indicated that healthcare waste management practices at OAUTHC did not align with the standards recommended by WHO.

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