

Impact of Covid-19 on Waste Disposal in Private Health Facilities in Ota, Ogun State, Nigeria

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Abstract:- Waste disposal is a vital aspect of public health that must not be neglected, as improper waste disposal can be hazardous to both the environment and the local population. With the onset and aftermath of the COVID-19 pandemic and lockdown in Nigeria, it would be fascinating to learn about the impact of the pandemic on waste disposal methods at private healthcare facilities in Ota, Ogun state. This study's objective is to investigate the effect of COVID-19 on medical waste management and disposal practices in private healthcare facilities in Ota, Ogun State, Nigeria. Using questionnaire responses, in-depth interviews, and site visits, the data for this study were collected. The study's findings indicate that Covid-19 has minimal to no impact on medical waste disposal practices in the study area. It was revealed, however, that the majority of healthcare facilities in the study area do not employ a waste manager. It is also important to note that the majority of businesses do not keep records of the amount of waste generated and disposed of, as well as the associated costs, and that only a minority use color-coding for the disposal of waste.

Keywords;- Medical Waste, Ota, Private Healthcare Facilities, Waste Management.

I. INTRODUCTION

The disposal of trash in health care institutions continues to be an important factor that contributes significantly to the public health of a community's inhabitants. The practice of excellent hygiene in all aspects cannot be overemphasized and is appropriately regarded as essential to the general health and safety of individuals. Waste is an inevitable by-product of human activity. It occurs in three states: solid, liquid, and gas. In recent years, waste has been defined and understood to be material that has no monetary or economic value and is abandoned or thrown away when it fails to fulfill its main purpose. [1]. There are several origins for hospital garbage, dental waste, medical laboratory waste, and other sorts of medical waste. [2-4]. Dangerous waste is either flammable, reactive, explosive, corrosive, radioactive, infectious, irritating, or sensitizing, or it is bio accumulative. [5]. Health care facility waste is regarded as one of the most hazardous wastes in the world, necessitating its disposal in accordance with safe and sustainable best practices worldwide.

As stated by Ruth Stringer, 2021, Science and Policy Coordinator, Health Care Without Harm, in the face of the Covid -19 pandemic, sustainable health care waste

management, including eventual disposal, is more crucial than ever to protect communities, health workers, and the planet as a whole, in order to reduce recurrent pollution and endemics. The pandemic Covid-19 causes an increase in patient and healthcare activity; one of the repercussions of Covid-19 is its impact on the amount and content of medical waste. [6, 7]. According to a study issued by the World Health Organization (WHO) in February 2022, the reaction to the COVID-19 epidemic has generated tonnes of additional medical waste, putting a significant pressure on waste management and disposal systems worldwide. It poses a threat to human and environmental health. The goal of this research was to examine the present waste management procedures of selected private healthcare institutions in Ota, Ogun State. The research also examined the knowledge of healthcare personnel on the processing and disposal of medical waste. It also examined how COVID-19 has affected the disposal of medical waste in Ota, Ogun State, Nigeria's private healthcare institutions.

II. METHODOLOGY

A cross-sectional (observational) research was undertaken in the Ota local government area of Ogun State, a south-western state in Nigeria. On February 3, 1976, the previous Western State was renamed. To the south is Lagos State, to the north are Oyo and Osun, to the west is Ondo State, and to the west is the Benin Republic. Ado-Odo/Ota is one of the 19 local government regions of Nigeria. On May 19, 1989, the former Ifo/Ota Local Government combined with the Ado-Odo/Igbesa Areas of the Yewa South Local Government to establish the current municipality. Lagos and Ado-Odo/Ota share a boundary.

The Local Government Area is the second largest in Ogun State, with its headquarters in Ota, which is located to the north at 6° 41' 00"N 3° 41' 00"E. Other towns and cities within include Araromi-Alade, Ado-Odo, Agbara, Igbesa, Iju-Ota, Itele, Kooko Ebiye Town, Owode, ang Sango Ota. Ota is Consequently, the local government produces the most amount of IGR for Ogun State. In accordance with the 2006 census, Ota had an area of 878 km² and a population of 526,565. [8].

This research examines the private healthcare institutions and how their wastes are disposed in the post-Covid-19 era. Five (5) private health institutions were chosen for the experiment using hierarchical, simple random, and convenience selection methods. The private healthcare facilities consist of those classified as OPD (Outpatient department treatment) and

IPD (In-Patient department occupancy) providers. This strategy guaranteed that the research included all sorts of private healthcare institutions functioning in Ota, Ogun State, and categorized them to preserve anonymity and confidentiality. A, B, C, D, and E codes were assigned to the hospitals.

The researched healthcare institutions provide medical, surgical, pediatric, and obstetric care, in addition to a number of specialized services, including dental care, amongst others.

These private healthcare institutions have been chosen among the one hundred thirty-two (132) private healthcare facilities in Ota. In Ota, Ogun State, the chosen private healthcare institutions serve those with low, moderate, and high incomes. Using direct visual monitoring (site visits) and questionnaires, each of the private healthcare institutions' waste output was evaluated. The waste produced by each of the selected private healthcare institutions was analyzed (sections of the questionnaire include; demographic Information, knowledge about the waste types, assessment of medical waste management practices, Information about the personnel involved in the management and disposal of waste, as well as waste disposal practices). Also established were the types of wastes produced.

In addition, interviews were conducted with the director of nursing, janitors, and laboratory officers to establish the amount of training of the employees in regards to waste disposal. The head of department for medical waste management at each private healthcare facility visited was provided with a copy of the questionnaire to complete in order to ensure that they have a thorough understanding of the questions contained therein and to obtain a firsthand account of/answers to the questions posed. This study used the same methodology that Longe and Williams did.[9]. Ogun State Waste Management Authority (OGWAMA) provided orientation and training on waste handling and management, segregation, collection, storage, transportation, and ultimate disposal to the management teams of the private healthcare institutions visited. Statistical Package for the Social Sciences (SPSS) version 28 was used to examine the data. The significance level of the link between variables was determined using the chi-square test of statistical significance at a confidence level of 95%. (5 percent sampling error). 0.05 was used as the significant threshold.

Each patient was given a thorough description of the experimental methods prior to obtaining their agreement to participate in the research. Those unwilling to participate were omitted from the research. By eliminating the names of the evaluated private healthcare institutions, confidentiality was protected.

Table 1. Socio-Demographic Characteristics Of Respondents

VARIABLE	PERCENTAGE (%)
Gender	
MALE	60%
FEMALE	40%
Age Grade	
BELOW 20	0%
21-30	40%
31-40	40%
41-50	20%
51-60	0%
60 AND ABOVE	0%
Educational Qualification:	
WASCE/SSCE	20%
B.Sc/OND/HND	60%
MBA/ MSc/ PGD	0%
OTHERS	20%
Experience/Years of service:	
LESS THAN 6MONTHS	0%
6-11MONTHS	0%
1-4 YEARS	20%
5-9YEARS	60%
10 YEARS AND ABOVE	20%
Level/Position:	
JUNIOR STAFF	0%
SENIOR STAFF	80%
PATIENT	0%
OTHERS	20%

III. RESULTS

The average age of respondents was 35.46 ± 1.66 years, and the majority were women. On average, respondents had been hospitalized for 9.73 ± 6.91 years. Hospital physicians and nurses comprised the bulk of responders. According to the assessment, none of the facilities examined kept track of how much waste they created. Ordinary, pathological, and chemical waste are the three categories of rubbish. Except for the pharmacy, which does not produce pathological waste, all hospital units included infectious, sharp, and pharmaceutical wastes. The kitchen and administrative facilities only create general garbage.

Each facility's response was knowledgeable about trash categorization. 75% of all paper, food, plastics, and bottles were classified as general waste. 10% of respondents believed that dirty cotton wool, swabs, and gloves constituted infectious trash. The majority of responders correctly recognized diseased waste as organs, fluids, and fetuses. The responders at the different sites had an understanding of trash classifications. 60 percent of respondents stated trash should be segregated at the source, compared to 40 percent who disagreed, and 85.5 percent said sharps collection should be done using safety boxes. About 80.5% of respondents said that medical waste separation is

required. Responses differed depending on the healthcare institution.

Others concurred that medical waste may be created as a consequence of diagnosis, vaccination, and treatment. The expertise of color coding was adequate to aid in the identification of garbage in their different facilities. The significant majority of responders accurately recognized all color codes for garbage. More than half of respondents (52.3%) correctly recognized the color code. The red color code for pathological trash was likewise recognized as the black color code for general garbage, but only a few of respondents were able to identify the yellow color code for infectious waste. There was a statistically significant correlation between respondents' occupation and their ability to recognize pathological waste color coding, with nurses having the best correlation due to their training.

Table 2. Assessment of Appropriate Waste Categorization by Respondents

CATEGORY OF WASTE	PERCENTAGE (%)
PATHOLOGICAL (urine ,vomit ,body fluids)	40%
PHARMACUETICAL (expired drugs, empty vials)	0%
CHEMICAL (batteries, damaged thermometers)	0%
INFECTIOUS (sputum, used cottons, gloves, soiled gauze)	60%
DOMESTIC (papers, remains of food)	0%
SHARPS (needles, syringes, scalpels, knives)	0%

The findings reveal that several on-site waste transportation methods are employed to transfer garbage from its source of origin to temporary disposal locations. Nonetheless, carts/wheelbarrows and trucks are the primary ways of transporting these materials from the premises of healthcare facilities.

During the trips, it was also noticed that all examined healthcare institutions use disposal methods that are most convenient for them. The medical waste is either buried in deep bore holes or incinerated at a remote location on-site.

Table 3. Assessment of Waste Disposal and Management Practices by Respondents

ENQUIRY AT EACH HEALTHCARE FACILITY	Percentage (%)
Does every generated waste within the hospital have separate waste bins? YES NO	100% 0%

Do you maintain a register for medical waste disposal in your ward? YES NO	40% 60%
Do you weigh the medical waste generated in your ward? YES NO	20% 80%
Has covid-19 impacted the way waste disposal is handled? YES NO	100% 0%
Do you colour code your medical waste for disposal? YES NO	80% 20%
Do you have procedures for collection/ handling of wastes? YES NO	100% 0%
Should medical waste be segregated? YES NO	0% 100%

Are wastes disposed by an external service? e.g private, public , none YES NO	80% 20%
Are medical personnel's educated/trained on medical waste management and disposal? YES NO	80% 20%
Are medical personnel's vaccinated? YES NO	80% 20%
Are medical staff educated on medical waste disposal? YES NO	100% 0%
Are disinfectants used during waste disposal? YES NO	100% 0%
Use of puncture-resistant container for waste collection applied? YES NO	80% 20%
Is employment of a waste manager necessary? YES NO	60% 40%
Do medical facilities have a pre-existing waste disposal plan? YES NO	100% 0%

Use of personal protective equipment applied during waste disposal? YES NO	100% 0%
Are staff aware of governmental legislations of medical waste management and disposal ? YES NO	60% 40%
Staff awareness on hazardous nature of waste? YES NO	100% 0%
Does the government check-up on the adherence of waste disposal on a regular basis?: YES NO	100% 0%
Is the waste disposal unit restricted for access? YES NO	40% 60%
Is the location of the waste disposal units planned before hand?: YES NO	20% 80%
Frequency of waste disposal per day? ONCE DAILY TWICE DAILY TRICE DAILY	60% 20% 20%
Waste disposal responsibility NURSES OTHERS	80% 20%
What material are the wastes disposed in SPECIAL BINS TRASH BINS NYLON OTHERS	40% 40% 0% 20%
Which type of waste is generated the most? PATHOLOGICAL PHARMACUETICAL CHEMICAL INFECTIOUS DOMESTIC SHARPS	40% 0% 0% 60% 0% 0%
Where is the final destination of the waste ONSITE OFFSITE	10% 90%
How are the waste disposed off finally? OPEN DUMPING INCENERATION CONTAINMENT OTHERS	0% 40% 40% 20%

IV. DISCUSSION

Using case studies from a number of private healthcare institutions in Ota, Ogun state, this research evaluated the influence of Covid-19 on waste disposal in private hospitals. On the basis of the findings of the disseminated questionnaires, a series of study-related replies and data were gathered.

This research demonstrates that private healthcare institutions in Ota, Ogun state, do not prioritize the disposal of medical waste adequately. Rather, there is a degree of negligence in these organizations' medical waste disposal procedures. Nevertheless, in certain nations there is worry about the spread of the virus owing to inadequate handling of infectious waste [10]. Priority should be given to the labeling of hospital wastes, the color coding of different types of medical waste to make collection easier, proper waste segregation, the employment of trained waste management personnel, the provision of special bins, and routine inspections by state or local governments. All of these waste management policies, regulations, and procedures are pretty typical and must be ingrained and obvious in every healthcare institution. On the basis of the findings and information acquired from the questionnaires, a sufficient number of these procedures were carried out at the visited institutions.



Fig. 1. Waste disposal methods.

In general, respondents supplied information on medical waste generating parts of the facility's services, including treatment and admission wards, diagnostic centers, and medical laboratory units. Segregation of wastes, particularly infectious wastes, at the point of formation is essential and essential for efficient medical waste disposal. The majority of respondents in the research believed that medical waste should be separated at the point of creation. This agrees with Asadullah et al [11]. 's results that 90,4 percent of survey respondents agreed that waste segregation should occur at the place of generation. When it comes to ultimate disposal, it is crucial to understand that medical waste segregation is a crucial step in lowering the amount of hazardous waste. The use of colored trash bags to properly differentiate contagious waste from general/domestic garbage makes the disposal of infectious waste easier and less onerous. 75 percent of respondents utilize safety boxes to collect sharps, which is in conformity with the World Health Organization's (WHO) recommendations, which state that sharps should be safely disposed of and secured in a container that is only three-quarters full prior to disposal [12].

According to World Health Organization statistics, the quantity of medical waste created varies by country depending on national wealth or degree of development, as well as on the size and kind of medical facility. Wealthier nations generate more medical waste than poorer nations. Highly developed nations generate 1.1–1.2 kilograms of waste per capita, of which 0.4–0.5 kilograms is hazardous waste; middle developed nations generate 0.8–6 kilograms per capita, of which 0.3–0.4 kilograms is hazardous waste; and developing nations generate 0.5–3 kilograms of waste per capita [13]. It comes as no surprise that the majority of medical waste is often designated as hazardous or toxic. Most private healthcare institutions have developed suitable waste disposal systems for all sorts of waste produced. The majority of private healthcare institutions use competent waste management authority to dispose of all medical waste at the facility in a responsible manner. The frequency of these disposal and management authority ranges from weekly to biweekly to monthly.

Hazardous waste should be transformed into a less dangerous form at the point of creation to allow for safer and easier handling. Mobile device sterilization/disinfection would be an appropriate procedure. Their quantity and capacity would be decided by the needs of the medical institution as well as the location of the ultimate treatment incinerator [14]. Waste segregation is a major issue faced in facilities generally in Nigeria as a whole. Open dumping is also a supplementary practice employed in waste disposal in health facilities in the study area, this is meant to be seen as a major violation of numerous health and safety regulations, but the government does little or nothing about this incessant practice. Dumping of medical waste in open areas is a practice that has major adverse effects on the wellbeing of the resident population in proximity. Contaminating the soil and underground or subsurface water by depositing these pollutants in unregulated locations can have a

direct environmental impact. Also, if no thorough filtering is done during incineration, the air can be polluted with dangerous pollutants, causing illness in the neighboring population; so, correct waste segregation methods should be followed to avoid environmental harm.



Fig. 2. ;poorly disposed medical wastes.

This study's visited healthcare facilities accommodate and implement the previously described segregation methods to a suitable degree. One of the reasons why medical establishments should be urged to segregate infected and non-infectious waste is that it would drastically reduce waste disposal expenses. By using segregation measures to minimize the additional costs of special processing, treatment, and disposal of infectious waste, healthcare institutions may save a significant amount of money [15]. In addition, trash segregation is one of the methods used to reduce the quantity of mixed waste produced by these medical institutions. Mixed garbage presents unique issues in waste management due to the difficulty in establishing solutions that are consistent with pollution risks. [16] The majority of these institutions' disposal sites are situated distant from the main hospital in a regulated location, out of the direct view of patients and non-medical staff. This is either a particularly created location or a suitably isolated region away from populated areas, and it is always placed behind the hospital.

In general, it can be said that the hospitals evaluated have strategies in place to dispose of trash to a level that is more than enough.

V. CONCLUSION

As discovered throughout this investigation, Covid-19 has had a minimal influence on medical waste disposal practices. There are still improvements that must be made in order to guarantee safe and appropriate waste disposal techniques. Recommendations to enhance waste disposal in the research region must include, but not be limited to, the following:

1. In all wards of the healthcare institution, there should be proper trash disposal and management training and education for workers.
2. Employing a medical waste manager is important for the correct management and monitoring of disposed medical waste, depending on the size of the healthcare institution.
3. To effectively sort and dispose medical wastes, color-coding systems must be used.
4. The government's standards and policies pertaining to health and safety must be strictly adhered to.

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