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ASSESSMENT OF HEALTH CARE WASTE TREATEMENT AND DISPOSAL METHODS PRACTICED IN PRIMARY HEALTH CARE CENTRES IN YENAGOA BAYELSA STATE, NIGERIA

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Abstract:

Aim: This study assess healthcare waste treatment and disposal methods practiced in all PHC in Yenagoa Metropolis. **Methods:** A Cross-Sectional Descriptive study design was used. The study population was (16) PHC in Yenagoa Metropolis. A census sampling technique was adopted to obtain (87) personnel staff in this study. The structured questionnaire was used and (74) was retrieved. Data are presented in frequency tables, figures and percentage. **Results:** Male were 21(28%) while Female were 53(72%). (5) PHC with 28(38%) responded to the practiced of treatment of HCW before disposal while (11) PHC with 46(62%) responded No treatment practiced of HCW before disposal. Among the twenty eight (28) respondents that revealed the treatment of HCW in their PHC, one (1) PHC uses autoclaving/steam sterilization with 7(25%) while (4) PHC with 21(75%) practiced Decontamination/Chemical Disinfection of HCW as the treatment methods. The study revealed that (10) PHC with (61%) responded to the practice of Open Dumping/Burning while (6) PHC with (39%) practice Disposal at Municipal Transfer Stations as HCW disposal methods. 74(100%) respondents indicated that there is no designated unit established to handle HCW. (4) PHC with (30%) indicated the engagement of Environmental Health Officers (EHO,), (12) PHC with (70%) respondents indicated No engagement of Environmental Health Officers (EHO) in the handling of HCW. **Conclusion:** Government and policy makers should ensure the training of staff such as Environmental Health Officers in all Primary Healthcare Centers and the provision of required facilities with an established unit for the treatment of Healthcare Waste before disposal.

Keywords:

Healthcare, Waste, Yenagoa, PHC, Disposal.

Healthcare waste is becoming a global public health concern, particularly in developing countries. Healthcare wastes include all the waste generated by healthcare establishments, research facilities, and laboratories as well as the waste produced in the course of healthcare undertaken in the home (such as dialysis, insulin injections, etc(Wassie *et al*., 2022;Ali *et al.*,2016). The World Health Organization (WHO), defines medical waste as waste generated by health care activities including a broad range of materials, from used needles and syringes to soiled dressings, body parts, diagnostic samples, blood, chemicals, pharmaceutical, medical devices, and radioactive materials (WHO, 2018). Healthcare waste may include materials such as dressings used on a patient who is either infectious or non-infectious, contaminated personal protective equipment, needles and sharps, human body parts chemicals substances, expired drugs or medicines, and nappies. The majority (85%) of the waste is non-hazardous, and biodegradable which does not require special disposal. The remainder is hazardous waste, 10% infectious and 5% is toxic chemicals, radioactive, pharmaceuticals, all of which requires special care and processing (Uddin *et al*., 2014; Messerle, 2018; Oyekale *et al.,* 2017).

Medical waste treatment is a function of the type of medical waste to be processed and the ultimate disposal of the waste after treatment. If there is any possibility of human contact after treatment, then the medical waste should be completely disinfected so that wastes workers or scavengers who may come into contact with the materials are not exposed to potentially infectious properties. A number of methods for medical waste treatment exist in varieties of health facilities, and depend on the size (large and small medical generators) as well as location. Common methods of medical waste treatment include; autoclaving, chemical disinfection, incineration, irradiation, and microwave (Megan, 2019; Christina et al., 2021; Umar *et al.,* 2024).

It is important to note that healthcare wastes, if not properly managed, could pose an even greater threat and hazards than the original diseases. It is the duty of hospital and healthcare centers to take care of public health issues such as medical waste. Specific approaches that may be employed include patient care and enlightenment, ensure clean and healthy environment for workers/community (Patil and Porhre, 2005; Hossain *et al*., 2011; Khalid *et al*., 2021). Carefree handling and disposal of MW impacts both directly and indirectly on staff, patient and environment. This is because the hospitals represent a unique environment, providing healthcare to patients and work environment for medical and other staff. In the process of healthcare delivery, medical waste is generated, which includes sharps, human tissues or body parts and other infectious materials (Alvin *etal*., 2005). Interestingly, there are reasonable ranges of technologies available for the treatment of healthcare wastes that may be appropriate for use in the third world countries. The World Health Organization (WHO) estimates that each year there are about 8 to 16 million new cases of Hepatitis B virus (HBV), 2.3–4.7 million cases of Hepatitis C virus (HCV) and 80,000–160,000 cases of Human Immunodeficiency Virus (HIV) due to unsafe injections disposal and mostly due to very poor waste management systems (WHO,1999). Contaminated injection equipment may be scavenged from waste areas and dump site either to be reused or sold to be used again. The negative health and environmental impacts of MW includes transmission of diseases by virus and microorganism, defacing the aesthetics' of the environment, as well as contamination of underground water tables by untreated MW in landfills (Chua *etal*., 2012).

Good medical waste management in hospital depends on a dedicated waste management team, good administration, careful planning, and sound organization, underpinning legislation, adequate financing

and full participation by trained staff (WHO, 2005). Primary health care services are provided at various Local government areas which are mostly rural and such services includes preventive, curative, promoting and rehabilitative health care services. These are further broken down to prevention and treatment of communicable disease, immunization, maternal and child health services family planning, public health education, environmental health and the collection of statistical data (Ebisike*et al.*, 2015).

MATERIALS AND METHODS

Study Area

The study area for this study was Yenagoa Metropolis ,the state capital of Bayelsa State Nigeria at coordinates 4°55′29″N 6°15′51″E.The LGA has an area of 706 km² and a population of 352,285 during the 2006 census. (Angaye, *et al.,* 2019).The study area has 16 primary health centres located at the Epie-Atissa Communities.

Study Population

The study population comprises all Primary Healthcare Centres in Yenagoa Metropolis totaling Sixteen (16) and all staff of the facilities.

Sample size /sampling Technique

A census sampling technique was adopted to include all the Primary healthcare centers and their staff totaling Eighty Seven (87) personnel in the study.

Materials for data Collection and Research Design

Structured questionnaire adopted from National Environmental Healthcare Waste Control Regulation, (2021) and WHO Guideline for Healthcare waste management was used to collect relevant data from the study population adopting a Cross-Sectional descriptive survey design method. However, the instrument was sub-divided into Three (3) sections. Were sections “A” contain the socio-demographic data of the respondents, section “B” contain information concerning healthcare waste treatment methods Practiced, section “C” contain information concerning healthcare waste Disposal method practiced and Section “D” contain the availability of waste Management unit and the engagement of license personnel in the primary Healthcare centres. The structured questionnaire were distributed to all the various Primary health Centres and immediate retrieval of questionnaire was made on the spot after filling.

Data Analysis

Data were analyzed using excel and SPSS version 23.0.

RESULTS

Table 1: Areas Covered in Yenagoa Metropolis

S/N	PHC Centres	Health staff	Respondents
1	Yenegwe	6	5
2	Agudama	10	6
3	Opolo	7	6

4	Yenezue –gene	11	8
5	Kpansia	6	5
6	Okaka/Ekeki	5	5
7	Azikoro	6	4
8	Amarata	8	7
9	Yenagoa	5	5
10	Famgbe	5	5
11	Yenanaka	1	1
12	Agbura	3	3
13	Akaba	5	5
14	Ogu	2	2
15	Swali	3	3
16	Ogbogoro	4	4
Total	**16**	**87**	**74**

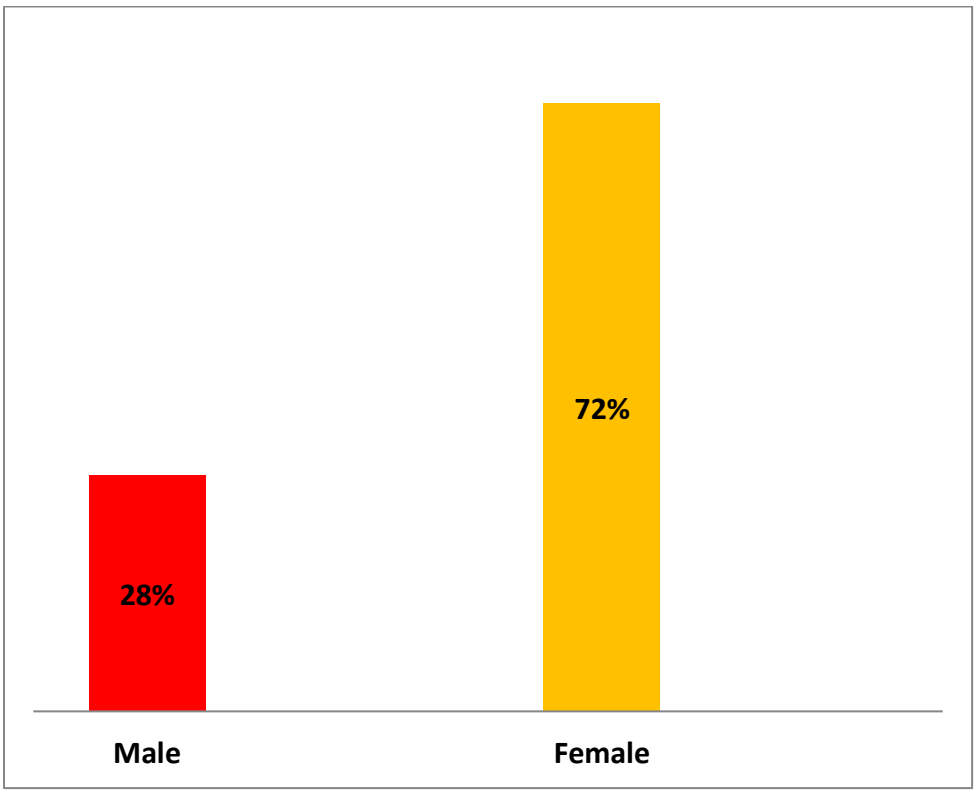

Figure 1: Gender of the Respondents.

This chart revealed males (28%) as the lowest respondents while Female (72%) make up the highest number of respondents.

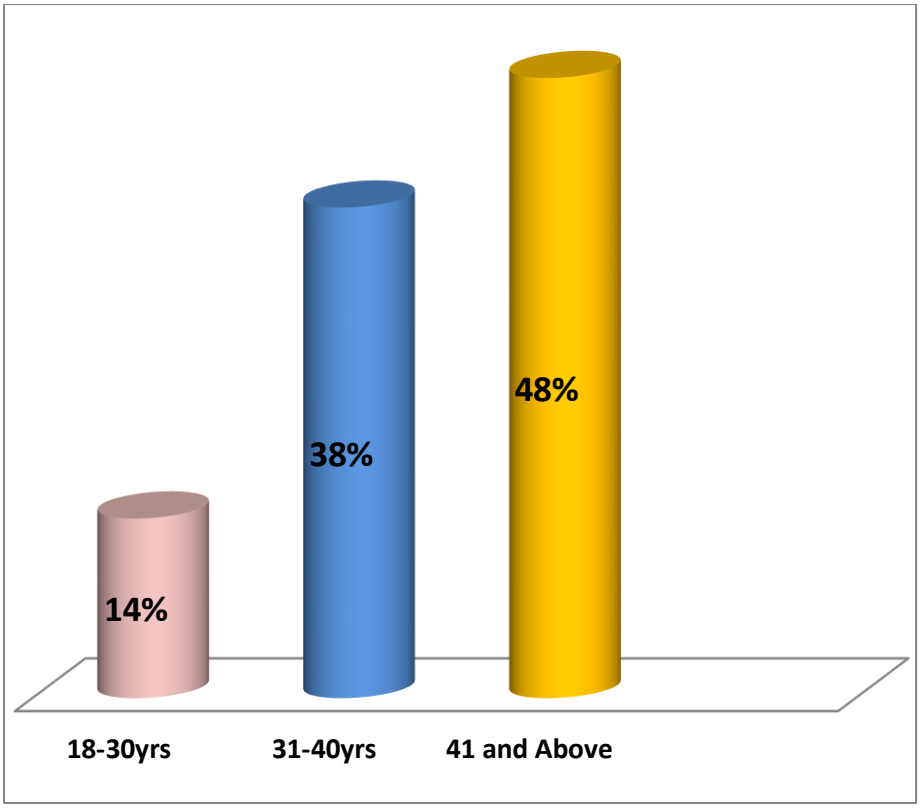

Figure 2: Age Range of Respondents

The above chart shows 18 – 30yrs (14%) as the lowest number of respondents and age >41yrs (48%) having the highest number of respondents.

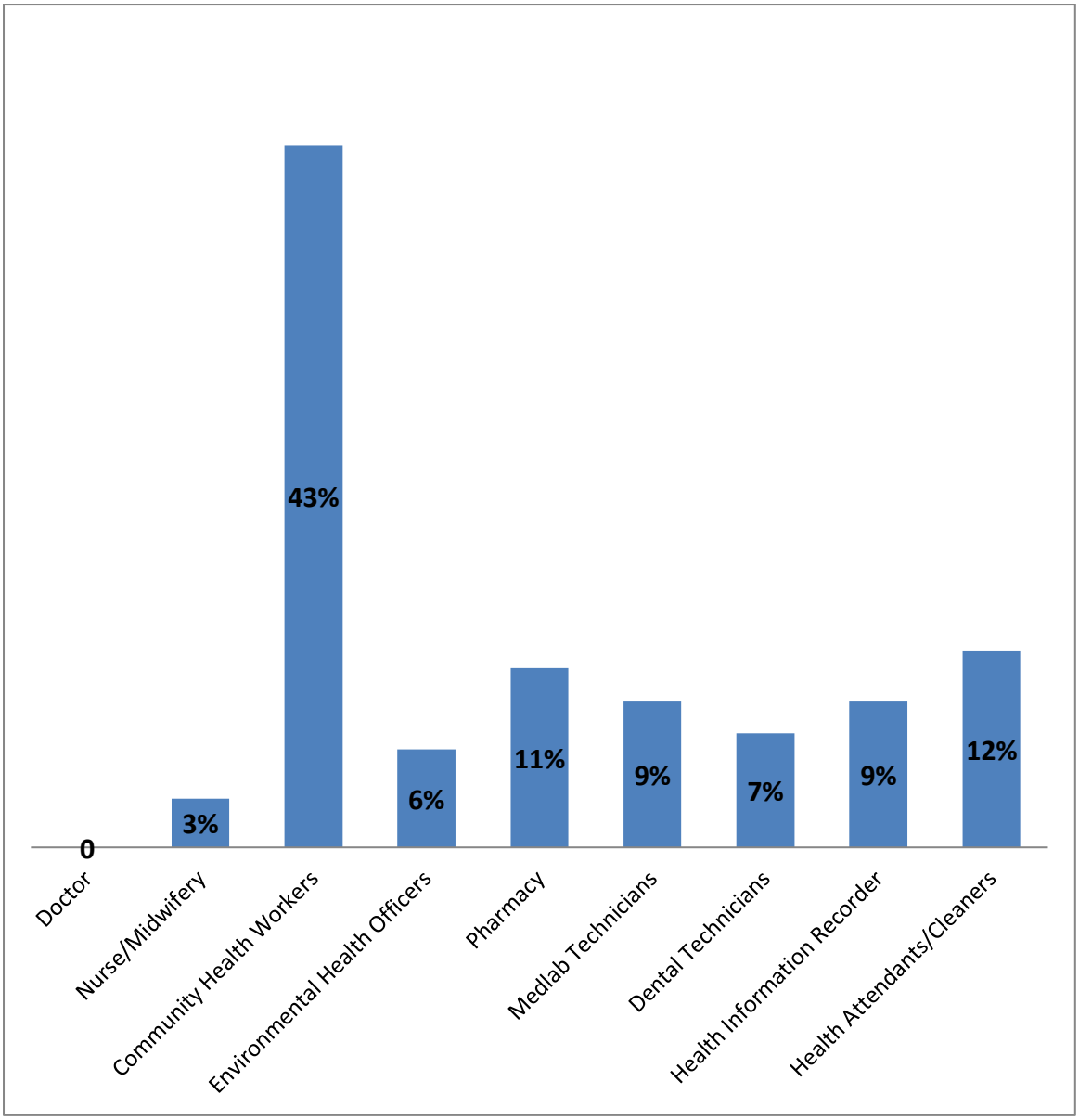

Figure 3: Professional Areas of the Respondents.

This shows that nurses/midwives (3%) have the lowest number of respondents while Community Health Extension Workers (43%) have the highest number among others.

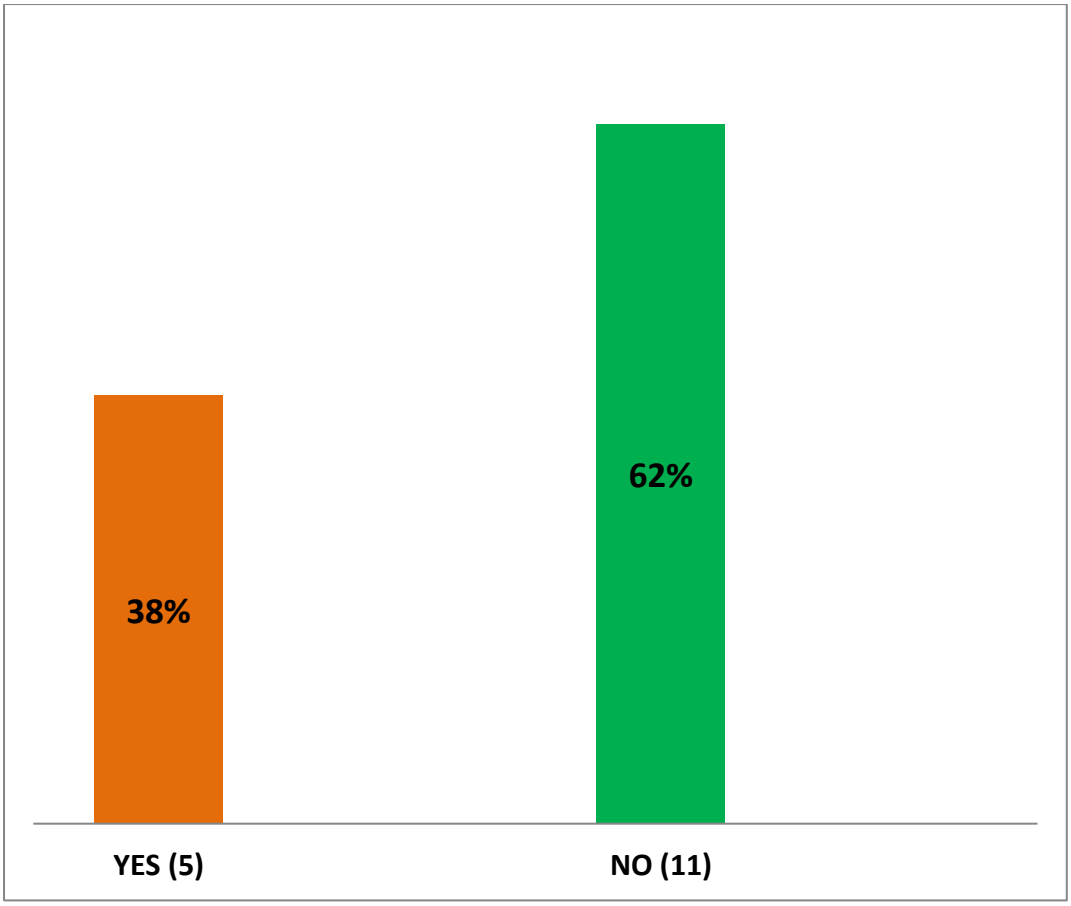

Figure 4: Treatment of HCW Practiced Before Disposal from the Respondents

This chart shows that (5)Primary Health Care Centers (38%) has the lowest number of respondents that responded 'Yes' to the treatment of health care waste before disposal while (11)with(62%) had the highest number of respondents 'No'to the treatment of Health Care Waste before disposal.

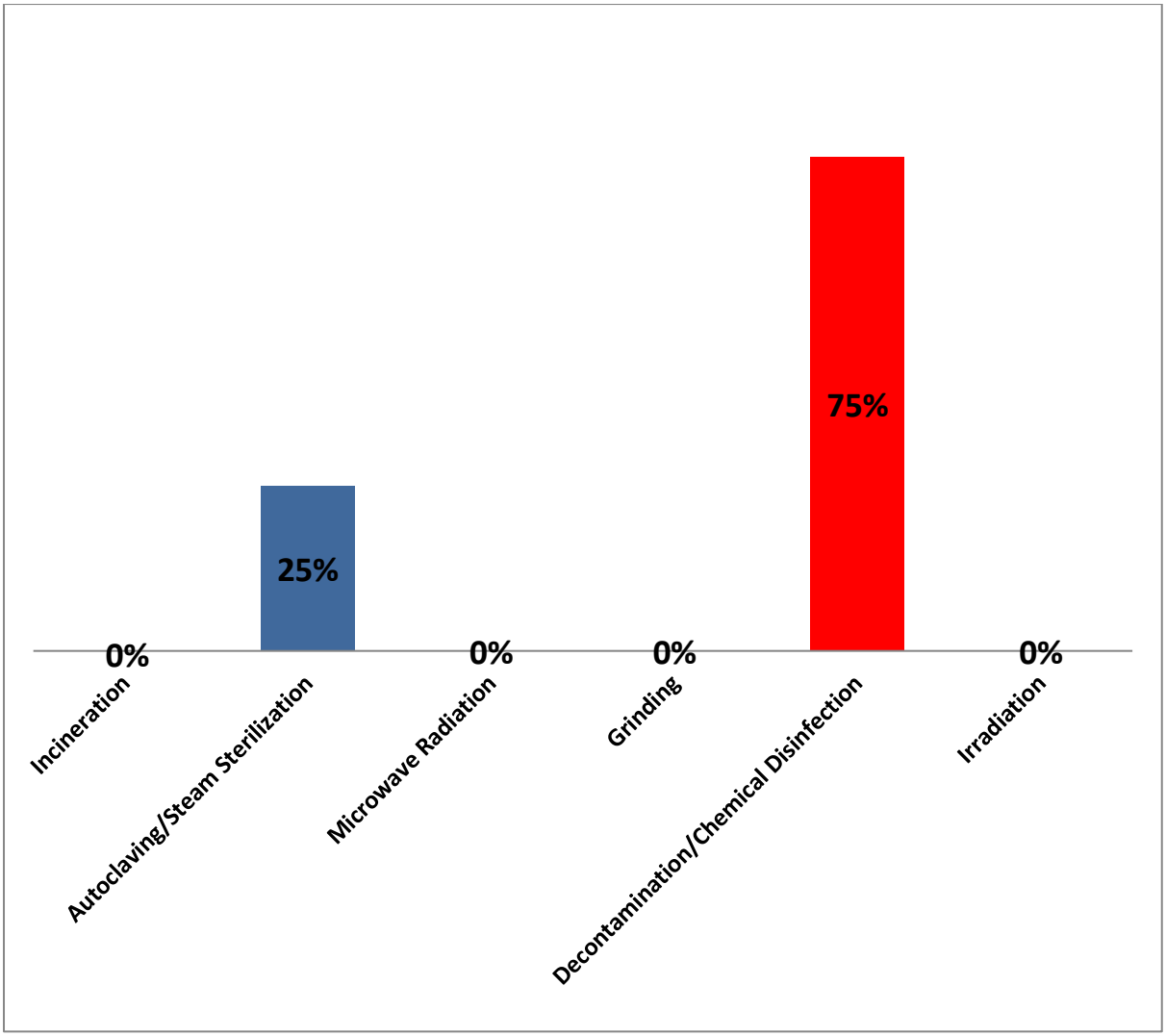

Figure 5: HCW Treatment Methods Practiced by PHC before Disposal from the Respondents.

This figures hows that among the twenty eight (28) responses that revealed the treatment of HCW in their Primary Health care Centres, one (1) Primary Healthcare Center uses autoclaving/steam sterilization with (25%) responses as HCW treatment method practiced while four (4) Primary Health Care Center with (75%) respondents revealed the use of Decontamination/ Chemical Disinfection of HCW as the treatment methods practiced.

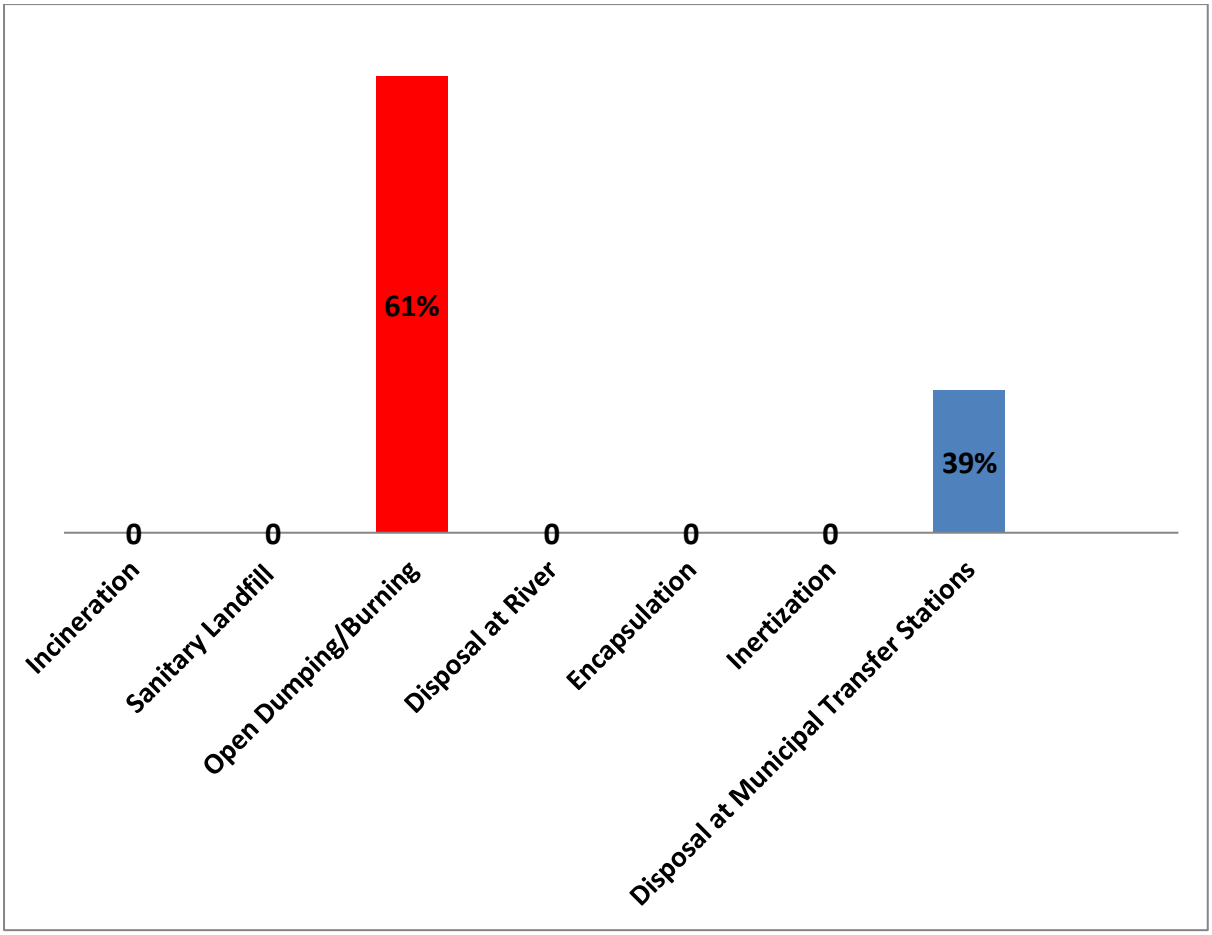

Figure 6: HCW Disposal Methods Practiced from the Respondents

Figure above shows that Ten (10) Primary Healthcare Center with (61%) agreed to Open Dumping/Burning as HCW disposal method practiced in their Healthcare Centers indicating the highest number of respondents while Six (6) Primary Health Care Center (39%) has the lowest number of

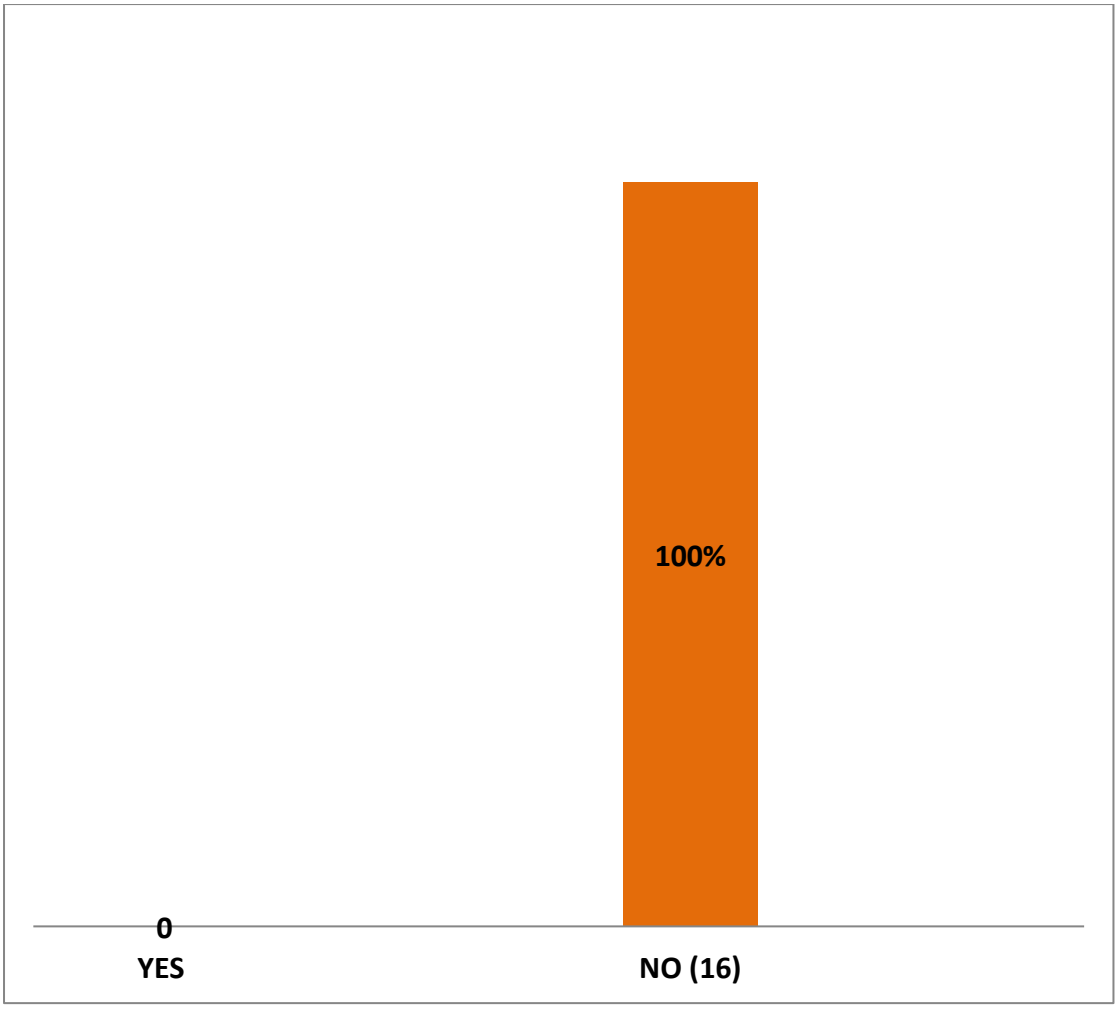

Figure 7: Availability of Designated HCW Management Unit In all Primary Healthcare Centers from the Respondents.

This shows that all the 74(100%) respondents indicated that there is no designated unit established to handle HCW in their Primary Healthcare Centre in Yenagoa Metropolis

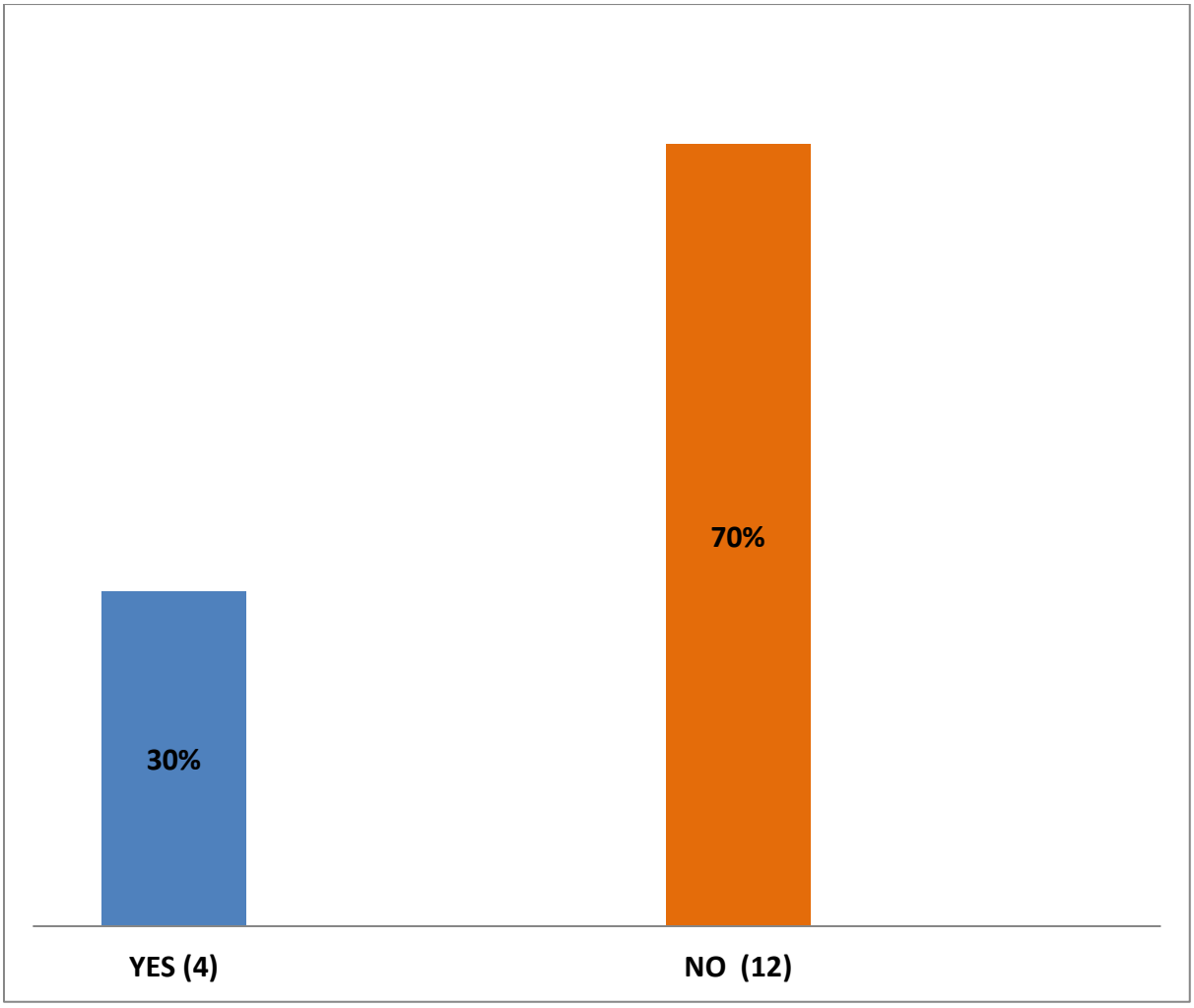

Figure 8: EHO'S Engagement at Primary Healthcare Centers in the Management of HCW

This figure indicate that Four (4) Primary Healthcare Centers (30%) has the lowest number of respondents indicated 'Yes' to the engagement of Environmental Health Officers in the handling of health care waste while (70%) with the Highest number of respondents indicated 'No' to the engagement of Environmental Health Officers in the handling of Health Care Waste.

DISCUSSION

In this study, sixteen (16) communities have Primary Health Care Centers with Staff strength of Eighty Seven (87) in Yenagoa Metropolis. However, only Seventy four (74) questionnaires were responded to and retrieved. 18 – 30yrs range of respondents were (14%), age 31-40yrs have (38%) respondent while>41yrs were (48%). Male were twenty one (28%) and Female were (72%). The professionals that responded to the questionnaires includes Nurses/midwifery (3%), CHEW (43%), EHO (6%), Pharmacy (11%), Medical Laboratory Technicians (9%), Dental Technicians (7%), Health Information Recorder (9%) and Health Attendants/Cleaners (12%) that made up the total responses of Seventy four 74(100%). These are shown in figure 1,.2, 3 and 4.

The majority of the Primary Health Care Center (11) with 46(62%) responded that no treatment of Health Care Waste is applied before disposal while (5) Primary Health Care Centers with 28(38%) responded yes to the treatment of health care waste in Yenagoa metropolis. One (1) Primary Healthcare Center uses autoclaving/steam sterilization with 7(25%) responses as HCW treatment

method practiced while (4) Primary Health Care Center with 21(75%) responses revealed the use of Decontamination/ Chemical Disinfection of pathological HCW as the treatment methods practiced.

This was consistent with the findings of Umar and Mohammed, (2014), who reported that treatment of hospital waste in primary health care center, revealed that none (0.0) of the hospital treat infectious waste before disposal, which is highly risky to the hospitals staff, community and scavengers. Similarly, this was also consistent with the findings of Aworh, *et al* (2014), who reported in their study that respondents showed that no form of treatment is being carried out on infectious wastes before the disposal of such waste. This however, is not consistent with the recommended standards of WHO, which requires that these infectious wastes be treated before disposal (WHO, 2014).

The result from this study shows that (10) Primary Healthcare Center (61%) responses uses Open Dumping/Burning as Healthcare waste disposal method practiced in their Healthcare Centers while Six (6) Primary Health Care Center (39%) responses revealed the use of Disposal at Municipal Transfer Stations as Health care waste disposal methods practiced in their Health Centers. However, the respective primary healthcare centers routinely use provided safety boxes for sharps from the local Government council for disposal. This finding is in agreement with Umar and Mohammed, (2014) study in Kano State that revealed majority of the Health centers (74.2%) practicing land disposal/ burning methods, (25.8%) burying methods and all the hospital were not having incinerator. This however, is not consistent with the recommended standards of WHO, to practiced open dumping/burning method of disposal of infectious health care wastes (WHO, 2014).

The result of the study further revealed that all the 74(100%) respondents indicated that there is no designated unit established to handle Healthcare waste in all the Primary Healthcare Centre in Yenagoa Metropolis. However, considering the need of engagement of professional Environmental Health officer in managing healthcare waste in all primary Health center, only Four (4) Primary Healthcare Centers with 22(30%) responded yes to the engagement of EHO in the handling of health care waste while majority of Twelve (12) Primary Health Care Center with 52(70%) responded no engagement of Environmental Health Officers in the handling of Health Care Waste in their primary healthcare centers in Yenagoa metropolis.

CONCLUSION

The study concludes that majority of the primary healthcare centre do not treat healthcare wastes before disposal. Most practice Open Dumping/Burning waste disposal method while few practice Disposal at Municipal Transfer Stations in their Primary Healthcare Centers contrary to the recommendation for National Environmental Healthcare Waste Control Regulation (2021) and WHO guidelines 2014. However, the respective primary healthcare centers routinely use provided safety boxes for sharps and transfer to the local Government council for disposal with no designated unit established to handle waste.

Conflict of Interest: None declared

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