NURSES/MIDWIVES COMPLIANCE WITH WHO GUIDELINES FOR HEALTHCARE WASTE MANAGEMENT IN PRIMARY HEALTHCARE CENTRES, ABIA STATE

Abstract

Medical waste management has been of concern to governments world-wide. Considering the paucity of literature on this topic this study investigated nurses and midwives awareness and management of maternity wastes in compliance with WHO guidelines in healthcare facilities in Abia State. Four research questions and four hypotheses guided this study. Literature were reviewed on the concepts and variables relevant to this study including the theoretical framework which was hinged on the Human belief model and the social systems theory. The research design was descriptive survey. The population comprised 93 midwives and nurses all of which were used for the study implying that the census sampling method was used. Data were collected through personal hand delivery and direct observation using questionnaire and observation schedule. Data collected were analysed using mean, percentage and z-test conducted at 0.05 (5%) level of significance. Results show that nurses and midwives in the healthcare facilities in Abia State are aware of and comply with the (WHO) guidelines on general waste management(68.5%) and to a great extent; infectious waste management (56.75%) to a great extent; guideline for hazardous waste management (69%) and guideline for pharmaceutical waste management (61.5%).Test of hypotheses conducted at 0.5% probability level or $p < 0.05$ comparing the opinion of nurses and midwives on compliance to the WHO guidelines did not reject any of the hypotheses. It was recommended among other things that Waste management curriculum be introduced in the pre and post certification trainings of all the nurses and midwives considering the health implications of mishandling these wastes; health management staff should be made to strictly enforce complies with WHO guidelines on waste management in all the healthcare facilities in the state. Also government should provide incinerators for the healthcare facilities in Abia State for proper burning of combustible healthcare wastes.

Key words: Nurses, Midwives, Compliance, Healthcare, Waste, Management

Introduction

Every healthcare institution generates wastes products which must be carefully and properly managed and disposed because of their negative health implications or hazards (Meghala et al., 2020). These healthcare wastes are of different categories depending on the status of the healthcare institutions that generate them. In terms of status Healthcare delivery institutions are divided into three major components namely Primary Healthcare, Secondary Healthcare and the tertiary Healthcare institutions depending on the complexity of the healthcare they

deliver (Guzder, 2020). Primary Healthcare centres include those at the Local Government Areas' health posts and the maternities. The secondary healthcare involves government hospitals while tertiary healthcare involves teaching hospitals, Federal medical Centres and the Specialist hospitals.

Waste generation and disposal depends on a number of factors including the type of waste generated, category of healthcare facility involved: primary, secondary or tertiary; funding, educational level of the facility management staff, personal decision of the facility head to enforce compliance on the staff among others (Gizalew et al., 2018). The wastes generated by maternities may differ from the wastes generated by the secondary and the tertiary healthcare institutions such as teaching hospitals and the Specialist hospitals as a result of the scope of their activities. Thus, the higher the operational status of the healthcare facility the more complex their activities and the more complex the type of wastes they generate. Similarly, the more complex the wastes generated the more dangerous they are to human health (Charter et al., 2014).

Similarly, healthcare management in private healthcare facilities may equally be different from that in Government owned healthcare facilities. This is likely to be so as government is involved they may have elaborate and regular funding to warrant advanced and modernized waste management and disposal systems (Abayomi and Oyekale, 2017). Government sponsorship and the monitoring of the application of fund and other statutory monitoring activities help to improve the level of management activities in government healthcare institutions than in the private ones which may be grappling with the difficulties caused by insufficient funding (Abayomi and Oyekale, 2017).

The type of healthcare waste generated may also differ with the level of education of the healthcare delivery management staff of the Healthcare facilities. Maternities that are headed by community health worker (chews) which are seen in different local government areas (LGAs) may not show high level of complicated waste generation and waste management techniques because of low funding and the level of education of the management staff. The low level of education of the chews may give way to ignorance of the knowledge of the regulatory guidelines laid down by government international health Agencies. The education level of the healthcare facilities managers, to a large extent also determine their levels of operation, the type of healthcare facilities acquired and the management of the facilities. With

adequate educational healthcare officers become more aware of what is expected of them and what is not. Meghala-Priya, Nandini, and Selvamani (2020) on the influence of education on hospital staff productivity it was stressed that education is a cardinal staff deployment determinant in very healthcare institution. Therefore, in healthcare waste generation and management it is also sine qua non.

These healthcare wastes that are generated have been differently classified though generally referred to as medical wastes (ANON, 2016). Biological wastes are defined as "any waste, which is generated during the examination, diagnosis, treatment or immunization of human beings or animals or research activities pertaining thereto or in the production or testing of biological or in health camps" (ANON, 2016: 1). In their own words Charter et al., (2014: 1) called wastes generated from healthcare institutions "healthcare wastes" and defined it to include all the wastes generated within healthcare facilities, research centres and laboratories related to medical procedures. In addition, it includes the same type of wastes originated from minor or scattered sources including wastes produced in the course of healthcare undertaken in the home (for example, home dialysis, self-administration of insulin, (recuperative care).

All these definitions present wastes from healthcare services as being the same so long as they are generated in the course of healthcare or healthcare related activities. Maternity wastes, on the other hand, are seen as all the wastes generated within healthcare facilities and related to medical procedures involving caring for woman all through the natal and post-natal periods. The Department of Health Manila (2022: 22) in the Healthcare management manual, in defining healthcare waste put it succinctly that "healthcare wastes include all the wastes that is generated during a Diagnostic treatment or immunization of human beings or animals, research, production or testing of biological activities or Wastes originating from minor or scattered sources."

They went ahead to categorize these wastes into ten (10) including general wastes, infectious wastes, pathological wastes, sharps, pharmaceutical wastes, genotoxic wastes, chemical wastes, wastes with high content of heavy metals, pressurized containers and radioactive wastes. Among these, the ones from institutional sources include nursing home wastes (Kamaye and Barden, 2015).

A number of classifications of theses wastes abound. In this respect, Amin, Gull, and Mehrab (2019) classified the waste as degradable, non-degradable, and re-useable. The s olid waste products are items like used needles hand gloves, and sanitary pads, semi-solid like excreta, anatomical parts and clotted blood, placenta, liquid are items like urine, fresh blood, sputum and amniotic fluid while gaseous wastes include things like sneezes from infected patients. These waste materials from maternity wards contain potentially infectious pathogens which must be properly disposed of (Guzder, 2020).

Further, Charter et al (2014) categorized these wastes as chemical wastes, radioactive, non-hazardous and general wastes. Many of these wastes, particularly, the solid ones, like bottles and needles (sharps) if not properly disposed constitute health hazards to the workers (Doctors and Nurses), people living and working within the surrounding of the healthcare facilities and the patients. In his own study Guzder (2020) classified the wastes as clinical wastes, cytotoxic wastes, offensive wastes and anatomical wastes. He continued to elaborate that healthcare wastes may include materials such as dressings used on a patient and may be either infectious or non-infectious, contaminated PPE, needles and sharps, human body parts, chemical substances, expired drugs or medicines and nappies. Their contents and structures are dangerous to people around. Needles and broken bottles are sharp objects that deeply pierce into human body when improperly disposed or carelessly kept. Not only that, they contain dangerous pathogenic substances which breed in the unused substances they were used to package (Charter, et al, 2018).

In primary healthcare centres like the maternity the major wastes are placenta, dead fetus, needles, syringes, soaked cottons, pads, gauss and amniotic fluid. The management of these wastes may not be in accord with the specifications of the regulatory health authorities. For instance, these primary healthcare centres may not have proper placenta pits and proper ways of burning other waste products thus subjecting the workers, clients and people within the adjacent environment to the danger of being infected.

These maternity wastes have so much negative effects on human life if one is exposed to them. These risk factors include infection of Doctors, Nurses, patients and other workers within the hospital. They also constitute environmental hazards. For example, the amniotic fluid, excreta, infected sputum and urine emit offensive odor and contain so many infectious

micro-organisms that make man and his animal to become bedridden with hepatitis A, B and HIV[2] virus **(**International Committee of the Red Cross, 2021).

These definitions and classifications were given credence and summated by Leonardo de-lima, Cloudio and Hietor (2017) who said though these medical wastes are the same some are peculiar to maternity departments and homes like, placentas, amniotic fluid, clotted blood, soaked sanitary pad, cut of human parts (anatomical parts) tumors like uterine fibroid masses. Amputated limbs and cancerous tumors removed during surgical operations, radioactive and heavy metal containing wastes may be generated from general and special hospitals. Semi-solid maternity wastes, like excreta contain ubiquitous quantity of infectious organisms. In fact, the higher the status of the healthcare facility the more complex the waste type generated and the higher the expected waste management and disposal techniques (Meghala-Priya, Nandini and Selvamani, 2020).

During the ravaging of nations in 2019 and 2020 by Covid-19 the environment was seen to be highly infested by COVID-19 Virus and co-catalytic pathogens thus leading to different measure being taken for human protection, like maintaining some distance between persons, wearing of face masks and the use of hand sanitizers. So it is of utmost importance for maternity waste products to be properly managed and disposed of (World Health Organisation, 2017).

As a result of the injurious nature of these wastes to workers and people around, their proper disposal becomes a matter of concern to stakeholders and authorities in health and health related matters. Thus, Afolabi, Aluko, Kehinde and Funmito (2018) asserted that Doctors, Nurses, midwives, technicians, sweepers, clients, hospital visitors and patients are at high risk if these wastes are poorly managed. In fact, Meghala, Nandini and Silvamani (2020) have stressed that improper healthcare waste management results in infectious diseases such as hepatitis A, B and HIV[2]. This therefore calls for proper waste management scheme in every healthcare facility.

Health and health related authorities all over the world have made moves to ensure careful and proper disposal of these waste. The Federal Republic of Nigeria (2021) and the International Committee of the Red Cross (2021) have all attempted to proffer a general healthcare waste management and disposal guidelines. Most common of these is that given

by Department of Healthcare Manila (2022) which said that Healthcare waste management strategies include: a). general management strategy, b) waste collection, c) waste recycling, d) waste storage and offsite disposal. Further, the case for proper waste disposal was reiterated by Gizalew, Girma, Haftu, Chorko and Girma (2018) who said that "the process of medical waste disposal which include sorting (segregation), handling/collection, storing, transportation, treatment and thereafter disposing should be adhered to by all medical waste handlers is germane at this point.

In consequence of the health risks contingent upon poor management and disposal of these wastes, one's mind becomes agitated by a question bordering on the environmental impacts of healthcare management and disposal in healthcare facilities in Nigeria (Abayomi and Oyekale, 2017, and Afolabi, Aluko, Kehinde and Funmito, 2018). In all ramifications, proper management of healthcare wastes will contribute in promoting healthy environment and consequently longevity to human beings.

As a result of the state of the secondary and the tertiary healthcare institutions waste generation and management may be organized following the hospital management organegram. At such a high level of healthcare with specific work assignments Nurses and midwives may not be involved in waste disposal. This may be left for personnel specially employed and trained for that purpose. In the primary healthcare centres this specificity in work including waste management and disposal may not be so organized. In this case it may even involve the Nurses and midwives acting and working as waste generators as well as waste handlers.

The World Health Organisation (2017) has decried the state of healthcare waste management in developing countries, particularly in Nigeria. In a study carried out in Kenya WHO observed that waste collection and disposal was still at its most primitive level and had no hope of improvement because of poor funding from the government. In a study carried out by Abah and Ohimain (2021) in Ondo State of Nigeria it was revealed that the level of healthcare waste management practice was zero (that is, unsustainable). This study highlighted the pitfalls of HCW management in Nigeria, a developing country where resources are limited. They also concluded by recommending adequate funding and retraining of healthcare officers as a measures to improve the HCW management practices in the country. Similarly, Babatola (n.d) carried out a study in Akure, Nigeria where he found out that there is no uniform practice of hospital waste management among the hospitals studied.

The study recommended that there should be source segregation of waste within each hospital as all wastes are often mixed in the same waste basket. It further recommended that government and the relevant agencies involved in healthcare and health related activities should be at alert to their responsibilities of regulating the waste management practices among the hospitals in the city. In their own study Abayomi and Oyekale (2017) did a study on Healthcare waste management in Nigeria: A case study. The study concluded that there was low compliance with standard HCW management. They recommended that possession of HCW management guidelines, staff training on HCW disposal and provision of requisite equipment for proper treatment of HCW would promote environmental safety in HCW disposal.

Virtually all these studies reviewed were done outside the study area. This thus creates a gap in knowledge as nothing is known about healthcare waste management practices in the study area, Abia State. It is against this backdrop that the problem of this study is directed to investigating the extent of Nurses and midwives in maternities in Abia State comply with the healthcare waste management guidelines given by the World Health Organization.

Statement of the Problem

It has been observed that many primary healthcare institutions dispose the wastes they generate without recourse to WHO guidelines on waste management. Many sharps and deep piercing medical wastes are suspected to be erroneously buried in the ground within the environment of the healthcare facilities (Abah and Ohimain, 2021; Obayomi and Oyekale, 2017). It has equally been observed that many healthcare facilities do not abide by the rules that guide the proper disposal of maternity waste products as a result of ignorance of the existence of these regulations as occasioned by low education. It has been observed too that some healthcare institutions dispose liquid waste into municipal sewage systems, may be, as a result of ignorance or neglect or because there are not being watched (Abahand, 2021). Many a time, non-segregated and untreated maternity waste matters like the sanitary pad have been seen thrown into public refuse disposal systems where they stay for days before they are carted away. This observation was given credence by Obayomi and Oyekale (2017: 3) when they said that “it is perplexing to note that in many instances healthcare wastes are disposed along with domestic wastes into landfil or municipal open waste dump sites|”. It has equally been seen where some healthcare institutions dig the ground and burry these wastes knowing that many of these wastes do not decompose easily (Pruss, Giroult and Rushbrook,

2022).Also uncompleted buildings close to maternity homes have been converted to maternity waste disposal dumps. A backlash effect of all these unacceptable maternity waste disposal methods is re-infection of health workers (Doctors, Nurses and Midwives), patients (pregnant women and their unborn babies), clients, visitors, other healthcare workers and people living within the healthcare facility environment. These unwholesome maternity waste management and disposal methods create doubt in the minds of health authorities concerning the propriety of maternity waste management of maternity personnel. Though Nigeria government has gazetted some guidelines for healthcare waste disposal and while Abia State government has also instituted Abia State Environmental Protection Agency (ASEPA) to oversee the problem of waste disposal in Abia State, much is yet to be done in terms of checking on the management and waste disposal operations of the maternities in the state.

Considering the crude methods of maternity waste management in practice in some healthcare institutions, the question that burgles one's mind is weather these institutions are aware of the existence of guidelines set out by the World Health Organization (WHO) and the Nigeria government governing the management of such waste matters or that maternity waste handlers purposefully decided to feign ignorance and dispose these wastes the ways they do because they are not being watched (Ravitch and Riggan, 2017). In consequence, therefore, the problem of this study put in question form is "to what extent do Nurses and midwives in maternities in healthcare facilities in Abia State properly manage wastes they generate from their daily healthcare operations?"

Aims and Objectives of the Study

The general objective of this study was to examine Nurses and midwives compliance with World Health Organization guidelines for maternity waste management in selected primary healthcare centres in Abia State. Specifically, the study attempted to:

1) Ascertain compliance of Nurses/midwives with World Health Organization guideline for general waste management;
2) Determine compliance of Nurses/midwives with World Health Organization guideline for infectious waste management;

Hypotheses

The following hypotheses were stated and will be tested at 0.05 level of significance:

H_{01}: There is no significant difference between the mean rating scores of Nurses and midwives on their compliance with WHO guidelines for general waste management. $p < 0.05$

H_{02}: There is no significant difference between the mean rating scores of Nurses and midwives on their compliance with WHO guidelines for infectious waste management. $P < 0.05$

METHODOLOGY

This research design adopted for this study was cross sectional descriptive survey. The Population of the study was 93 made up of 38 (40.86%) Midwives and 55 Nurses (59.14%). The sample for the study involved all the 93 members of the population. That is, this researcher employed census sampling techniques for the selection of the sample. Census sampling is a sampling procedure involving the use of the entire members of a population for a study. This method was adopted because the researcher felt that the population was small enough and manageable for the study within the time and resources available for the study. Hence, no sampling was done. The data for this study was collected using a questionnaire. The data collected were analyzed using mean, percentage, Chi-Square and z-test. Specifically, mean, percentage and z-test were used to answer the research questions collected with the questionnaire while mean, percentage and Chi-Square were used to analyse the observation data collected with observation schedule. A mean of 2.50 (the mean of the 4 points scale used in drafting the instrument) was used as the decision norm to decide on accepted and rejected items. The hypotheses were tested at 0.05 probability level using the z test and the Chi-Square. The results were put in tables.

RESULTS

Demographic Information

Table 1: Shoeing Components Distribution of the Population used for the Study and Data Retrieval

Source	Males	Female	Total	Percentage
Nurses	11 (20%)	44 (80)	55	(59.14)
Midwives	2 (5.3)	36 (94.75)	38	(40.86)
Total	13 (13.98	80 (86..02)	93	100

From the Table above the total number of participants in this study was 93 the population of the study. Out of this number 13 were males while 80 were females. Of the 13 male participants 11 were nurses while 2 were midwives. Out of the 80 females 44 were nurses and 36 midwives. Among these 93 participants 10 were used to establish the reliability coefficient of the data collection instrument while 83 were used for the actual study. A total of 83 instruments were administered and were all (100%) retrieved before data analyses were started. This fit was achieved because the research personally visited the healthcare facilities and collected the data herself.

Objective One:

Table 2: Results of Data Analysed on the Nurses and Midwives Management of General Healthcare wastes (Questionnaire Data) n = 83

S/N	Items	VGE	GE	LE	VLE	TOT	$\bar{X}$	R/A
1	Kitchen wastes are separated from medical wastes before they are disposed.	80	117	30	9	238	2.84	GE
2	Colour codes are used in separating wastes in this maternity.	56	30	40	39	165	1.99	LE
3	Wastes generated in this maternity are handled according to WHO guidelines.	10	75	60	18	193	2.33	GE
4	All wastes are not handled in the same way in this maternity.	100	105	20	3	228	2.75	GE
5	General solid wastes are thrown into municipal refuse bins.	90	84	46	2	222	2.67	GE
6	Kitchen liquid wastes are disposed in municipal sewers.	120	90	16	5	231	2.78	GE
7	Bio-degradable kitchens wastes are dumped in municipal refuse dumps.	140	105	24	1	270	3.25	VGE

8	Domestic wastes are not disposed along with medical wastes	152	99	18	3	272	3.28	VGE
	Cluster Mean	**SD = 0.43**			**68.5%**	**2.74**		

Results of data analysis presented in Table 2 show that the respondents agreed to a great extent that they comply with WHO guidelines on general waste management. This was observed from the cluster mean of 2.75 (68.5%) which falls within the range of great extent. This value is equivalent to 68.5% while 31.5 % disagreed complying with these guidelines. From the table Kitchen wastes are separated from medical wastes before they are disposed had a mean of 2.84 and was great extent and accepted. Colour codes are used in separating wastes in this maternity had mean 1.99 and was low extent and rejected. Wastes generated in this maternity are handled according to WHO guidelines had mean 2.33 and was great extent but rejected. All wastes are not handled in the same way in this maternity had mean 2.75 and was great extent and accepted. General solid wastes are thrown into municipal refuse bins had mean 2.67 and was great extent and accepted. Kitchen liquid wastes are disposed in municipal sewers had mean 2.78 and was great extent. Bio-degradable kitchens wastes are dumped in municipal refuse dumps had mean 3.25 and was very great extent and accepted. Domestic wastes are not disposed along with medical wastes had mean 3.28 and was very great extent and accepted.

Objective Two

To what extent do Nurses/midwives comply with World Health Organization guideline for infectious waste management?

Table 3: Results of Data Analysed on the Nurses and Midwives Management of Infectious Healthcare wastes (Questionnaire Data) n = 83

S/N	Items	VGE	GE	LE	VLE	TOT	$\overline{X}$	R/A
9	In this maternity infectious wastes are first separated from other waste types before they are disposed.	80	84	30	20	214	2.58	GE
10	Infectious wastes are put in special colour containers for ease of identification.	36	36	30	47	149	1.80	LE
11	We disinfect infectious wastes before disposing them.	44	45	40	37	166	2.00	LE
12	We separate infectious waste into solid, liquid, semi-solid before	40	48	42	36	166	2.00	LE

	disposing them.							
13	Anatomical solid wastes are buried in special landfills.	40	42	40	39	161	1.94	LE
14	We incinerate some infectious wastes.	64	30	36	39	169	2.04	GE
15	We flush amniotic fluids direct into the sewage gutter.	88	72	30	22	212	2.55	GE
16	We burn some of the inflammable but infectious wastes.	160	120	20	2	302	3.64	VGE
17	We have specially designed landfill where we dispose most of the infectious waste materials.	36	39	42	40	157	1.89	LE
	Cluster Mean	**SD =**		**56.75%**		**2.27**		

Results of data analyses presented in table 3 show that the respondents agreed to a great extent that they comply with the WHO guidelines on infectious waste management. This was conserved from the cluster mean which had a value of 2.27 (56.75%). This is equivalent to 56.75%. From the table, in these maternity infectious wastes are first separated from other waste types before they are disposed had mean 2.58 and was great extent. Infectious wastes are put in special colour containers for ease of identification had mean 1.80 and was low extent. We disinfect infectious wastes before disposing them had mean 2.00 and was low extent. We separate infectious waste into solid, liquid, semi-solid before disposing them had mean 2.00 and was low extent. Anatomical solid wastes are buried in special landfills had mean 1.94 and was low extent. We incinerate some infectious wastes had mean 2.04 and was great extent. We flush amniotic fluids direct into the sewage gutter had mean 2.55 and was great extent. We burn some of the inflammable but infectious wastes had mean 3.64 and was very great extent. We have specially designed landfill where we dispose most of the infectious waste materials had mean 1.89 and was low extent.

4.2: Hypotheses

Hypothesis One

H_{01}: There is no significant difference between the mean rating scores of Nurses and midwives on their compliance with WHO guidelines for general waste management.

Table 4: Hypothesis Test on Nurses and Midwives Compliance with WHO Guidelines on General Healthcare Waste Management

Sources	N	$\overline{X}$	SD	P	Z_{cal}	Z_{crit}	Decision
Nurses	55	2.79				`	

			0.14	<0.05	1.15	1.96	Do not Reject Ho
Midwives	38	2.76	0.11			

Results of hypothesis test presented in Table 4 show that there is no significant difference between the man rating scores of Nurses and midwives on their compliance with WHO guidelines on general waste management. This was observed from the calculated z of 1.15 which is less than the critical z of 1.96. From the Table the mean rating score of the of the 55 Nurses was 2.79 with a standard deviation of 0.14 while the mean rating score of the 38 midwives was 2.76 with a standard deviation of 0.11. The probability level was 0.05. The calculated z was 1.15 while the critical z was 1.96. Since the calculated z was less than the critical z the null hypothesis was not rejected.

Hypothesis Two

H_{02}: There is no significant difference between the mean rating scores of Nurses and midwives on their compliance with WHO guidelines for infectious waste management.

Table 5: Hypothesis Test on Nurses and Midwives Compliance with WHO Guidelines on Infectious Healthcare Waste Management

Sources	N	$\overline{X}$	SD	P	Z_{crit}	Decision
Nurse	55	2.67	0.20			
				<05	1.96	Do not Reject Ho
Midwives	38	2.71	0.15			

Results of hypothesis test presented in Table 5 show that there is no significant difference between the man rating scores of Nurses and midwives on their compliance with WHO guidelines on infectious healthcare waste management. This was observed from the calculated z of 1.10 which is less than the critical z of 1.96. From the Table the mean rating

score of the of the 55 Nurses was 2.67 with a standard deviation of 0.20 while the mean rating score of the 38 midwives was 2.71 with a standard deviation of o.15. The probability level was 0.05. The calculated z was 1.10 while the critical z was 1.96. Since the calculated z was less than the critical z the null hypothesis was not rejected.

Discussion of Findings

In this section the results of data analyses with respect to the respective research questions and hypotheses are discussed. The discussions were made separately for each research question and hypothesis.

Nurses and Midwives Management of General Healthcare wastes in Abia State

The management of general waste in a hospital environment is completely different from the way other waste matters are handled. By observation there is a mixed practice of proper maternity waste management and a display of ignorance of the existence of the maternity waste regulatory guidelines (Amin et al., 2017). However the level of practice and certain actions of some midwives and nurses are implicating showing that they have to a certain extent knowledge of the existence of the waste management guidelines (Leonardo et al., 2017). For instance, using baskets of different colours to put tissues, polythenes, papers and easily combustible materials and another to put bottles, syringes, and having stove with which they boil hot water to sterilize used blades for reuse are testimonies to their knowledge of the waste management guidelines.

As a matter of concern the different health risk nature of the wastes has caused intensive studies to be carried out to determine how they are managed by Nurses and midwives in maternities in Abia State, whether or not in compliance with WHO guidelines. Data analysis showed that the respondents agreed to a great extent that they comply with WHO guidelines on general waste management. This is sequel to their responses that kitchen wastes are separated from medical wastes before they are disposed, all wastes are not handled in the same way in the maternities, general solid wastes are thrown into municipal refuse bins, kitchen liquid wastes are disposed in municipal sewers. Bio-degradable kitchen wastes are dumped in municipal refuse dumps and that domestic wastes are not disposed along with medical wastes. These responses tacitly confirm that the Nurses and midwives in maternities in Abia State comply with who guidelines on general waste management as they practice the

act of separating and handling general waste separately from medical wastes (Leonardo et al., 2017).

The results of hypothesis test conducted in respect of this research question showed that there is no significant difference between the mean rating scores of Nurses and midwives on the way they manage general wastes in their maternities. This result became clear from the calculated z which is less than the critical z and hence, did not warrant the rejection of the null hypothesis. From field observation, the researcher saw that all the maternities separate kitchen wastes from medical wastes before disposing them. This is also a confirmation of the results of the questionnaire data and information got from it (Abahand, 2021).

These general waste management practices of Nurses and midwives in Abia State is in consonance with the WHO guideline which stipulates that kitchine wastes should be segregated from other medical wastes and disposed separately (ANON, 2016, WHO, 2017 and Federal Republic of Nigeria, 2021). In a similar manner, Aba and Ohimain (2021) in their study observed that general waste are generated mostly at different points outside the health issues treatment areas in the hospitals and as such are disposed separately. These findings are in tandem with the statement of the International Committee of the Red Cross (ICRC, 2021) that greater percentage of the wastes generated in hospitals are domestic and do not portend any danger of infection and that they be dispose along the municipal principles.

Nurses and Midwives Management of Infectious Healthcare wastes in Abia State

Infectious maternity wastes are one of the medical wastes that are potentially dangerous to human beings. Nurses and midwives in Abia State have shown that they do not comply with the WHO guidelines for the management of these infectious wastes through the following responses. Infectious wastes are not put in special colour containers for ease of identification; they do not disinfect infectious wastes before disposing them, anatomical solid wastes are not buried in special landfills, they do not incinerate some infectious wastes and that they flush amniotic fluids direct into the sewage gutters (Aba and Ohimain, 2021). These statements that attracted negative responses from the Nurse and midwives are at the core of the WHO guidelines and propositions for proper management of infectious healthcare wastes. Though the Nurses and midwives agreed that they separate wastes like sharps from the liquid waste, it is natural that such wastes do not go together and as such this practice may not be counted a

studied habit and learned work practice but an intuitive one. Results of hypothesis test conducted with respect to this research question showed that there is no significant difference between the mean rating scores of Nurses and midwives on their handling of infectious medical wastes (Charter, et al., 2018). This response was observed from the calculated z which was less than the critical z. In fact, the response showed unanimity of opinion by the Nurses and midwives. From the results of field observation the researcher saw that the nurse and midwives do not separated non-biodegradable wastes from bio-degradable wastes before they are disposed, Infectious liquid are flushed into soak away piths, Medical wastes are burnt in the open, medical wastes are not separated into different components for proper disposal and that they do not use colour coded containers to separate medical wastes into different components. These observations confirm the results of the questionnaire responses that the Nurses and midwives practices of handling infectious medical wastes are at variant between maternities (Ravitch and Riggan, 2017).

Proper disposal of infectious medical wastes is strongly emphasized by WHO for the welfare of the workers and the people living within the environment of the healthcare facilities (Charter, et al., 2018).This is as a result of their concomitant health risks (Meghala-Priya, Nandini and Selvamani, 2020). Researchers have shown that poor disposal of infectious medical wastes result in various kinds of infection such asHepatitis A, B and HIV^2 virus, (WHO, (2nd edition) (2014), Aba and Ohimain, 2021) and ICRC, 2021).These findings on non-compliance or inappropriate practices on infectious waste management by the Nurses and midwives in Abia State is a signals to poor training or omission in the training curriculum of the health officers or a function of poor regulatory monitoring for compliance by the appropriate health officials or government ministry. This finding is similar to the finding of Afolabi, Aluko, Kehinde and Funmito (2018) about the management of infectious medical wastes in private hospitals in urban areas in Nigeria. In fact, the bottom line of all these is that Nurses and midwives do not comply with the WHO guidelines on the management of infectious medical waste in Abia State.

Conclusions

The following conclusions were drawn based on the data analyses and interpretations results and the findings thereof:

1. Nurses and midwives in the maternity in Abia State are aware of and comply with the World Health Organisation (WHO) guidelines on general waste management to a great extent;
2. Nurses and midwives in Maternities in Abia State comply with World Health Organization guideline for infectious waste management to a great extent;
3. Nurses and midwives in Abia State comply with World Health Organization guideline for hazardous waste management;
4. Nurses and midwives in Abia State comply with World Health Organization guideline for pharmaceutical waste management.
5. The responses of the midwives and the nurses on their awareness and compliance with the waste management guidelines were unanimous.
6. This researcher attributes these responses which were authenticated with an observation as a result of educational and training outcomes and the willingness to put the acquired knowledge to work as adduced by the human behaviour model theory upon which this study was based.

Recommendations

Based on this study the following recommendations were made:

1. Waste management curriculum should be introduced in the pre and post certification trainings of all the nurses and midwives considering the health implications of mishandling of these wastes.
2. Health management staff should be made of strictly enforce complies with WHO guidelines on waste management in all the healthcare facilities in the state. This will help in the proper management of these wastes and avoid re-infection of people by diseases.
3. Hospital management should make sure she provides nurses and midwives with the necessary equipment to enable them do their works effectively.

Ethical Approval:

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

Consent

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

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