



## **Determinants Of Medical Waste Disposal Methods Among Nurses In Health Institutions In Rivers West Senatorial, Rivers State**

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### **ABSTRACT**

This study was to examine the determinants of medical waste disposal methods among nurses in health institutions at Rivers West Senatorial, Rivers State. A descriptive cross sectional survey design was adopted for the study. The population for this study consisted of 685 health personnel (nurses) with the sample size of 685 nurses used for the study. A multi-stage sampling procedure was adopted for the study which was presented in three stages in order to select the sample for the study. The instrument for eliciting information for this study was structured questionnaire titled Questionnaire on Determinants of Medical Waste Disposal (QDMWD) which was in three sections. The validated instrument had a reliability coefficient value of 0.86 using Pearson Products Moment Correlation Coefficient. Collected data were coded and analyzed using Statistical Products for Service Solution (SPSS) version 25.0). The findings of this study illustrated that there was a significant difference between training ( $p<0.05$ ), work unit ( $p<0.05$ ), year of work experience ( $p<0.05$ ), availability of equipment/materials ( $p<0.05$ ) and waste segregation ( $p<0.05$ ) and medical waste disposal methods in health institutions of Rivers west senatorial district of Rivers State. It was concluded that medical waste disposal among nurses was good. The study recommended that nurses and other health personnel should ensure that waste generated in the health facility are segregated and separated according it types to enable proper disposal

**Keywords:** medical waste, disposal methods, nurses

### **INTRODUCTION**

Since medical waste can harbor potentially hazardous bacteria and poses a risk of infection transmission from healthcare facilities to healthcare staff, patients, and the general public, it can be said to be of the greatest environmental concern. Proper medical waste management (MWM) is required to manage waste from generation through separation, collection, transport, and treatment to final disposal in order to avoid negative effects on human health, the community, and the environment. Nursing is a physically demanding profession, and those who practice it are exposed to hospital waste, which increases the risk of infections and other illnesses. Laor (2017) found that only 24% of garbage was correctly disposed of and that 43% of hospital waste was adequately managed by nurses because cleaners are typically expected to handle this work alone.

Hence, anything that comes into contact with bodily fluids is generally considered to be medical waste. It is specifically any solid waste produced during the diagnosis, treatment, or immunization of people. Wastes are the leftover pieces of hard materials, such as glass or wood, that remain after something has been used or destroyed. Therefore, the disposal of waste continues to be a big concern, particularly in

rural and urban areas (where waste is astronomically expanding) in developing and transitional economies. Due to the range of items that make up household waste, it is difficult to handle and manage in both urban and rural areas (Huntley, 2010). The increased attention given to the management of urban waste, according to Yoada et al. (2014), is a response to aesthetic concerns, inconveniences, environmental pollution, and risk to the public's overall health due to hazards of heaps of waste that are left littering in most health facilities. Any trash produced as a byproduct of healthcare activities in clinics, dental offices, hospitals, and laboratories is referred to as medical waste. Any substance that might come into touch with the body when conducting research, administering medication, or providing any kind of treatment is included. It's likely to be infectious, or potentially infectious, and is often contaminated with bodily fluids in some way & but the term can also be used to refer to general waste from any medical practice, as well as specific waste streams typically found in the medical industry. All needles, scalpels, razor blades and any other sharp objects are generally referred to as Sharps.

The collection, gathering, storage, and disposal of medical waste might take place on- or off-site. Environmental Protection Agency (2014) notes that on-site treatment of large amounts of biomedical waste typically necessitates the use of relatively expensive equipment and is typically only cost-effective for very large hospitals and major universities with the space, labor, and funding to operate such equipment. Off-site treatment and disposal involve hiring of a biomedical waste disposal service (also called a truck service) whose employees are trained to collect and haul away biomedical waste in special containers (usually cardboard boxes, or reusable plastic bins) for treatment at a facility designed to handle biomedical waste. The methods of medical waste disposal include: land filling, incineration, open dumping, composting, and mechanical destructor (Adogu, et al., 2015), and recently scavenging. Ifegbesan (2010) also highlighted the link between several socio-demographic characteristics, such as age, gender, educational attainment and occupation, and location, and awareness of settings and practices, particularly in schools. However, inadequate waste management practices in healthcare management and gender and educational background score or suggest a tendency for teachers' and students' use of medical waste disposal techniques to vary by gender and educational background. It may be relevant that nurses disregard the disposal of garbage created at their workplace and blame hospital cleaners for it. Medical waste generated by healthcare facilities is so dangerous that it can lead to a number of health issues and clinical infections, especially when it is improperly disposed of. It is not encouraging seeing how nurses handle and dispose of rubbish in their institution. It is against this backdrop that this study examined the determinants of medical waste disposal methods among nurses in health institutions at Rivers West Senatorial, Rivers State.

#### **Aim And Objectives Of The Study**

The aim of this study was to assess the determinants of medical wastes disposal among nurses in health institutions in Rivers West Senatorial, Rivers State. The objectives of the study sought to:

1. Examine the extent to which training determine medical waste disposal in health institutions of Rivers West senatorial District, Rivers State
2. Determine the extent to which work unit determine medical waste disposal in health institutions in Rivers West senatorial District, Rivers State
3. Determine the extent to which work experience determine medical waste disposal in health institutions in Rivers West senatorial District, Rivers State
4. Determine the extent to which equipment/materials made available for medical waste disposals in health institutions in Rivers West senatorial District, Rivers State
5. Examine the extent to which segregation determine medical waste disposal in health institutions in Rivers West senatorial District, Rivers State

#### **METHODOLOGY**

The area of this study was Rivers West Senatorial District, Rivers State, Nigeria. A descriptive cross sectional survey design was adopted for the study as the research design. The population for this study consisted of 685 health personnel (nurses) in the one hundred and nineteen (119) health facilities in Rivers

West Senatorial District which includes community health officers, nurses, doctors, laboratory scientist, among others. The sample size of this study was 670 nurses which were adopted from the population. This sample size was used because the population is in less hundreds so as to enable the generalizability of findings. Census or block sampling method was utilized in selecting the sample. This due to the manageable size of the population (the population was also used as the sample because of its size).

The instrument for eliciting information for this study was structured questionnaire titled Questionnaire on Determinants of Medical Waste Disposal (QDMWD). This instrument was in three sections A, B, and C. In section A depicts information on socio-demographic variables of the respondents such as age, gender, training, work experience, availability of equipment/material, waste segregation and work unit. Section B illustrated the attitude towards medical waste disposal methods with the response items of Very High Extent (VHE), High Extent (HE), Low Extent (LE) and Very Low Extent (VLE). In the section C, information relating to methods of medical waste disposal among nurses. The response items were keyed on available (A) and Not Available (NA) with criterion mean of 2.5 and 50%.

The instrument was validated by the supervisor and three experts from the department of Human Kinetics Health and Safety Studies for content, construct and face validity. Copies of the questionnaire were given alongside the objectives, research questions and null hypotheses to the aforementioned experts for moderation. The criticism, moderation and correction were used to redesign the instrument. Hence the instrument was valid and used for the study. A test retest method was employed using 20 copies of the instrument among nurses in general hospital in Yenagoa Local Government Area of Bayelsa State and after two the same copies were re-administered because of their homogenous characteristics. The pilot study has similar characteristics and without any dichotomy. The Reliability coefficient value of 0.86 for determinants of medical waste disposal methods was obtained using Pearson Products Moment Correlation Coefficient (PPMC). Hence the instrument was reliable and used for the study.

The questionnaire was administered with the help of three research assistants which was done within three weeks interval following on spot retrieved after completion. Collected data were coded and analyzed using Statistical Products for Service Solution (SPSS) version 25.0). The result was obtained using descriptive and inferential statistical tools include simple percentage for summarizing socio-demographic data while mean and standard deviation for answering research questions, ANOVA and chi-square, were used to test the null hypotheses at 0.05 level of significance.

## RESULTS

**Research Question 1:** *To what extent does training determine medical waste disposal in health institutions of Rivers West senatorial District, Rivers State?*

Table 4.1 revealed the extent to which training determines the medical waste disposal of nurses in health institutions in Rivers West senatorial District, Rivers State. Table 4.3 indicated that the mean rating showed that to a high extent training determines the medical waste disposal among nurses in health institutions in Rivers West senatorial District, Rivers State. This is because the mean rating of each item is greater than the criterion mean (2.5). This is also confirmed by the grand mean rating ( = 2.61) which is greater than the criterion mean (2.5). The finding of the research question indicated that to a high extent, training determine medical waste disposal of nurses in Rivers West senatorial District, Rivers State.

**Table 4.1: Mean Rating and Standard Deviation on Training and Medical Waste Disposal among Nurses**

S/N	Items/Statement	Mean( $\bar{X}$ )	SD	Decision
1	I have received training on the disposal of metals	2.56	.51	HE
2	I have been trained on the disposal of corrosives	2.51	.47	HE
3	I have received training on the disposal of personal protective equipment	2.79	.73	HE
4	I have received training on disposal of wound dressing	2.68	.62	HE
5	I have been trained on the disposal of sharps	2.75	.69	HE
6	I have received training on the disposal of body tissues/organs	2.65	.58	HE
7	I have been trained on the disposal of radioactive materials	2.53	.44	HE
8	Training is provided for the disposal of W turbing	2.54	.46	HE
9	Training is provided for the disposal of medicals/pharmaceuticals	2.57	.52	HE
10	Training is provided for the disposal of poisons	2.59	.53	HE
11	Training is provided for the disposal cytotoxic waste	2.52	.47	HE
<b>Grand Mean Rating</b>		2.61	.56	

**Research Question 2: To what extent does work unit determine medical waste disposal in health institutions in Rivers West senatorial District, Rivers State?**

**Table 4.2: Mean Rating and Standard Deviation of Nurses on the extent to Work Unit Determines Medical Waste Disposal**

S/N	Items/Statement	Radiological Lab			Ward			Laboratory			Theatre			Pharmacy			Immunization			Health Records		
		$\bar{X}$	SD	Rmk	$\bar{X}$	SD	Rmk	$\bar{X}$	SD	Rmk	$\bar{X}$	SD	Rmk	$\bar{X}$	SD	Rmk	$\bar{X}$	SD	Rmk	$\bar{X}$	SD	Rmk
1	Disposal of metals	2.43	.37	LE	2.53	.47	HE	2.46	.41	LE	2.41	.37	LE	2.43	.38	LE	2.44	.39	LE	2.46	.42	LE
2	Disposal of corrosives	2.58	.53	HE	2.41	.36	LE	2.61	.57	HE	2.43	.38	LE	2.45	.41	LE	2.48	.42	LE	2.42	.38	LE
3	Disposal of PPE	2.62	.58	HE	2.58	.54	HE	2.63	.59	HE	2.69	.63	HE	2.48	.43	LE	2.62	.58	HE	2.44	.39	LE
4	Disposal of wound dressing	2.51	.47	HE	2.66	.61	HE	2.51	.47	HE	2.71	.67	HE	2.58	.52	HE	2.42	.37	LE	2.45	.41	LE
5	Disposal of sharps	2.56	.51	HE	2.67	.62	HE	2.56	.52	HE	2.74	.68	HE	2.43	.38	LE	2.68	.63	HE	2.46	.42	LE
6	Disposal of body tissues/organs	2.47	.42	LE	2.79	.73	HE	2.48	.42	LE	2.74	.67	HE	2.54	.48	HE	2.46	.42	LE	2.43	.38	LE
7	Disposal of radioactive materials	2.78	.73	HE	2.74	.68	HE	2.69	.63	HE	2.53	.48	HE	2.43	.38	LE	2.41	.37	LE	2.38	.34	LE
8	Disposal of W turbing	2.69	.62	HE	2.76	.72	HE	2.55	.51	HE	2.83	.78	HE	2.41	.36	LE	2.52	.48	HE	2.36	.32	LE
9	Disposal of medicals	2.41	.36	LE	2.79	.73	HE	2.48	.42	LE	2.78	.73	HE	2.75	.71	HE	2.73	.68	HE	2.38	.33	LE
10	Disposal of poison	2.68	.63	HE	2.81	.78	HE	2.63	.58	HE	2.69	.66	HE	2.63	.59	HE	2.48	.43	LE	2.35	.31	LE
11	Disposal of stationaries	2.59	.53	HE	2.78	.73	HE	2.52	.47	HE	2.73	.69	HE	2.63	.58	HE	2.45	.39	LE	2.73	.69	HE
12	Disposal of cytotoxic	2.63	.57	HE	2.82	.77	HE	2.68	.63	HE	2.66	.61	HE	2.53	.48	HE	2.43	.37	LE	2.43	.37	LE
13	Disposal of pathological human fluids	2.57	.52	HE	2.79	.73	HE	2.66	.62	HE	2.84	.79	HE	2.47	.42	LE	2.54	.49	HE	2.25	.21	LE
<b>Grand Mean Rating</b>		<b>2.58</b>	<b>.53</b>		<b>2.71</b>	<b>.67</b>		<b>2.58</b>	<b>.54</b>		<b>2.68</b>	<b>.64</b>		<b>2.52</b>	<b>.47</b>		<b>2.51</b>	<b>.46</b>		<b>2.43</b>	<b>.38</b>	

Table 4.2 revealed the extent to which the work unit of nurses determine their medical waste disposal in Rivers West senatorial District, Rivers State. The grand mean ratings of nurses in radiological laboratory, ward, laboratory, theatre, pharmacy and immunization to a high extent disposed medical waste. The grand mean ratings of the nurses in these units are greater than the criterion mean (2.5). On the other hand, the nurses in health records to a low extent disposed medical waste. This is because the grand mean rating of the nurses was 2.43 which is less than the criterion mean (2.5). The result of this research question revealed that work unit determine the disposal of medical waste in Rivers West senatorial District, Rivers State.

**Research Question 3:** *To what extent does work experience determine medical waste disposal in health institutions in Rivers West senatorial District, Rivers State?*

**Table 4.3: Mean Rating and Standard Deviation of Nurses on the Extent to which Work Experience Determine Medical Waste Disposal**

S/N	Items/Statement	Work Experience											
		1-5 years			6-10years			11-15years			16 years and above		
		$\bar{X}$	SD	Rmk	$\bar{X}$	SD	Rmk	$\bar{X}$	SD	Rmk	$\bar{X}$	SD	Rmk
1	Disposal of metals	2.51	.47	HE	2.56	.51	HE	2.69	.65	HE	2.71	.67	HE
2	Disposal of corrosives	2.53	.49	HE	2.58	.52	HE	2.71	.67	HE	2.74	.69	HE
3	Disposal of PPE	2.56	.52	HE	2.69	.65	HE	2.75	.71	HE	2.98	.94	HE
4	Disposal of wound dressing	2.61	.57	HE	2.72	.68	HE	2.79	.75	HE	2.96	.91	HE
5	Disposal of sharps	2.58	.54	HE	2.75	.71	HE	2.86	.82	HE	2.94	.88	HE
6	Disposal of body tissues/organs	2.54	.48	HE	2.67	.62	HE	2.88	.84	HE	2.97	.92	HE
7	Disposal of radioactive materials	2.51	.47	HE	2.64	.59	HE	2.79	.75	HE	2.89	.85	HE
8	Disposal of W turbing	2.53	.49	HE	2.67	.62	HE	2.74	.69	HE	2.91	.87	HE
9	Disposal of medicals	2.58	.54	HE	2.71	.67	HE	2.78	.74	HE	2.94	.89	HE
10	Disposal of poison	2.49	.45	LE	2.67	.62	HE	2.75	.71	HE	2.89	.85	HE
11	Disposal of stationaries	2.57	.52	HE	2.65	.61	HE	2.78	.74	HE	2.96	.91	HE
12	Disposal of cytotoxic	2.46	.41	LE	2.58	.54	HE	2.66	.62	HE	2.88	.84	HE
13	Disposal of pathological human fluids	2.53	.48	HE	2.64	.59	HE	2.69	.65	HE	2.87	.82	HE
<b>Grand Mean Rating</b>		<b>2.55</b>	<b>.47</b>		<b>2.65</b>	<b>.59</b>		<b>2.76</b>	<b>.72</b>		<b>2.91</b>	<b>.86</b>	

Table 4.3 revealed the extent to which work experience determines medical waste disposal in health institutions in Rivers West senatorial District, Rivers State. The grand mean ratings of the nurses showed to a high extent work experience determine the medical waste disposal of nurses in health institutions in Rivers West senatorial District, Rivers State. This is because the grand mean ratings of the nurses (based on their work experience) are greater than the criterion mean (2.5). This result revealed that work experience of nurses determine their disposal of medical waste in health institutions in Rivers West senatorial District, Rivers State.

**Research Question 4:** *To what extent are equipment/materials made available for medical waste disposals in health institutions in Rivers West senatorial District, Rivers State?*

**Table 4.4: Availability of Equipment/Materials for Medical Waste Disposal**

S/N	Equipment/Materials	Availability			
		Available		Not Available	
1	Black bag	318	48	247	52
2	Yellow biohazard bag	324	49	341	51
3	Red biohazard bag	311	47	354	53
4	Brown biohazard bag	296	45	369	55
5	Radiological bio-hazard bag	282	42	383	58
6	Open top container	243	37	422	63
7	Waste disposal bins	416	63	249	37
8	Plastic shaft shredder	113	17	552	83
9	Crusher machine	108	16	557	84
10	Recycling machine	24	4	641	96
11	Compactor	46	7	619	93
12	Dump sites	22	3	643	97
<b>Average Percent</b>		<b>209</b>	<b>32</b>	<b>456</b>	<b>68</b>

Table 4.4 revealed the extent to which equipment/materials are made available in health institutions in Rivers West senatorial District, Rivers State. Table 4.6 showed that equipment/material to a low extent are available in health institutions in Rivers West senatorial District, Rivers State. This is because the average percent of equipment/materials available is less than the criterion percent (50 percent). The result of the research question is that to a low extent equipment/materials are available. This has negatively affected medical waste disposal among nurses in health institutions in Rivers West senatorial District, Rivers State.

**Research Question 5:** *To what extent does segregation determine medical waste disposal in health institutions in Rivers West senatorial District, Rivers State?*

**Table 4.5: Mean Rating and Standard Deviation of Nurses on the Extent to which Segregation Determines Medical Waste Disposal**

S/N	Items/Statement	Training		
		Mean ( $\bar{X}$ )	SD	Decision
1	Black bag	2.98	.92	HE
2	Yellow biohazard bag	2.84	.78	HE
3	Red biohazard bag	2.91	.86	HE
4	Brown biohazard bag	2.64	.58	HE
5	Radiological biohazard bag	2.73	.67	HE
<b>Grand Mean Rating</b>		<b>2.82</b>	<b>.76</b>	

Table 4.5 revealed the extent segregation determine medical waste disposal in health institutions in Rivers West senatorial District, Rivers State. Table 4.7 revealed that black bag is more used in disposing medical waste ( $\bar{X} = 2.98$ ), this is followed by red bag ( $\bar{X} = 2.91$ ), then yellow bag ( $\bar{X} = 2.84$ ), radiological bag ( $\bar{X} = 2.73$ ) and then brown bag ( $\bar{X} = 2.64$ ). This finding showed that segregation determine medical waste disposal in health institutions in Rivers West senatorial District, Rivers State.

**Hypothesis 1**

There is no significant difference in the mean rating of nurses on the extent to which training determine the medical waste disposal in health institutions of Rivers West Senatorial District, Rivers State.

**Table 4.6: Anova of the Difference in the Mean Rating on the Extent to which Training of Nurses Determine Medical Waste Disposal**

Source of Variation	Sum of Sources	Df	Mean Sum of squares	Cal F-value	p-value	Decision
Between	66.484	15	4.432	.499	.522	p >.05
Within	5754.812	649	8.867			Ho <sub>3</sub> is Accepted
<b>Total</b>	<b>5821.296</b>	<b>664</b>				

Alpha level = .05

Table 4.6 showed that there is no significant difference in the mean rating of nurses on the extent to which training determine medical waste disposal in Rivers West Senatorial District, Rivers State at .05 Alpha level (Cal F-value = 4.99; Df = 15/664; p >.05). The null hypothesis is accepted. The result of the test of the hypothesis is that there is no significant difference in the mean rating of nurses on the extent to which training determine medical waste disposal in Rivers West Senatorial District, Rivers State.

**Hypothesis 2**

There is no significant difference in the mean rating of nurses on the extent to which work unit determine the medical waste disposal in health institutions of Rivers West Senatorial District, Rivers State.

**Table 4.7: Anova of the Difference in the Mean Rating on the Extent to which Work Unit of Nurses Determine Medical Waste Disposal**

Source of Variation	Sum of Sources	Df	Mean Sum of squares	Cal F-value	p-value	Decision
Between	156.297	6	26.049	3.395	.001	p <.05
Within	5078.542	658	7.718			Ho <sub>4</sub> is Rejected
<b>Total</b>	<b>5821.296</b>	<b>664</b>				

Alpha level = .05

Table 4.7 indicated that there is significant difference in the mean rating of nurses on the extent to which work unit determine medical waste disposal in Rivers West Senatorial District, Rivers State at .05 Alpha level (Cal F-value = 3.375; Df = 6/664; p < .05). The null hypothesis is rejected. The result of the test of hypothesis is that there is significant difference in the mean rating of nurses on the extent to which work unit determine medical waste disposal in Rivers West Senatorial District, Rivers State.

**Hypothesis 3**

There is no significant difference in the mean rating of nurses on the extent to which work experience determine medical waste disposal in health institution in Rivers West Senatorial District, Rivers State.

**Table 4.8: Anova of the Difference in the Mean Rating on the Extent to which Work Experience of Nurses Determine Medical Waste Disposal**

Source of Variation	Sum of Sources	Df	Mean Sum of squares	Cal F-value	p-value	Decision
Between	148.781	3	49.594	16.531	.000	p <.05
Within	4375.614	661	6.619			Ho <sub>5</sub> is Rejected
<b>Total</b>	<b>4524.395</b>	<b>664</b>				

Alpha level = .05



Table 4.8 revealed that there is significant difference in the mean rating of nurses on the extent to which work experience determine medical waste disposal in Rivers West Senatorial District, Rivers State at .05 Alpha level (Cal F-value = 16.531, Df = 3/664;  $p < .05$ ). The null hypothesis is rejected. The result of the test of hypothesis is that there is significant difference in the mean rating of nurses on the extent to which work experience determine medical waste disposal in Rivers West Senatorial District, Rivers State.

**Hypothesis 4**

There is no significant difference in the availability of equipment/materials for medical waste disposal among nurses in health institutions in Rivers West Senatorial District, Rivers State.

**Table 4.9: Chi-Square Analysis on the Extent to which Equipment/Materials are Available for Medical Waste Disposal**

S/ N	Equipment/Material s	Availability		Df	$\chi^2$ Value	p- value	Decision
		Availabl e	Not Available				
1	Black bag	318(209)	347(456)	11	4832.748	.000	p < .05 Ho <sub>6</sub> is Rejected
2	Yellow bag	324(209)	341(456)				
3	Red bag	311(209)	354(456)				
4	Brown bag	296(209)	369(456)				
5	Radiological bag	282(209)	383(456)				
6	Open top container	243(209)	422(456)				
7	Waste disposal bags	416(209)	249(456)				
8	Plastic shaft shredder	113(209)	552(456)				
9	Crusher machine	108(209)	557(456)				
10	Recycling machine	24(209)	641(456)				
11	Compactor	46(209)	619(456)				
12	Dump sites	22(209)	643(456)				
<b>Total</b>		<b>2503</b>	<b>5477</b>				

Table 4.9 showed that there is significant difference in the availability of equipment/ materials for medical waste disposal among nurse in health institutions in Rivers West Senatorial District, Rivers State at .05 Alpha level (Cal  $\chi^2$  value = 4832.748, Df = 11,  $p < .05$ ). The null hypothesis is therefore rejected. The result showed that the provision of equipment/materials in health institutions for medical waste disposal significantly differ.

**Hypothesis 5**

There is no significant difference in the mean rating of nurses on the extent to which segregation determine medical waste disposal in Rivers West Senatorial District, Rivers State.

**Table 4.10: Anova of the Difference in the Mean Rating on the Extent to which Segregation Determine Medical Waste Disposal among Nurses**

Source of Variation	Sum of Sources	Df	Mean Sum of squares	Cal F-value	p-value	Decision
Between	33.812	4	8.453	1.074	.525	p > .05
Within	5196.117	660	7.872			Ho <sub>7</sub> is Accepted
<b>Total</b>	<b>5229.929</b>	<b>664</b>				

Alpha level = .05

Table 4.10 revealed that is no significant difference in the mean rating of nurses on the extent to which segregation determine medical waste disposal in Rivers West Senatorial District, Rivers State at .05 Alpha level (Cal F-value = 1.074; Df = 4/664;  $p > .05$ ). The null hypothesis is accepted. The result of the

test of the hypothesis is that there is no significant difference in the mean rating of nurses on the extent to which segregation determine medical waste disposal in health institutions in Rivers West Senatorial District, Rivers State.

## DISCUSSION

The result of research question 1 (Table 4.1) revealed that training of nurses to a high extent determine medical waste disposal in health institutions in Rivers West Senatorial District, Rivers State. When the mean ratings of nurses on the extent to which training determine medical waste disposal in health institution in Rivers West Senatorial District, Rivers State was subjected to one way analysis of variance (Anova), the calculated F-value was found not to be statistically significant at .05 Alpha level. This result is in agreement with Thirunwukkarasu et al (2020) and Amalu et al (2014) that training is significantly related to medical waste disposal. Also, this result is in agreement with Akkajit et al (2020) that regular training is a determinant for medical waste disposal. This present study may be due to the fact that regular training will enable the nurses to acquire new knowledge on the disposal of medical waste, the nurses will acquire knowledge procedure to adopt in disposing medical waste and training will bring the nurses u to date on the right procedure involved in disposing medical waste.

The result of research question 2 (Table 4.2) revealed that to a high extent work unit determine medical waste disposal in health institutions in Rivers West Senatorial District, Rivers State. When the mean ratings of nurses on the extent to which work unit determine medical waste disposal in health institutions in Rivers West Senatorial District, Rivers State was subjected to one way analysis of variance (Anova), the calculated F-value was found to be statistically significant at .05 level of significance. This result is in agreement with Agwu (2012), Babayemi and Dauda (2010) and Akkajit et al (2020) that work unit in the health institution was found to be a strong predictor of medical waste disposal as the amount of medical waste generated varies from one unit to another. The present study showed that more medical waste are generated from the ward, followed by the theatre, radiological laboratory, laboratory, pharmacy, immunization and health records. Thus, the result of the study revealed that while more medical waste are generated in the ward, health records was the least in the generation of medical waste. In other words, more medical waste is disposed from the ward than from other units or other departments in health institutions in the area.

The result of research question 3 (Table 4.3) indicated that to a high extent work experience of the nurses determines their medical waste disposal in health institutions in Rivers West Senatorial District, Rivers State. When the mean ratings of nurses on the extent to which work experience determine medical waste disposal in health institution sin Rivers West Senatorial District, Rivers State was subjected to one way analysis of variance (Anova), the calculated F-value was found to be statistically significant at .05 level of significance. This result is in agreement with Hakim et al (2014), Banga (2013) and Adogu et al (2015) that nurses with longer years of work experience were significantly more likely to have satisfactory knowledge and determine modern method of medical waste disposal. This result may be due to the fact that the more years an individual spends on a job, the more he/she will be more experienced and matured to engage in more satisfying professional activities.

The result of research question 4 (Table 4.4) revealed that equipment/materials to a low extent are available for medical waste disposal among nurses in health institutions in Rivers West Senatorial District, Rivers State. When the response of the nurses on the extent to which equipment/materials are available for medical waste disposal in health institutions in Rivers West Senatorial District, Rivers State was subjected to chi-square analysis, the calculated  $\chi^2$  value was found to be statistically significant at .05 level of significance. This result is in agreement with Twumasi (2017) that availability of disposal Material and equipment significantly relate to adequate management of medical waste. In addition, Babacia et al (2015) and Eventh et al (2010) that accessibility and availability of equipment are more encouraging for nurses to good method of medical waste disposal. The present study is because the equipment/materials for medical waste disposal are not uniformly provided. While some of the

equipment/materials are made available, many more were not provided in health institutions in the area. Thus, most of the equipment/materials needed for medical waste disposal in health institutions in the area. The result of research question 5 (Table 4.5) indicated that segregation to a high extent determined medical waste disposal among nurses in health institutions in Rivers West Senatorial District, Rivers State. When the mean ratings of nurses on the extent to which segregation determine medical waste disposal in health institutions in Rivers West Senatorial District, Rivers State was subjected to one way analysis of variance (Anova), the calculated F-value was found not to be statistically significant at .05 level of significance. This result is in agreement with Musa et al (2020) that nurses who understand waste segregation are more likely to disposal adequately medical waste of different types. This result is also in agreement with Barloa et al (2016) that waste segregation significantly predict medical waste disposal. This present result showed that nurses to a high extent understand waste segregation of medical waste in health institutions in Rivers West Senatorial District, Rivers State.

## CONCLUSION

Considering the result of this study, it was concluded that medical waste disposal among nurses was good and the level of training acquired on the method of medical wastes disposal was determined by training, work experience, work unit, availability of materials and equipment and waste segregation among others. There is need for the nurses to engage in consistent training in order to improve their skill and knowledge of modern method of medical wastes disposal especially in health institutions in order to reduce occurrence of health problems.

## RECOMMENDATIONS

Considering the findings and conclusion of this study, the following recommendations were made;

1. Government through the Ministry of health should organize regular training programme for the nurses and other health personnel on biomedical medical waste management necessary through symposiums, role play, interactive lectures, and other feasible training methods to improve the system.
2. Local authorities should implement a well-planned collection and transfer process for medical waste in order to reduce the risk of environmental pollution and the risk of infection or injury to healthcare workers and the general public.
3. Nurses and other health personnel should ensure that waste generated in the health facility are segregated and separated according it types to enable proper disposal
4. Government through waste management agency should provide the public with medical solid waste infrastructures and improving citizens' awareness about solid waste source separation and recycling to promote solid waste recycling programmes holds great promise for developing effective public campaigns and behaviour changing interventions.
5. Government and non-governmental organizations should take responsibility for the collection and disposal of the wastes generated especially with the health care facility, as well as for the operation and maintenance of their equipment.
6. Government should provide medical waste disposal material and equipment to every health institutions across the state to enable workers manage and dispose adequately.
7. There is need for greater government involvement, community participation and orientation with private and government owned health sector involvement in medical waste management.

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