Texila International Journal of Public Health
Volume 5, Issue 3, Sep 2017

Health Care Waste Management Practice amongst Health Care Workers in Health Facilities in Bida Local Government Area, Niger State - Nigeria

Article by Otojareri K.A[1], Omosigho O P[2], Otojareri U.C.G[3], Emumwen E.G[2]
[1]*NHIS Unit, Federal Medical Centre Bida. Niger State Nigeria*
[2]*Medical Microbiology Dept., Federal Medical Centre Bida. Niger State Nigeria*
[3]*Nursing Division, Umaru Sanda General Hospital Bida, Nigeria*
Email: otojareri.kohwo@yahoo.com[1]

Abstract

Health care wastes (HCW) are all waste generated from health care facilities, research facilities and other associated laboratories. The aim of this study is to determine the knowledge, attitude, practice and factors affecting health care waste management practice amongst health care staff in health facilities in Bida Local Government Area. This descriptive study was carried out among health care personnel in all the health facilities in Bida Local Government. The respondents who had worked in the health facilities for a period of one year and above were studied. The tools for data collection were semi structured questionnaires and observational checklist. A total of 314 respondents were interviewed. The mean age of respondents was 33.8±6.8 years. The level of knowledge of health care staff in the health facilities was fair. Respondents' attitudes were excellent in 22.3%, good in 46.8% and poor in 30.9%. Respondents' practice of health care waste management (HCWM) was fair in 56.4%, excellent in 23.6% and poor in 20.1%. Also, noted was that awareness of existing policy on HCW, a standing Supervisory Committee on HCW in the various health facilities affected positively the practice of HCWM. The study showed that the level of knowledge and attitude amongst health staff in health care facilities in Bida Local Government was fair and their current practice of health care waste management was found to be good. From the findings in the study, the knowledge, attitude and practice of health care waste management amongst health care staff can be improved by organizing training and retraining programmes like workshops, seminars etc. Policies on health care waste management should be widely circulated to improve the awareness amongst health care staff.

Keywords*: Health Care Waste; Health Care Waste Management, Bida Local Government Area.*

Introduction

Waste according to Basel convention is any substance or objects which are supposed to be disposed or which are required to be disposed by the provision of law[1]. Waste can also be defined as product arising from humans activities that are discarded because there are no longer useful and could be solid, liquid or gases.[1]

Health care waste can be defined as any waste, which is generated during the diagnosis treatment or immunization of human beings or animals or in the production or testing of biologicals, irrespective of the volume, characteristics and composition.[2] Health care waste (HCW) has also be defined as all wastes generated from health care and health research facilities and associated laboratories.[3]

The World Health Organization (WHO) defines health care waste (HCW) as the total waste stream from a health care or research facility that includes both potential risk waste and non-risk waste materials.[4] Health care wastes can also be categorized in the following way viz – infectious wastes which includes wastes suspected to contain pathogens e.g. laboratory cultures, waste from isolation wards, tissues (swabs), materials or equipment that have been in contact with infected patients, excreta, - pathological waste includes human tissues or fluids e.g. body parts, blood and other body fluids, fetuses. Sharps which consists of sharps waste and it includes needles, infusion sets, scalpels, knives, blades,

broken glasses. Pharmaceutical waste which are wastes containing pharmaceuticals such as pharmaceuticals that are expired or no longer needed, items contaminated by germs or containing pharmaceuticals (boxes, bottles). Waste with high content of heavy metals which could be a sub classification of chemicals waste which are usually highly toxic such as batteries, broken thermometers, blood pressure gauge etc. Pressurized containers which are potentially harmful gas in containers such as gas cylinders, gas cartridges and aerosol cans. Radioactive waste which are wastes from ionizing radiotherapy or laboratory research, contaminated glassware, packages such as alpha particles, beta particles, and gamma rays. About 75% to 90% of wastes produced by health care providers is "non risk or general" health care waste whilst the remaining 10% to 25% of health care waste is regarded as hazardous and may create a variety of health risk.[2, 4]

Health care waste management is therefore defined as a discipline associated with control of health care waste generation, collection, storage, transfer and transport, processing and disposal of solid wastes in a manner that is in accordance with the best principle of public health, economics, engineering, conservation and other environmental conditions.[1]

Effective management or disposal of hospital waste should include basically, storage in generating premises, effective collection, effective transportation and proper disposal. However, in Nigeria a report by Coker et al states that there is a near total absence of institutional arrangement for the management of medical wastes.[5] there are steps in management of health care wastes. Segregation of hospital wastes in which there is separation of different types of wastes at the point of generation and keeping them isolated from each other. Segregation is the most important step in the entire process of hospital waste management. There is need for special attention to be given to the relatively small quantities of infectious and hazardous waste thereby reducing not only the risk but also the cost of handling, treatment and disposal. The most appropriate way of identifying the categories of waste is by sorting the waste into colour coded plastic bags or containers.[6]

With the increase in health care waste generation from health care facilities coupled with lack of trained work force to manage health care waste, the individual, community, would continue to suffer hazards from exposure to health care waste.

This study which is to determine the level of knowledge, attitude, practice and factors affecting practices of health care waste management amongst health care staff of health facilities in Bida Local Government Area, will help provide information and create awareness on the health care staff and the public of hazards that can arise from health care waste and its effects. This will help to improve the attitude of health care personnel and the management of the hospitals to health care waste management. The current practices on HCWM are expected to improve in our health facilities. To the Government/Ministry of Health the study would help remind those in leadership positions of the need to ensure that policies on health care waste management are implemented.

Materials and method

A descriptive cross sectional study was carried out amongst three hundred and fourteen (314) health care workers handling health care waste in the health facilities which includes a Federal Medical Centre (F.M.C), a general hospital, five primary health care clinics and 2 dispensaries in Bida local government area. Only those health care workers who had spent a year and above in service were included in the study the study was carried out between February and April 2011

Study population

Bida, the second largest town in Niger state. It is a local government area in Niger state Nigeria. The local government area covers an area of 51 square kilometers and has a population of 188,181.[7] Bida is located South-West of Minna the capital of Niger state, about 9km North of River Kaduna, along Bida-Mokwa road. It is a dry and arid town and the major ethnic group is Nupe. Bida is the head quarter of the Nupe kingdom and the title by which their king is called is 'Etsu Nupe'. The town is known for its production of tradition crafts notably glass and brass ware. Bida is also known for its Durbar festival.Bida

local government is made up of fourteen wards. Federal government institutions sited in the town are; The Federal Polytechnic, National Cereals Research Institute. There are about 9 government health institutions which includes, a Federal Medical Centre (F.M.C), a general hospital, five primary health care clinics and 2 dispensaries. There are also 5 private health institutions. There are other social amenities in the town like pipe borne water and electricity supply.

Sampling method

A total population study was carried out amongst three hundred and fourteen (314) health care workers. Using the exclusion criteria health care workers in the various health facilities that were less than a year in service were excluded from the study.

Two tools, questionnaire and observation check list were used to collect data for the study. The semi structured questionnaires consisted of open and closed ended questions was administered by interviewers. Qualitative information were sought on sociodemographic characteristics of respondents, their knowledge, attitude, practice of health care waste management and factors affecting the practice of health care waste management.

Observational checklist was used to check for the presence of certain equipments in the premises of all fourteen (14) health care facilities in Bida Local Government where the health care workers worked. Items that were checked for were colour coded bins, protective gadgets used by the hospital assistants handling health care waste, incinerator, and disposal sites within the health facilities.

Data management

A day was set aside for the training of two research assistants, an infectious control staff and a medical laboratory scientist. They were trained on the appointed day and during the period of the pretest, on how to interview participants for the study.

Pretest: To ensure appropriate data collection, questionnaires were pretested at Kutigi rural hospital, Kutigi which was about 48km from Bida. From the pretest, necessary corrections in the questionnaires were made before the commencement of the study.

Statistical Package for Scientific Solution (SPSS) Version 16 was used for coding and analysis of data. Data were presented in words, frequency distribution tables and charts. Chi-square statistical test of association and test of significance were carried out where applicable and the level of significance set at $p<0.5$ and confidence level at 95%.

Ethical consideration

Ethical approval for this study was giving by Health department of Bida local government Verbal consent were obtained from the participants after full explanation for the reason of the study including its risk and benefits. Consent was also obtained from the management of the various health facilities used in the study following an explanation of the benefits of the study.

Results

The mean age of the respondents was 33.8± 6.8 years. A higher proportion of respondents 156 (49.7%) were in the age group 31-40 years, followed by 111 (35.4%) in 21-30years age group and only nine (9%) were in age group 51-60 years. Half of the respondents 158 (50.3%) were females while 156 (49.7%) were males. A higher proporiton of the respondents 62.7% were married and 36.3% were single. A higher proportion of the respondents 148 (47.1%) were nurses, followed by doctors 16.9% and others comprising physiotherapist, radiographers etc. 6.1%. Over half of the respondents 174 (55.5%) had worked for 1-5years, followed by respondents 70 (22.3%) who had worked for 6-10years and 24 (8.7%) had worked over 20 years. **(Table 1)**

Table 2 shows that over half of the respondents 166 (52.9%) worked with the tertiary health care institutions, followed by 82 (26.1%) respondents who worked with the secondary health institutions, 40

(12.7%) worked with the primary health care centre (P.H.C.C) and only three respondents, 3(1.0%) worked with the dispensaries.

A higher proportion of respondents 213 (67.8%) had knowledge of General waste, followed by 151 (48.1%) that knew of infectious waste whilst 58 (18.5%) knew of waste with high content of heavy metals.0020 (**Table 3)**

Over half of respondents 177 (56.4%) mentioned incineration as method of health care wastes disposal, followed by 75 (23.9%), 40 (12.7%) that mentioned open burning and open dumping respectively as methods of disposal whilst only 22 (7.0%) mentioned disposal method is by local council authority**.(Table 4)**

Table 5 shows a higher proportion of respondents 63.2% that were aware of a policy on health care waste management knew of incineration as a method of waste disposal. There was a statistically significant association between awareness of policy and knowledge of method of waste disposal. (p=0.011)

A higher proportion of respondents that had knowledge of waste segregation 24.8% and 57.0% had excellent and fair practices respectively. There was a statistically significant association between knowledge of waste segregation and practice**. (Table 6)**

A higher proportion of respondents 289 (92.0%) felt health care waste management was everyone's responsibility, 268 (85.4%) felt it was an issue, 117 (37.3%) respondents saw it as an extra burden on clinical staffs, 116(36.9%) felt it was the responsibility of only clinical staffs, whilst only 97 (30.9%) felt it was government responsibility**. (Table 7)**

A higher proportion of respondents 28.8% that were aware of a policy on health care waste management had excellent practice of HCWM while 58.6% though not aware of the policy had fair practice. There was a statistically significant association between awareness of health care waste policy and its practice. (p=0.005) **(Table 8)**

Table 1. Socio-demographic data

Variable	Frequency (N = 314)	Percent
Age (years)		
21-30	111	35.4
31-40	156	49.7
41-50	38	12.1
51-60	9	2.8
Sex	156	49.7
Male	158	50.3
Female	114	36.3
Marital status	197	62.7
Single	3	1.0
Married	53	16.9
Widowed	148	47.1
Occupation	23	7.3
Doctor	22	7.0
Nurse	26	8.3
Medical laboratory scientist	23	7.3
Pharmacist	19	6.1
Hospital assistant	174	55.5
Community health officer	70	22.3
Others	36	11.4
Work experience (years)	10	3.2
1-5	24	8.7

6-10
11-15
16-20
> 20

Table 2. Type of Health Care Setting

Health Care Setting	Frequency	Percentage
Tertiary health care institution	166	52.9
Secondary health care institution	82	26.1
Primary health care centre	40	12.7
Private clinic	19	6.0
Maternity homes	4	1.3
Mean Age: Mean– 33.8 ± 6.8 years.	3	1.0
Dispensaries		
Total	**314**	**100**

Table 3. Knowledge of types of waste by respondents

Types of waste	Frequency	Percent
General waste	213	67.8
Infectious waste	151	48.1
Highly infectious waste	130	41.4
Radioactive waste	83	26.4
Waste with high content of heavy metal	58	18.5
Pharmaceutical waste	107	34.1

*multiple response

Table 4. Knowledge of method of health care waste disposal by respondents

Disposal	Frequency	Percent
Open dumping	40	12.7
Incineration	177	56.4
Open burning	75	23.9
Through local council authority	22	7.0
Total	314	100.0

Table 5. Respondent's awareness of existing policy on healthcare waste management and their knowledge of method of waste disposal

Policy	Waste disposal by facility (%)				Total
	Open dumping	Incineration	Open burning	Local authority	
Yes	20(10.1)	125(63.2)	39(19.7)	14(7.0)	198(100)
No	20(17.3)	52(44.8)	36(31.0)	8(6.9)	116(100)
Total	40(12.7)	177(56.4)	75(23.9)	22(7.0)	314(100.0)

X^2= 11.214, df = 3, P=0.011

Table 6. Respondent knowledge on waste segregation and their practice of health care waste management

Segregation of waste	Practice (%)			Total
	Excellent	Fair	Poor	
Yes	74(24.8)	170(57.0)	54(18.2)	298(100)
No	0(0.0)	7(43.8)	9(56.2)	16(100)
Total	74(23.6)	177(56.4)	63(20.1)	314(100.0)

$X^2 = 15.452$, df = 2, P = 0.001

Table 7. Respondents Attitude to health care waste management*

Attitude	Frequency	Percent
Health care waste management is respondent responsibility	289	92.0
Health care waste management is a topical issue in Nigeria	268	85.4
Health care waste management is government responsibility only	97	30.9
Health care waste management should be the responsibility of only clinical staff	116	36.9
Health care waste management is an extra burden on the clinical staff	117	37.3

*multiple response

Table 8. Awareness of policy on health care waste management and their practice of HCWM

Policy	Practice (%)			Total
	Excellent	Fair	Poor	
Yes	57(28.8)	109(55.0)	32(16.2)	198(100)
No	17(14.7)	68(58.6)	31(26.7)	116(100)
Total	74(23.6)	177(56.4)	63(20.1)	314(100.0)

$X^2 = 10.432$ df = 2 P = 0.005

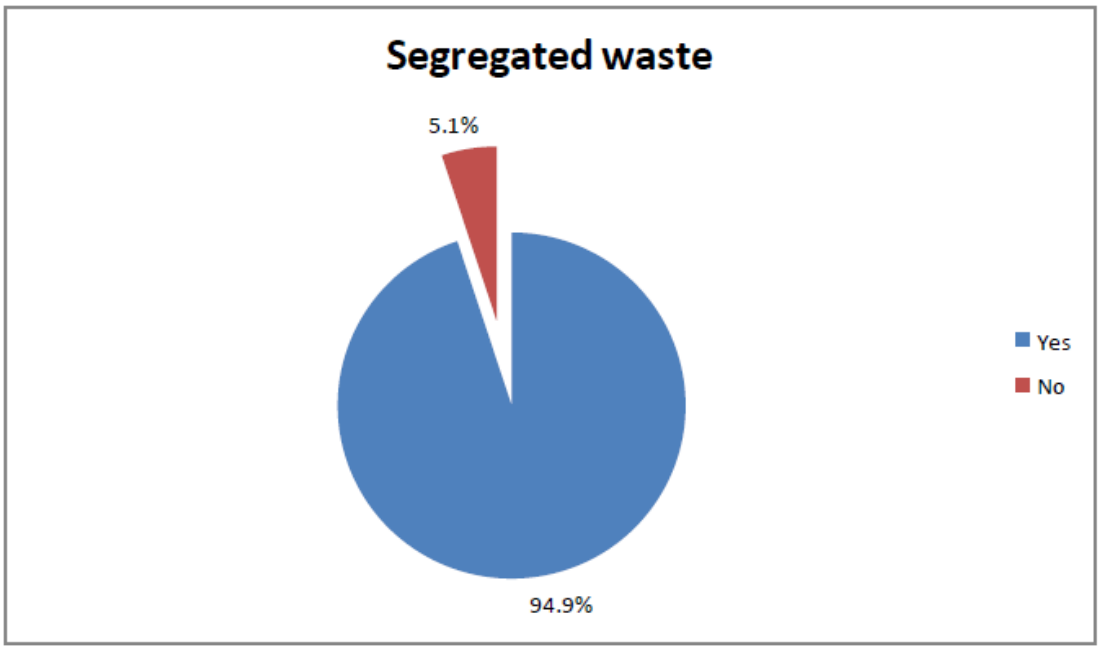

Figure 1. Respondent's knowledge of whether waste should be segregated Majority of the respondents 94.9% knew that waste should be segregated whilst the remaining 5.1% do not know.

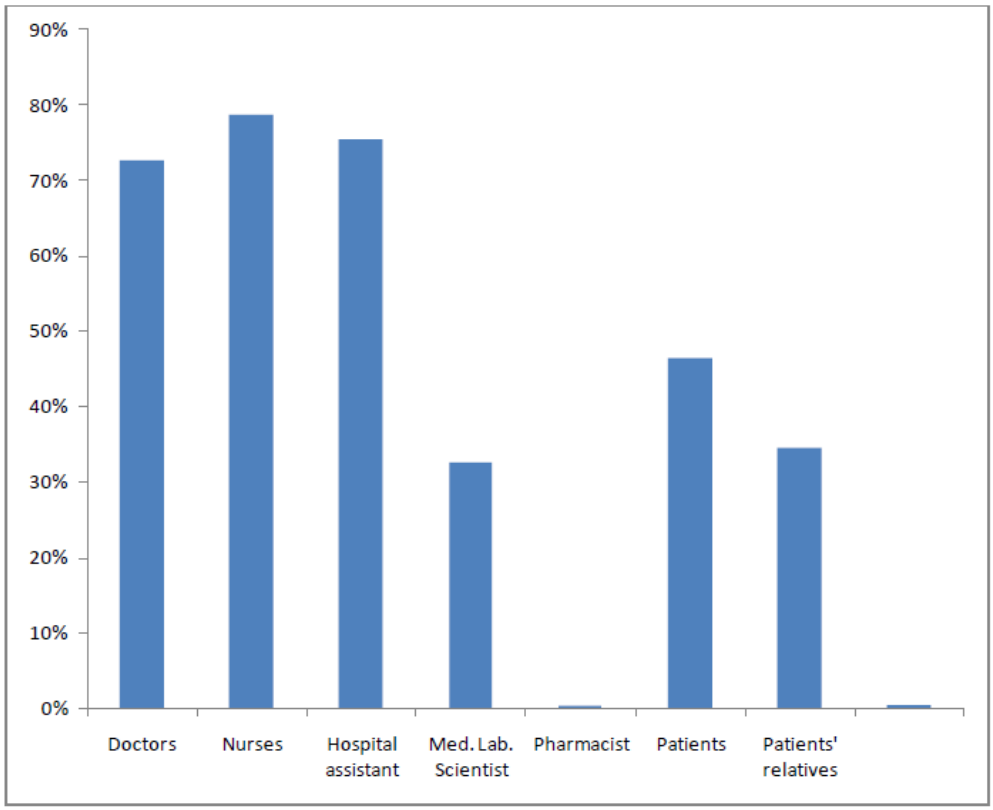

Figure 2. Knowledge of category health care staffs that are prone to infections from improper health care waste management

A higher proportion of respondents 247(78.7%) believed nurses were at risk of contracting infections from improper health care waste management, followed by 228(72.6%) who believed doctors were at risk and only one respondent 1(0.3%) believed the pharmacist was at risk.

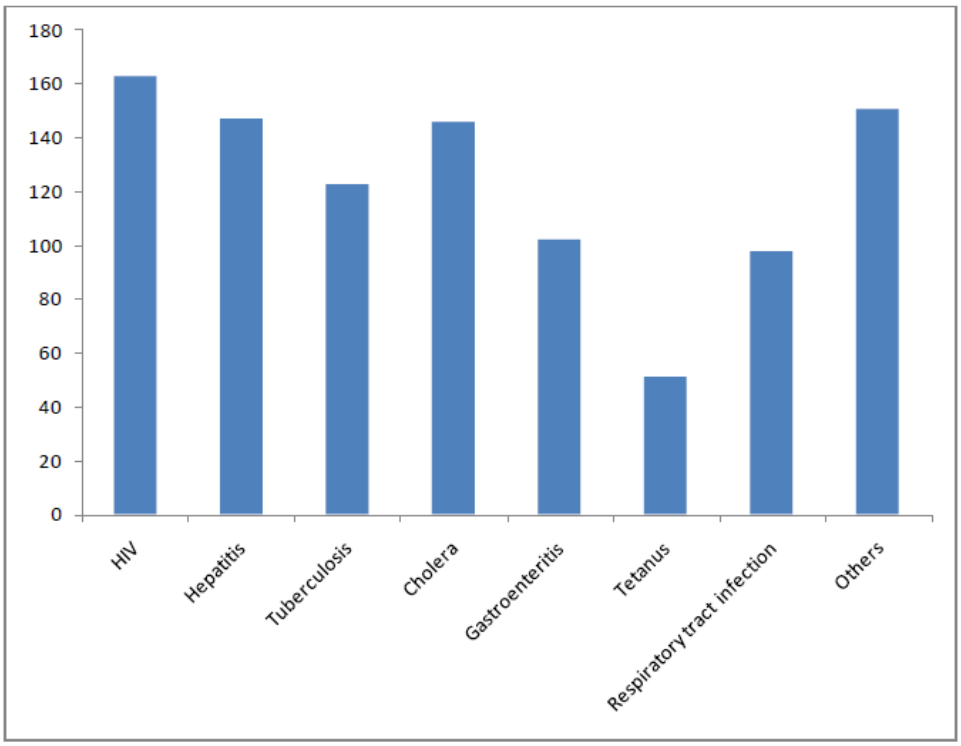

Figure 3. Knowledge of infections that can be gotten from improper waste management

A higher proportion of respondents 161 (51.9%) knew H.I.V infections could be gotten from improper health care waste management, followed by 151 (48.1%) who knew of other infections as common cold, malaria, dermatitis and only 51 (16.2%) knew about tetanus gotten from improper health care waste management.

Discussion

The health care personnel population in Bida local government health facilities was predominantly below the middle age group with a mean age of 33.8± 6.8 years. About half of the respondents were within the age group of 31 – 40 years. This could be consistent with the present campaign for increase awareness to education within the Bida area in the last two decades which has reflected in young graduates and secondary school leaver's influx into the civil service. It is not surprising that there was a higher number of females, especially with the current enlightenment on promoting female education. The finding that a higher number of respondents in this study were married may be linked to the fact that most of the respondents within the age bracket of 31 – 40 are married in our society.

A higher number of respondents in this study are nurses and doctors. This is consistent with the fact that nurses are usually the majority in terms of population in most health care facilities. This is similar to a study carried out in a tertiary health care institution at Irrua in Edo State on Health Care Waste Management in Nigeria, which noted that Doctors and Nurses made up 90% of the study population.[8]
Over half of the respondents had worked for 1 – 5 years, again showing a younger civil service in the health facilities. This could be due to recent establishment of a tertiary health care institution in Bida town which had to recruit new employees.

Findings from this study showed an appreciable number of respondents had knowledge of general, infectious and highly infectious waste as types of waste. However, this knowledge is limited as only a few respondents had probably had any form of training on health waste management.

This study showed a high number of respondents who had knowledge that waste should be segregated, were also found to have had awareness of health care waste management. This finding is in contrast to a similar study in Jos on waste management in health care establishments within Jos metropolis. [9] In the Jos study, it was found that waste were not segregated in any of the hospital, the health workers were not aware of any relevant hospital waste plan in place, and none of the staff had been trained on health care waste management.

Surprisingly knowledge of waste segregation were not affected by awareness of policy on health care waste management. The increase knowledge of waste segregation could be the result of billboards, posters on notice board within the hospital premises that had inform the respondents on health care waste management. A high number of the respondents from the study that had knowledge on waste segregation had good attitude and practice of health care waste management. There was a statistically significant association between knowledge of waste segregation and practice (P = 001). These results are consistent with findings from a critical analysis of health care waste management in developed and developing countries with case studies from India and England. [10] From this study in India and England, proper handling, segregation of health care wastes was done in these countries. The segregation of waste was done according to respective colour coded bags as prescribed by Biomedical waste management and handling rules. [10] The report from an Abuja study on characterization and management of solid medical wastes showed that waste segregation was not practiced in hospitals within Abuja metropolis. [11]

A higher proportion of respondents from this study had knowledge of infections like HIV, Hepatitis etc. that could be gotten from improper health care waste disposal. This was consistent with same paper presentation above on overview of health care waste management in Nigeria, which noted that the health care workers faced the risk of infection due to blood borne pathogens and highlighted some important pathway of transmission of disease to health workers as percutaneous injection with contaminated sharps and also there could be contamination through faecal oral route e.g. Salmonellosis, hepatitis A. [12]

The study also showed that over half of the respondent had knowledge of incineration as a method of waste disposal. A higher number of respondents with knowledge of this method of waste disposal were aware of existing policy on health care waste management.

The attitude of respondents to health care waste management from this study is good. The study showed pharmacist and medical laboratory scientist had excellent and good attitude respectively. The older workers were also found to have had long years of working experience which had made the worker developed a better attitude as found in this study.

Health care waste management practice had been found to be good in this study as shown by majority of respondents that segregated wastes and used coloured coded bins in their various health facilities. The reason for this could be because workshops on health care waste management has been organized a few times in Bida Local Government, thus improving their awareness on health care waste management. This is contrary to the study in Jos on health care waste management in health establishment in the Jos metropolis which noted that the overall practice of health care waste management was poor. [9]

The practice of health care waste management was found from this study to be influenced by factors as a monitoring committee on standby, and an awareness of a policy on health care waste management. This results are contrary to those found in a study carried out in a tertiary health facility in Irrua in Edo state in Nigeria, where it was found that there were no health care waste management manual in place, no instructions or committee in place to oversee the health care waste management. [8] This resulted to poor practice of health care waste management.

On working experience influencing health care waste management practice, the study showed, respondents with more years of working experience had a fair practice. This could be the result of having learnt these practice over years.

Conclusion

The level of knowledge of health care waste management amongst health care workers in Bida local government area was fair. Their attitude as seen from results of this study was good.

The practice of health care waste management amongst health care staff was fair.

Awareness of existing policy, management, and having been certified from health care waste training, were found to affect the practice of health care waste management.

Recommendation

From the finding of the study, the following are been recommended.

1. There should be organization of workshops and seminars on health care waste management to improve their knowledge on health care waste management.
2. There should be posters, carrying information on health care waste management that will help to improve on their attitude.
3. There should be health talks, dramas which are informative on hazards that can be gotten from wrong practices of health care waste management. This will help to improve the practices of health care waste management.
4. The management of health facilities should make available personal protective devices/equipments to those workers involved in carrying and disposing of wastes as this will further encourage them.
5. Government should ensure that health care waste policies are widely circulated, to reach the common man, and each health facility has written plan on health care waste management and made available to all health care facility staffs.

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