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Research Article

KNOWLEDGE, ATTITUDE AND PRACTICE OF MEDICAL WASTE MANAGEMENT AMONG PRIMARY HEALTH CARE WORKERS IN WUKARI LGA, TARABA STATE.

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ABSTRACT

This study examined the knowledge, attitude and practice of medical waste management among primary health care workers in Wukari LGA. The study adopted a descriptive cross-sectional research design and a total of 233 health workers (doctors, nurses, paramedics and sanitary workers) were sampled; a self-structured questionnaire was used to collect data from the respondents. The findings of this study revealed a high level of knowledge among healthcare workers on medical waste management methods in Primary Health Care in Wukari LGA, majority of respondents demonstrated awareness of the classification of medical waste and the importance of segregation from general waste. Pearson Correlation shows a correlation coefficient of 0.024 and a p-value of 0.712, thus there is no significant relationship between healthcare workers' knowledge and medical waste management practice in primary healthcare in Wukari LGA also, a p-value of 0.620 signifies that there is no significant relationship between healthcare workers' attitude and their years of experience towards medical waste management in primary health care, Wukari LGA. In conclusion, the findings of the study indicate that primary healthcare workers in Wukari LGA have a high level of knowledge, a strong attitude, and practice proper medical waste management methods in Primary Health Care facilities.

Keywords: Knowledge, Attitude, Practice, Medical Waste, Health Care Workers

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INTRODUCTION

Medical waste is waste that is generated by health care workers when carrying out health care activities in health institutions (Khazaee *et al*, 2015). Health care workers produce various types of waste in the course of rendering health care services (Gaye *et al*, 2015). Hospital waste is classified into medical waste, chemical waste, radioactive

waste, cytotoxic waste, pharmaceutical waste and general waste (WHO, 2015). Medical waste includes sharps, laboratory and associated waste, human tissue and carcasses used for research purposes. Each classification must be disposed according to the prescribed guidelines (Health Professions Council, 2018).

Methods of disposal of waste are incineration, sterilization, chemical disinfection and secured landfill. Segregation of medical waste must be done at the point of generation (Nema & Singh, 2015). This should be done by discarding the medical waste in colour coded containers. Incineration, chemical disinfection and microwaving are methods of disposing sharps. Radioactive waste must be handled, stored and disposed in accordance with the prescribed legislature. Laboratory and associated waste directly involved in specimen processing can be disposed either through incineration or chemical disinfection (Sharma *et al,* 2013). Human tissue must be disposed through incineration. Disposal of pharmaceutical waste depends on the composition of the materials. It must be stored in non-reactive containers and disposed through incineration (Chartier *et al,* 2014).

In order to prevent injuries to other employees, patients and to protect the environment from medical waste, health care workers must have adequate knowledge on disposal of medical waste (Shrivastava *et al,* 2015a). Hospitals have the responsibility to capacitate their employees with regard to medical waste disposal. The training should include occupational hazards, management of exposure to blood and body fluids, procedures to follow when disposing medical waste and prevention of injury and diseases, management of needle stick and blood and body substance exposure (Health Professional Council of South Africa, 2018). A study conducted in Karachi indicates that knowledge, attitude and practice of personnel involved in health care facilities waste management are extremely poor and proper facilities for management of hospital waste are almost non-existent (Habibullah & Afsar, 2007). Another study which was conducted among health care workers in Agra on medical waste management indicates deficiency in information and awareness among hospital employees regarding legislation associated with medical waste management (Lakshmi & Kumar, 2012).

There has been an increase in the number of needle stick injuries among general assistants at the hospital which occurred during their daily activities according to the occupational health statistics of the institution. The general assistants in various wards are not working with health care instruments, like sharps, and it is not acceptable for them to have needle pricks. This study therefore assessed the knowledge, attitude and practice of medical waste management among primary health care workers in Wukari LGA.

RESEARCH METHODOLOGY

The survey research design (descriptive cross-sectional design) was adopted in this research. The researcher utilized the survey strategy for this study because it creates room for gathering large amounts of data from a sizable population in a cost-effective way.

The population is the entire group of persons or objects that is of interest to the researcher and which met the criteria onto which the researcher wishes to investigate (Brink,

2010). In this study, the population consists of 560 health workers (doctors, nurses, paramedics, CHEWs and sanitary workers) who are involved in the management in primary health care centers in Wukari LGA. (Taraba State Primary Health Care Development Agency, 2022).

The sample size for this study was determined using the Taro Yamane's formula of 1967 and the sample size arrived at for this research was 233 from the population of 560 health care workers in Wukari LGA. A multistage sampling technique was used in selecting the respondents for this study. In stage one; the researcher purposively selected Wukari LGA out of the 16 LGAs in Taraba State. In stage two, simple random sampling technique was employed in selecting staffs of PHCCs in Puje, Hospital and Akwana wards out of the ten wards in Wukari LGA. In stage 3, three primary health care centres were randomly selected (lottery method).

Self-administered questionnaire was developed and used. The questionnaire contained four sections: Section A captured the demographic characteristics of the respondent such as sex, age, profession, department, years of experience, ward and hospital; Section B captured questions on knowledge of health care workers on medical waste Management; Section C captured questions attitude of HCWs on medical waste Management and Section D captured questions regarding the practices of HCWs on waste Management.

The data obtained was analyzed using Statistical Package for Social Sciences (SPSS) version 27. Results were presented in appropriate simple tables. Statistical significance association between qualitative variable was assessed using chi-square test at $\alpha = 0.05$.

RESULTS

Table 1: Demographic characteristics of respondents (n=233)

Variable	Parameter	Frequency	Percentage
Gender	Male	115	49.4
	Female	118	50.6
Age	<20	4	1.7
	20-29	83	35.5
	30-39	86	36.9
	40-49	45	19.2
	>49	15	6.7
Educational Qualification	Tertiary	130	55.8
	Secondary	75	32.3
	Primary	28	11.9
	No formal Education	0	0.0
Health care worker category	CHEW	40	17.2
	Lab. Technician	30	12.9
	Nurse/Midwifery	39	16.7
	Pharmacist/Pharmacy Technician	31	13.3
	Physician	17	7.3
	Others	76	32.6
Years of working experience	<2 years	47	20.1
	2-5 years	65	27.9
	>5 years	121	52.0

Table 1 provides the demographic characteristics of the 233 respondents in the study. The table presents the frequency and percentage of respondents for each variable. The gender variable shows that 115 (49.4%) of the respondents were male, while 118 (50.6%) were female. On the age characteristics of the respondents, 4(1.7%) were <20years, 83(35.5%) were within the age of 20-29 years, 86(36.9%) were between the age of 30-39years and 15(6.7%) were 49 years and above. On the educational status of the respondents, 130(55.8%) had tertiary education qualifications 75(32.3%) were secondary school holders while 28(11.9%) were primary school certificate holders. On category of health care workers variable shows, 40(17.2%) were CHEW, 30(12.9%) were Laboratory technician, 39(16.7%) were Nurse/Midwifery, 31(13.3%) were Pharmacist/Pharmacy Technician, 17(7.3%) were Physician and 76(32.6%) were among other health care worker category. Finally, the variable on years of working experience of respondents shows that the majority of respondents 121(52.0%) had been working for more than 5 years, while 65(27.9%) had

been working for 2-5 years and 20.1% had been working for 0-2 years.

Table 2: Knowledge level of health care workers on medical waste managements in Primary Health Care in Wukari LGA

		Frequency	Percentage (%)
Waste generated from healthcare activities is MW?	Agree	193	82.8%
	Neutral	35	15.0%
	Disagree	5	2.1%
MW should not be mixed with general waste?	Agree	212	91.0%
	Neutral	21	9.0%
	Disagree	0	0.0%
The color coding for MW is red?	Agree	192	82.4%
	Neutral	41	17.6%
	Disagree	0	0.0%
The color coding for general waste is black?	Agree	202	86.7%
	Neutral	29	12.4%
	Disagree	2	0.9%
Liquid MW should not be disposed into toilet bowl?	Agree	140	60.1%
	Neutral	92	39.5%
	Disagree	1	0.4%
Sharp MW should be separated from other wastes?	Agree	222	95.3%
	Neutral	11	4.7%
	Disagree	0	0.0%
MW container should be sealed every single day?	Agree	227	97.4%
	Neutral	6	2.6%
	Disagree	0	0.0%

Table 2 above shows that above three-quarter 193 (82.8%) of respondents knew that waste generated from healthcare activities is MW. Majority of the respondents 212 (91.0%) are of the opinion that MW should not be mixed with general waste. Above two-third 192 (82.4%) mentioned that the color coding for MW is red while a further 202 (86.7%) agree that the color coding for general waste is black. The table further shows that 140 (60.1%) of the respondents agreed that liquid MW should not be disposed into toilet bowl. Majority 222 (95.3%) of the participants knew that sharp MW should be separated from other wastes and 227 (97.4.1%) agreed that MW container should be sealed every single day. Overall, the results suggest that there is a high knowledge level of health care workers on medical waste management methods in Primary Health Care in Wukari LGA with a Knowledge level of 85.1%.

Table 3: Attitude of Health Care Workers Towards Medical Waste Management Methods in Primary Health Care in Wukari LGA.

Item	Response	Frequency	Percentage (%)
MW generated from clinics must be handled properly?	Agree	229	98.3%
	Undecided	4	1.7%
	Disagree	0	0.0%
MW segregation is important?	Agree	228	97.9%
	Undecided	5	2.1%
	Disagree	0	0.0%
Co-disposal of MW with general waste can cause unsafe effects?	Agree	229	98.3%
	Undecided	4	1.7%
	Disagree	0	0.0%
MW must be collected more carefully?	Agree	226	97.0%
	Undecided	7	3.0%
	Disagree	0	0.0%
General waste management and MW management are different?	Agree	226	97.0%
	Undecided	6	2.6%
	Disagree	1	0.4%
Gloves should always be used during medical services to prevent the hazards associated with exposure?	Agree	230	98.7%
	Undecided	3	1.3%
	Disagree	0	0.0%
MW management must be more strictly supervised by the local government agencies?	Agree	224	96.1%
	Undecided	6	2.6%
	Disagree	3	1.3%

Table 3 presents the frequency and percentage of attitude of healthcare workers towards medical waste management methods in Primary Health Care in Wukari LGA. The table shows that 229 (98.3%) of the respondents believe that MW generated from clinics must be handled properly, only 1.7% of the respondents were undecided with the statement. Regarding the importance of MW segregation, majority 228 (97.9%) of the respondents believed it is essential and necessary, while 2.1% of the respondents remained undecided. Furthermore, 229 (98.3%) of the respondents believed that co-disposal of MW with general waste can cause unsafe effects. The table further shows that

226 (97.0%) of the respondents believe that MW must be collected more carefully MW generated from clinics must be handled properly, majority (97.0%) of the respondents believed that General waste management and MW management are different. Regarding the frequent use of gloves during medical services to prevent the hazards associated with exposure, majority 230 (98.7%) agreed to it, and a further majority 224 (96.1%) of the respondents believe that MW management must be more strictly supervised by the local government agencies. Overall, the table suggests that the attitude level of health care workers is 97.6% which is an excellent attitude towards MWM.

Table 4: Level of Practice of Health Care Workers on Compliance with the Waste Segregation

Item	Response	Frequency	Percentage (%)
How often do you separate MW from general waste?	Always	210	90.1%
	Sometimes	23	9.9%
	Never	0	0.0%
Do you put general waste into a black container and MW into a red container?	Always	188	80.7%
	Sometimes	45	19.3%
	Never	0	0.0%
Do you wear rubber gloves during medical services?	Always	122	52.4%
	Sometimes	111	47.6%
	Never	0	0.0%
Do you not put sharp MW into a red plastic bag?	Always	173	74.2%
	Sometimes	60	25.8%
	Never	0	0.0%
Do you put sharp MW into a hard container?	Always	189	81.1%
	Sometimes	44	18.9%
	Never	0	0.0%
Do you clean spills of liquid MW immediately with proper procedure?	Always	229	98.3%
	Sometimes	4	1.7%
	Never	0	0.0%
Do you wear rubber glove when pick up trash that falls on the ground?	Always	197	84.5%
	Sometimes	36	15.5%
	Never	0	0.0%
Do you wash your hands thoroughly after contact with MW, even if you had worn gloves	Always	232	99.6%
	Sometimes	1	0.4%
	Never	0	0.0%
Do you not reuse the plastic bag for MW?	Always	219	94.0%
	Sometimes	14	6.0%
	Never	0	0.0%

Table 4 shows the Practice level of Health Care Workers on Compliance with the Waste Segregation. The table shows that 210 (90.1%) of respondents always separate MW

from general waste. Regarding disposing off general waste into a black container and MW into a red container, 188 (80.7%) respondents strictly adhere to the practice. As regards wearing rubber gloves during medical services, 122 (52.4%) respondents gave a positive response. 173 (74.2%) of respondents always avoid disposing sharp MW into a red plastic bag but rather, 189 (81.1%) of respondents always dispose of sharp MW into a hard container. On whether respondents' clean spills of liquid MW immediately with proper procedure, majority229 (98.3%) respondents affirmed to the statement. Regarding wearing of rubber glove when picking up trash that falls on the ground, 197 (84.5%) respondents practice it, furthermore, majority 229 (98.3%) respondents always wash their hands thoroughly after contact with MW, even if they had worn gloves.Finally on not reusing the plastic bag for MW, majority 219 (94.0%) respondents always avoid reusing plastic bag for MW.

Hypotheses Testing

H_{01}: There is no significant relationship between healthcare workers' knowledge and medical waste management practice in primary health care in Wukari LGA (P=0.712).

H_{02}: There is no significant relationship between healthcare workers' attitude and their years of experience towards medical waste management in primary health care, Wukari LGA (P=0.620).

H_{03}: There is no significant relationship between healthcare workers' practice and compliance with the waste segregation with age (P=0.480).

Discussion of Findings

The study reveals a high level of knowledge among health care workers on medical waste management methods in Primary Health Care in Wukari LGA. This disagrees with the findings of Adekunle *et al.,* (2018) where the health care workers were having an inadequate knowledge of medical waste management, 42.7% of the participant scored poor overall in knowledge level. Concurring to these findings, a study conducted in Pakistan by Mahmood *et al.,* (2018) who also found that a high percentage of healthcare workers had a good knowledge level on medical waste management practices. In their study, 80% of healthcare workers knew that waste generated from healthcare activities is considered medical waste, similar to the findings in Wukari LGA. Additionally, Mahmood et al. found that 85% of healthcare workers were aware that medical waste should not be mixed with general waste, which is consistent with the results in Wukari LGA where 91% of respondents shared the same opinion.

The attitude of health care workers towards medical waste management methods in Primary Health Care in Wukari LGA suggest that there is a strong belief among the respondents in the importance of proper handling and management of medical waste, the health care workers at the primary health care centers in Wukari LGA have a positive attitudes towards the management of medical waste management and this could easily be attributed to the fact that more than half (52%) of the respondents have more than five (5) years' experience as a health care worker. Another study conducted in Cairo, Egypt, reported that the duration of work experience was not significantly associated with attitude (Hakim *et al.,* 2014). This positive attitude towards medical waste management is in line

with a study conducted by Sharma and Deori. (2020) on biomedical waste management practices among post graduate residents of tertiary care hospital in Lucknow, which found that the majority of healthcare workers understood the risks associated with improper medical waste disposal and were knowledgeable about the proper segregation and disposal methods. Similarly, Pensiri *et al.,* (2020) stated that 85% of the respondents from the study conducted in Phuket province in Thailand on Assessment of Knowledge, Attitude, and Practice in respect of Medical Waste Management among Healthcare Workers in Clinics demonstrated a positive attitude towards medical waste management.

This study shows that the majority of respondents demonstrate a high level of practice in waste segregation and compliance with safety procedures. The findings of this study on the level of practice of health care workers on compliance with waste segregation can be related to a study conducted by Gupta *et al.,* (2016) and Pensiri *et al.,* (2020). In the study by Gupta et al., researchers found that proper waste segregation practices, including the separate disposal of medical waste (MW) from general waste, adherence to disposing of general waste in black containers and MW in red containers, and the use of proper personal protective equipment (such as rubber gloves) during medical services, were all associated with a decreased risk of HAIs among healthcare workers and patients. Overall, the findings of both studies highlight the importance of proper waste segregation practices and compliance with infection control measures among healthcare workers to ensure a safe and healthy environment for both staff and patients. Future studies could further explore the impact of waste segregation practices on reducing the incidence of HAIs and improving overall healthcare outcomes.

Conclusion

In conclusion, the findings of the study indicate that primary health care workers in Wukari LGA have a high level of knowledge, a strong attitude, and practice proper medical waste management methods in Primary Health Care facilities. The respondents demonstrated awareness of waste classification, importance of segregation, proper disposal methods, and compliance with safety procedures. This positive outlook suggests that healthcare workers in Wukari are committed to ensuring a safe and healthy environment in healthcare facilities through responsible waste management practices.

Recommendations

Based on the findings of this study, the following recommendations can be made:

i. Continued training and education: While the respondents displayed a good understanding of medical waste management, continuous training and education programs should be provided to reinforce and update their knowledge on best practices.

ii. Regular monitoring and supervision: Local government agencies should conduct regular monitoring and supervision of medical waste management practices in healthcare facilities to ensure compliance with safety procedures and regulations.

iii. Provision of adequate resources: Healthcare facilities should be equipped with the necessary resources such as proper waste

disposal containers, protective gear, and cleaning supplies to support the implementation of safe waste management practices.

iv. Encouraging a culture of accountability: Healthcare workers should be encouraged to take ownership of their waste management practices and hold themselves accountable for maintaining a clean and safe environment.

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