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The Need to Protect Public Health in Edo State, Nigeria

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Abstract. Health care facilities are established to provide treatment and safeguard the health of the people against conditions that pose risk or threat to health care providers, patients, waste handlers and the entire community. Health care activities are carried out to protect, restore health and save lives but paradoxically, they are known to generate wastes that poses obvious health risks either by direct infection or through exposure to dangerous chemicals and radiation materials. The purpose of the study was to determine the medical waste management practice in health care facilities in Edo State. Eight research questions were raised to guide the study while six hypotheses were formulated and tested at 0.05 level of significance. The population for the study comprised the 1,383 health care facilities in Edo State. A sample size of 276 respondents was selected using the multi-stage sampling technique. The instrument used was a validated Dichotomous scale format questionnaire with 29 items. The instrument's reliability was established using the test-retest method of estimating reliability and a co-efficient value of 0.68 was obtained. Data generated from the study were analyzed using descriptive statistics of frequency count, percentage and inferential statistics of binomial test and chi-square. The findings revealed that some health care facilities still do not fully comply with the dictates of approved practices specifically in the areas of segregation, incineration method, use of water proof floor with good drainage, treatment modalities and that there was no absolute difference in the urban and rural settings in terms of medical waste management. It was concluded that the immense benefits of proper waste management should be fully utilized in compliance with the approved practices to avert the possibility of accidents and disease outbreak that could result in loss of life and property. It was recommended that health care facilities should improve practices at all the stages of waste management. Therefore, all health care facilities owe a duty to protect the public and the environment and should have peculiar responsibilities as regard the waste they produce in a sanitary manner to reduce infection and illness.

1. Introduction

Medical waste is an overwhelming public health problem that affects public health, social and economic well-being of the people. The management of medical waste has become a major challenge in most health care facilities all over the world especially in the developing countries and Nigeria in particular. The management of medical wastes is critically at suboptimal level reflecting especially in poor handling and ineffective disposal methods of medical wastes. These have a high propensity to expose human beings and the environment to potentially hazardous wastes. Medical waste constitute waste materials generated in health care facilities such as hospitals, clinics, health centres, blood banks, dental centres, veterinary clinics, research and laboratory facilities etc(United States Environmental Protection Agency,2012). The contribution of medical wastes to environmental pollution and associated health risks due to their infectious nature and unpleasant sight and smell have generated increased public interest in both developed and developing nations of the world (Awodele, Adewoye and Oparah, 2016).

Generally, health care institutions and facilities are expected to take care of public health issues including medical wastes. These health facilities are considered unique environments that would provide health care to patients and ideal work environments for medical and other staff. Specifically, health care institutions apart from ensuring patient care, would also be expected to apply specific approaches to ensure clean and healthy environment for workers and the community at large. As a matter of fact, the Basel Convention Agreement reached by member states of the United Nations states that it is the responsibility of health care

establishments to treat and dispose wastes generated in such a manner as to ensure that there would be no adverse health or environmental risks (United Nations Environment Programme, 1999).

It has generally been observed that developed countries face challenges with the sheer volume of waste from the use of disposables on one hand, while on the other hand developing countries whose supplies are limited are dealing with the dilemma of sorting and disposing all types of medical wastes in sanitary manner (Globalisation), 2010. Health care activities all over the world are known to generate significant amounts of these hazardous medical wastes. It is believed that several hundreds of tons of medical wastes are deposited in open waste dumps and surrounding environments, often alongside non-hazardous solid wastes (Abah & Ohimain, (2010). Recent studies in Nigeria have estimated waste generation of between 0.562 to 0.670kg/bed/day and as high as 1.68kg/bed/day (Longe &William,2006; Olubunmi,2009).

The problem of medical waste is considered a huge one considering the fact that medical waste is the third largest source of waste in the United States of America and that in developing countries, the unsanitary disposal of medical waste has put millions of lives at risk. This is because dumping sites are often visited by scavengers for goods. In other words, these emerging countries face a myriad of health problems arising from the burning of waste as open dumping in unsanitary landfills and incinerators are still the main vehicles used to dispose medical wastes. It is paradoxical to note that health care activities that are expected to protect health, cure patients and save lives, are known to throw up wastes that pose obvious health risks either by way of direct infection or through exposure to chemical and radiation materials (International Committee of the Red Cross, 2011).

The problem associated with sanitary medical waste disposal in the developing world are also ascribed to poor funding and the lack of government regulatory laws which would serve as legal backing for proper waste management (United Nations Development Programme, 2014). The poor management of health care waste potentially exposes healthcare workers, waste handlers, patients and the community at large to infection, toxic effects, injuries and the risks associated with environmental pollution. The UNDP (2014) therefore advocated that it is essential for all medical waste materials to be segregated at the point of generation, appropriately treated and disposed off safely. The transmission of diseases and micro-organisms, defacing the aesthetics of the environment, environmental pollution, as well as contamination of soil and underground water tables by untreated medical waste are some of the negative health and environmental impacts of medical waste (Manyela and Lyasenga,2010).

WHO, estimates that each year, there are about 8 to 16 million new cases of Hepatitis B virus (HBV), 2.3 to 4.7 million cases of Hepatitis C virus (HCV) and 80,000 to 160000 infectious cases of Human Immuno-deficiency Virus (HIV) mostly due to very poor waste management systems particularly those involving disposal of unsafe infectious materials (WHO,1999). It was also observed that in many health care facilities in the developing world, the waste is not segregated but burnt in harmful incinerators, even in the open. Unfortunately, these methods of waste disposal further pollute the environment and spread diseases as Nigeria is not paying enough attention to the problem of medical waste. In most developed countries, a holistic approach to health care waste management has been adopted as an integral part of the national health care systems. These include the establishment of regulatory framework, development of national plans and the development of innovative approaches. In many developing countries like Nigeria, many health concerns are competing for limited resources, therefore, the management of medical waste has not received the attention and priority it deserves. Medical wastes are still handled and disposed together with domestic wastes in the same collecting bins at road sides and disposed in similar fashion. This practice was observed in some hospitals in Lagos by Awodele et al (2016) where medical waste are still mixed with municipal waste in their on-site storage facility. An initial visit to some health institutions in Benin city by the researcher also confirmed similar practices of mixing untreated medical wastes with municipal wastes in collecting bins and at dump sites and disposed of in residential waste landfills.

There may not be much difference in the way and manner medical wastes generated in various health care facilities are managed in Nigeria. Olubukola (2009) reported similarity in waste generated and health care waste management practices in two general hospitals as characterized by a lack of waste minimization or waste reduction strategies, poor waste segregation practices, lack of instructive posters on waste segregation and disposal of health care wastes with general wastes. A near total absence of institutional arrangement for health care waste in Nigeria has been reported by others (Coker, Sangodoyin and Ogunlowo,1998). WHO (2014) has always advocated that it is essential for all medical wastes materials to be segregated at the point of generation, appropriately treated and disposed off

safely. It is crucial to note that as long as modern medicine is constantly maintained and sustained to ensure quality of life and healthy well-being, the health sector is likely to generate by-products that would adversely affect people and the environment.

In Nigeria, the extent to which medical wastes are managed on the basis of government regulatory laws and policies, careful planning, sound organization, adequate financing and full participation by trained staff is not very clear. There is therefore, the urgent need to assess the medical waste management practices of health care facilities in Edo State as part of efforts to protect public health.

2. Essentiality to protect Public Health

Public health is concerned with protecting the health of entire populations and these populations can be as small as a local neighbour- hood or as big as the entire country. It is the science of protecting and improving the health of families and communities through promotion of healthy lifestyles, research for disease and injury prevention, detection and control of infectious diseases (Centre for Disease Control and Prevention Foundation,2016). The functions are to:

- Monitor health
- Detect and investigate health problems
- Conduct research to enhance prevention
- Develop and advocate sound public health policies
- Implement prevention strategies and promote healthy behaviours
- Foster safe and healthy environments
- Provide leadership and training

According to Wikipedia (2014) public health is the science and art of preventing disease, prolonging life and promoting health through organized efforts and informed choices of society, organizations, public and private, communities and individuals. It further stated that the focus of public health intervention is to improve health and quality of life through prevention and treatment of disease and other physical and mental health conditions which is achieved through surveillance of cases and promotion of healthy behaviours of which examples are: the promotion of hand-washing, breastfeeding, delivery of vaccinations and even distribution of condoms to control the spread of sexually transmitted diseases. Public health is about helping people to stay healthy and protecting them from threats to their health so that everyone would be able to make healthier choices regardless of their circumstances to minimize the risk and impart of illness.

Three core areas were identified as public health functions derived from Health Promotion and Disease Prevention technologies which are:

- Identifying health problems and priorities through assessment and monitoring of the health communities and populations at risk.
- Formulating public health policies, collaborating with community and government leaders designed to prioritize to solve the identified local and national health problems.
- Assuring that all populations have access to appropriate and cost- effective care, including health promotion and disease prevention services and evaluation of the effectiveness of that care.

CDC (2016) further said that public health differs from other professions because it is comprised of many professional disciplines such as medicine, dentistry, nursing, optometry, nutrition, health education, environmental sciences etc as its activities focuses on entire populations rather than on individual patients and that health care is vital to all of us some of the time but public health is vital to all of us all of the time.

Sharma and Zodpey (2011) indicated that the extent to which people are able to improve the health of the public depends largely upon the quality and preparedness of the public health workforce which in turn relies on the relevance and quality of its education and training. They also opinned that public health education for long has been expected to find solutions to multitude of public health problems via building the capacity of public health workforce.

Pitt Public Health (2016) resolved that public health is a field for people who care about the greater good of human beings and that it is constantly evolving in response to the needs of communities and populations around the world. Pitt Public Health (2016) further said that the mission of public health includes not only the practice of public health policy but the research of public health issues and the education of future leaders who will eventually translate that research into practices and policies. This will improve the health of people worldwide as it has lasting positive effect on people, helps promote a healthy environment and serves as a moral and ethical imperative.

3. Methodology

3.1 Research Design

The descriptive survey research design was used for the conduct of this study. This was considered

appropriate because information about how medical waste is managed and its impact on human health and the environment were collected and described as they exist without manipulating their conditions.

3.2 Population of the Study

There are currently 1,383 (one thousand, three hundred and eighty-three) registered public and private health care facilities in Edo State (Edo

State Ministry of Health, 2016). They are located in urban and rural areas of the three senatorial districts of Edo State. Specifically, there are 182, 59 and 35 health care facilities in Edo South, Edo North and Edo Central respectively (Appendix II).

3.3 Sample and Sampling Techniques

A multi-stage sampling technique was used to obtain the sample size for the study. It involved stratifying the health care facilities in the eighteen local government areas into three senatorial districts, viz Edo South, Edo Central and Edo North. The systematic random sampling technique was used to select 10% of the health care facilities within each senatorial district. This was done by arranging the health care facilities alphabetically after which the first name and every other 10^{th} names were selected in each Local Government Area making a total of 138 health care facilities as the target sample size. Purposive sampling technique was then used to select the officer in charge and the next ranking officer in each health care facilities to respond to the questionnaire. The purpose was to select officers who have adequate knowledge of the normative activities in the health care facilities and to help clarify where observations appear to be confounded. A total of 276 respondents were selected as sample size.

3.4 Research Instrument

The instrument for data collection is a questionnaire developed by the researcher (Appendix VIII). The questionnaire consists of two sections (A and B). Section A elicited information about the bio-data of the respondents while section B consist of 29 items eliciting responses on medical waste management in health care facilities. The response set was patterned along Likert scale format response of Strongly Agree, Agree, Strongly Disagree and Disagree. Responses from the respondents were graduated into levels of utilization. From 90%-100% were categorized as high, 80%-89% was medium, and 79% downward was categorized as low. In the same vein, for specific levels of usage, 90% to 100% were categorized as excellent while 80% to 89% as good, 70 to 79% as average and 69% downwards was categorized as poor respectively.

3.5 Validity of the Instrument

The instrument was content validated by the researcher's supervisor and other two experts in the Department of Health, Safety and Environmental Education in the Faculty of Education, one from the Department of Nursing Services and the other from the Department of Waste Management, UBTH, Benin City, making a total of five validators. Their suggestions and corrections were effected and incorporated in the final draft of the instrument.

3.6 Reliability of the Instrument

The test-retest method of reliability was used in determining the reliability of the instrument. The instrument was administered to 36 respondents across the eighteen local government areas that are not part of the study. After an interval of two weeks, the same instrument was administered to the same group of respondents. The scores obtained from the two administrations were correlated, using Pearson Product Moment Correlation Co-efficient to establish the reliability of the instrument. A coefficient value of 0.68 was achieved which was deemed high enough for the study.

3.7 Method of Data Collection

Letters of introduction (Appendix iii) was obtained from the researcher's supervisor by the researcher. These were given to all the Directors/Administrators of the various selected health care facilities in Edo State. The instrument was administered to the respondents with the help of 5 trained research assistants who were briefed on how to be courteous and persuade the respondents to respond to the questionnaire. After completion, 276 questionnaire were retrieved.

3.8 Method of Data Analysis

The fully completed copies of the questionnaire were analyzed using descriptive statistics of frequency count, percentage, and inferential statistics of t-test, binomial test and chi square. These were done using the statistical package for social sciences (SPSS).

4. Findings

Findings revealed that despite the advantages inherent in the employment of proper medical waste management, some health care facilities in Edo State

still do not fully comply with the dictates of best practices. Specifically, the findings revealed that:

- Some health care facilities still do not segregate their medical waste at the source of generation despite being a major medical waste management practice.
- Some health care facilities still employ incineration method which is now being discouraged in emerging countries in an attempt to reduce the volume of waste.
- The use of water proof floor with good drainage is low in some of the health care facilities.
- In some of the health care facilities, treatment modalities of medical waste are generally poor. It was however established that there should be regular and proper waste management practices in these health care facilities.
- There is no absolute difference between the waste management practices of the medical centres in the urban setting compared to those on the rural setting.

5. Conclusion

In the light of the findings of this study, it is the conclusion of the researcher that the immense gains accruable from proper waste management should be fully utilized in compliance with the approved practices in the management of medical waste in the areas generation, collection, segregation, storage, transportation, treatment and disposal of waste thereby averting the possibility of accident and disease outbreak that could result in loss of life and property. Therefore, all health care facilities owe a duty to protect the public and the environment and should have essential responsibilities as regard the waste they produce in a sanitary manner, thereby reducing infection and illness. There should be awareness campaign for proper waste management.

6. Recommendations

Consequent upon the findings of the study, the following recommendations were made:

- That health care facilities in Edo State should improve practices in their waste management.
- There should be efficient segregation of different categories of medical waste at the source of generation as it is the key to achieving a sound medical waste management in these health care facilities.
- Medical waste should be effectively stored in water proof floor with good drainage in these health care facilities.
- There should be strict compliance of treatment modalities of medical waste in these healthcare facilities especially disinfection of waste.
- Transportation of medical waste should be secured if the benefits of segregation are to be realized in these health care facilities.
- There should be enabling laws and strict enforcement of these laws.

References

Abah, S.O. & Ohimain, E.I. (2011). Health care Waste Management in Nigeria: A case study. *Journal of Public Health and Epidemiology*. Vol.3 (3). pp. 99-110 2011.

Awodele, O., Adewoye, A. A., Oparah, A.L. (2016) Assessment of medical waste management in seven hospitals in Lagos, Nigeria. Retrieved from www.ncbi.org/public health on the 30th of August, 2017

Awoyemi, T.T., Obayelu, O.A., & Opaluwa, (2011). Effects of Distance on Utilisation of Health Care Services in Rural Kogi, Nigeria. Retrieved from www.krepublishers.com on the 8th of February, 2017.

Bakare, W. (2018). Solid Waste Management in Nigeria. Retrieved from www.bioenergyconsult.com/solid-waste-nigeria on the 5th of May,2018.

California Department of Public Health (2016). The medical waste management programme. Retrieved from www.cdph.ca.gov/ on the 10th of April,2016.

Centre for Disease Control and Prevention Foundation. (2016) What is public health? Retrieved from www.cdcfoundation.org/content on the 7th of March,2016.

Coker, A.O., Sangodoyin, A.Y., & Ogunlowo, O.O. (1998). Managing Hospital Waste in Nigeria. Proceedings of 24th Annual Conference of Water Engineering and Development Centre (WEDC), Loughborough University, U.K.pp 70-72.

Globalisation (2010). Medical waste: Challenges faced around the world. Retrieved from www.globalization101.org. on the 24th of November, 2014.

Health Care Without Harm (2014 a). Medical Waste: know the issue. Retrieved from http://noharm-asia.org/content on the 16th of October, 20114.

International Committee for Red Cross (2011). Medical waste management. Retrieved from www.ICRC .org/eng/assets on the 21st of October, 2014

Manyele, S. V. & Lyasenga, T.J. (2010). Factors affecting medical waste management in low-level health facilities in Tanzania. African *Journal of Environmental Science & Technology*. Vol. 4. (5) pp. 304-318, 2010.

Medical Waste Management Act (2014). Medical waste management programme. Retrieved from www.cdph.ca,gov on the 19th of November, 2017.

Ogawa, H. (1995). Sustainable solid waste ` management in developing countries. Retrieved from https/www.gdrc.org on the 20th of October,2014.

Okwesili, J., Ndukwe, O., Nwuzor, C. (2016). Urban Solid Waste Management and Environmental Sustainability in Abakiliki Urban, Nigeria.Retrievedfrom www.europeanscientificjournal.vol.12,no.23 .ISSN 1857-7881,2016.

Pitt Public Health (2016). Why study public health? Retrieved from www.publichealth.edu on the 17th of May, 2016.

Singh V.P. Biswas, G. & Sharma, J.J (2007). Biomedical waste management: An emerging concern in Indian hospitals. India *Journal of Forensic Medicine & Toxicology*. Vol. 1 (2) pp. 39-44. 2007

Stockholm Convention Draft (2014). Protectinghuman health and the environment from persistent organic pollutants Retrieved from www.en.wikipedia.org/stockhohu convention on the 5th of November, 2014.

Tiger Sanitation Utah (2015). The importance of proper waste management. Retrieved from www.tigersanitationutah.com on the 11th of April, 2016.

United Nations Environment Programme (2014). Waste management: Integrated solid waste management. Retrieved from www.unep.org/gpwm on the 25th of October, 2014.

United Nations Development Programme (2013). Global Health Care Project. Retrieved from www.gefmedwaste.org/sation.php on the 21st of November, 2014.

United Nations Environment Programme (1999). Solid Waste Management in Health Care Facilities. Retrieved from www.unep.org on the 25th of October,2015.

United Nations Environment Programme (2014) Waste Management Guidelines. Retrieved from www.unep.org/gpwm on the 25th of October, 2014.

United States Environmental Protection Agency (2014). Disposal of medical sharps. Retrieved from www. Epa.gov/osw/nohaz on the 24th of November, 2014.

United States Environmental Protection Agency (2014). Medical Waste Tracking Act: Medical waste. Retrieved from www.epa.gov/osw/nohaz on the 24th of November, 2014.

WHO. (2014). Medical waste fact sheets. Retrieved from www.who.int/mediacentre/ factsheets on the 21st of October, 2014.

WHO. (2014). Risks associated with health care waste. Retrieved from app.who.int/iris/bistream on the 18th of November, 2014.