

SOLID WASTE MANAGEMENT PRACTICES AMONG PUBLIC HEALTH CARE FACILITIES IN CARCANMADCARLAN

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ABSTRACT

This study is a descriptive-evaluative survey which determined the solid waste management practices and disposal method of public health care facilities in CARCANMADCARLAN area. It is anchored with the Laws and Policies of Hospital Waste; the Metropolitan Manila Authority (MMA) Ordinance No. 16, Hospital Licensure Law (Republic Act No. 4226) and The Toxic Substances and Hazardous and Nuclear Waste control Act of 1990 (Republic Act No. 6969). A self-made questionnaire was used in the analysis and interpretation of data which has the following findings: Rural Health Units are classified as primary health care facility, while secondary health care facility offers specialized ambulatory medical services and common hospital cares; Aluminum, beverage cans, plastic materials and cellophanes are the most common waste disposed in the healthcare facility; on used medical waste such as gloves, used IV tubing, used catheter bags and tubing, empty IV bottles, human and pathological waste are commonly disposed by secondary healthcare facility; Waste disposal method in these healthcare facilities is rarely implemented; There is no significant difference as to waste management practices and disposal method of the primary and secondary healthcare facility and; Hand washing and use of disinfectants are the primary occupational and health precautionary measures performed by the respondents. It is concluded that classification of healthcare facility is dependent on the services it offers; thus, it recommends Intervention programs on managing medical waste must be conducted to the respondents for a better implementation.

Keywords: Solid Waste Management, Solid Waste Practices, Healthcare Facilities.

INTRODUCTION

The World Health Organization stressed that environmental accountabilities and appropriate waste disposal methods are essential to every member of the community. Improper disposal of wastes will bring hazard to human life and environment (WHO, 2011). Health care facilities primarily function to uphold prevention and cater cure against illnesses. Hence, health care practitioners' role is to promote correct practice of waste segregation to sustain a healthy life and environment. Health Care Waste Management (HCWM) is a major challenge for health facilities where people are exposed to risks due to poor of handling of waste. The best medical waste management practice is to prevent and minimize the generation of waste (Jang et al., 2006). In the study of Pradhan (2008), current solid waste management system in a municipality in India is not sustainable. However, the study showed that people in Darjeeling acted on the development of a sustainable system.

In the Philippines, degradation of the environment caused by man-made activities has pushed lawmakers to re-access laws to mitigate this damage. Laws and Policies on Hospital Waste such as the Metropolitan Manila Authority (MMA for brevity) Ordinance No. 16, Hospital License Law (Republic Act No. 4226) and The Toxic Substances and Hazardous and Nuclear

Waste Control Act of 1990 (Republic Act No. 6969) were created to which this study is primarily anchored. Likewise, the Health Care Management Manual of the Department of Health highlights the basic ways to manage waste management, segregation and proper identification of the waste. Similar principles govern the other laws subject on this research, in the MMA Ordinance No. 16, Hospital Licensure Law (Republic Act No. 4226) and the Toxic Substances and Hazardous and Nuclear Waste Control Act of 1990 (Republic Act No. 6969).

As a concerned citizen of a locality, it is imperative to be acquainted with the practices of managing medical wastes which are considered hazardous and infectious. Developing municipalities such as Carrascal, Cantilan, Madrid, Carmen, and Lanuza, also known CARCANMADCARLAN in Surigao Del Sur are now beset with waste management related problems such as flooding, uncollected garbage and inadequate or inappropriate disposal sites. This situation is highly tremendous to the health of every individual.

The perseverance of the researcher to conduct this study is to determine the waste management practices and disposal method of public health care facilities in CARCANMADCARLAN as basis for enhancement of long-standing processes of disposing waste.



Figure 1. Schematic Diagram of the Study

STATEMENT OF THE PROBLEM

This study was conducted to determine the waste management practices among health facilities in CARCANMADCARLAN. Specifically, this study aimed to answer to the following questions:

1. What is the profile of the public primary and secondary level health care facility in CARCANMADCARLAN in terms of the following indicators:
 - 1.1 Classification of Health Care Facility
 - 1.2 Location of the Health Care Facility?
2. What common wastes are disposed in the identified public health care facilities?
3. What are the management practices of each public health care facility in terms of the following indicators?
 - 3.1 Handling
 - 3.2 Labeling

- 3.3 Containment
- 3.4 Transport
- 3.5 Storage
- 4. In terms of the following indicators. What is the extent of implementation of waste disposal methods practiced by the health care facilities?
 - 4.1 Incineration
 - 4.2 Disposal in Sanitary Landfills
 - 4.3 Autoclaves
 - 4.4 Mechanical/Chemical Disinfection
 - 4.5 Irradiation
- 5. Is there a significant difference in the waste management practices and disposal methods between the primary and secondary public health care facilities?
- 6. What are the occupational health and safety precautionary measures practiced by the respondents?
- 7. What intervention program can be proposed to improve the existing waste management practices among the primary and secondary public health facilities in CARCANMADCARLAN?

HYPOTHESIS

The null hypothesis was tested at 0.05 level of significance

H₀: There is no significant difference in the waste management practices and disposal methods between primary and secondary health care facilities in CARCANMADCARLAN.

SIGNIFICANCE OF THE STUDY

The health and wellness of every individual depends on the practice of promoting a hale and hearty environment. The researcher believed that the result of this study will help; the community to be enlightened with status of the waste disposal and can therefore generate immediate action in resolving the problems concerning garbage disposal; the Department of Health to guide them in educating the people about the health risks resulted from improper waste disposal; the hospital personnel to be responsive in upholding prevention against possible illnesses caused from unsafe medical of waste disposal; the Local Government Units, the Community Development Information Center (CDIC), the Philippines Information Agency (PIA) and other government agencies in determining the behaviour and values of a particular group towards environmental issues and get involve in information dissemination, the patients to be provided with knowledge regarding hospital waste management and proper hospital waste segregation; the schools to operate waste reduction programs through school related groups and may be included in science classes and environmental clubs in their academic programs; the science instructors to stretch first-hand awareness as basis and references in teaching students with regards solid waste disposal; the researchers to use the recommendations of this study for potential opportunity to conduct related research study and underscore variables not identified in the present undertaking.

SCOPE AND LIMITATION OF THE STUDY

This study is limited to the common practices of disposing waste of the primary and secondary public healthcare facilities in CARCANMADCARLAN. The respondents of this study were the employees from the five Rural Health Unit located at each municipality of CARCANMADCARLAN and the Madrid District Hospital at Madrid, Surigao del Sur which

is classified as a secondary health care facility. It covered a one year time frame from school year 2012 to 2013.

DEFINITION OF TERMS

The following terms were operationally defined to easily understand this study:

CARCANMADCARLAN. Refers to the five municipalities in the province of Surigao del Sur included in the study. The acronym is derived from the first syllable of the town Carrascal, Cantilan Madrid, Carmen, and Lanuza

Hospital Waste. Denotes to all waste, biological or non-biological materials generated from hospital, and is not intended for further use

Level of care. Pertains to the intensity of medical care being provided by the physician or health care facility

Mechanical/Chemical Disinfection. Refers to the use disinfecting agents and materials in washing soiled materials

Medical Waste. Stresses wastes generated in the diagnosis, treatment or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biological.

Primary Health Care Facility. Denotes to the coordinated, comprehensive and personal care, available on both a first-contact and continuous basis; it incorporates the tasks of medical diagnosis and treatment, psychological assessment and management, personal support, communication of information about illness, prevention and health maintenance.

Secondary Health Care Facility. Refers to the medical care available in the community hospital, comprising the bulk of in-patient medical care and equipped to provide all but the most specialized of care, surgery and diagnostic modalities

Solid Waste. Refers to a type of waste that contains not more the 30% liquid

Waste Management Practices. Refers on the process how wastes are being disposed by the employees of the different health care facilities under study.

Waste Segregation. Refers to the solid waste management practice of separating and storing different materials found in solid waste in order to promote recycling and re-use of resources and to reduce the volume of waste for collection and disposal.

LITERATURE REVIEW

Health institutions are the primary advocate of safety and sanitation as prevention against various diseases. It is their duty to look after the public health by ensuring a clean, healthy environment for their employees and the community. In the process of health care, waste is inevitably generated (Patil and Pokhrel, 2004). In which, it eventually become a public health issue that attracts the attention all over the world (Miyazaki, Une, 2005).

The waste generated from hospitals is now recognized as a serious problem. It has harmful effects to both the environment and or on human beings through direct or indirect contact that can cause serious sickness and diseases that can even lead to death. Handling, segregation, mutilation, disinfection, storage, transportation and final disposal are vital steps for safe and scientific management of biomedical waste in any establishment. However, poor management of health-care waste can cause serious disease to health-care personnel, to waste workers, patients and to the general public. Moreover, inappropriate waste containers and unprotected pits increase risk exposure of the health care workers, of waste handlers and of the community at large. (WHO, 2003; HCWH, 2007).

Medical wastes constitute a larger part on what is known as ‘hazardous wastes’ of today (Chul-Jang et al 2006). In the last few decades, the generation of medical waste in Palestine, as well as many other countries, has become a serious problem and a hazardous issue that had a negative impact on human health and the environment (Miyazaki, Une, 2005). Waste management is an issue that has to be dealt with daily in order to control the huge amounts of waste currently passing through the towns and cities (Larsen, 2009). Hazardous products may be toxic, corrosive, explosive, or flammable. Minor attention has been directed to its proper handling and disposal of this waste.

Disposal of hospital and other medical waste requires special attention since this can create major health hazards. Inappropriate waste management will cause ecological contamination and may lead to transmission of diseases. The management of the medical waste is an emerging issue that is magnified by lack of training, awareness, and financial resources to support solutions.

The proper collection and disposal of this waste is of great importance as it can directly and indirectly impact the health risks to both public health and the environment (Abdulla et al., 2008). Practices in waste management are different over the world depending upon the country’s budgetary requirement. In some countries, it is now recognized that the waste-management hierarchy should be imposed with some flexibility to take into consideration environmental, economic, and social costs. It is understood that the Best Practicable Environmental Option (BPEO) will vary for individual waste streams and local circumstances. Florence Nightingale laid emphasis on the need for handling the physical environment in order to hasten the recovery of a client. She stressed that in nurturing the environment through providing nutrition, hygiene, light, comfort, appropriate noise, socialization and hope, the body could repair itself (Udan, 2004). Segregating waste offers a big help in solid waste problems (Cabildo, 2008). However, the growing quantity of garbage and sewage from cities increases every year. Thus, the best way to cope with waste problem is through a waste prevention approach (Yusico, 2008).

Three main concerns call for nationwide attention on solid waste management and waste resource recovery. One is the magnitude of the problem of waste generation, collection and disposal. The second pertains to the prospects of recovering resources from waste discarded by its original or previous user. The third concern raises the imperative for lifestyle changes in values, attitudes and critical behaviours (Rebullida, 2000). The problem of the health care facilities regarding their wastes may not be visible to the eyes. However, it does not implies that the people are safe from diseases.

METHODOLOGY

The researcher made use of descriptive-evaluative survey to define the different processes in waste management practiced by the respondents and to evaluate the validity and reliability through actual visitation in the area. The 93 permanent employees of public health care, both primary and secondary facilities in CARCANMADCARLAN, Surigao del Sur were taken as respondents of this study. A self-made questionnaire validated by experts was used to easily meet the objectives of this study. It is made up of four parts: Part 1 indicates the profile of the public health care facility in terms of primary and secondary level of health care facility: Part 2 is divided into two; first part indicates the different waste being disposed by the employees of the Primary and Secondary public health care facilities, second is the common waste management practices in the public healthcare facilities in CARCANMADCARLAN: Part 3

indicates the waste disposal method in the area under study: Part 4 shows the occupational health and safety precautionary measures practiced by the respondents. Data were tallied and recorded accordingly. The result was analysed and interpreted using; The Simple Percentage to identify the waste commonly disposed by the health facilities understudy; Weighted Mean to determine the extent of practices in handling and disposing the waste generated by the respondents; Analysis of Variance (ANOVA), in determining if there is significant difference in the waste management practices and disposal method of the primary and secondary health care facilities in CARCANMADCALAN.

RESULTS AND DISCUSSIONS

The data gathered were analysed and interpreted giving the answers to the problems of this study.

Profile of public health care facility in CARCANMADCARLAN area in terms of the identified indicators

| Classification | Location of Public Health Care Facility | Number of Employees |
|----------------|---|---------------------|
| Primary | RHU Carrascal | 16 |
| Primary | RHU Cantilan | 14 |
| Primary | RHU Madrid | 10 |
| Primary | RHU Carmen | 9 |
| Primary | RHU Lanuza | 8 |
| Secondary | Madrid District Hospital | 36 |
| Total | | 93 |

Table 1. Profile of Public Health Care Facility in CARCANMADCARLAN

Table 1 shows the profile of the public health care facility. Five (5) of them is classified as primary health care facility while one (1) of them is a secondary health care facility. The primary health care facilities were identified as the Rural Health Unit of the Municipality while the district hospital is considered as the secondary health facility.

Common wastes disposed in the identified public health care Facilities.

| Common waste disposed | Health Care Facilities | | Total | % |
|----------------------------------|------------------------|-----------|-------|------|
| | Primary | Secondary | | |
| Aluminum and Beverage Cans | 57 | 36 | 93 | 100 |
| Plastic Materials and Cellophane | 57 | 36 | 93 | 100 |
| Vials | 56 | 36 | 92 | 98.9 |
| Paper materials | 55 | 35 | 90 | 96.7 |
| Used plastic containers | 46 | 30 | 76 | 81.7 |
| Syringe | 48 | 25 | 73 | 78.4 |
| Ampules | 47 | 26 | 73 | 78.4 |
| Used cotton balls | 47 | 26 | 73 | 78.4 |
| Used gauzed pad | 40 | 25 | 65 | 69.8 |
| Used plaster | 40 | 23 | 63 | 67.7 |
| Broken thermometer | 37 | 25 | 62 | 66.6 |
| Broken glasses and bottle | 14 | 36 | 50 | 53.7 |
| Sharp Objects (needles, scalpel) | 44 | 25 | 49 | 52.6 |

| | | | | |
|--|---|----|----|------|
| Used gloves | 8 | 23 | 31 | 33.3 |
| Used IV tubing | 7 | 21 | 28 | 30.1 |
| Used blood bag | 7 | 21 | 28 | 30.1 |
| Used IV catheters | 7 | 21 | 28 | 30.1 |
| Uses catheter bags and tubing | 7 | 17 | 24 | 25.8 |
| Empty IV bottles | 0 | 21 | 21 | 22.5 |
| Human Waste (Urine, Feces, etc.) | 8 | 13 | 21 | 22.5 |
| Pathological Waste (Waste consist of tissue, placenta, and body fluids.) | 5 | 11 | 16 | 17.2 |
| Food left overs | 9 | 2 | 11 | 11.8 |
| Extracted tooth | 5 | 2 | 7 | 7.5 |

Table 2. Common Waste Disposed in the Public Healthcare Facilities

As depicted in the table, it can be observe that 100% of the respondents identified aluminum, beverage cans, plastic materials and cellophane as the most common waste disposed in their area. Food left overs and extracted tooth are the least disposed waste in the facility. Result implies that waste generated from public health care facilities is not limited medical wastes but as well as to the common household wastes. It could be attributed that the respondents bring packed or instant food and drinks. Moreover, the waste disposed by the health facilities determines the services that they offer.

Management practices of each public health care facility in terms of the identified indicators

| Waste Management Practices | Health Care Facilities | | Grand Mean | Qualitative Description |
|----------------------------|------------------------|-----------|------------|-------------------------|
| | Primary | Secondary | | |
| Handling | 2.82 | 2.41 | 2.61 | Regularly practiced |
| Labeling | 2.80 | 2.72 | 2.76 | Regularly practiced |
| Containment | 2.98 | 3.11 | 3.04 | Regularly practiced |
| Transport | 2.78 | 2.80 | 2.79 | Regularly practiced |
| Storage | 3.12 | 3.13 | 3.12 | Regularly practiced |
| Over all Mean | 2.90 | 2.83 | 2.86 | Regularly practiced |

Table 3. Summary of Waste Management Practices in the Public Healthcare Facilities

In general, the respondent assessed their waste management practices as regularly practiced with a grand mean of 2.86. It shows that public health care facilities regularly practice handling, labeling, containment, transport, and storage of hospital waste. However, its regularity done 3 times a week only. With this, a problem is being observed and need to be addressed since medical wastes pose severe effects on health and the environment in a minimal time (Lekwot et al., 2012).

The extent of implementation of waste management disposal in terms of the identified indicator

| Waste management Disposal Method | Primary Mean | Secondary Mean | Grand Mean | Qualitative Description |
|----------------------------------|--------------|----------------|------------|-------------------------|
| Incineration | 1.68 | 1.13 | 1.40 | Not implemented |
| Disposal in Sanitary Landfills | 2.28 | 1.83 | 2.05 | Rarely implemented |
| Autoclaves | 2.50 | 2.16 | 2.33 | Rarely implemented |

| | | | | |
|----------------------------------|------|------|------|------------------------|
| Mechanical/chemical disinfection | 4.03 | 3.36 | 3.69 | Many times implemented |
| Irradiation | 1.00 | 1.00 | 1.00 | Not implemented |
| Over all grand mean | 2.29 | 1.89 | 2.09 | Rarely implemented |

Table 4. Waste Management Disposal Method

The respondents assessed their waste disposal method as rarely implemented having an overall grand mean of 2.09. This implies that the public health care facilities rarely implements the entire waste management rules. This could be attributed with the fact that the services offered by the healthcare facilities in CARCANMADCARLAN area are only limited to the availability of equipment in the area. Since the health care facilities under study fall in the primary and secondary level of care, there is no higher form of medical cases that can generate waste that require a higher form of disposal method. This scenario is supported by the study of Abah and Ohimain, (2011) that the choice of waste treatment technology is tailored to the kind of healthcare facility services as well as availability and affordability of the technology.

Significant difference between the Waste Management Practices and Disposal Method of Primary of Public Health Care Facilities

| Sources of Variation | Sum of Squares | Mean Squares | F-ratio | Tabular F(0.05) | Decision |
|----------------------------|----------------|--------------|---------|-----------------|----------|
| Waste management Practices | 6.006 | 6.006 | 6.79 | 161.4 | Accept |
| Disposal Method | 0.0924 | 0.0924 | | | |

Table 5. ANOVA Table On the difference between the Waste Management Practices and Disposal Method of Public Health Care Facilities

Table 5 showed that the waste management practices and disposal method of the public health care facilities gained a computed F- ratio of 6.79 which is less than the critical value of 161.4 at 0.05 level of significance; hence, the null hypothesis is accepted. It therefore implies that primary and secondary healthcare facility has the same waste management practices and disposal method.

Occupational Health and Safety Precautionary Practices of the respondents.

| Occupational Health and Safety Precautionary Practices | Health Care Facilities | | Total | % |
|---|------------------------|-----------|-------|------|
| | Primary | Secondary | | |
| Hand washing | 57 | 36 | 93 | 100 |
| Use of disinfectants | 57 | 36 | 93 | 100 |
| Using of disposable gloves when handling waste | 48 | 26 | 74 | 79.5 |
| Following Safe system for waste management and disposal | 39 | 25 | 64 | 68.8 |
| Covering cuts and abrasions with waterproof dressing | 43 | 15 | 58 | 62.3 |
| Safe collection and disposal of sharps | 41 | 17 | 58 | 62.3 |
| Managing cases of exposure to blood and body fluid | 34 | 23 | 57 | 61.2 |
| Promptly cleaning up of spills and other body fluids | 37 | 19 | 56 | 60.2 |
| Ensuring availability of personal protective equipment | 35 | 19 | 54 | 58 |
| Wearing of aprons, gown, & etc. | 26 | 19 | 45 | 48.3 |
| Immunization from disease (e.g.,Hepatitis B., Flu) | 12 | 30 | 42 | 45.1 |

| | | | | |
|--|----|---|----|------|
| Using of face mask when disposing waste | 27 | 6 | 33 | 35.4 |
| Enforcing safe practices though monitoring and supervision | 20 | 6 | 26 | 27.9 |
| Wearing of eye protector goggles | 4 | 6 | 10 | 10.7 |
| Face shields | 2 | 2 | 4 | 4.3 |
| Set up and empower an Infection Control Committee | 4 | 0 | 4 | 4.3 |

Table 6. Occupational Health and Safety Precautionary Practices

The table shows that all the respondents are practicing the primary occupational and health precautionary measures such as hand washing and use of disinfectants. It can also be seen that succeeding occupational and health precautionary measures are also being performed. However, from the informal interview done, performing the primary occupational and health precautionary measures is not being performed every day. Similarly, the wearing of eye protector goggles, face shields, setting up and empowering an Infection Control Committee is the least performed precautionary measures by the respondents. Standard precautions such as hand hygiene, use of disinfectants and the use of personal protective equipment when handling waste are minimum infection prevention practices that apply to all patient care regardless of any setting where health care delivered (CDC, 2014).

Based from the findings of this study, it revealed that there is a lack of management practices and disposal method practiced by the respondents. There is a need to enhance waste management among health care facilities since some aspects of waste management are necessarily be addressed. Hence, an enhancement of solid waste management practices in primary and secondary health care facility in CARCANMADCARLAN is being proposed.

CONCLUSIONS

Based from the interpreted and analysed data, the problems of this study were answered giving the following conclusions; the classification of a healthcare facility is dependent on the services it offers; the type of waste generated by the health care facility is dependent on the by-products of the services rendered by the facility; there is a need to revisit the practices of the respondents in managing the medical waste for they are probably the source of contamination and potentially capable of causing disease; the choice of waste treatment technology is tailored with the kind of healthcare facility services as well as availability and affordability of the technology; regardless of the classification of a healthcare facility, waste management and disposal method is the same; standard precautions such as hand hygiene, use of disinfectants and the use of personal protective equipment when handling waste are minimum infection prevention practices that apply to all patient care regardless of any setting where health care delivered.

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